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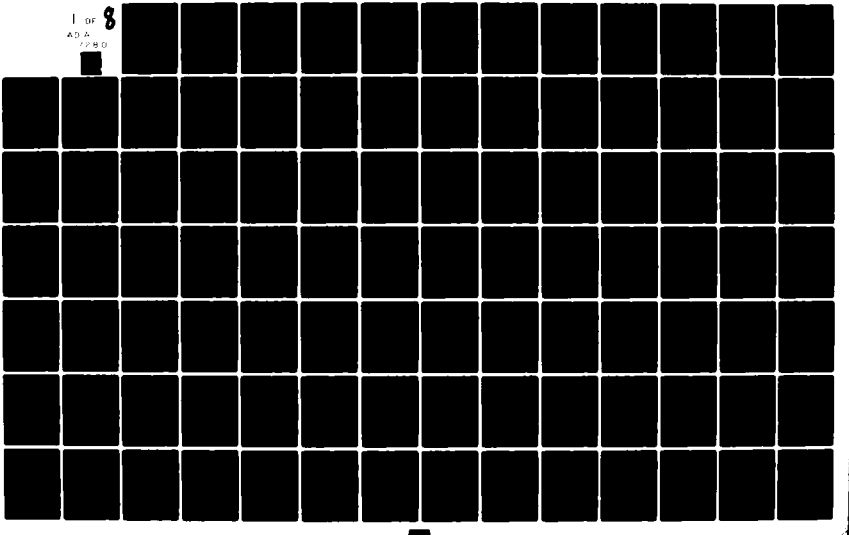

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ARCHAEOLOGICAL INVESTIGATIONS AT THE SAN GABRIEL RESERVOIR DISTRICTS, CENTRAL TEXAS

VOLUME 1

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report presents the results of archaeological investigations conducted by North Texas State University at two Corps of Engineers reservoirs on the San Gabriel River in Central Texas. The archaeology project consisted of site survey, evaluation, and data recovery of endangered cultural resources at North Fork and Granger Reservoirs. Eighty new prehistoric and one hundred historic sites were recorded, of which nine prehistoric and thirteen historic sites had further study. Additional research involved the Hoxie Ranch, and evaluations

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of a Paleo-Indian site (41WM419), and the Cervenka Site (41WM267).

The two reservoirs, locatedin different environmental zones, offered an opportunity to examin varying human adaptations. First, the cultural patterns of the two reservoirs were delineated. Next, the adaptive patterns and artifact assemblages were compared to determine if the two reservoirs were part of the same cultural area.

Contributions to Central Texas archaeology include: 1) the chronology of human occupation has been augmented by thirty-seven new radiocarbon dates; 2) an alternative to current models of prehistoric adaptation for the area is proposed; 3) an interpretation of the occurrence of burned rock middens has been presented; 4) an evaluation of the "phase" concept in Central Texas indicated the geographical boundaries of the phases varied through time.

F I N A L R E P O R T

ARCHAEOLOGICAL INVESTIGATIONS AT THE SAN GABRIEL RESERVOIR DISTRICTS, CENTRAL TEXAS

Compiled and Edited by
T. R. Hays
Principal Investigator

VOLUME 1

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ABSTRACT

This report presents the results of a series of archaeological investigations conducted by North Texas State University at two Corps of Engineer reservoirs on the San Gabriel River in Central Texas. The archaeology project consisted of site survey, evaluation, and data recovery of endangered cultural resources at North Fork Reservoir and Granger Reservoir. The survey for prehistoric sites focused on the proposed park areas. The historical site survey, however, encompassed all of both reservoirs. Eighty prehistoric sites and one hundred historic sites were located and recorded. Subsequently, nine prehistoric and thirteen historic sites were selected for further evaluation under the first contract modification. Other modifications involved additional research on the Hoxie San Gabriel Ranch, evaluation of a Paleo-Indian site (41WM419) discovered during borrow activities, and evaluation of the Cervenka Site (41WM267). These modifications increased the time of the project from eighteen to forty-eight months.

The results of the archaeological investigations in the San Gabriel Reservoir Districts have varied from paleoenvironmental reconstruction to experimental field procedures (including a test for data redundancy) to cluster analysis of projectile points. The research results are in individual chapters with the data base presented as appendices.

North Fork Reservoir is situated west of the Balcones Escarpment, while Granger Reservoir is located to the east on the Gulf Coastal Plains. Because the two reservoirs were located in different environmental zones, they offered an opportunity to examine varying human adaptations. First, the cultural patterns of the two reservoirs were delineated. Next, the adaptive patterns and artifact assemblages were compared to determine if the two reservoirs were part of the same cultural area.

This research project has contributed to an understanding of Central Texas archaeology in several ways. First, better control of the chronology of human occupation in Central Texas has been obtained by the dating of thirty-seven radiocarbon samples. Second, current models of prehistoric adaptation for the area have been examined and an alternative model proposed. Third, an interpretation of the occurrence of burned rock middens has been presented. Finally, an evaluation of the "phase" concept in Central Texas indicated the geographical boundaries of the phases varied through time.

ACKNOWLEDGEMENTS

One of the most difficult tasks in preparing a report is acknowledging those individuals who aided in its production. In a large multi-year project such as San Gabriel, a great number of people have been involved at its various stages. Consequently, it may not be possible to assemble the names of all those individuals. It is hoped, however, that no one will feel slighted if their name has been omitted, for the effort of each is appreciated.

First, appreciation should be expressed to the agency that sponsored the work, the Fort Worth District, U. S. Corps of Engineers. Special thanks must be extended to Denver Mills, Bud Horsman, Roger Hamilton, Sue Hazen and Bob Burton of the Planning Branch for their assistance in seeing the project to a successful conclusion. Other Corps of Engineers personnel who provided assistance are Larry Banks, Southwest Division Archaeologist; Ron Zunker, San Gabriel project manager at Georgetown; and Ken Howell, Corps of Engineers Park Ranger.

Many members of North Texas State University have provided continued help in completing this project. Our gratitude goes to Dr. Bill Glaze, former director of the Institute of Applied Sciences; and Dr. Ken Dickson, current director, who contributed logistical and financial support from their limited resources. The staff of the Institute of Applied Sciences must be acknowledged for their dedication and long hours spent in finalizing the report: especially Brenda Ettredge and Elaine Curry, for typing and numerous chores in preparing the manuscript; Gerald Blow and Julia Kerestine, who drafted the many figures; Marie-Anne Demuynck and Nancy Reese for their superb artifact illustrations; Jan Hansen, who supervised the final production.

Of course, this report would not have been possible without a tremendous effort on the part of the field and laboratory crews. A large number of crew members were involved in the several field seasons at San Gabriel. These dedicated individuals were certainly instrumental in the success of the project. Often the crews worked under adverse conditions, but always performed their tasks in a pleasant and professional manner. To each of these people we express our appreciation.

A final expression of gratitude should be extended to the several authors of the report who spent long hours, sometimes unpaid, to draft and revise their various sections. Thank you all for a job well done.

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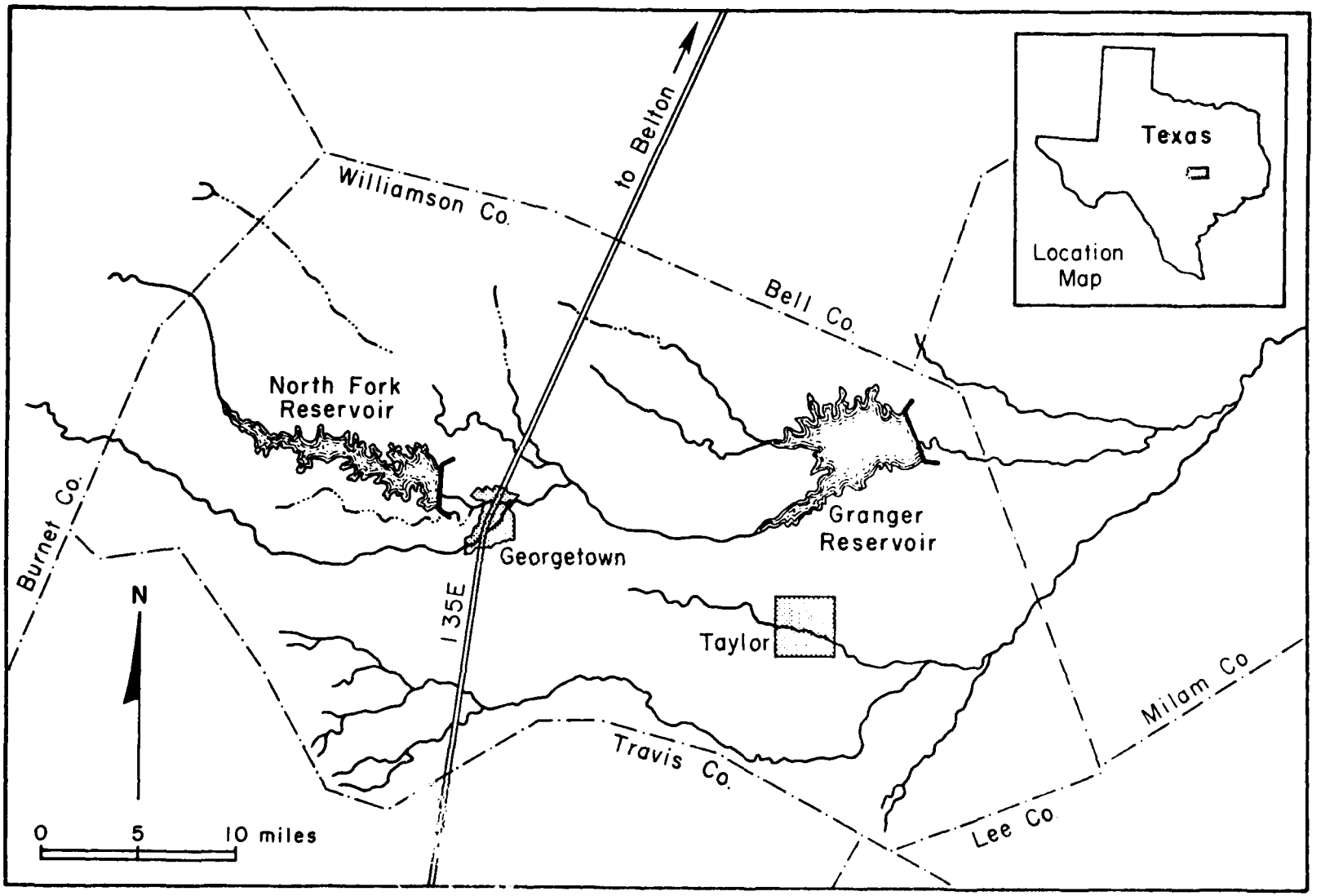
I. INTRODUCTION

Figure 1.1-1. Location Map of San Gabriel Archaeology Project.



1.0 Project Description

by

T. R. Hays

1.1 Location

This report concerns cultural resource investigations undertaken by the Archaeology Program of the Institute of Applied Sciences, North Texas State University at two U. S. Army Corps of Engineers reservoir districts on the San Gabriel River, Central Texas. The North Fork Reservoir (now Lake Georgetown) is located 3.5 km west of Georgetown, Williamson County, Texas on the North Fork of the San Gabriel River. Laneport Reservoir (now Granger Lake) is located on the main stem of the San Gabriel River about eleven km north of the town of Taylor , Williamson County, Texas (Fig. 1.1-1).

North Fork Reservoir will have a conservation pool covering 1,310 acres at elevation 791 feet msl. Maximum flood pool is at elevation 834 feet msl., and would inundate 3220 acres.

Granger Reservoir will be formed by a ninety-nine foot high earth fill dam measuring approximately 11,700 feet in length. Conservation pool elevetion is 504 feet msl. Flood level is 528 feet msl. The reservoir will form a maximum lake flooding 11,040 acres along the San Gabriel Rive· and Willis Creek.

1.2 Report Format

The report is divided into four volumes comprised of ten sections. Volume 1 includes Section I which contains introductory material, background information and a description of the project. Section II outlines the research design, the methodology which governed the research, and an evaluation of the pilot study of field methodology for determining a point of data redundancy. Section III provides results of the major excavations as individual site reports. Section IV describes the site survey and testing phase. Chapter 9 is concerned with the survey of public use areas. Chapters 10 and 11 present the results of historical research in the two reservoirs. Chapters 12 and 13 deal with test excavations at prehistoric and historic sites respectively.

Volume 2 contains a major section (V) of the report, the artifact descriptions and analyses. Chapter 14 describes traditional projectile point typology, presents new groups of projectile points, describes and analyses lithic tools and debitage for comparisons of site total assemblages, as well as describing non-lithic artifacts.

Sections VI-VIII provide a synthesis of environmental and archaeological data, and draws conclusions regarding prehistoric life-ways in the two reservoir districts. Chapter 15 presents data necessary for paleoenvironmental reconstruction. Chapters 16-18 synthesize all the data in statements about the archaeology of the two reservoirs. Chapters 19-21 (Contributions to Central Texas Archaeology) present discussions on specific topics based on the new data derived from the San Gabriel excavations.

Section IX lists the reference materials used in the report. Volume 3 (Section X) consists of nine appendices which contain raw data of environmental and artifact studies.

Volume 4 is Appendix J which reports the results of work by the Texas Archaeological Survey at three sites in Granger Reservoir.

2.0 Scope of Present Study

by

T. R. Hays

2.1 Initial Contract Requirements

The present project is the latest of a number of archaeological studies conducted in the San Gabriel Reservoir Districts. These investigations were designed to meet federal requirements for cultural resource management of Corps of Engineers properties. The plan of archaeological mitigation at the San Gabriel Districts has a multi-purpose design consisting of three different concepts: conservation, preservation, and data recovery. The present work was concerned with that portion of the program related to data recovery. The work to be performed was based on the conclusions of a meeting between three former archaeological contractors (UT Austin, Texas A&M, and NTSU), the State Historic Preservation Officer's staff, the National Park Service, and the Fort Worth District, Corps of Engineers at the North Fork project office on December 13-14, 1976. Major portions of the resulting data recovery plan were published by Moore, Shafer, and Weed (1978).

In a letter dated March 17, 1977 the Fort Worth District, Corps of Engineers requested the Archaeology Program at NTSU to respond to a Scope of Services concerning archaeological data recovery in the San Gabriel Reservoir Districts. The Scope of Services indicated that sites presumed to represent the full range of archaeological potential for contributing significant information for the area were selected for study. The data recovery program also was designed as a pilot study to evaluate the feasibility of determining a "point of diminishing returns," and the validity of using this technique in archaeological conservation. By use of statistically valid sampling, it was intended that maximum data recovery could be achieved with the minimum of excavation in order to: "1) preserve sites for future research; and, 2) reduce costs of mitigation in the best interests of archaeological goals, historic preservation, and the public interest." Analysis and statistical evaluation of each site was to be concurrent with field work in order to minimize the amount of work needed to obtain statistically valid samples from each site. The decision to stop work on a particular site or cluster of sites was to be based on a curve of diminishing returns and the archaeologist's professional judgement.

The Scope of Services for this project called for survey, testing, excavation, and a written report detailing the results of the work. The survey phase was to include "all fee lands not previously surveyed to locate sites of archaeological, architectural, or historical interests." Those areas amounted to about 2,500 acres at North Fork Reservoir and 2,200 acres at Granger Reservoir.

Excavations were to be conducted at the following sites:

North Fork	Granger
41WM53	41WM124
41WM56	41WM133
41WM57	41WM163
41WM66	41WM165
41WM72	41WM230
41WM328	41WM267
41WM330	41WM295
41WM331	41WM297

Limited surface collections were to be made from:

North Fork	Granger
41WM65	41WM117
41WM360	41WM134
	41WM286

The following sites were to be tested for features:

North Fork	Granger
41WM71	41WM258

In addition, site 41WM122 at Granger Reservoir was to be examined and recommendations made for preservation of the site. Finally, "an archival study and physical examination of all historic sites within the project boundaries" was to be conducted.

The Scope of Services indicated the research goals should be directed toward a diachronic and synchronic reconstruction of cultural history. Some of the objectives derived from the Interagency Archaeological Services - Denver (1976) were: (1) paleoenvironmental reconstruction and relationships to available resources with models of exploitation; (2) a settlement and population history; (3) socio-economic reconstruction for each definable time period; (4) an explanation for the cultural dynamics of the local sequence defined.

In addition to the above generalized problem orientation, IAS - Denver suggested that excavations could provide information which may be useful in examining the following problem areas:

1) excavations at burned rock middens and their surrounding areas could attempt to determine the function of the sites with respect to resource utilization, as well as the span of time of occupancy;

2) investigation of deeply stratified sites should include horizontal as well as vertical comparisons so that intersite, inter-feature, and interartifact relations could be explored;

3) investigation of quarry and procurement sites should attempt to determine subsistence activities and utilization of raw material resources.

The results of the research would be presented in a final report suitable for publication. The final report would contain: 1) an overview of the project areas; 2) individual site reports; 3) a summary of the archaeology of each lake district; 4) a comparison of the two lake areas; 5) statements regarding the importance of this work for Central Texas archaeology.

In April, 1977 a technical and fee proposal was submitted by NTSU to the Fort Worth District. At the Corps' request, the Texas Archaeological Survey of the University of Texas at Austin included a proposal to conduct investigation at several sites in the Granger Reservoir. Because of the magnitude of the proposed costs, a government audit was required for both NTSU and UT-Austin. These audits were completed in June, 1977. The first negotiating session occurred on July 15, 1977 and was concerned primarily with questions raised by the audits. A second negotiating session resumed on August 25, 1977. During that meeting, it was mutually agreed that the scope of work exceeded the funds currently available. The proposed budget was large due to certain unknowns regarding the field effort. Further, it was agreed that the government would revise the scope of work to clarify and limit the maximum amount of work required.

A copy of the revised scope of work was dated October 6, 1977. A revised proposal was submitted on October 13, 1977. The proposal included a schedule of maximum effort at the sites in terms of cubic meters of excavation and/or man days per site (Table 2.1-1). Negotiations resumed and were successfully concluded on November 8, 1977. The final contract documents were signed and completed on December 8, 1977.

Field work was scheduled to begin in January, 1978. The NTSU crews began the survey in the park areas and fee lands of the North Fork Reservoir on January 9, 1978. The UT-Austin crews would begin work at the Loeve-Fox site (41WM230) in the Granger Reservoir. The winter of 1977-78 proved to be one of the coldest on record in Central Texas. Work was hampered by cold, rain, sleet and ice. A total of approximately 390 mandays was lost during January and February, 1978 because of inclement weather, even though work continued under adverse conditions.

Field work was supposed to terminate after six months, but circumstances forced an extension of the work. First, a number of mandays were lost due to adverse weather. Second, and more importantly, work at certain sites took more time to complete than had been anticipated. For example, the Scope of Work required the contractor to "excavate each test pit to the limit of cultural deposition."

Table 2.1-1

Primary Contract Time/Work Allocation

Site	Max.M^3	Man-Days/Site
A. North Fork		
73	72	216
56	120	360
57	80	240
330	5	15
331	2	6
328	30	90
66	1	3
53	30	90
65	Surface Collect	2
360	Surface Collect	6
71	Strip and Test	50
		1078
B. Granger		
230 - UT	300	900
165 - UT	150	450
133 - UT	108	324
267	150	450
124	160	480
295	5	15
297	20	60
163	5	15
134	Surface Collect	10
117	Surface Collect	10
286	Surface Collect	15
258	Strip and Test	20
122	Test and Profile	30
		2779

This requirement was impossible to meet in some instances, because the previous information regarding the depth and complexity of some sites was erroneous. A case in point is site 41WM267 (Cervenka). The document used by the Corps and NTSU to estimate the necessary effort for the site indicated site 41WM267 was "two to two and one-half meters" in depth (Patterson and Moore, 1976). Our 1978 test excavations sampled cultural horizons 5.8 meters deep. Later tests (1979) indicated the cultural deposits were at least 7.5 meters in depth. Testing had to be terminated at that depth because of ground water flooding.

Site 41WM267 is but one example of the problems encountered when a well organized cultural resource management (CRM) plan is not followed. Ideally, CRM guidelines call for a three stage or phase approach consisting of survey, testing, and excavation. The survey should identify all of the known or visible cultural resources in an area. Based on the survey, representatives of each type of site are tested to determine the potential for eligibility for nomination to the National Register of Historic Places. Finally, a sample of those National Register sites are preserved or excavated to mitigate the adverse impact of a construction project on the significant cultural resources prior to construction.

Too often, however, the archaeology is not part of the pre-construction planning process. Consequently, in many cases, the construction is already underway, and the archaeology is conducted as a salvage project. In the San Gabriel project, the NTSU Scope of Work called for survey, testing, and excavation in the same contract, and while construction was in progress. It is suggested that if the work had been completed in stages, the cultural resources would have been better served at possibly lower cost to the government.

The original Scope of Services listed eight (8) sites at which work would result in "extensive data recovery" (COE 1977).

North Fork		Granger	
41WM53	41WM214	41WM165	41WM230
41WM73	41WM215	41WM133	41WM267

All of the sites had been tested previously, except 41WM165 and 267. Sites 41WM214 and 215 were later determined to be outside the Corps property line and were not excavated. In the final negotiated list, six (6) sites were selected for extensive data recovery.

North Fork	Granger	
41WM56	41WM124	41WM230
	41WM133	41WM267
	41WM165	

Of these six sites, two had not been tested prior to planned excavation (41WM165, 267). As it turned out, site 41WM165 did not require as much work as anticipated because it was a deflated site over bedrock. On the other hand, site 41WM267 was considerably more complex than anticipated. Consequently, unused mandays scheduled for site 41WM165 were diverted to site 41WM230. Nonetheless, the "limit of cultural deposition" was not attained at either site 41WM230 or 41WM267. Subsequently, site 41WM230 was to be protected and preserved, while more funds were obtained for additional work at 41WM267.

2.2 Contract Modifications

The survey portion of the contract regarding the fee lands was completed in March, 1978. The historic background and field survey of the two reservoirs was completed in May, 1978. A preliminary report on the results of these surveys was submitted in May, 1978. As a result of the recommendations of that report, the Corps proposed to fund a testing project at selected prehistoric and historic sites in the two reservoirs.

A "notice to proceed" for Modification #1 calling for test excavations at nine (9) sites was mailed to NTSU on July 10, 1978. Negotiations were conducted and concluded on August 10, 1978. On August 28, 1978, NTSU was notified to amend the Scope of Work to increase the number of additional sites to be examined from 9 to 22. A proposal was submitted on September 15, 1978. Negotiations commenced and were concluded on October 6, 1978. The sites to be studied and the approximate manday effort for each are presented in Table 2.2-1. Field work began October 15, 1978 and ended December 15, 1978.

While in the field, the field director was made aware of the presence of a possibly early prehistoric site being exposed by borrow activities in Borrow Area "I" in North Fork Reservoir. The site was visited by the field crew in November, 1978. Artifacts from the buried site indicated a probable Early Archaic or Paleo-Indian occupation. In addition, the presence of numerous hearths indicated the possibility of examining one of the few examples of a Paleo-Indian campsite in Central Texas. The Fort Worth District archaeologist was apprised of the possible significance of the site in late November, 1978. It was not until January 22, 1979 that a "notice to proceed" was issued for data retrieval at the archaeological site, subsequently designated 41WM419, located in Borrow Area "I". Field work began January 29, 1979 and ended February 16, 1979. The results of that effort are presented in the site report for 41WM419 (Chapter 12.21). The formal modification (#4) was completed in September, 1979.

Table 2.2-1

MODIFICATION #1: TIME/WORK ALLOCATION

SITE	LAKE*	TYPE**	MAN-DAYS	WORK
41WM402	NF	P	23	Surface collections
41WM403	NF	H	6	Map and Test
41WM399	NF	H	12	Test
41WM218	NF	P	40	Extensive testing
41WM409	NF	H	12	Test
41WM408	NF	H	12	Test
41WM318	GR	P	30	Test
41WM414	GR	H	10	Test
41WM415	GR	H	10	Test
41WM323	GR	P	14	Test
41WM125	GR	P	8	Test
41WM126	GR	P	15	Test
41WM368	GR	P	15	Test
41WM417	GR	H	6	Test
41WM418	GR	H	2	Document
41WM413	GR	H	36	Map and Test
41WM410	GR	H	6	Test
41WM411	GR	H	12	Test
41WM412	GR	H	12	Test
41WM416	GR	H	12	Test
41WM61	NF	P	30	Backhoe and Test
41WM404	NF	P	66	Excavation

* NF = North Fork
GR = Granger

** P = Prehistoric
H = Historic

On March 5, 1979 a "notice to proceed" was issued for additional work on the history of the Hoxie San Gabriel Ranch. NTSU submitted a proposal and negotiations were conducted on April 27, 1979. The final Scope of Work for modification #2 included: (1) an expansion of the known history of the Hoxie Ranch from 1938 to its acquisition by the Corps; (2) record of existence of the artifact culture of the residents and tenants of the Hoxie Ranch; (3) record of any folklore related to the ranch or its people that may come from interviews. The results of that research and oral history documentation is included in Appendix I of this report.

During the test excavations in 1978 at the Cervenka site (41WM267) in the Granger Reservoir, it had become apparent that the depth of the site had been badly misjudged by previous investigators. The site was supposed to be 2-2 1/2 meters deep. Yet, our work indicated a depth of at least 5.3 meters. That estimate was based on backhoe trenches which were limited to the extent of the backhoe boom. Consequently, the vertical cultural limits of the site could not be reached, and only a relatively small sample of the early deposits were tested as part of the initial contract. As a result, recommendations were made by NTSU supporting additional work at that site.

On June 13, 1979, a "notice to proceed" was issued to conduct excavations in the lower levels of the Cervenka Site (41WM267). NTSU submitted a technical and cost proposal on July 11, 1979. It was determined that the Scope of Work would require more funds than were currently available. Consequently, a revised Scope of Work was provided and negotiations were completed on August 8, 1979. This modification (#3) provided for between 16 and 20 cubic meters of Late and Early Archaic material and between 9 and 18 cubic meters of Paleo-Indian/Transitional deposits to be excavated. Analyses were to be performed only on the cultural materials from the lowest levels of the site (Paleo-Indian/Transitional). The laboratory analysis and report of the upper levels of the excavations were to be the subject of another contract at a later time. The two month field season at the Cervenka Site began in October, 1979.

In July, 1980 NTSU was informed that funds were available for the analysis of the cultural materials excavated from the upper levels at the Cervenka Site (41WM267), and that a Scope of Work would be forthcoming. Preparation of the Scope of Work was delayed, however, and was not issued until February, 1981. Negotiations began in April, 1981 and were concluded in July, 1981. The contract documents were signed and completed September 8, 1981. This final modification concludes the involvement of NTSU in the San Gabriel Archaeology project. What began as an eighteen month project has been extended to over forty-eight months (Fig. 2.2-1).

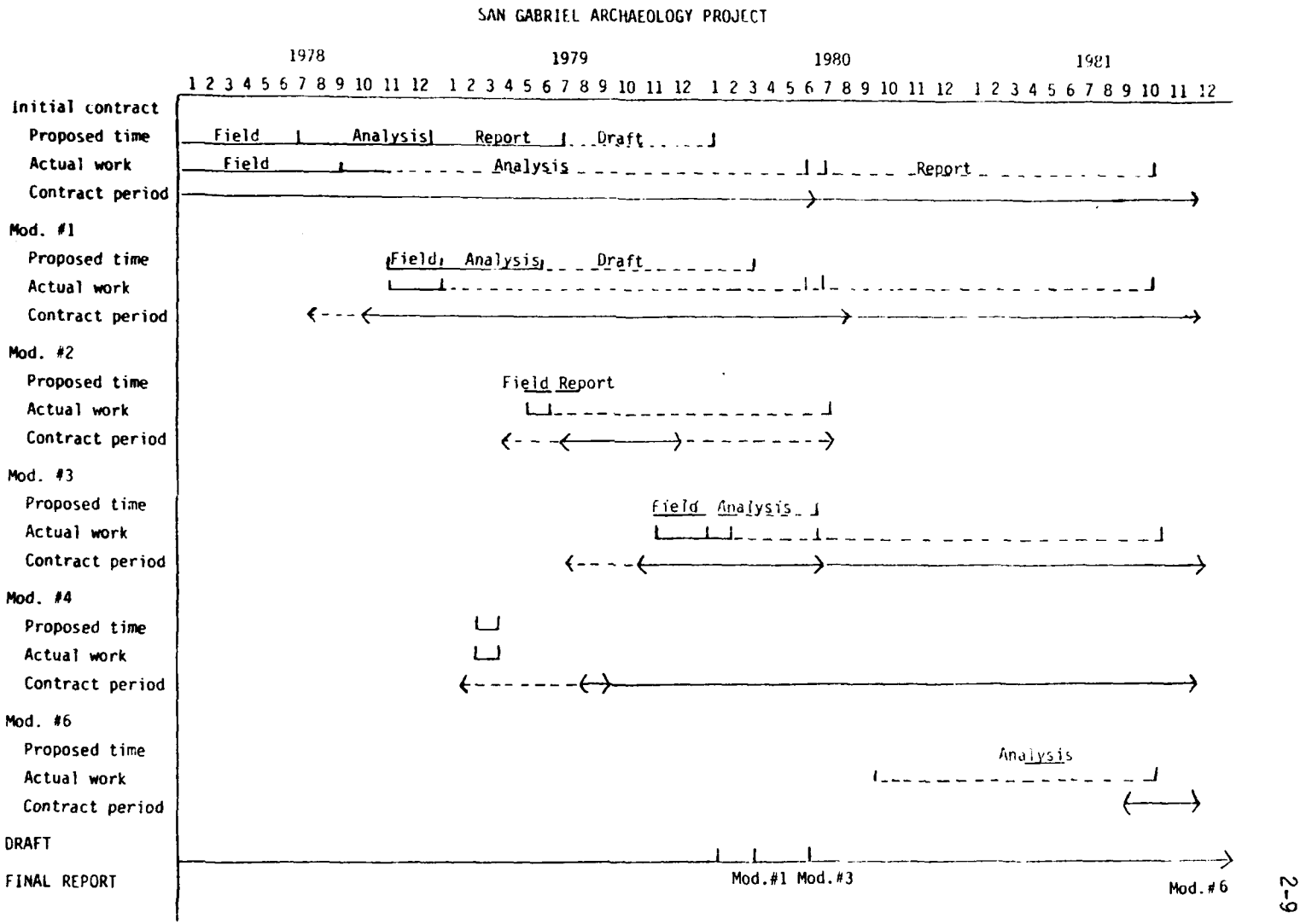


Figure 2.2-1. Time line for San Gabriel Archaeology Project.

3.0 Environmental Setting

3.1 Modern Vegetation

by

Ray Kenmotsu

Introduction

During 1978-79 a floristic study was conducted on United States Army Corps of Engineers North Fork and Granger reservoir sites in Williamson County, Texas, in conjunction with archaeological investigations of the same area.

Directed toward a delineation of population parameters based on the physiognomy of major life forms, this study provides a plant inventory baseline and a summary of current patterns of distribution and community composition as influenced by environmental factors (Appendix A). While the relationship between archaeological sites and the natural environment may never be resolved, attempts at defining the ecology of prehistoric man must be couched in an appreciation and understanding of as many environmental factors as can be studied.

North Fork Reservoir

The North Fork Lake study area lies along the northern branch of the San Gabriel River watershed approximately four miles northwest of Georgetown, Texas. Included within the Central Texas section of the Great Plains physiographic region (Fenneman 1931), the area has undergone substantial deformation and features a varying topography of rugged hills, deeply dissected canyons and alluvial terraces. The study area covers approximately 6,000 acres with elevations varying from about 1,000 feet atop the upland bluffs to 750 feet along the river valley channels.

Regional Provinciality

Based on major plant associations and geographical setting, the North

Fork Lake study area is included in the eastern sector of the Balconian Biotic Province (Blair 1950) and the generalized Comanchian Biotic Province of Dice (1943). This is recognized by Tharp (1939) as the oak-cedar (Quercus-Juniperus) region, a characteristic vegetation type along the eastern margin of the Edwards Plateau.

Because of the impact of grazing pressure by domestic livestock, the vegetation of the Edwards Plateau has reportedly changed drastically in the past 100 years. Early reports of the Edwards Plateau describe it as a prairie-grass covered area with woody plants scattered along slopes and drainages (Harvard 1885, Bentley 1898). Additionally, the Edwards Plateau has been classified by Weaver and Clements (1938) as part of the grassland climax of North America.

This general pattern of prairie grass elimination and woody invader species increase is most evident in the western, more arid portion of the Edwards Plateau, but may not hold true under the more mesic conditions found in the study area.

Presently, woody vegetation in the study area dominates on upland, slope, and riverine locations with herbaceous and grass species best established along alluvial terrace sites.

Environmental Factors

Climatic Factors

The climate of the study area is transitional, between dry subhumid and moist subhumid (Thornwaite 1943), creating a marginal range of moisture availability for plant need and use. Rainfall is moderate with an annual precipitation average of 32 inches. Periodic flooding and river channel overflow, however, does occur. Seasonal temperatures vary from a minimum daily average of 36° Fahrenheit in January and a mean maximum daily temperature of 97° Fahrenheit in August. The average growing season period lasts 257 days.

Edaphic Factors

An understanding of soil conditions is basic to an ecological insight into plant occurrence and distribution. The highly varied soils of the study area have been generally treated in a Department of Agriculture soil survey of Williamson County, Texas (Templin, et al. 1938). Soils information used for the present report is essentially derived from field observation and from unpublished data gathered by a recent Soil Conservation Service detailed survey of Williamson County and the write-up sheets available in the area office of the United States Soil Conservation Service, Austin, Texas.

Generally, soil development is dependent upon the erosional precipitators, topography, and geologic formations occurring in the area. Most of the soils of the North Fork study area are derived from old Comanchean limestone, with rock layers varying in hardness, texture, and purity. Some of the soil factors of greatest concern to the botanist are such profile characteristics as general composition (rock, silt, clay), structure (loosely, single-grained to highly aggregated), depth (shallow to deep), and permeability. All of these factors influence moisture availability and the overall site development suitable for successful plant growth. A brief summary of the area soils follows.

Generally, the soils along the narrow river channel and bank margins are deep, well-drained, grayish-brown silty clay loams formed in limed alluvium. These level to gently-sloping soils are moderately permeable and are subject to flooding because of periodic river overflow. The soils are moderately alkaline with a few weakly cemented calcium carbonate concretions throughout the profile.

Adjacent to the river margin soils and extending to the lower slopes of the surrounding uplands, fine silty clays occur on the sloping stream terraces. These deep, well-drained soils are largely derived from the alluvial deposits of stream overflows and the fluvial reworking of upland gravels. Occupying the position between the river and the upland slopes, these terrace soils form an elongated, rolling landscape along the valley floor. Terrace slope, ranging from 2 to 6%, allows for a slow-to-medium runoff feeding toward the main river channel. The calcereous, generally friable soils contain (few-to-many), strongly-cemented calcium carbonate concretions and are moderately permeable.

The soils of the adjacent slopes, primarily those along toe-slopes and the beveled edges of old high terraces, are composed of outwash materials of calcareous silty clay and coarse-textured sediments from weathered limestone. Small runoff drainages cut down the slopes exposing accumulations of colluvial limestone fragments and chert gravels, which vary in concentration throughout the profile in some areas. Additionally, quantities of leaf litter mix in the upper portions of the solum where deciduous trees cover the slopes. The soils are well-drained and are moderately permeable.

Along the slopes and uplands of undulating hills, the soils are shallow lithosols of clays and clay loams overlying fractured limestone bedrock, generally within twenty inches depth. The surface is commonly covered with coarse fragments of angular limestone cobbles, slabs, and stones that comprise most of the soil mixture and increase with depth. The soils exist only as thin mantles in eroded areas, and exposed bedrock is common where rapid runoff occurs. Soil development is best along the broad ephemeral drainages that flow intermittently from the uplands onto the lower terraces.

Tables

The methods of vegetation evaluation and quantification vary with the nature of the vegetation and the study goals. Any modification of methodology and application depends on the composition and structure of floral elements. No single technique of vegetation analysis is totally satisfactory for use in all areas.

The sampling approach to the vegetation of the North Fork study area involved a modification application of transect techniques as used in the wandering quarter method (Catana, 1963). Each transect consists of a series of measurements taken through the population studied. In application, a starting point and compass line (Usually a cardinal direction) are chosen. The nearest tree/shrub individual within a 90^{o} angle of inclusion (45^{o} to either side of the compass line bisector) is identified and is taken as the starting point for measurements. With this individual acting as the new vertex and using the previously selected compass line bisector, another 90^{o} angle of inclusion is constructed. Again the nearest individual within this new angle of inclusion is determined and identified, and the distance between the vertex and this nearest individual recorded. This procedure is continued with each recorded individual serving in turn as the new vertex for the following constructed angle. The series of recorded distances, angle construction, and species identification is continued through the population for a minimum of 15-20 recorded distances.

Several of these transects are taken through the populations studied, with the number of transects varying with population area and configuration. The distance measurements may be later computed to give a general estimate of population density. The mean distance between individuals can be squared to give an estimate of the mean area per individual in the population. Density can then be calculated per unit of area.

To determine the relative density of each species, each plant individual encountered is identified and the number of occurrences of a species is recorded. Additionally, the relative basal area dominance may be figured from the bole measurements taken of each of the individuals encountered in the transects.

The following abbreviations and notations are applicable to Tables.

T - distance measurement.

N - number of distances measured.

ΣTn - sum total of distances measured through population.

$Tm = \frac{\Sigma Tn}{N}$ - mean distance between plant individuals

Tm^2 - mean area per plant individual.

$Dp = \frac{100{,}000 \text{ Meters}}{Tm^2}$ - population density per hectare.

Si - total number of individual plants of a given species.

Si - sum total of individual plants of all species

%D (Relative Density) =

$\frac{Si}{\Sigma Si} \times 100\%$ - Number of individuals of one species as a percentage of the total number of individuals of all species.

Bi - Total basal area of all individuals of a given species.

Bi - Sum total of basal area of all individuals of all species.

%C (relative Dominance of Basal Area)=

$\frac{Bi}{Bi} \times 100\%$ - Basal area of individuals of one species as a percentage of the total basal area of individuals of all species.

Major Vegetation Areas

Based primarily on major variations in topography and/or plant associations, five relatively discrete vegetation areas are recognized on the North Fork Lake site. The area designations and plant associations, denote the significant species showing dominance and/or indicator value in the various areas.

Because of presence of multiple suitable habitats and species' adaptive potential, it is not uncommon to find a given species widely distributed over several of the different major vegetation areas. The resulting continuum of overlapping species populations issues from the individual response of each species to the environmental gradient.

The varied nature of the topography within the study area allowed for a systematic overview of plant communities. Vegetational association with the major topographic features was an important element useful in interpreting the many local occurrences of plant associations and the interacting factors of hydrology, topography, and soils.

Riparian Association

Restricted to areas along river banks, out on alluvial river channel islands, and the perimeter of isolated stock tanks, occasional riparian species occur as widely scattered individuals. Sycamore (Platanus occidentalis) and cottonwoods (Populus deltoides) were the most frequently noted species; however, black willow (salix nigra var. nigra) and common cattail (Typha latifolia) contributed significant growth in local areas.

Mesic Woodland (elm-hackberry association)

This plant community occurs primarily in the deep soils along the river bottoms and in association with moist alluvial habitats. Past clearing for rangeland development and the recent clearing activities contracted for reservoir development have eliminated most of these woodland populations. Although these small populations may have formed thickets of substantially larger cover over bottom and terrace sites in some areas of the reservoir, they are presently distributed in narrow, elongated groves fringing the river margins.

The growth of seral trees of remnant populations is dominated by cedar elms (Ulmus crassifolia) and netleaf hackberry (Celtis reticulata). Although the overall abundance may vary at different particular points along the river, the woodland densities may exceed fourteen hundred trees and shrubs per hectare in the few acreas lacking in recent disturbance, as in the sample site (Table 3.1-1). The data also reflect the greater relative density and basal area dominance of the cedar elms.

TABLE 3.1-1

Field Sample Data for Mesic Woodland.

N=19
Tn=50.55M
Tm=2.66M

$Tm^2=7.08M^2$
Dp=1,412 trees/ha.

	Si	%D	Bi	%C
Ulmus crassifolia (cedar elm)	13	65.0%	6.31M.	84.13%
Celtis reticulata (netleaf hackberry)	2	10.0%	0.48M.	6.40%
Bumelia lanuginosa (ironwood)	2	10.0%	0.27M.	3.60%
Ptelea trifoliata (wafer ash)	2	10.0%	0.27M.	3.60%
Dispyros texana (mexican persimmon)	1	5.0%	0.17M.	2.27%

Major shrub understory components include ironwood (Bumelia lanuginosa), Mexican persimmon (Diospyros texana), and wafer ash (Ptelea trifoliata). Other woody species of note include the pecan (Carya sp.), red ash (Fraxinum pensylvanica) and flameleaf sumac (Rhus lanceolata).

Rangeland (grasses and herbaceous species)

This designation includes both currently grazed and former pastureland. These assemblages, dominated by grasses and herbaceous species, generally occur on alluvial terraces.

Changes in relative dominance of species in these areas can be attributed to the changing relative productivity of species resulting from seasonal and phenological cycles. During the early phase of the study (winter months), relatively little cover of green herbage occurred over the area; however, scattered populations of bluestems (Bothriochloa spp.) and johnson grass (Sorgum halepense) persisted, showing relative dominancein local areas amongst dry litter. A few individuals of scattered mullein (Verbascum thapsus) and bull-nettle (Cnidosculus texana) were also noted.

The early vernal aspect of the spring flora was marked by the wide-spread flowering of chervil (Chaerophyllum tainturieri) and the emergence of brome grasses (Bromus unioloides and B. japonicus). Herbaceous species appearing include Texas vervain (Verbena halei), Mexican hat (Ratibida columnaris), and Texas frog-fruit (Phyla incisa).

Slopes (Mixed deciduous association)

Amid the gravelly soils of footslopes at the base of the exposed limestone bedrock, the abrupt, rising slopes are covered with a dense canopy of deciduous trees. Oak species dominate this portion of the area, with Texas red oak (Quercus texana) and white shin oak (Q. sinuata var. breviloba). Although the overall relative density of the red oak was greater, the shin oak appeared to attain a slightly larger bole growth per individual (Table 3.1-2).

As indicated by the species dominants, this sample site offers a locally dry habitat receiving moisture primarily from the runoff of adjacent upland areas. More mesic species, however, do occur in the sample and comprise most of the remaining floral constituents. Cedar elm and pecan together contributing 25% of the relative basal area, grow best along the shallow runoff slope drainages, as does the arizona walnut (Juglans major). Interspersed throughout the area, western soapberry (Sapindus saponaria var. drummondii) and hackberry trees occupy areas of thick soil accumulations along depositional shelves. The shrub understory is dominated by Mexican persimmon and southern black-haw (Viburnum rufidulum).

TABLE 3.1-2

Field Sample Data for Slope Vegetation.

N=41
Tn=169.11Meters
Tm=4.12M.

Tm^2=16.97M^2
Dp=589 trees/ha.

	Si	%D	Bi	%C
Quercus texana (texas red oak)	17	40.48%	7.26M.	29.24%
Q. Sinuata var. breviloba (shin oak)	8	19.05%	6.90M.	27.29%
Carya sp. (pecan)	4	9.52%	2.99M.	12.04%
Ulmus crassifolia (cedar elm)	3	7.14%	3.57M.	14.38%
Juniperus ashei (post cedar)	3	7.14%	0.84M.	3.38%
Celtis reticulata (netleaf hackberry)	1	2.38%	1.20M.	4.83%
Diospyros texana (mexican persimmon)	3	7.14%	0.84M.	3.38%
Juglans major (arizone walnut)	1	2.38%	0.59M.	2.38%
Sapindus saponaria var. drummondii (western soapberry)	1	2.38%	0.45M.	1.81%
Viburnum rufidulum (southern black-haw)	1	2.38%	0.19M.	0.77%

Uplands (oak-cedar association)

The vegetation over this portion of the study area is the well established and commonly recognized "hill country" association of scrub live oak (Quercus virginiana var. fusiformus) and post cedar (Juniperus ashei). Although all of the upland areas surveyed have undergone substantial modification, most of the activity has centered around "cedar chopping" and general eradication for rangeland development.

As evidenced by the observed condition of the sample site (tree stumps, etc.), the area has received recent cedar clearing and is presently dominated by species of scrub live oak and Texas red oak (Table 3.1-3). The overall density of about 800 trees per hectare in the sample may be expected to vary substantially throughout the upland populations of the study area, depending on the degree of disturbance.

The entire area is underlain with a fractured substrate of limestone at shallow soil depths that varies in size and number of fissures. Deep cracks may perforate the rock slabs and provide rooting areas of accumulated soil sediments. Soil moisture to the plants growing in these areas is provided by runoff water shed into these fissures.

Open upland areas occurring between the trees are interspersed with sparse populations of little bluestem (Schizachyrium scoparium) and three-awns (Aristida spp.). Shrub components include Texas kidneywood (Eysenhardtia texana), evergreen sumac (Rhus virens) and Mexican persimmon.

Broad ephemeral canyon draws have been eroded between the upland hills and offer a more mesic habitat for plant development. Depending on the amount of upland runoff received, the large drainages may vary in degrees of moisture availability and sediment depth. Accordingly, the distribution and composition of the floral assemblages also vary with these factors. The plant composition of moist habitats created by the flow of active seep springs closely resembles the plan composition occurring along the river valley margins. Along drier drainage sites, the upland vegetation extends in distribution down the drainage slopes creating vegetative homogeneity along the environmental gradient.

Conclusion

The nature of the North Fork vegetation, its distribution, and species composition have been discussed. Although much of the variation encountered can be attributed to the complex environmental factors, the influence of human modification of the area has been substantial. Clearer understanding of the area's flora can be greatly assisted by thorough research of the land-use history.

TABLE 3.1-3

Field Sample Data for the Upland Vegetation.

N=45
Tn=156.63 Meters
Tm=3.48M.

Tm^2=12.11M^2
Dp=826 trees/ha

	Si	%D	Bi	%C
Quercus virginiana var. fusiformis (scrub live oak)	25	54.35%	13.52M.	45.57%
Quercus spp. (oaks)	15	32.61%	12.09M.	40.75%
Juniperus ashei (post cedar)	3	6.52%	1.16M.	3.91%
Ulmus crassifolia (cedar elm)	2	4.35%	2.30M.	7.75%
Eysenhardtia texana (kidneywood)	1	2.17%	0.60M.	2.02%

Granger Lake

Setting

The Granger Lake study area occupies the bottomland and prairie formations along the main stem of the San Gabriel River in Williamson County, Texas. It is situated approximately 32 miles west of the confluence of the South and North Forks of the watershed on the edge of the Balcones Escarpment. Located north-northeast of Taylor, Texas, the lake area covers 14,000 acres of the Blackland Prairie, a western inclusion of the Gulf Coast section of the Coastal Plain Physiographic Province (Fenneman 1938). The area is generally of level to gently rolling landscape formed by erosion of fluvial and deltaic sediments dating to the Upper Cretaceous.

Vegetation Classification

A number of regional classification systems have addressed the Blackland Prairie flora. In their concept of life zones, Merriam (1898) and Bailey (1905) included the Blacklands in the Humid Division of the Lower Austral Zone. The generalized treatments offered by Dice (1943) and Blair (1950) consider the area a component of the Texas Biotic Province. The Texas Province represents an extensive ecotone with intergrading woodland and prairie associations in which the Blacklands is a major prairie member.

An early comprehensive inventory and ecological summary delineated the structure of major plant assemblages based on successional dominants throughout the eastern half of Texas (Tharp 1926). The Blacklands were designated an extension of the Andropogon-Stipa-Aristida Association. Scattered populations of these climax types were observed in the study area; however, their limited areal extent no longer reflects a climax prairie formation.

An analysis of the North American Grassland Formation recognized three major climax grassland types (Carpenter 1940). This work considered the Blacklands occurring within the lower Southern Faciation of the Tall Grass Prairie. Stipa leucotricha (Texas wintergrass) and Andropogon spp. (bluestems) were deemed the binding climax dominants.

The classification scheme offered by Dodd (1968) characterizes the Blacklands as a True Prairie member. Schazachyrium scoparium (little bluestem) and Andropogon garardii (big bluestem) provide the major contributions to upland prairie communities within the central portion of the True Prairie type. Mesic lowland areas of this association are dominated by Elymus canadensis (Canada wild-rye) and Panicum spp. (panic grasses).

Presently, the flora of the study area reflects substantial land-use modification resulting from agricultural and rangeland development. The upland prairie and bottomland populations are almost entirely in "old-field" assemblage, dominated by herbaceous, grass, and shrub species common to disturbed areas. Few bottomland populations of reported climax demonstrate well-developed structure with most occurring as scattered isolates. Woody vegetation is primarily restricted to mesic habitats along major drainage corridors.

Edaphic Factors

Soils of the study area primarily Vertisols and soils demonstrating vertic tendencies. Derived from the Taylor Marl and Navarro Groups, uppermost members of the Upper Cretaceous (Bureau of Economic Geology 1974), the soils generally lack a "B" horizon grading from "A" to "Ac" in profile. This horizonation is partly due to the soils' high shrink-swell potential which results from the wetting and drying of the fine-particle fraction, principally 2:1 expandable clays of montmorillonitic clay mineralogy. When dry, the soil may sufficiently contract to form deep cracks which, while open, are filled by surface debris. Upon rewetting, the clay matrix hydrates and expands attempting to refill its original volume. The cracks close but resulting pressure between the original soil matrix and the extra surface-derived materials may cause vertical shifts between these matrices and the formation of grooved "slickenside" structures.

Within the study area, soils of the level to gently sloping upland prairie and ancient terraces are primarily included in the Houston Black and Branyon Series, members of the fine, montmorillonitic, thermic family of Udic Pellusterts. These calcareous soils are of low chroma and lack a blocky structure and clay skins within a meter of the soil surface (Soil Survey Staff 1975). They differ from Typic Pellusterts in that the broad cracks are open from 90 to 150 cumulative days in most years.

Soils of the floodplain bottomlands are mollisols, typified in the study area by the Tinn and Krum Series. Both series possess a mollic epipedon and a clayey particle-size class. The soils develop wide cracks in most years and tend to demonstrate vertic behavior. The Tinn Series (an Haplaquoll) differs from the Krum Series (an Haplustoll) primarily in its characteristics associated with wetness.

Vegetation Areas

Plant distribution in the Granger Lake study area reflects the extensive Blackland conversion to cropland and rangeland use. While regional control of plant development is still exerted by atmospheric and physical conditions, the disruption of local biotic and abiotic systems has resulted in subseral occurrences of species adapted to disturbed sites.

Mesic Woodland (Ulmus-Celtis-Fraxinus)

These areas represent the remnant populations of bottomland and stream bank tree species growing in clayey, calcareous sediments. Most of these populations form wooded corridors along the main stem drainages of the San Gabriel River and Willis Creek.

Variability in species dominants was indicated by ocular estimates of local populations. However, the ubiquitous occurrences of Celtis reticulata (netleaf hackberry), Fraxinus pensylvanica (red ash) and Ulmus crassifolia (cedar elm) were noted in overview and are reflected in the sample data (See Table 3.1-4). These sample populations are of moderate density and disturbance, occurring in sample sites bordering bottomland areas cleared for agricultural use.

Additionally, Fraxinus pensylvanica and Salix nigra var. nigra (black willow) were prevalent among populations fringing the major drainage channels (Table 3.1-5). Other common species include Morus rubra (red mulberry), Sapindus saponaria var. drummondii (western soapberry), Populus deltoides (eastern cottonwood) and Carya spp. (pecans). Many of the pecan individuals are hybrids escaping as isolates from the bottomland populations of cultivated hybrid species.

Bottomland/Floodplain

Most of the floodplain bottoms in the study area have been formerly converted to copy and rangeland use, though they now lie fallow. Presently, vegetation assemblages represent ground-cover regrowth reflecting both poorly developed community structure and the disturbed condition of the site.

Population dominants vary with the seasonal life-cycle of species and successional development within local communities. The disruption of native, naturally occurring ecosystems have provided areas for expansion and proliferation of aggressive, highly adaptive species. Collection of specimens throughout the study area and observation of their distribution revealed general trends in community growth of predominate species.

Brome grasses, Bromus unioloides and B. japonicus were observed to dominate the spring flora. They are introduced species used occasionally for forage and erosion control. They are most commonly distributed in areas of disturbance, mainly old fields, ditches, and roadsides. By mid-summer, however, these species have been replaced in shaded areas by Elymus canadensis and Sorghum halepense (johnson grass) on open sites.

Cynodon dactylon (bermuda grass) and Bothriochloa ischaemum (K. R. bluestem) dominate areas of "improved pasture." These warm season perennials are introductions to Texas, commonly cultivated for grazing by livestock and wildlife.

TABLE 3.1-4

Field Sample Data for Mesic Woodland.

N=38
Tn187.34Meters
Tm=4.93M.

Tm^2=24.30M^2
Dp=412 trees/ha.

	Si	%D	Bi	%C
Celtis reticulata (netleaf hackberry)	20	50.0%	14.38M.	46.86%
Ulmus crassifolia (cedar elm)	7	17.50%	6.90M.	22.48%
Carya sp. (pecan)	4	10.0%	3.41M.	11.11%
Fraxinus pensylvanica (red ash)	2	5.0%	1.30M.	4.24%
Morus rubra (red mulbery)	2	5.0%	0.67M.	2.18%
Populus deltoides (eastern cottonwood)	1	2.5%	2.20M.	7.17%
Xanthoxylum clava-herculis (prickly ash)	1	2.5%	0.41M.	1.34%
Bumelia lanuginosa (gum elastic)	1	2.5%	0.37M.	1.21%
Ilex decidua (deciduous holly)	1	2.5%	0.15M.	0.49%
Melia azedarach (chinaberry)	1	2.5%	0.90M.	2.93%
	40	100.00%	30.69M.	100.01%

TABLE 3.1-5

Field Sample Data for Mesic Woodland.

N=29
Tn=115.12Meters
Tm=3.97M.
Tm^2=15.76M^2
Dp=635 trees/ha.

	Si	%D	Bi	%C
Fraxinus pensylvanica (red ash)	8	26.67%	5.76M.	22.45%
Salix nigra (black willow)	3	10.0%	2.59M.	10.09%
Ulmus crassifolia (cedar elm)	2	6.67%	2.74M.	10.68%
Maclura pomifera (osage orange)	7	23.33%	3.38M.	13.17%
Morus rubra (red mulbery)	2	6.67%	0.93M.	3.62%
Carya spp. (pecan)	2	6.67%	1.86M.	7.25%
Populus deltoides (eastern cottonwood)	1	3.33%	4.8M.	18.71%
Bumelia lanuginosa (gum elastic)	1	3.33%	1.13M.	4.40%
Sapindus saponaria (soapberry)	1	3.33%	1.12M.	4.36%
Celtis reticulata (hackberry)	1	3.33%	0.61M.	2.38%
Acer negundo (box elder)	1	3.33%	0.18M.	0.70%
Melia azedarach (chinaberry)	1	3.33%	0.56M.	2.18%
	30	99.99%	25.66M.	99.99%

The occurrence of scattered populations of Stipa leucotricha is noteworthy. This species is a recognized climax dominant. The relatively stable communities of this climax remnant and the thriving of Elymus canadensis in mesic habitats may indicate the potential for restoration of native conditions. Although other grass species considered to be indices of climax condition are represented in the bottomlands, they as yet occur in infrequent, isolated, and small populations.

Prairie Association

The upland prairie assemblages share common mixed community structure and species diversity with those of the bottomland. Many species are distributed over prairie and floodplain landforms, and in both areas, reflect "old field" characteristics. Common species to these disturbed sites include Sorghum halepense, Baccharis neglecta (roosevelt weed), Torilis arvensis (hedge parsley), Melilotus officinalis (yellow sweet clover), Phyla incisa (texas frog-fruit) and Solanum elaeagnifolium (silver-leaf nightshade).

One collection site was a prairie community of moderate areal extent consisting of an Aristida oligantha (prairie three-awn) and Schizachyrium scoparium mosaic. While the presence of Aristida spp. generally indicates dry or disturbed/overgrazed conditions, the presence of the S. scoparium climax type is considered an index of good range condition. The vigor of the S. scoparium community is in part a funtion of soil moisture. Given adequate precipitation over time, it should replace the more xeric A. oligantha community (Lynth 1971). Assuming no further land disturbances, this may well be anticipated due to the soils' ability to buffer moisture stress conditions.

3.2 Geology of the San Gabriel River Valley

by

Stephen A. Hall

North Fork Reservoir

Alluvium

The narrow valley of the North Fork of the San Gabriel River is cut deeply through thick-bedded Cretaceous limestones on the west, upthrown side of the Balcones Fault zone. The alluvial fill in the valley exceeds 4 meters in thickness. The alluvium represents a single, long-term episode of aggradation, lacking any evidence of an erosional break. The sediment is predominantly a yellowish brown clay with occasional lenses of limestone gravel. A thick gravel bed, such as occurs at section G-6 (Table 3.2-1) is commonly found at the base of the alluvial sections resting on Cretaceous limestone.

The present-day channel of the North Fork has entrenched about six meters through valley fill sediments and into Cretaceous limestone. The result is a terrace surface isolated above and paralleling the channel.

The terrace alluvium may all be Holocene in age. The earliest radio-carbon dated alluvial horizon is 5285 ± 725 BP (UGa-2482) and the latest dated horizon is 1155 ± 95 BP (UGa-2471). These dates indicate general correspondence of North Fork alluviation to that at Stillhouse Hollow Dam on the Lampasas River about 45km north of Georgetown (Cheatum and Slaughter 1966). Unionid shells from 4 meters depth at Stillhouse Hollow are radiocarbon dated 4970 ± 250 years BP. The basal gravels along the North Fork, as well as those reported from the Lampasas, may also be Holocene in age owing to the absence of iron staining and cementation.

Paleosol

A paleosol A-horizon occurs at the top of the terrace alluvium along the North Fork. The paleosol is about 1 meter in thickness and is mantled by varying amounts of colluvium and alluvial debris, especially along the margins of the terrace where sediment is washed from adjacent hillslopes. This soil was forming about 1,500 years ago. The beginning and end of the soil development is not well determined, however.

The paleosol is not covered by alluvium, except that emptied out of small tributaries onto the terrace surface, indicating that the North Fork channel was trenched during or after the development of the soil A-horizon. Also, the absence of an alluvial mantle indicates that, subsequent to channel trenching, there has been no valley alluviation or, if there was some, it did not reach the level of the terrace surface and paleosol.

Table 3.2-1. Measured sections of Quaternary valley fill along the North Fork of the San Gabriel River, Williamson County, Texas (September, 1976). Sections G-1, 2, 3, 4, 5, and 7 are found on Leander NE quadrangle, 7.5-minute series; section G-6 is found on Round Rock quadrangle, 15-minute series (U.S.Geological Survey).

G-1. 4.3 km N of Seward Junction on Hwy. 183, 1.3 km east on Jim Hogg Road, first crossing of North Fork, NE side of crossing

	thickness (meters)
brown silty clay, occasional gravels, contains land snails Rabdotus and Helicina	0.45
yellowish brown silty clay, slightly more indurated than overlying silty clay, contains Rabdotus and Helicina; gravels are concentrated in lower 1.45 meters of unit	1.80+
total thickness	2.25 meters

On NW side of crossing, the yellowish brown clay rests directly on Cretaceous limestone without the concentration of gravels; a large block of calcium carbonate-cemented gravel rests on the limestone and is embedded in the yellowish brown clay-the block has washed into its present position from an unknown source.

G-2. 4.2 km E of section G-1 on Jim Hogg road, at the junction with an unnamed tributary of the North Fork.

	thickness
grayish brown clay with scattered lenses of gravel; gray color probably due to high organic content	1.5+ meters

G-3. 0.7 km E of G-2 on Jim Hogg road, at crossing of North Fork, N bank and downstream from crossing.

	thickness
yellowish brown clay with scattered gravels and gravel lenses; contains land snails Bulimulus and Helicina.	1.4
grayish brown clay, scattered gravels and thin gravel lenses, contains land snails Rabdotus, Helicina, and Polygyra and aquatic snail Helisoma	0.6+

total thickness	2.0 meters

G-4. South side of North Fork, 1.4 km E of G-3 along Jim Hogg road, 0.4 km west (upstream) from Hunt Crossing on North Fork

	thickness (meters)
reddish yellow clay, scattered gravels, a 10-cm gravel lense at base of unit, contains land snails Rabdotus and Helicina and aquatic snail Helisoma	1.0
covered interval	0.6
yellow clay with calcium carbonate nodules (may be an old paleosol; if so, it predates paleosol at G-6), some scattered gravel	0.3
yellow clay	0.9
gravel bed, rests on Cretaceous limestone	0.5
total thickness	3.3 meters

G-5. North side of North Fork, immediately downstream from Russell Crossin, 6.7 km east of G-4 on Jim Hogg road.

	thickness
dark grayish brown clay (paleosol) with scattered gravels at base	0.6
light yellowish brown clay, 30 cm gravel lense at base	0.6
reddish yellow clay, calcareous, gravel lense at 70-80 cm, 280-320 cm, and 420-600 (base) cm below top of unit; basal gravel rests on Cretaceous limestone; scattered gravels and land snails throughout entire section; unionid bivalves at top of 280-320 cm gravel lense.	4.8
total thickness	6.0 meters

G-6. South bank of North Fork, adjacent archaeological site Wm-53; 2.7 km from Old Lampasas Road, just downstream from new crossing about 1.0 km down from North Fork Dam.

	thickness
light to dark grayish brown clay (paleosol)	1.0
yellowish brown clay, occasional land snails Rabdotus, and Helicina and unionid clams; scattered gravel; aquatic and land snail fauna occurs at base of this unit immediately above underlying gravel bed	2.1
gravel bed, with reddish yellow clay; lacks calcium carbonate accumulation	1.2
total thickness	4.3 meters

G-7. North bank of North Fork, 0.7 km downstream (east of Hunt Crossing, 1.1 km east of G-4, along Jim Hogg road.

	thickness
grayish brown clay	1.5
light brown clay with gravel lenses; unit rests on Cretaceous bedrock	1.0
total thickness	2.5 meters

Cretaceous bedrock at this locality is incised 3-4 meters.

Granger Reservoir

The San Gabriel River valley in the vicinity of Granger Reservoir is broader and has less relief than the North Fork area. This is due directly to the presence of soft upper Cretaceous marls that weather and erode more easily than the thick bedded limestones farther upstream. Also, in contrast to the North Fork area, a thick deposit of fluvial gravels mantles the valley sides and upland areas between valleys. These high terrace gravels are limestone cobbles derived from erosion of lower Cretaceous limestone to the west. The gravels accumulated at the boundary of the Balcones Fault zone and may be analagous to the Pleistocene Uvalde gravels first described southwest of San Antonio (E.G. Wermund, personal communication). These gravels were probably deposited as an enormous alluvial fan at the topographic break of the Balcones Escarpment. In the Granger Reservoir area, the gravels are eroded, and fine grain Holocene alluvium fills the San Gabriel River Valley. Although archaeological sites occur on the eroded surface of the Pleistocene gravels, no archaeological remains have been found in the gravel. The gravel is well exposed in quarries around Circleville, Texas.

4.0 Archaeological Background

by

T.R. Hays and Olin McCormick

4.1 Previous Investigations

Archaeological investigations in the San Gabriel Reservoir Districts were initiated in 1963. As a result of their reconnaissance, Shafer and Corbin (1965) reported 55 prehistoric sites in the North Fork Reservoir area, and 24 in Laneport (Granger) Reservoir. In the North Fork, the John Ischy site (41WM49), a burned rock midden, was subsequently tested (Sorrow 1969) as was the Barker site (41WM71), a surface site on an alluvial terrace (Sorrow 1970). Later, the Texas Archeological Survey tested an additional eight sites. Four sites (41WM57, 73, 88, and 115) were burned rock middens; and four (41WM33, 34, 56, and 87) were alluvial terrace sites (Sorrow 1973). Jackson (1974) reported additional survey and test excavations in the North Fork District. Forty seven new sites were recorded, and limited testing occurred at four late Archaic sites consisting of two terrace sites, one burned rock midden, and one surface site. Finally, North Texas State University tested four sites in the proposed borrow areas of the North Fork (Sullivan, Hays, and Humphreys 1976). These sites included three alluvial terrace sites (41WM50, 52 and 53) and one burned rock midden (41WM81). Survey and limited testing was also conducted by Texas A & M University (Fig. 4.1,2) in both Granger Lake (Moore, Shafer and Weed 1978) and North Fork Lake Districts (Patterson 1977, Patterson and Shafer 1980).

Following the initial reconnaissance survey (Shafer and Corbin 1965), three sites (41WM118, 133 and 135) at Granger Reservoir were tested (Eddy 1973). Excavations at the Loeve-Fox site (41WM230), including a Post-Archaic cemetery, were reported by Prewitt (1974). Emergency test excavations at the site at Granger dam (41WM21) were undertaken by Texas A & M University (Shafer, et al. 1978). In addition, excavations at three sites near Hoxie Bridge (41WM130, 284, and 294) were reported by Bond (1978). Lastly, the results of NTSU research in the two reservoir districts are presented in this report.

4.2 Culture History

Previous archaeological research in Central Texas has resulted in a chronological framework for the region based primarily on projectile point types (Weir 1976). Kelly (1947) used the McKern (1939) Midwestern Taxonomic System in an attempt to group archaeological materials from

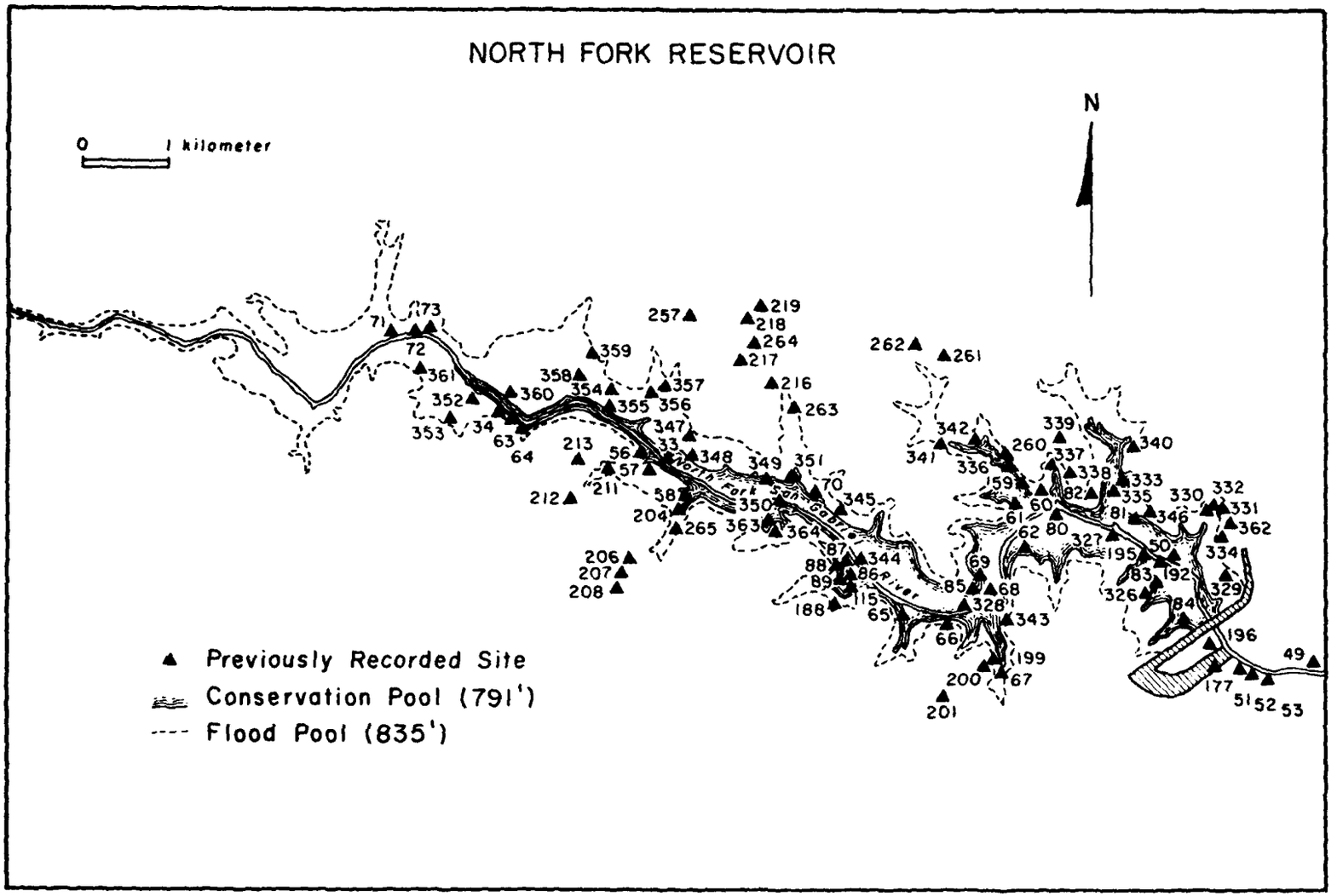

NORTH FORK RESERVOIR
N
0 1 kilometer
▲ Previously Recorded Site
Conservation Pool (791')
Flood Pool (835')
North Fork San Gabriel River

Figure 4.1-1

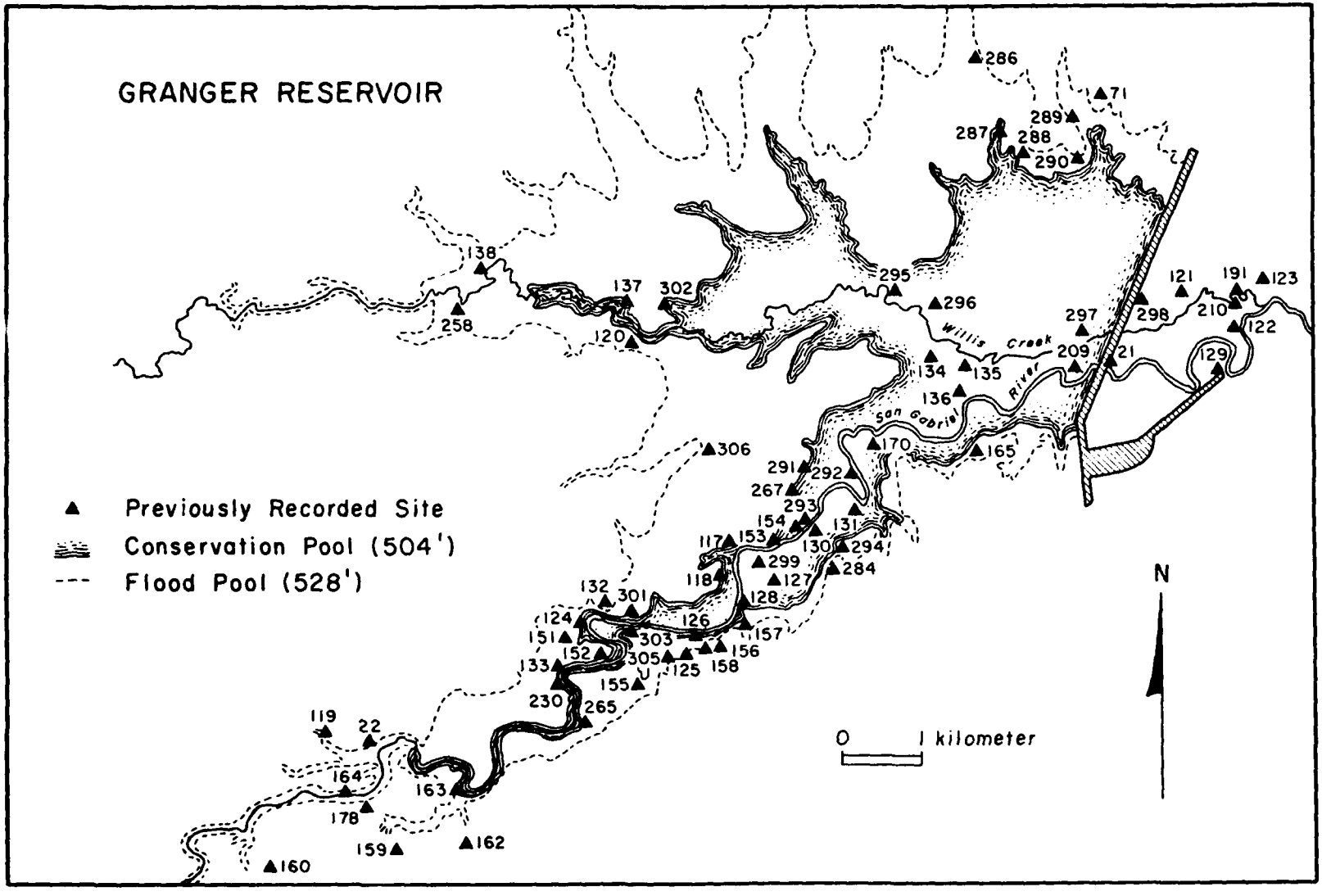

GRANGER RESERVOIR
Previously Recorded Site
Conservation Pool (504')
Flood Pool (528')
Willis Creek
San Gabriel River
N
0 1 kilometer
286
71
289
287
288
290
138
137
302
295
296
258
120
297
298
121
191
123
210
122
209
21
129
134
135
136
306
170
165
291
292
267
293
154
131
117
153
130
294
299
284
118
127
128
132
301
124
126
157
151
303
156
152
305
125
158
133
155
230
265
119
22
164
163
178
159
162
160

Figure 4.1-2

Central Texas. Suhm, Krieger, and Jelks (1954) grouped various projectile point types and ceramics into "fossil indexes" for Central Texas and other regions of the state. The most widely used source or artifact classification was published by Suhm and Jelks (1962).

Paleo-Indian

Man's earliest appearance in Central Texas apparently occurred at the end of the Pleistocene. Clovis, Folsom, Plainview, and Angostura projectile points have been found on the surface at various locations in Central Texas. Well-dated, in situ cultural remains from this early period are few, however. The Levi site in Travis County has Clovis, Plainview, and Angostura points dated before 7350 ± 150 B.P. (Alexander 1963). The Horn Rockshelter in Bosque County has an Angostura occupation associated with a radiocarbon date of 9980 ± 370 B.P. (Watt 1968). At the St. Mary's Hall site in San Antonio, Folsom, Plainview, and Golondrina points were dated around 8000 B.P. (Hester 1978).

It has been proposed that the presence of Angostura, Meserve, and Golondrina points represent the early occupation of Central Texas, named the Circleville Phase (Prewitt 1974). In the San Gabriel River Valley, the Loeve Site at Granger Lake has produced an Angostura-like point radiocarbon dated to 8500 ± 130 B.P. (Moore, Shafer and Weed 1978). The in situ presence of Clovis, Plainview, Angostura, Meserve, and Golondrina points has also been documented in the North Fork Reservoir during the present study at Site 41WM419 (Chapter 12.21).

Archaic

The Archaic represents a broad hunting and gathering cultural pattern beginning around 7000 B.P. and lasting until approximately 1500 years ago. Artifacts include large stemmed "dart points," and gouges, but no pottery. The evolutionary sequence of culture change is based on the occurrence of specific projectile point types. Most of the sites studied in this project would be considered "Archaic."

Johnson, Suhm, and Tunnell (1962) established four subdivisions within the Archaic period of Kelly's Edwards Plateau Aspect. Sorrow, Shafer, and Ross (1967) developed a chronological model based on projectile points and radiocarbon dates. Weir (1976) proposed several "phases" within the Archaic. A more recent chronological construct (Fig. 4.2-1) incorporating Patterson (1977) and earlier researchers was presented in Patterson and Shafer (1980). Finally, in this report other possible chronologies are presented (Chapter 7.1; Appendix J).

Neo-American

The Neo-American or Post-Archaic period is characterized by the presence of small "arrow points" and ceramics. The Austin and Toyah Phases contain Scallorn and Perdiz points, respectively. The earliest pottery is described as Leon Plain (Suhm and Jelks 1962). In the San

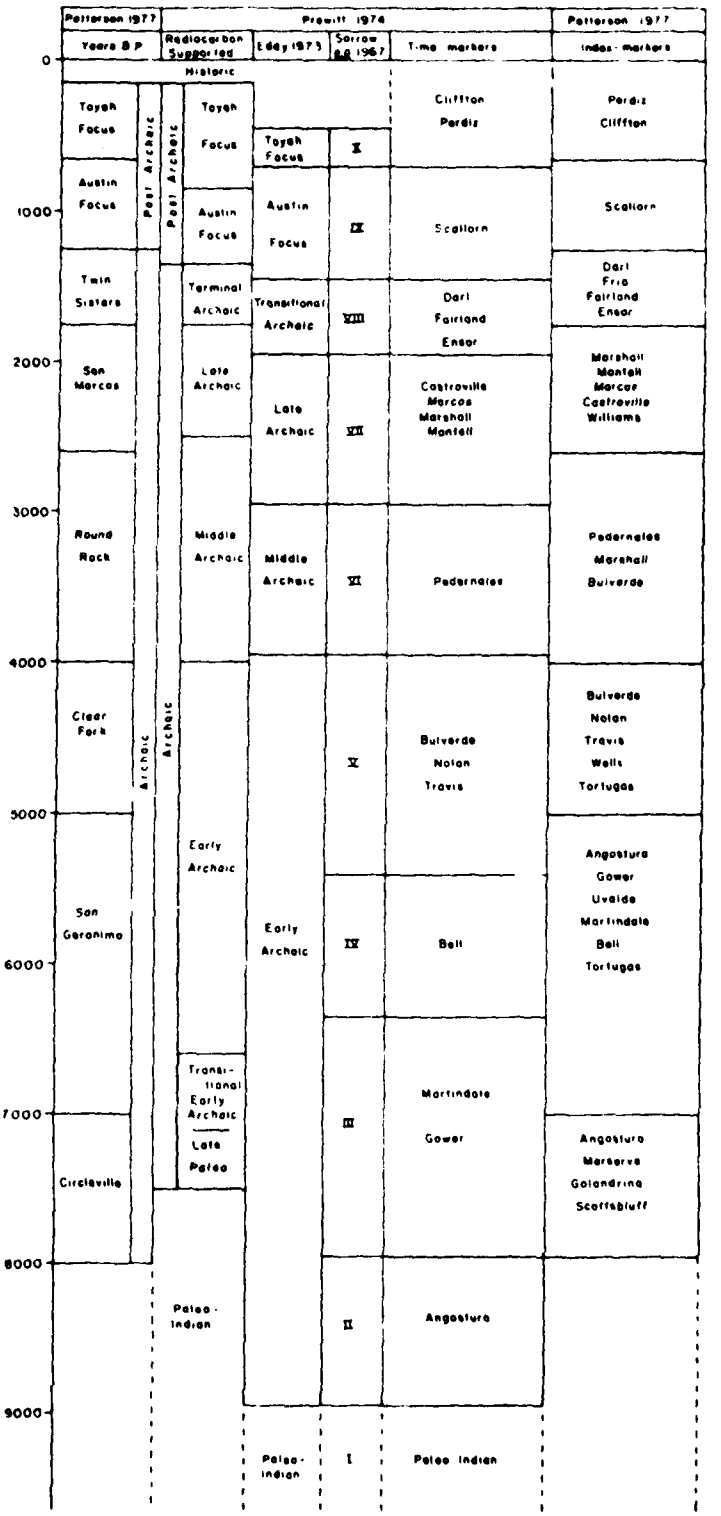


Figure 4.2-1

(after Patterson and Shafer 1980)

Gabriel Reservoir Districts, very few sites have unmixed Post-Archaic assemblages. Undisturbed Austin components occur at sites 41WM53, 41WM56, 41WM328, and 41WM404 in the North Fork Reservoir. Toyah Phase artifacts occurred at sites 41WM56 and 41WM71, but may not be in primary context. In the Granger Reservoir, Austin, and Toyah components are best represented at sites 41WM230 (Loeve-Fox) and 41WM258 (Bigon-Kubala).

4.3 Site Typology

One of the contributions of the work by Jackson (1974) was the use of a systematic site typology for describing cultural manifestations in the San Gabriel Reservoir Districts. Jackson used the typology defined in an earlier synthesis of Central Texas archaeology (Suhm 1960). The recognized types were: open lithic scatters, burned rock middens, terrace sites, lithic procurement sites, and rockshelters. Patterson and Shafer (1980) indicate that "functionally, the sites in the North Fork district fall into three classes: habitation (i.e., open lithic scatters, terrace sites, rockshelters, and around certain, probably most, burned rock middens; lithic procurement; and special processing (burned rock middens.)" Nonetheless, the site typology defined by Suhm (1960) was used in the survey by Texas A & M (Patterson and Shafer 1980). A similar site typology was utilized in this report.

II. RESEARCH DESIGN

5.0 Proposed Research

by

T. R. Hays

5.1 Research Goals

The proposed research was directed toward providing an understanding of man's utilization of this region of Central Texas through time. To this end, data would have to be gathered pertaining to the chronology of human occupation in the reservoir areas, a reconstruction of the paleo-environment for each time period, and the human utilization of those environments. The overall goals of this research design are outlined below.

These two reservoir districts offer a unique opportunity to test paleo-ecological models as they are located in different environmental zones. The North Fork Reservoir is on the edge of the Balcones Escarpment, whereas the Granger Reservoir is on the Coastal Plain. In order to understand the human adaptations in these two areas, the necessary models must be constructed in the following ways:

1. The history of paleo-environments: to be based on geomorphological studies and radiocarbon dated faunal and floral samples.

2. Resource exploitation consisting of the subsistence base and origins of raw materials utilized: to be determined by analyses of floral and faunal remains and identification of raw materials.

3. Socio-economic reconstruction which would require defining cultural components and site function: to be accomplished by comparisons of the total range of artifacts, not just the appearance of so-called "diagnostic" artifacts.

4. Once distinct components have been defined, their distribution in varying environmental zones can be plotted. The resulting settlement patterns will provide testable models for cultural change or stability through time for each area.

5. Finally, when an understanding of each reservoir district is gained, comparisons between the two areas can be accomplished. If similar adaptations are found for different environments, it may be that the same people were exploiting both areas at different seasons. This and other hypotheses of cultural adaptation and interaction could then be tested.

5.2 Analytical Methodology

Chronology

Until now, only the relative chronology of projectile point types developed at Stillhouse Hollow (Sorrow, et al. 1967) had been applied to the San Gabriel Reservoir sites. Sorrow (1973) indicated that no excavations had been directed toward verifying the applicability of that chronological framework in the North Fork District. Jackson (1974) reported charcoal was collected from one site, but it was not processed for radiocarbon dating. One date of 1620 ± B.P. (Tx-2539), indicating a probable Twin Sisters Phase occupation, was obtained by NTSU from test excavations at site 41WM53 (Sullivan, Hays, and Humphreys 1976: 19-26).

In the Granger District, Eddy (1973) reported two carbon dates for late periods (A.D. 600-1100) corresponding with Darl points and Perdiz arrow points. Three other dates averaging 5000 B.C. were obtained, but no "temporally restricted artifact types" were associated with those hearths. Prewitt (1974) presented a composite chart showing all radiocarbon dates for Central Texas. Fifty-three of the sixty-one dates were later than 2400 B.P. (Late and Post Archaic). Ten of the fifteen dates from the San Gabriel District were from one site (41WM230).

The critical need for "absolute" dating techniques for sites in the San Gabriel Reservoir districts was apparent. Consequently, every effort was made to locate and collect sufficient charcoal to date each occupational unit. At the end of the project twenty six new radiocarbon dates were available for this area.

Cultural Affiliation

Identification of similar sites is dependent upon characteristic elements of the sites. Studies of stone tool typologies and technologies are particularly important in postulating similar contemporaneous groups or the derivation of one group of people from another. Technological comparisons depend on the collection of all chipped stone material (tools, cores, debitage, and debris). Lithic assemblages were compared based on the total range of artifacts recovered, not just so-called "diagnostic" artifacts. The lithic artifacts were classified by artifact class, raw materials utilized, artifact size as well as specific stylistic and technological attributes (e.g., kind of retouch, platform types, and angles).

Attribute Analyses

Several attribute analyses were applied to separate categories within the recovered tool assemblages in an attempt to detect those attributes which are temporally sensitive. Several projectile point

types encompassing a relatively large number of identifiable specimens were recorded in the excavations. Although formal projectile point type designations have a utility as general temporal markers, the rather wide morphological parameters associated with many of the types tend to detract from their usefulness in defining stylistic trends and temporal boundaries.

It was proposed that an attribute analysis could provide chronologic information through a detailed examination of the marked morphological variability noted among the specimens included under each of these types. The attribute analyses of points included both qualitative (e.g., edge morphology, base morphology, blade form, etc.) and quantitative (e.g., maximum thickness, maximum length, basal width, etc.) observations. The attribute analyses resulted in a model which corroborated certain projectile point types, but also created a number of new types (Chap. 14.2).

Classification of Total Tool Assemblages

A type list was developed for tool assemblages recognizing both class (e.g., scraper, burin, point, etc.) and type (e.g., simple end-scraper on a flake with lateral retouch, dihedral burin on snap, Scallorn point) levels of classification. The list entailed specific descriptions and an illustration for each of the included types (Chap. 5.3). Such lists have proved to be practical organizational devices for chipped stone industries related to other prehistoric provinces (e.g., Bordes, 1961; Tixier, 1963; Wendorf, 1968; Marks, 1976; Henry, Kirby, Justen and Hays, 1980) and should be equally useful in evaluating the assemblages from the San Gabriel sites. Although the use of such lists for the generation of cumulative curves has met with limited success in seriating sites, type lists nevertheless represent a highly efficient means of defining inter- and intra-assemblage relationships (Chap. 16-18).

Settlement Patterns

After intersite comparisons have been made, the distinct cultural components defined can be placed within a chronological framework. Final assemblage groupings will take into account the functional variability expected between sites of the same cultural manifestation.

Next, the distribution of clusters of similar contemporaneous sites can be plotted on the reconstructed landscapes. The resulting settlement patterns should provide models for culture change or stability (e.g., differences in site size or location) through time for each area.

Subsistence Patterns

Identification of natural resource exploitation was based on examination of lithic materials, floral and faunal remains. Excavation procedures maximized the retrieval of small seeds, bones, and shells. These data could be used in environmental reconstruction as well as provide information about human eating habits. Remains of animals, fish and molluscs had been reported from sites in both districts. Since pollen studies proved unfruitful (Chap.15.3), flotation of matrix samples was used to recover small carbonized seeds which might have been missed with ordinary screening procedures. These seeds and accompanying tiny rodent, reptile, and fish bones would be most useful in reconstructing past environments and subsistence economies. Seasonality of resource utilization also was possible through examination of floral and faunal remains. The types of seeds present, age of mammals hunted, presence of migratory fowl, and size of molluscs all provide an indication of occupational seasonality. Identification of sources of raw material also can provide an insight into movements of people for resource exploitation. The provenance of lithic materials used for ground stone artifacts indicated external contacts during certain periods.

Paleo-Environment

Cultural ecology cannot be defined without a knowledge of the environments in which the adaptations occurred. A reconstruction of the past environment could result from geomorphological studies of terrace formation, drainage patterns, soil types, etc. Identification of pollen, land and aquatic fauna (particularly gastropods) can be most informative about past environmental conditions. Only in the Granger District have these studies been attempted (Eddy, 1973). It was unknown if pollen would be preserved and the results of previous efforts were negative (Bryant 1977). Large numbers of land snails however, had been reported from both the North Fork and Granger districts. Eddy (1973) indicated possible value of using these fauna as indicators of environmental change through time. Molluscan data from this project (Chapter 15.6) provide a more limited interpretation of climatic fluctuation, however.

Cultural Interaction

The problem orientation of this research design was toward a delineation of past cultural ecology through time in the North Fork and Granger Reservoir Districts. Since these two areas are located in different but adjacent environmental zones they provide an excellent laboratory for constructing paleo-ecological models. Separated by about twenty miles, the North Fork Reservoir is located on the edge of the Balcones Escarpment, whereas the Granger Reservoir is on the

Coastal Plain. Thus, two differing biotic zones are represented which may have necessitated differing human ecological adaptations.

After delimiting the cultural manifestations in the two reservoir districts, comparisons between the two areas could be accomplished. These comparisons were based on total assemblage characteristics and adaptive patterns. The purpose of the comparisons was to determine whether these districts were parts of distinct cultural areas or were part of the same culture area (Kroeber 1939).

Another area of comparison could involve site catchment analysis in the two reservoir districts in order to determine the territory utilized by the prehistoric inhabitants. It is recognized that prehistoric man may have limited his movements from a particular site in search of natural resources (cf. Eddy 1973). On the other hand, mobile groups commonly occupy more than one site during the year. Transhumance, for example, is an effective way of combining the exploitation of upland and lowland resources (Higgs and Vita-Finzi 1972). Of course, constructing these and other hypotheses of cultural interaction and adaptation would depend upon sites yielding the necessary cultural and environmental data. The recent work in these districts indicate that the necessary environmental data are difficult to obtain.

5.3 Lithic Tool Classification

by

Marie-Anne Demuynck

Methodology

After the excavated material was brought to the laboratory, the tools were separated from the general debitage and debris during the primary analysis. The tools were then subdivided into major categories. Later all tools were numbered, catalogued, studied, measured and classified. The projectile points and projectile point fragments were separated from the rest of the tools at that time, since they were to be the subject of a separate study (Chapter 14.1).

A very large amount of tools were recovered from the various excavated sites in both reservoirs, and it was very clear from the start of the analysis and classification processes that there was no existing typological classification system for Central Texas stone tools satisfactory to our needs. Consequently, a system was designed which would allow adequate comparisons of lithic assemblages from the different excavated sites of both reservoirs. This system follows the same principles as existing morphological typology systems (Henry, Kirby, Gusten and Hays 1980; F. Bordes 1961; Marks 1976, Wendorf 1968; J. Tixier 1963), which were adapted and expanded to fit our assemblages. Where possible necessary, well-identified, well-published, and generally accepted Central Texas artifact types were added and/or integrated into the classification. In general, the stone tools were divided into the following 16 classes:

I. Scrapers
II. Denticulates
III. Notches
IV. "Boring" tools, including gravers, borers, perforators, drills and other borer tools.
V. Truncations
VI. Backed pieces
VII. Burins
VIII. Composite tools
IX. Retouched pieces
X. Bifaces and biface fragments
XI. Gouges
XII. Axes
XIII. Chopping tools
XIV. Scaled and battered pieces
XV. Unifaces
XVI. Points and point fragments

Each of these classes was, when necessary, further divided into several types and subtypes. For example: class = scrapers; type =

single endscraper; subtype = single denticulated endscraper. For further explanations and more information on the various classes, types and subtypes, refer to the typelist and the individual site reports.

For each site, all the tools were initially studied as one assemblage. Afterwards when all the tool types were established, the sites were studied as to their respective cultural components. It is necessary to remark here that an unfortunately large number of tools came from undatable or mixed strata, and therefore could not be used in determining cultural stone tool assemblages. In the final synthesis, only the identifiable cultural zones were used.

An extensive analysis and study of the lithic tools of 5 North Fork and 6 Granger Reservoir sites were the basis for the development of the tool classification used in this report. Tools from two of the Granger Reservoir sites, i.e. 41WM133 and 41WM230 had to be returned to TAS before the analysis was entirely completed.

Several other sites, which were tested, surface collected, as well as new sites discovered during survey, yielded lithic materials, debitage elements as well as tools. The debitage elements of these sites were analysed in exactly the same way as the other sites. The tools were analysed and classified according to the typelist established during previous analysis. In very few cases a new tool type variant had to be added to the typelist when it was not previously encountered. The tools from surface collections and testing were not as extensively described as was done for the main sites, and were added to the site descriptions (Chapter 12.0).

After considerable deliberation, it was decided that cumulative diagrams would be the best way to present our results. A cumulative graph was made for every site, reflecting its various cultural components. A cumulative graph was also made for each cultural component, comparing the said cultural zones from all sites where they occur (Chapter 18.0).

Classification

The various tool classes used for the graphs, and their subdivisions are the following:

Class I. Scrapers:

1. single endscrapers
2. single sidescrapers
3. double and multiple scrapers
4. other scrapers

Class II. Denticulates

5. serrated pieces
6. denticulated pieces

Class III. Notches:

7. single notched flakes
8. multiple notched flakes
9. notched blades, bladelets and microblades
10. other notched pieces

Class IV. "Boring" or "borer" tools:

11. gravers
12. borers
13. perforators
14. drills
15. other boring tools

Class V. Truncations

16. single truncations
17. double truncations

Class VI. Backed pieces

18. backed along a complete edge
19. partially backed pieces
20. double backed pieces, and other backed pieces.

Class VII. Burins

21. angle burins
22. dihedral burins
23. oblique burins
24. transversal burins
25. multiple burins

Class VIII. Composite tools

26. --not subdivided--

Class IX. Retouched pieces

27. unilaterally retouched pieces
28. bilaterally retouched pieces
29. multilaterally retouched pieces
30. other retouched pieces

Class X. Bifaces

31. small triangular - subtriangular bifaces
32. medium to large triangular to subtriangular bifaces
33. pointed bifaces with irregularly retouched base
34. stemmed and shouldered bifaces

35. miscellaneous bifaces
36. "preforms" and/or unfinished bifaces

Class XI. Gouges

37. --not subdivided--

Class XII. Axes

38. --not subdivided--

Class XIII. Chopping tools

39. --not subdivided--

Class XIV. Scaled pieces

40. --not subdivided--

Class XV. Unifaces

Class XVI. Points (Chapter 14.1)

A total of 40 different classes and types were compared for all the main sites and all their cultural components. Projectile points and projectile point fragments were not included, nor were the biface fragments. It was thought that the latter would contribute very little if anything to the final comparisons. None of the unidentifiable fragments from the various tool classes were included, for the same reasons.

Projectile points and projectile point fragments were not included in the cumulative diagrams either. These artifacts are the traditional cultural markers used for dating the cultural components, and it was thought that their inclusion might bias our sample. It was the specific objective of the research to emphasize the other tool classes present in the San Gabriel lithic assemblages.

Based on the typological analysis and the results of the cumulative diagrams for each cultural component, an attempt was made to construct a tentative type list for each cultural component. It is evident that a more permanent type list can only be composed after stone tools from many other Central Texas sites are studied in a similar manner.

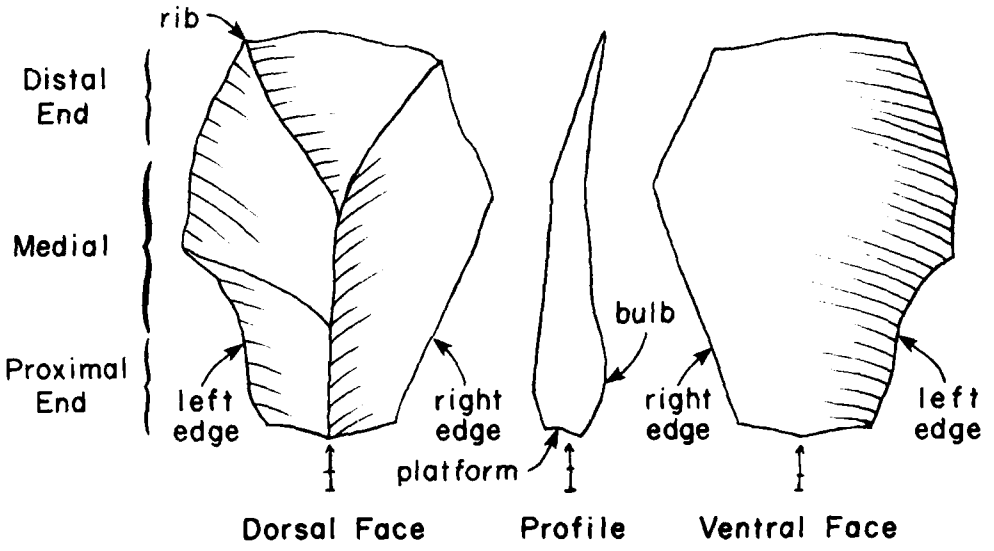
At this point, it seems necessary to emphasize that none of the terms given as names to the different artifact classes and types have any functional implications. The terms only name certain morphological and technological similar tool types, so that the cultural horizons of the sites could be compared to each other on an adequate basis. To be able to determine the real functions of the tools with some degree of certainty, a very extensive and specialized microscopic analytical study is needed, which was beyond the scope of the present analysis. Occasionally, randomly chosen artifacts were examined under a low power magnification, and an indepth study seems promising.

Terminology

The terms used in the description of all tools made on flakes and blades is consistent with that used for the debitage and debris analysis. Definitions for all terms, such as "flake", "blade", etc. are the same, as are the terms used to indicate the amount of cortex left on the dorsal face. The terms "primary" (100% cortex) and "tertiary" (no cortex) were always written in full. The secondary elements were indicated as follows:

--secondary a elements (+50% cortex) = Sa or secondary (Sa).
--secondary b elements (-50% cortex) = Sb or secondary (Sb).

The different parts and elements of flakes, blades, etc. are shown in Figure 5.3-1:



The flakes were oriented dorsal face up, ventral face down, the proximal end and striking platform of the element towards the analyst. The left and right edge can then be easily named. The top part of the element is called the "distal" end, the opposite part containing the bulb and the platform, is called the "proximal" end. The middle part is named "medial". The dorsal face can have cortex or another natural surface (primary elements), or ribs (tertiary elements) or both (secondary elements). The ventral face contains the bulb and cone at the proximal end, ripples and more or less perceptible fissures.

Dorsal retouch relates to retouch visible on the dorsal face (also called obverse retouch), ventral retouch relates to retouch visible on the ventral face (also called inverse retouch). The size

of the retouch was arbitrarily determined as follows:

--"fine" retouch: all retouch shorter than 2 mm.

--"small" retouch: all retouch longer than 2 mm. and shorter than 4 mm.

--"medium" retouch: all retouch longer than 4 mm. and shorter than 6 mm.

--"large" retouch: all retouch longer than 6 mm. and shorter than 10 mm.

--"very large" retouch: all retouch longer than 10 mm.

Only in the very beginning is there any need to measure the retouch size; afterwards it can easily be estimated by an experienced analyst.

Four different retouch angles were discerned although no specific measurements were assigned:

--flat retouch
--medium retouch
--steep retouch
--perpendicular retouch (retouch which forms an angle of 90^{o} or more).

Type List

The type list is ordered by sequence of the tool classes; i.e. the scrapers are the first class, with the different scraper types and subtypes, followed by the denticulated pieces, etc. For each tool class, general references and definitions can be found in the works cited in the introduction. Specific subtypes are referenced separately where necessary.

I. SCRAPERS (Figs. 5.3-2,3).

A. Single endscrapers

1. on flake
2. on retouched flake
3. on blade, bladelet or microblade
4. denticulated endscraper
5. notched endscraper
6. shouldered endscraper
7. inverse endscraper on flake
8. inverse endscraper on retouched flake
9. transverse endscraper

B. Single sidescrapers

1. on flake
2. on retouched flake
3. denticulated sidescraper
4. notched sidescraper
5. on backed flake or blade
6. inverse sidescraper on flake
7. 'rabot' (de Heinselin, 1962, p. 28)

C. Double scrapers, end- and sidescrapers

1. double endscraper
2. double sidescraper
3. atypical double sidescraper, i.e. both scraper bits are small and occupy only part of each edge in non equivalent loci
4. single end- and single sidescraper
5. single end- and single sidescraper, dejete

D. Multiple scrapers

1. 3 or 4 scraperbits

E. Scrapers

1. 'giant' scraper
2. corescraper
3. microscraper
4. doubtfull specimens, usually because of a damaged scraperbit

F. Fragments

1. unidentifiable scraperbit fragments
2. scraperbit renewal spalls

II. DENTICULATES (Figs. 5.3-4,5).

A. Serrated pieces (or microdenticulated pieces)

1. a whole flake edge is finely denticulated or serrated
2. partially serrated piece
3. serrated fragment

B. Denticulated pieces (or macrodenticulated pieces)

1. Flakes - denticulated flake
   - denticulated flake with continuous and regular additional retouch
2. Blades, bladelets and microblades

FIGURE 5.3-2

STONE TOOLS: SCRAPERS.

	Site	Type
a	41WM267	single endscraper on flake.
b	41WM56	single endscraper on a retouched flake.
c	41WM56	single sidescraper on flake.
d	41WM56	single denticulated sidescraper.
e	41WM56	single sidescraper with notch.
f	41WM56	double scraper, single end and single side.
g	41WM133	double sidescraper on flake.
h	41WM163	microscraper.

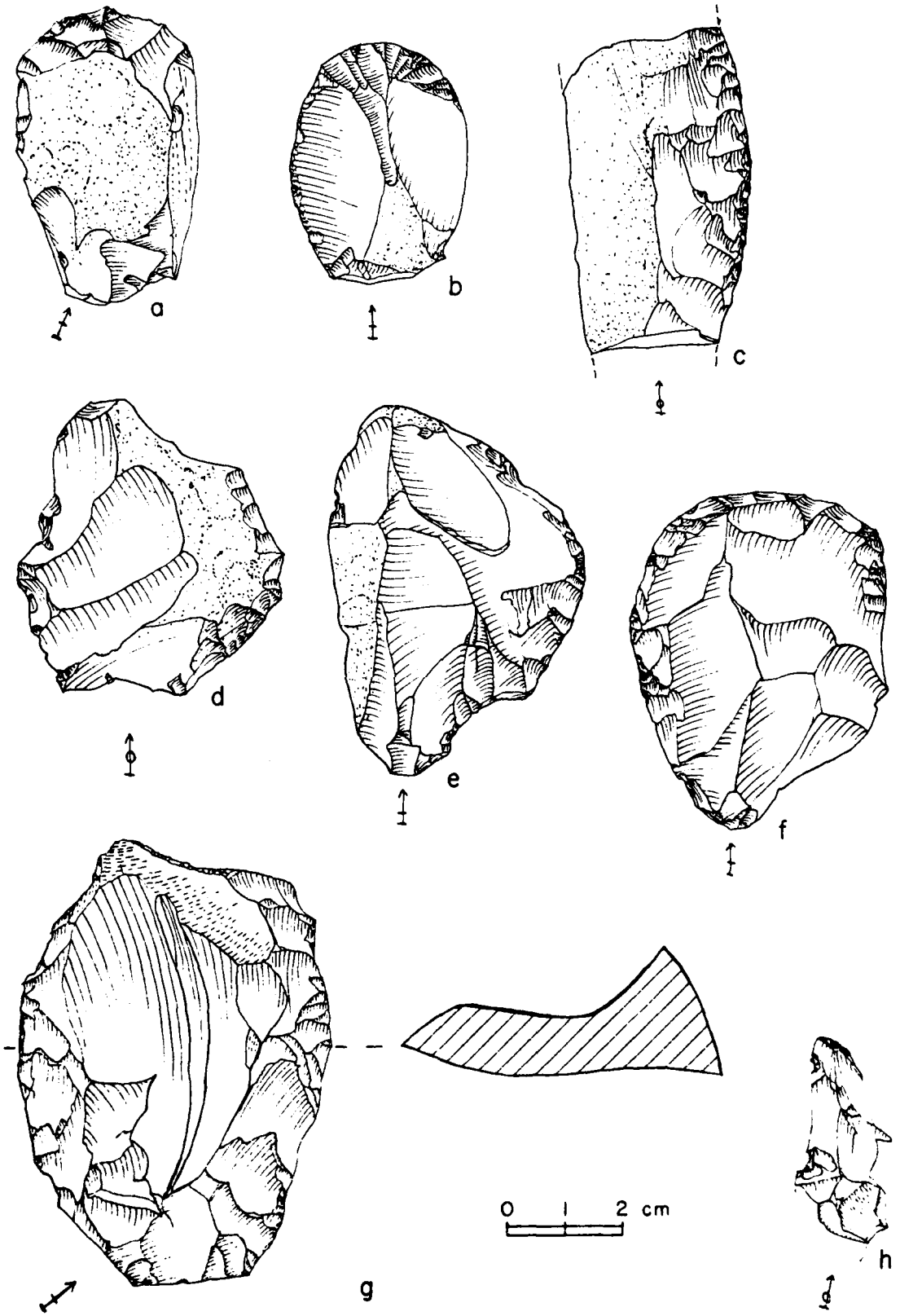
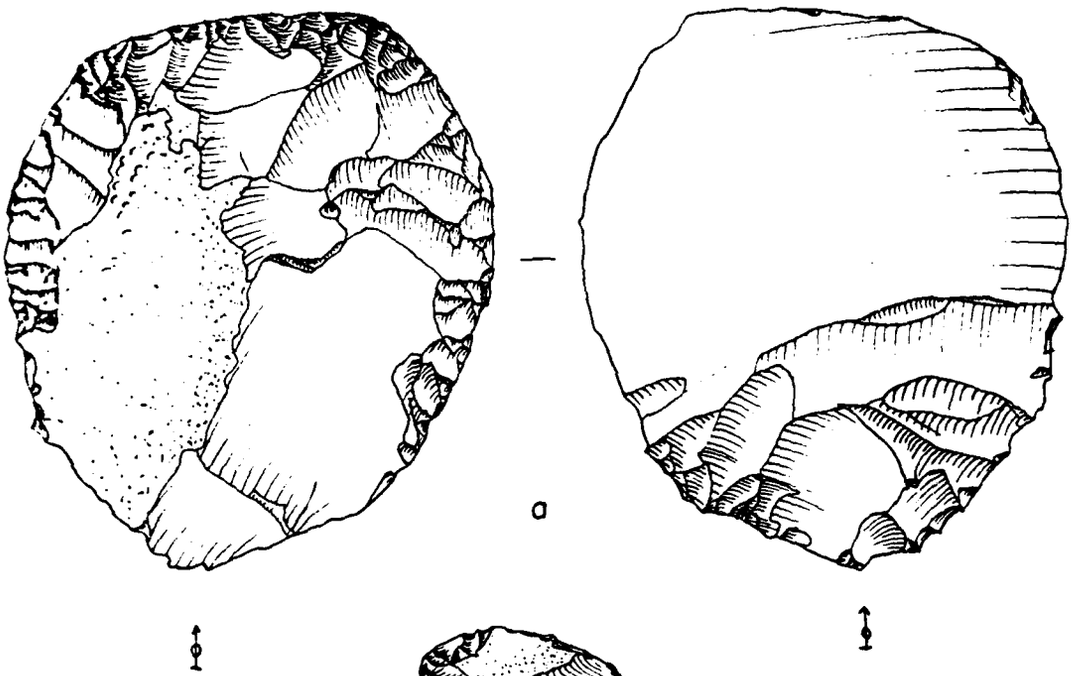

a
b
c
d
e
f
g
h
0 1 2 cm

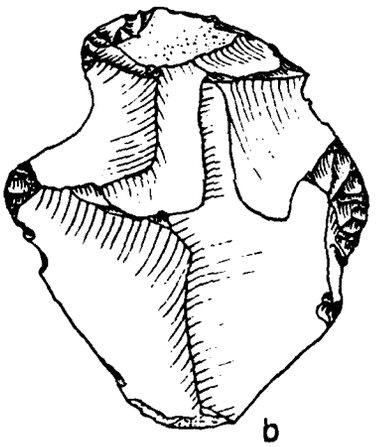
FIGURE 5.3-3

STONE TOOLS: SCRAPERS.

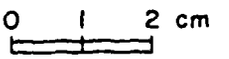
	Site	Type
a	41WM267	multiple scraper, dorsal and ventral view.
b	41WM56	multiple scraper.
c	41WM56	double corescraper, 2 faces.

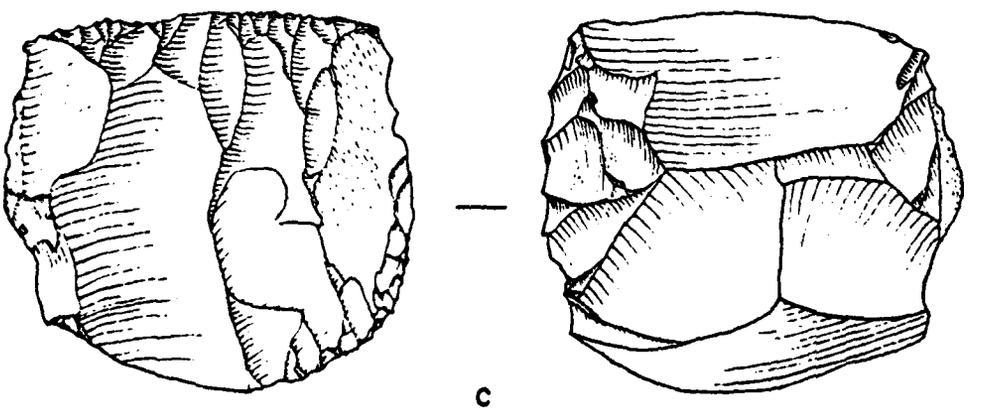


a



b





c

FIGURE 5.3-4

STONE TOOLS: SCRAPERS AND DENTICULATES.

	Site	Type
a	41WM56	'giant' scraper.
b	41WM56	scraperbit renewal spall.
c	41WM56	scraperbit renewal spall, ventral and dorsal view.
d	41WM56	denticulated blade.
e	41WM124	denticulated piece, front and back view.

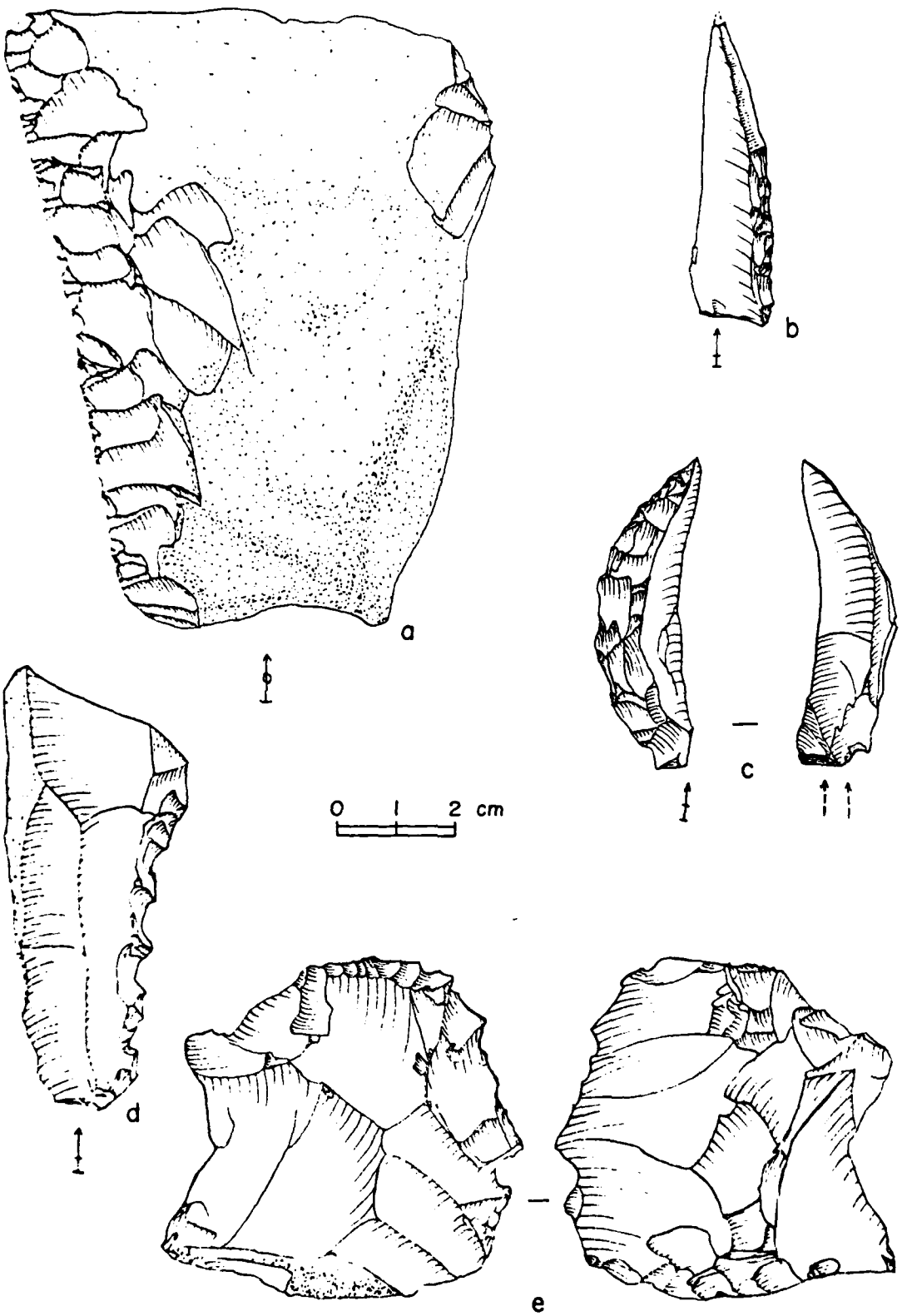
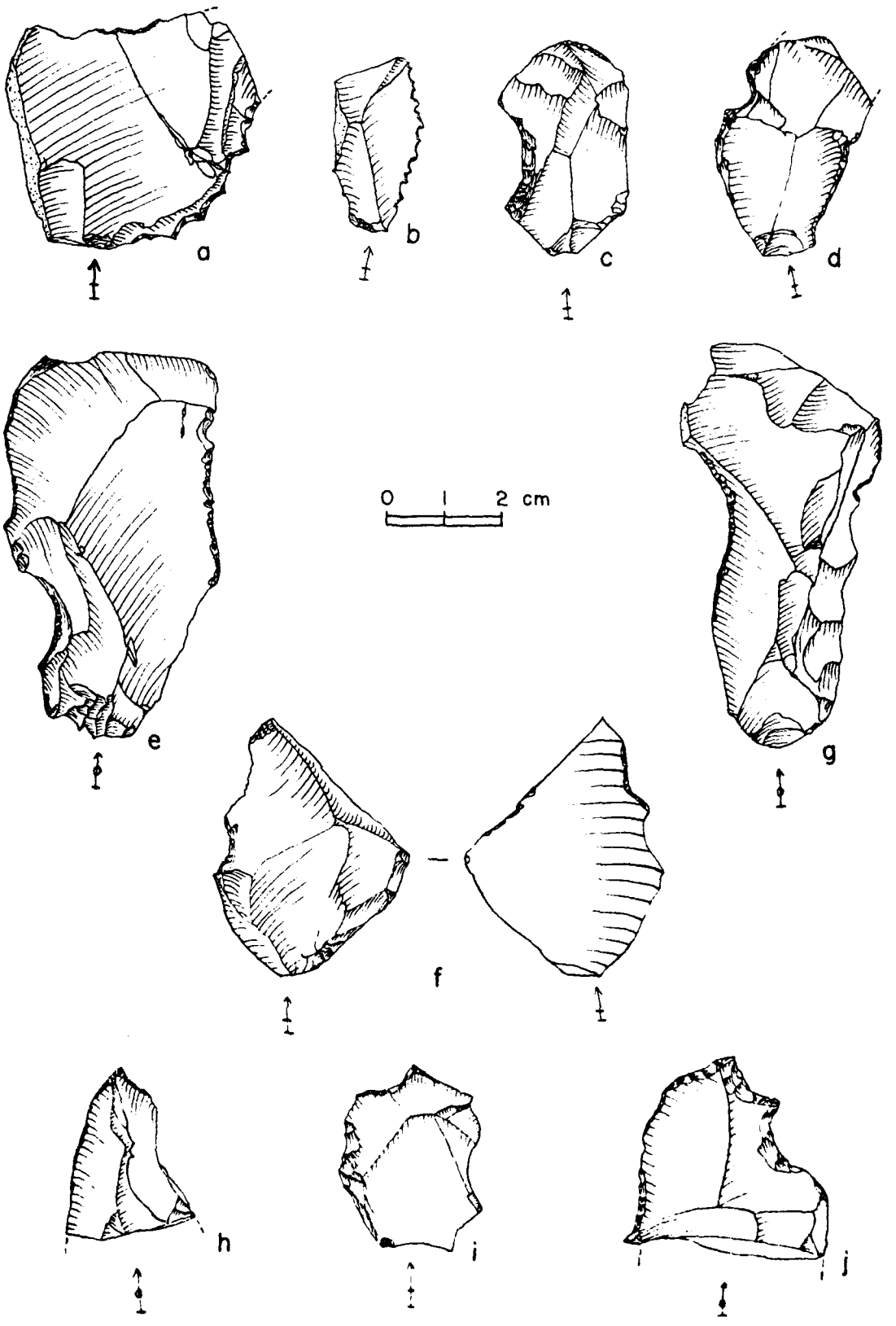

a
b
c
d
e
0 1 2 cm

FIGURE 5.3-5

STONE TOOLS: DENTICULATES, NOTCHED PIECES AND GRAVERS.

	Site	Type
a	41WM133	denticulated flake.
b	41WM258	serrated flake.
c	41WM124	single notched flake.
d	41WM267	single notched flake.
e	41WM73	single notched flake, with additional continuous retouch.
f	41WM53	two adjacent notches, alternating retouch.
g	41WM57	meganotch.
h	41WM267	normal graver on flake axis
i	41WM124	graver made by a notch and a straight edge.
j	41WM56	multiple beaked graver on flake edge.


a
b
c
d
e
g
0 1 2 cm
f
h
i
j

III.NOTCHES (Figs. 5.3-5)

A. Single notched flakes

1. notched flake, by dorsal ventral or bifacial retouch
2. notched flake with additional continuous retouch
3. large crudely notched flake

B. Multiple notched flakes

1. notched flake with multiple non-adjacent notches, occasionally with additional continuous retouch
2. notched flake with multiple, occasionally adjacent notches with a maximum of 2 adjacent notches, and possibly also with additional continuous retouch
3. notched flake with 2 alternating adjacent notches
4. large, crude piece with multiple notches

C. Notched blades, bladelets and microblades

1. with single notch
2. with multiple non-adjacent notches

D. Other

1. with meganotch (i.e. a very large, usually shallow, notch)
2. with alternatingly retouched non-adjacent notches on different edges
3. strangulated pieces

IV. BORING TOOLS (Figs. 5.3-5,6,7)

Boring tools include gravers, borers, perforators and drills, as well as the much larger and cruder tools as for example picks.

A. Gravers

Gravers are sharply pointed boring tools, made by unifacial retouch.

1. Gravers on axis

a. with a sharp dorsally retouched point
b. with a sharp ventrally retouched point
c. 'beaked' graver on a flake axis
d. heavy graver, triangular cross-section with steep dorsal retouch
e. heavy graver, formed by a small straight edge and a notch

2. Gravers on flake edge:

a. normal graver, made by dorsal retouch
b. normal graver, made by ventral retouch
c. 'beaked' graver

d. 'beaked' graver, made by ventral retouch on a previously retouched edge; the latter retouch is dorsal.

3. Oblique gravers

a. normal graver
b. formed by a small straight edge and a notch
c. graver, triangular cross-section

B. Borers

Borers are made by alternating retouch, i.e. ventral on one edge, dorsal on the other one.

1. Borers on axis

a. sharply pointed borer
b. less sharply pointed borer
c. borer made on the point of a projectile point

2. Borers on edge

a. sharply pointed borer

3. Oblique borers

a. heavy borer, triangular cross-section
b. 'bec'

4. Other

a. borer made on a flake spall
b. borer made on a burin spall

C. Drills

1. Drills on a pointbase

a. on winged pointbase
b. on shouldered pointbase

2. Drills on bifacially retouched bases, not pointbases

a. on basically triangular base
b. on transverse rectangle or oval
c. on vertical parallellogram

3. Fragments

a. drillbit fragments
b. drillbit and base fragments, further unidentifiable

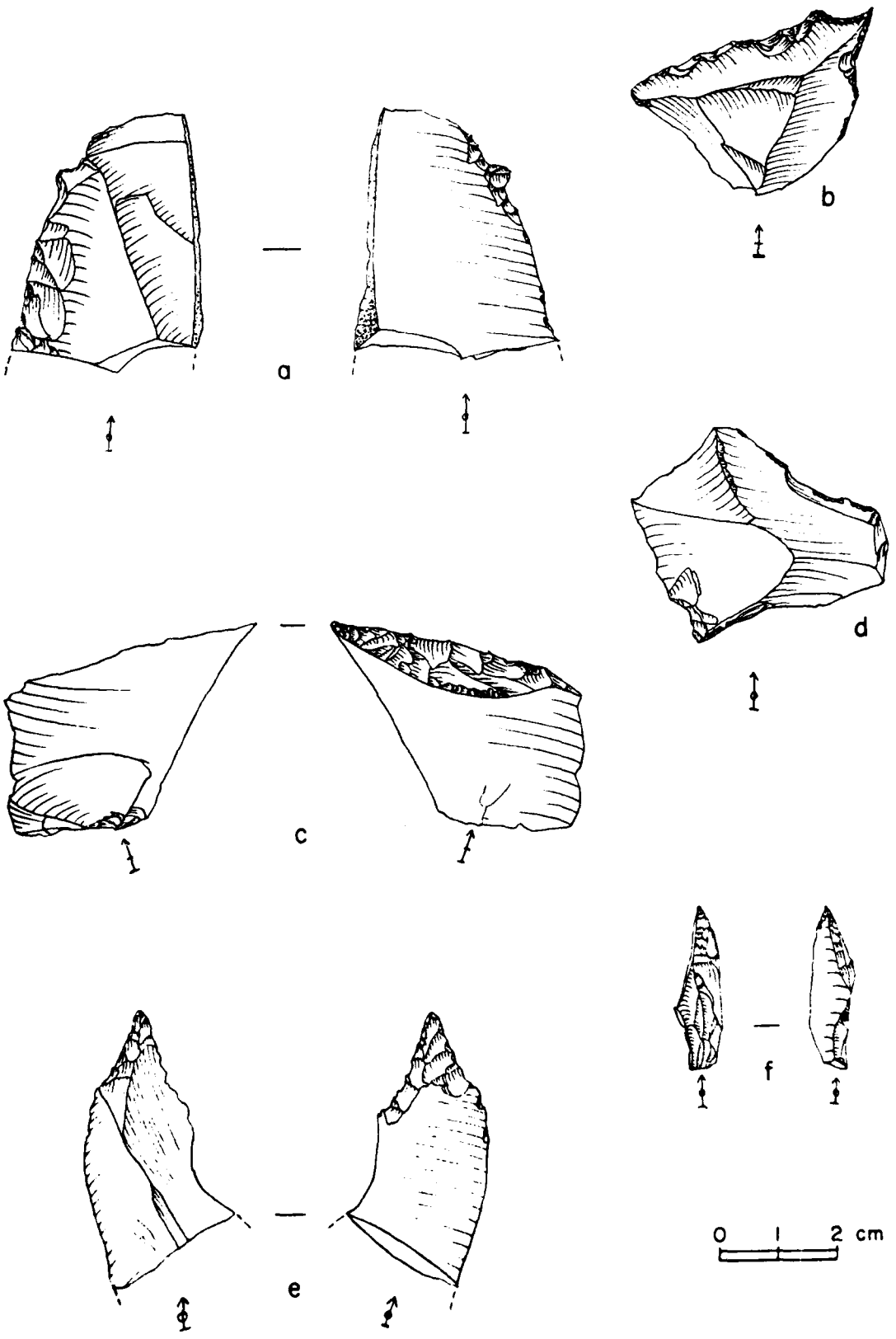
D. Perforators

Perforators are very similar to borers but are made by bifacial retouch.

FIGURE 5.3-6

STONE TOOLS: GRAVERS, BORERS AND PERFORATORS.

	Site	Type
a	41WM124	graver on a backed edge, dorsal and ventral view.
b	41WM73	normal oblique graver.
c	41WM53	borer made on a flake (eclat outrepasse.), dorsal and ventral view.
d	41WM124	oblique 'heavy' graver.
e	41WM56	perforator, dorsal and ventral view.
f	41WM267	borer on burinspall, dorsal and ventral view.


a
b
c
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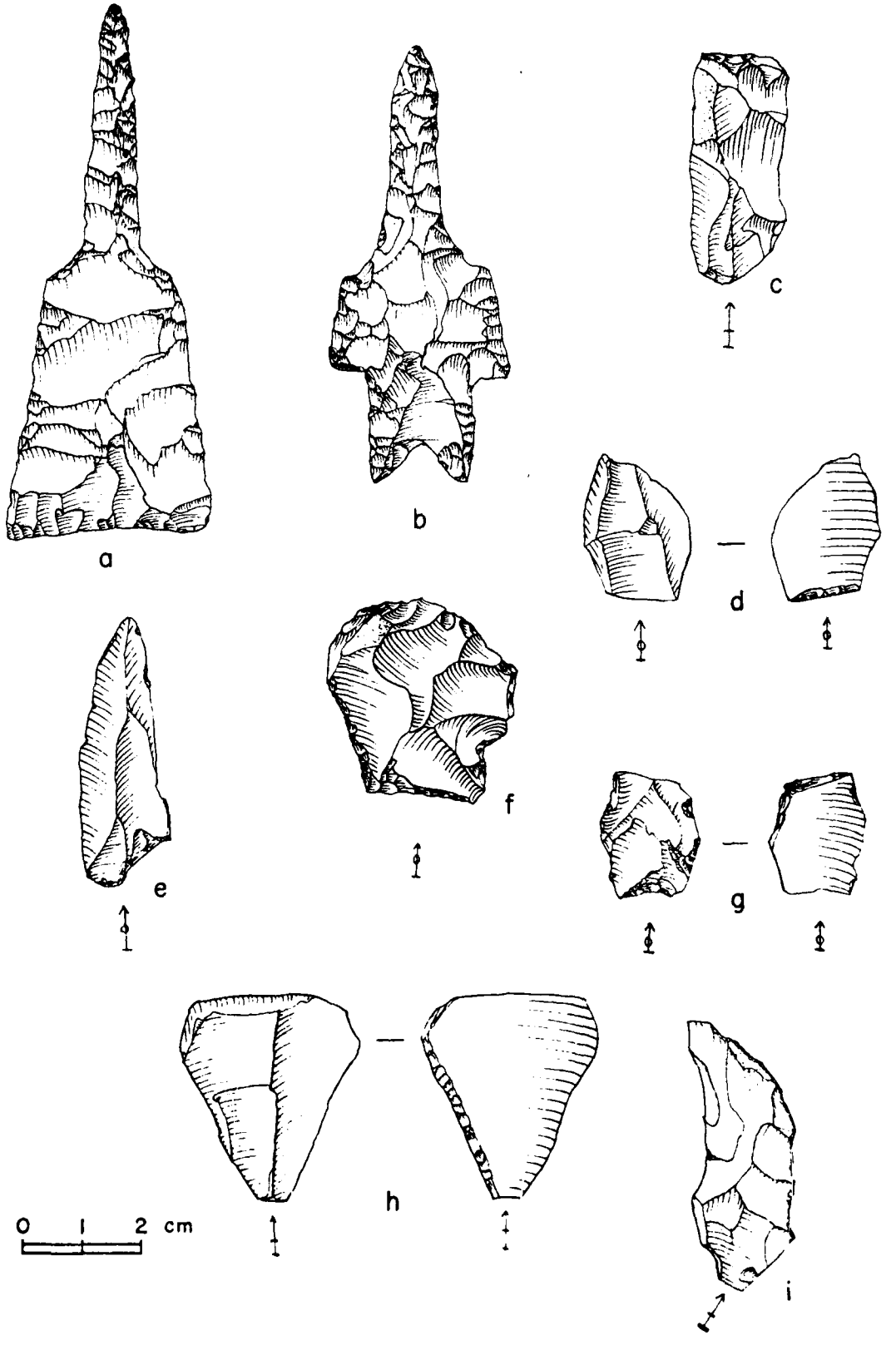
f
0 1 2 cm

FIGURE 5.3-7

STONE TOOLS: DRILLS, TRUNCATIONS AND BACKED PIECES.

	Site	Type
a	41WM56	drill on bifacial base.
b	41WM267	drill on projectile point base.
c	41WM124	straight distal truncation by dorsal retouch.
d	41WM56	straight proximal ventral truncation, dorsal and ventral view.
e	41WM56	concave proximal oblique truncation by dorsal retouch.
f	41WM163	straight proximal dorsal truncation.
g	41WM56	double truncation, made by alternate retouch, dorsal and ventral view.
h	41WM53	straight ventral backed piece, dorsal and ventral view.
i	41WM328	backed bladelet, dorsal convex.


a
b
c
d
e
f
g
h
i
0 1 2 cm

1. on flake axis
2. on projectile point axis

E. Other

1. picks
2. heavy, special borers

V. TRUNCATIONS (Figs. 5.3-7)

A. Distal truncation

1. made by dorsal retouch
2. ventral retouch

B. Proximal truncation

1. made by dorsal retouch
2. ventral retouch

C. Double truncation

1. both extremities are truncated

VI. BACKED PIECES (Figs. 5.3-7,8)

A. 1 whole edge is backed

1. straight or slightly convex backed edge by

a. dorsal retouch
b. dorsal retouch with ventral preparation
c. ventral retouch

2. convex backed edge by

a. dorsal retouch
b. ventral retouch

3. concave backed edge by

a. dorsal retouch
b. ventral retouch

B. 1 edge is only partially backed by

1. dorsal retouch
2. ventral retouch
3. on blades, bladelets and microblades

C. Double backed

1. the edges are straight or slightly convex
2. the edges are double concave

3. the edges were backed by alternate retouch
4. the edges have mixed outlines

D. Special

1. backed and truncated pieces
2. cortex backed pieces with additional continuous retouch

VII. BURINS (Figs. 5.3-8,9,10)

A. Angle burins

1. single angle burins

a. on truncation - straight normal truncation
- oblique straight truncation
- concave truncation
- convex truncation

b. on snap

c. on platform - single facetted
- unaltered cortex
- unaltered non-cortex platform

2. double angle burins

a. on the same edge, opposed extremities
b. on opposed edges, opposed extremities
c. on one extremity, opposed edges

B. Dihedral burins

1. single dihedral burin on axis
2. single dihedral burin on angle
3. single dihedral burin on edge
4. 'reversed' dihedral burin

C. Oblique burins

1. single oblique burin on snap
2. single oblique burin on a non-retouched naturally steep edge
3. single oblique burin on a steeply retouched backed edge
4. single oblique burin on a bifacially retouched edge

D. Multiple burins

1. mixed multiple burins

E. Transversal burins

1. single transversal burins

a. from a natural edge or snap
b. from a retouched edge

FIGURE 5.3-8

STONE TOOLS: BACKED PIECES AND BURINS.

	Site	Type
a	41WM53	concave backed edge, dorsal retouch.
b	41WM57	partially backed microblade, dorsal retouch.
c	41WM124	double backed bladelet, straight edges.
d	41WM56	double backed blade, concave edges.
e	41WM56	single angle burin on oblique ventral distal truncation; dorsal and ventral view.
f	41WM230	single angle burin from platform.
g	41WM56	single angle burin on snap, made on a biface fragment.
h	41WM56	single angle burin on snap, made on a biface fragment; renewed at least once.

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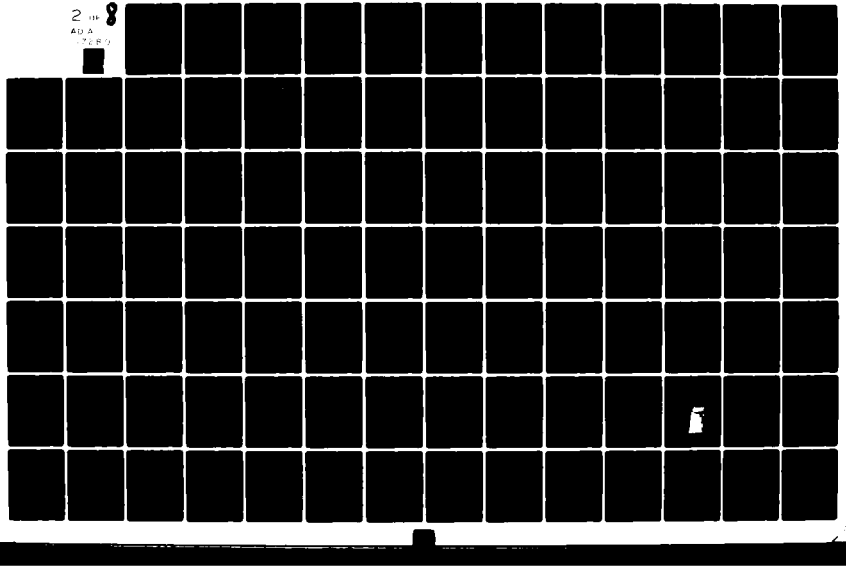

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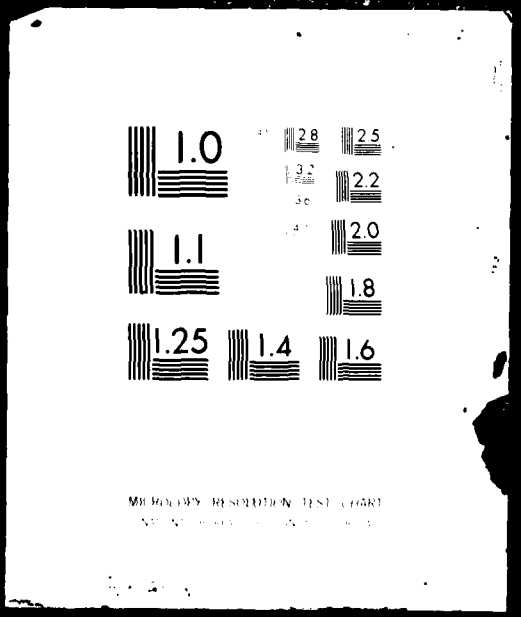

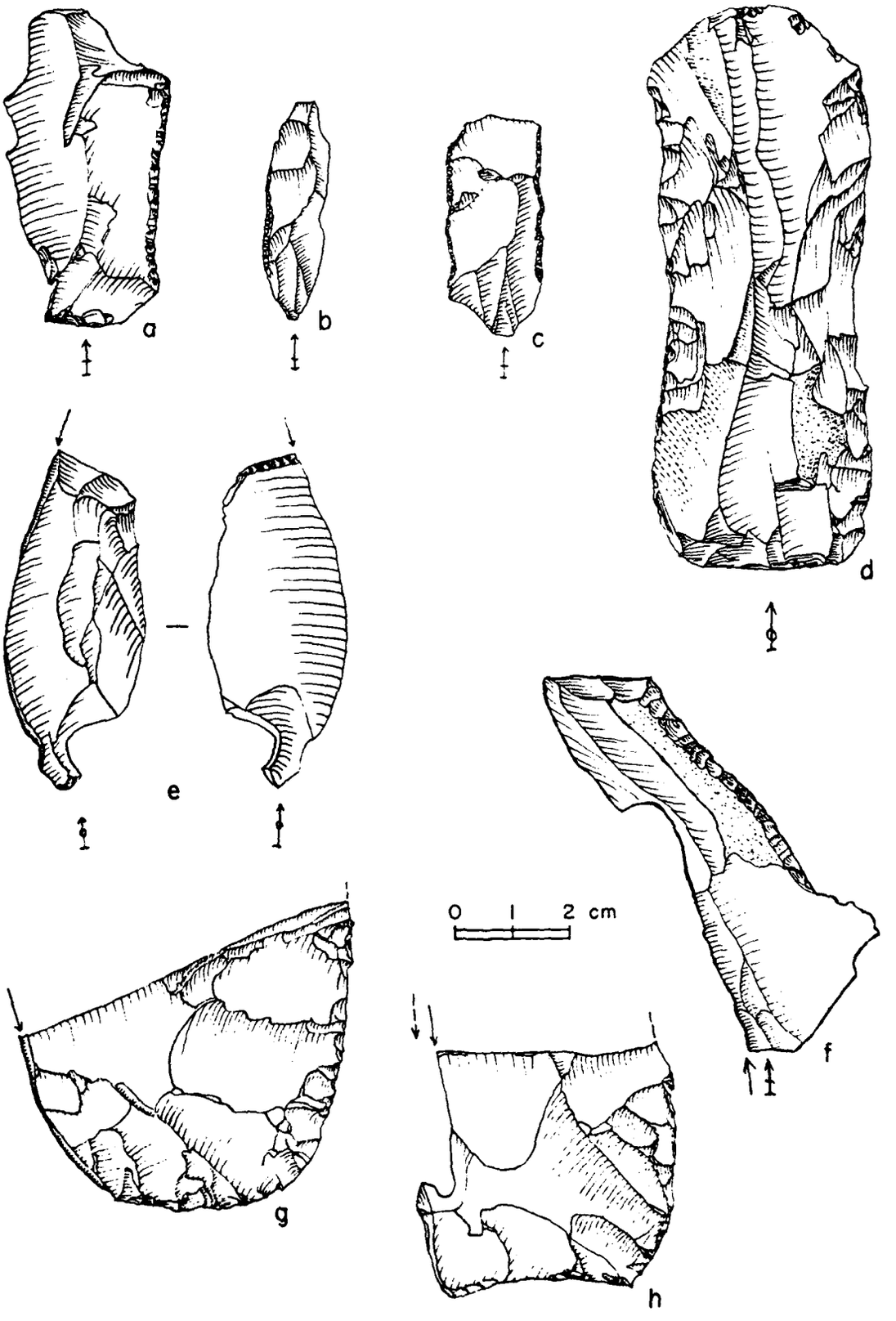
a
b
c
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e
f
g
h
0 1 2 cm

FIGURE 5.3-9

STONE TOOLS: BURINS.

	Site	Type
a	41WM133	double angle burin on snap, made on a projectile point; upper face with 2 profiles.
b	41WM56	double angle burin on snap, made on a projectile point.
c	41WM56	double angle burin on double snap, made on a projectile point stem.
d	41WM56	double angle burin on snap, made on a biface fragment.
e	41WM56	double angle burin on snap, made on a projectile point stem.
f	41WM328	double transversal burin on the same extremity, dorsal face with cross-section.
g	41WM56	dihedral burin on the flake axis, dorsal and ventral view.

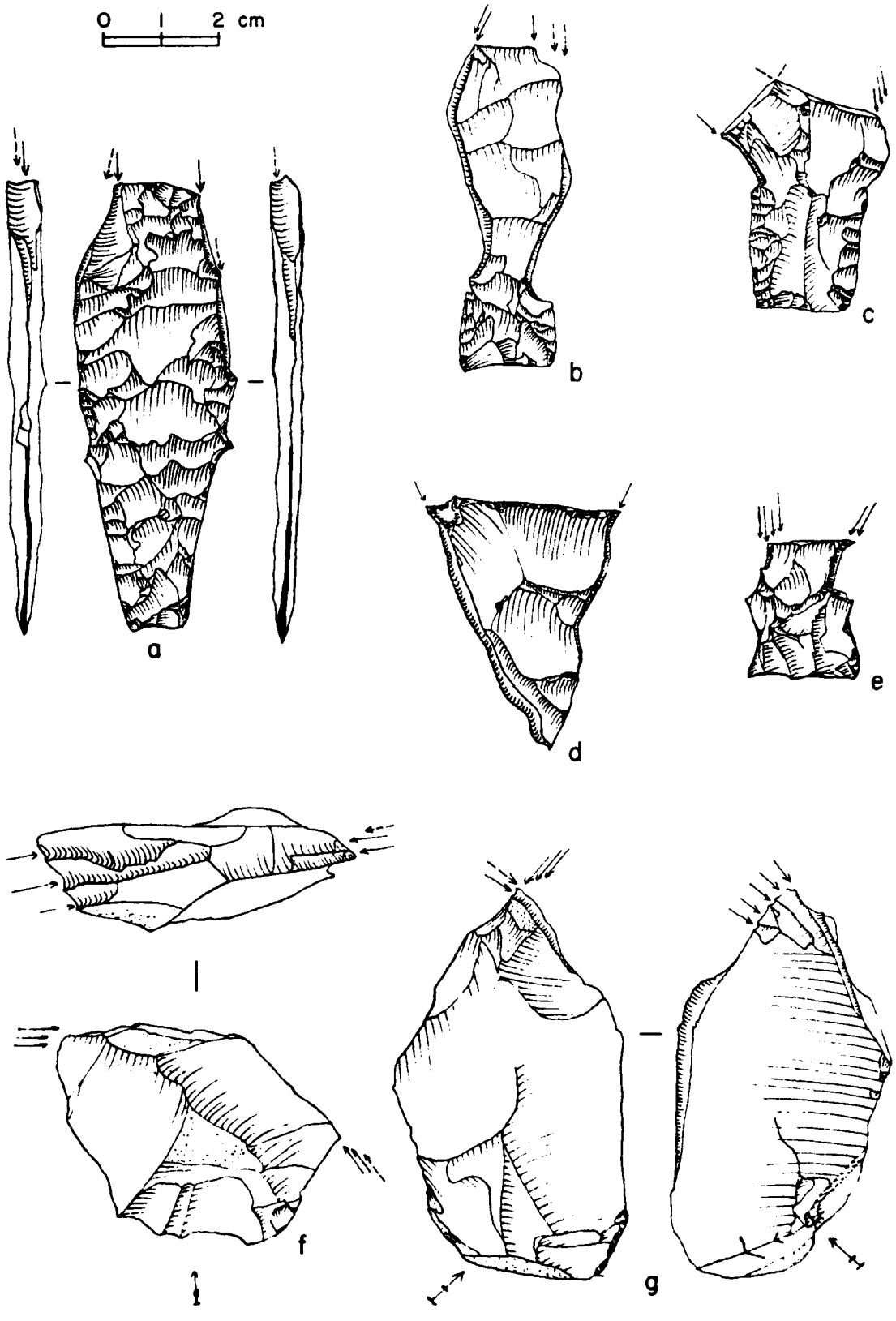
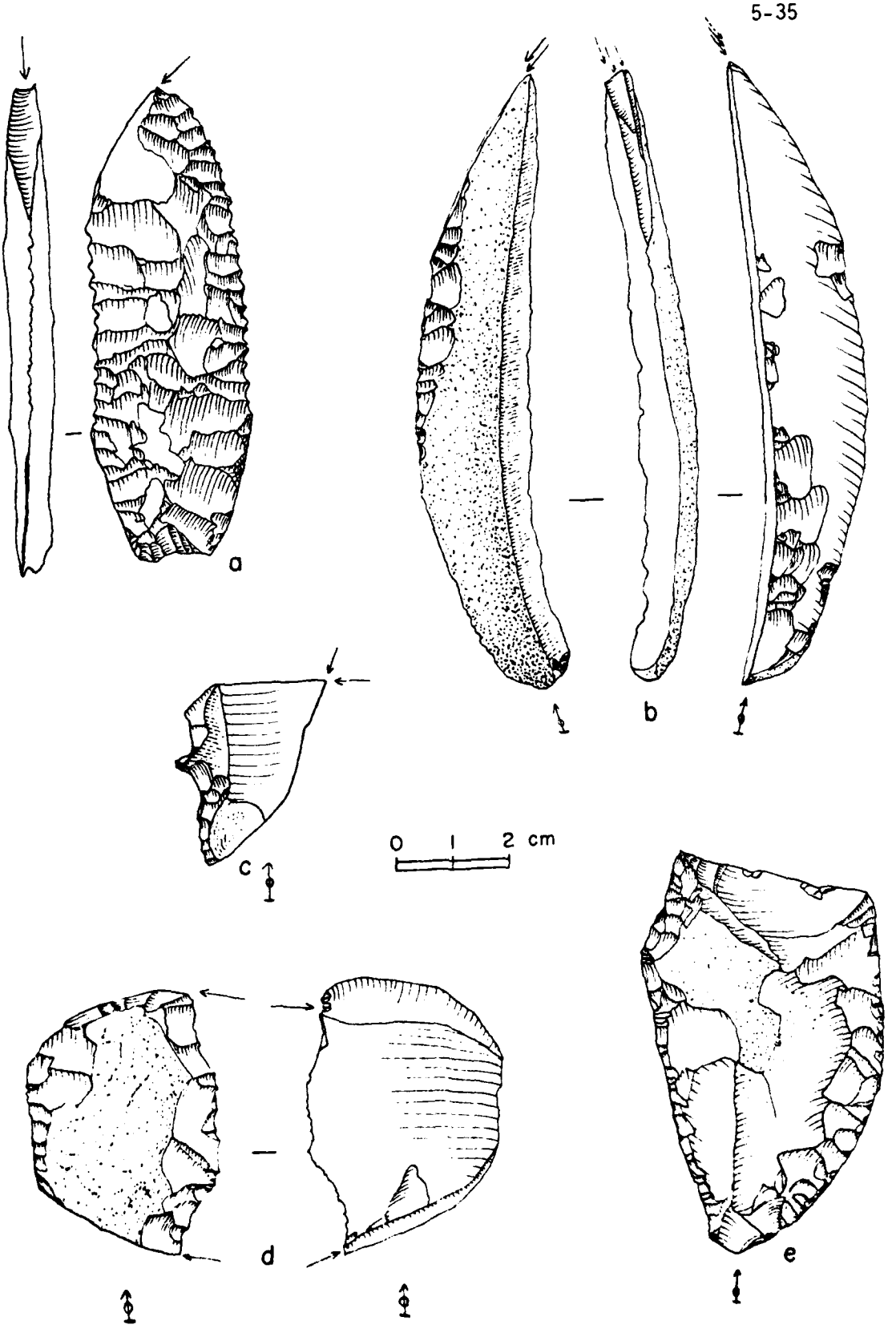

0 1 2 cm
a
b
c
d
e
f
g

FIGURE 5.3-10

STONE TOOLS: BURINS AND COMPOSITE TOOLS.

	Site	Type
a	41WM133	oblique burin, made on a projectile point.
b	41WM56	single oblique burin from a non-retouched naturally steep edge, made on a blade; dorsal and ventral view with profile.
c	41WM56	composite tool: beaked graver and dihedral angle burin.
d	41WM56	composite tool: double transversal burin and backed sidescraper, dorsal and ventral view.
e	41WM56	composite tool: sidescraper and oblique graver.


a
b
c
0 1 2 cm
d
e

2. double transversal burins
   a. on one extremity, from natural edges
   b. on opposed edges, opposed extremities, from natural edges

VIII. COMPOSITE TOOLS (Fig.5.3-10)

IX. RETOUCHED PIECES (Figs.5.3-11,12,13)

A. Unilateral pieces

1. dorsal retouch: 1 edge: - ± whole edge
   - less than ½
   1 end: - proximal
   - distal

2. ventral retouch: 1 edge: - ± whole edge
   - less than ½
   1 end: - proximal
   - distal

3. Bifacial retouch: 1 edge: - ± whole edge
   - less than ½
   1 end: - proximal
   - distal

4. Alternating: 1 edge
   1 end

5. Mixed bifacial and unifacial: 1 edge

6. Discontinuous: 1 edge
   1 end

B. Bilateral pieces

1. dorsal retouch: 2 edges:- ± whole
   - ± whole, 1 partially
   - partially, equivalent loci
   - partially, unequivalent loci
   1 edge &
   1 end: - both partially
   - ± whole

2. ventral retouch: 2 edges:- ± whole
   - ± whole, 1 partially
   - partially, equivalent loci
   - partially, unequivalent loci
   1 edge &
   1 end: - ± whole
   - ± whole base, partially (-½) edge

3. bifacial retouch: 2 edges
   1 edge & 1 end

4. alternating retouch:
   2 edges, 1 alternating retouched
   1 edge alternatingly retouched and 1 end retouched
   1 end alternatingly retouched and 1 edge retouched

5. alternate retouch: 2 edges:- + whole
   - $\overline{1}$ whole and 1 partially
   - partially, equivalent loci
   - crude retouch
   - double
   1 edge and 1 end
   2 ends

6. mixed bifacial and non bifacial:
   2 edges:- + whole
   - $\overline{1}$ whole, 1 partially
   1 edge and 1 end

7. discontinuous retouch:
   2 edges
   1 edge and 1 end

8. mixed unifacial retouch:
   1 edge and 1 end

C. Multilateral pieces

1. dorsal retouch: 2 edges and 1 end
2. ventral retouch: 2 edges and 1 end
3. bifacial retouch: 2 edges and 1 end
4. mixed bifacial and nonbifacial retouch:
   2 edges and 1 end:
   - 2 edges unifacial, end bifacial
   - 1 edge bifacial, 1 edge and 1 end unifacial

   All
5. discontinuous retouch:
   2 edges and 1 end
6. mixed unifacial retouch:
   2 edges and 1 end

D. Special

1. pointed flakes and blades
2. pieces with triangular cross-section:
   - + use retouch?
   - + retouch from ribs

FIGURE 5.3-11

STONE TOOLS: RETOUCHED PIECES.

	Site	Type
a	41WM267	unilaterally dorsally retouched blade.
b	41WM267	unilaterally partially ventrally retouched flake, dorsal and ventral view.
c	41WM56	unilaterally dorsally retouched flake.
d	41WM267	unilaterally bifacially retouched blade, dorsal and ventral view.

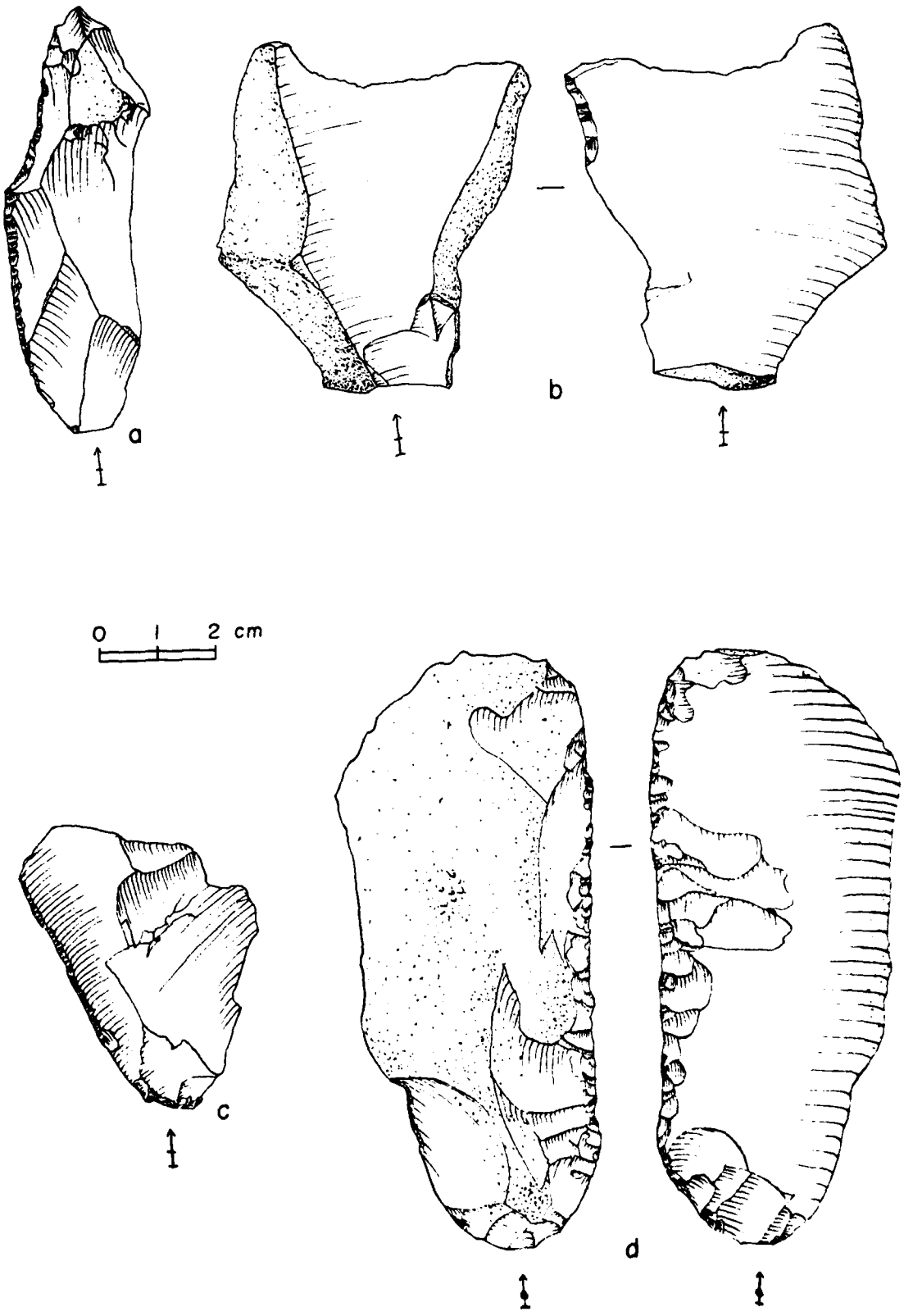
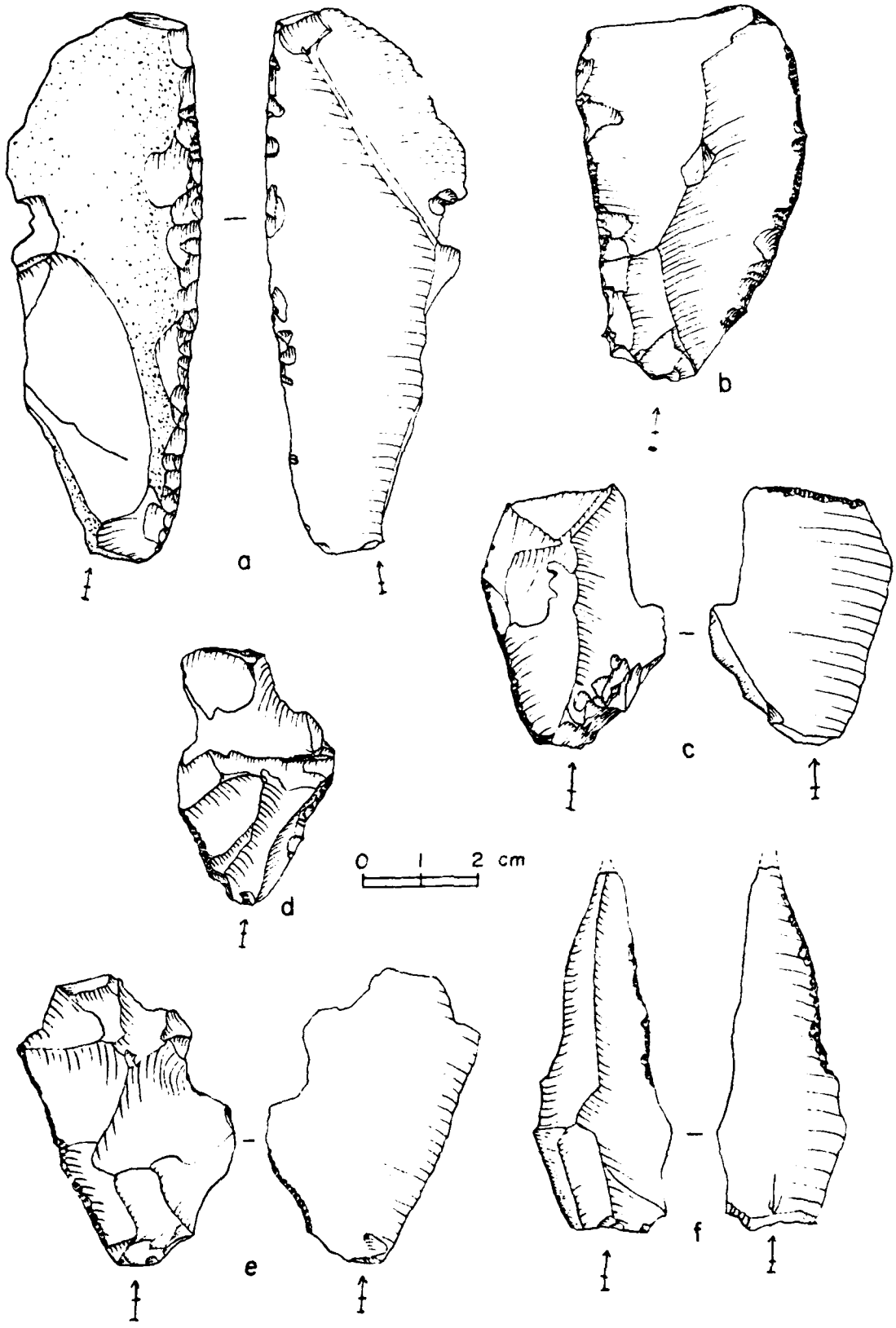

a
b
0 1 2 cm
c
d

FIGURE 5.3-12

STONE TOOLS: RETOUCHED PIECES.

	Site	Type
a	41WM56	unilaterally retouched blade, mixed bifacial and unifacial retouch; dorsal and ventral view.
b	41WM163	bilaterally dorsally retouched flake.
c	41WM57	bilaterally retouched flake, alternate retouch, dorsal along one edge, ventral on the distal end; dorsal and ventral view.
d	41WM163	bilaterally retouched flake, dorsal retouch, partially on both edges, in equivalent loci.
e	41WM73	bilaterally retouched piece, alternate retouch, one whole and one edge partial; dorsal and ventral view.
f	41WM56	bilaterally retouched blade, alternating retouch, dorsal and ventral view.


a
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d
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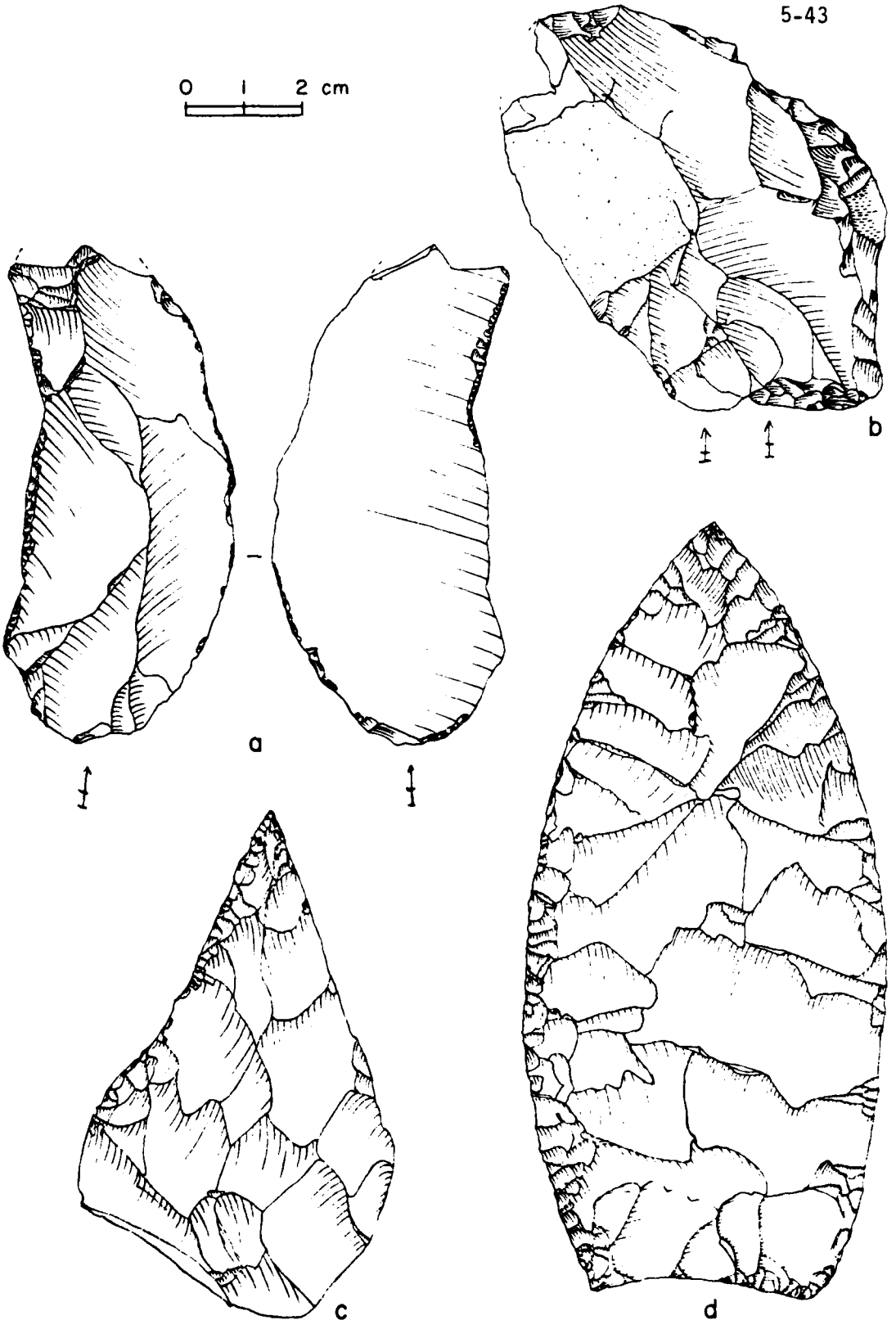
f
0 1 2 cm

FIGURE 5.3-13

STONE TOOLS: RETOUCHED PIECES AND BIFACES.

	Site	Type
a	41WM57	bilaterally retouched piece, double alternant; dorsal and ventral view.
b	41WM133	multilaterally retouched flake.
c	41WM304	biface with accentuated working end and unfinished base.
d	41WM56	biface, large unnamed triangular biface with concave base.


0 1 2 cm
a
b
c
d

3. retouched burin spalls
4. éclats outrepassés with unidentifiable tool fragments on the distal end

X. BIFACES (Figs. 5.3-13,14)

A. Finished bifaces

1. small bifaces, triangular and subtriangular
   a. triangular bifaces with a concave base:
      - thin in cross-section
      - thick in cross-section
   b. triangular bifaces with a straight or slightly convex base:
      - thin in cross-section
      - thick in cross-section
   c. bifaces with a strongly convex base:
      - thin in cross-section
      - thick in cross-section
   d. larger artifacts with a strongly convex base
   e. elongated subtriangular bifaces
   f. subtriangular bifaces, probably finished tools but less carefully retouched than the above artifacts. One extremity is pointed, but usually not very sharply

2. medium to large bifaces
   a. unnamed, large triangular bifaces with concave base, very carefully retouched
   b. unnamed, large subtriangular bifaces with a strongly convex base, very carefully retouched
   c. unnamed, large triangular bifaces with a straight or very slightly convex base, very carefully retouched
   d. unnamed, large bifaces with rounded base and elongated tapering end, very carefully retouched
   e. unnamed bifaces, very wide at the base
   f. subtriangular bifaces, somewhat irregular, seldom sharply pointed
   g. triangular bifaces, not elongated, with strongly concave base
   h. irregular subtriangular bifaces with strongly convex base
   i. triangular bifaces, with straight oblique base
   j. irregular elongated subtriangular bifaces
   k. irregular and narrow elongated triangular bifaces, medium length
   l. very elongated triangular bifaces
   m. 'biface en larme' or 'teardrop' bifaces
   n. wide subtriangular bifaces, convex edges
   o. irregular subtriangular bifaces, sharply pointed, with a convex base
   p. irregular subtriangular bifaces, sharply pointed, with a straight base

3. bifaces with an accentuated working end and an unfinished or only roughly retouched base

   a. finished tools
   b. less carefully worked tools, possibly unfinished

4. stemmed, shouldered or notched bifaces

   a. stemmed bifaces where the stem is gradually evolving from the biface, slightly recurring at the base
   b. stemmed bifaces, where the stem is gradually evolving from the biface as in the above type, but not recurring at the base
   c. strangulated bifaces, possibly projectile points
   d. 'sickle' formed tool
   e. 'cornertang knife'
   f. bifaces with a double notched base; the notches are shallow
   g. bifaces with a single basal notch
   h. assymmetric shouldered bifaces
   i. double stemmed bifaces
   j. other stemmed bifaces

5. miscellaneous bifaces

   a. 'chisels'
   b. bifaces with sharp, convex and wide working edge, and narrow sharp and straight working edge on the other extremity
   c. large bifaces, plano-convex in cross-section
   d. small elongated bifacial tools
   e. bifacial tools with one working edge slightly convex and unifacially retouched
   f. elongated subrectangular/rectangular bifaces
   g. nearly round, thin and small bifaces

B. Preforms

1. intensively worked preforms

   a. small suboval or subcircular bifaces
   b. medium large, suboval or subcircular bifaces
   c. preforms, pointed at one extremity
   d. medium sized preforms, without a pointed extremity
   e. large and elongated preforms
   f. miscellaneous

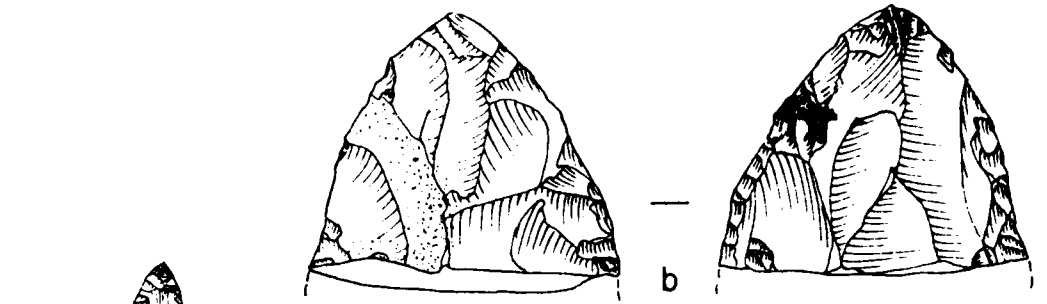
2. less intensively worked preforms

   a. medium and large elongated preforms, one extremity slightly pointed
   b. rectangular preforms
   c. large ovoid preforms

FIGURE 5.3-14

STONE TOOLS: BIFACES, UNIFACES AND CHOPPING TOOLS.

	Site	Type
a	41WM56	biface with accentuated working end and finished base.
b	41WM133	pointed biface fragment, upper face and under face view.
c	41WM56	uniface, dorsal and ventral view.
d	41WM230	chopping tool.



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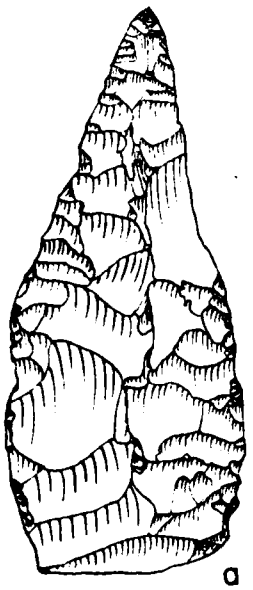
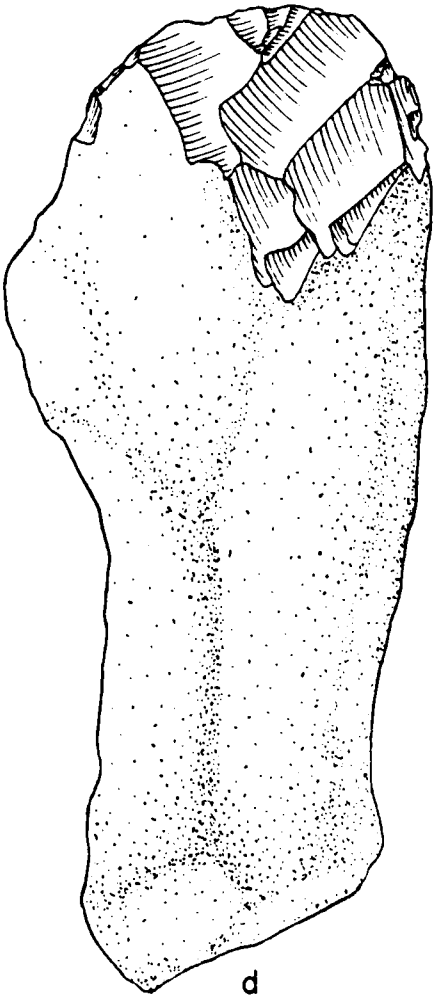


a



d

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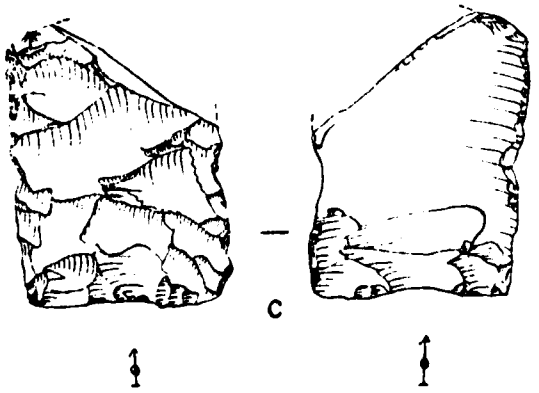


c

3. preforms with minimal retouch

   a. cortex backed artifacts
   b. crude, randomly worked artifacts
   c. miscellaneous

BIFACE FRAGMENTS

1. Basal Fragments

   Includes all fragments that have 2 basal corners or another form of basal extremity.

   a. a more or less straight base, the edges at right angles to the base
   b. a more or less straight base, the edges at sharp angles to the base
   c. a more or less straight base, the edges at obtuse angles to the base
   d. a more or less straight base, the edges at mixed angles to the base
   e. fragments with a strongly convex base outline
   f. fragments with a tightly concave base outline
   g. slightly pointed base fragments
   h. shouldered or skimmed base fragments
   i. 'special' base fragments
   j. roughly retouched, probably unfinished tool fragments

2. Top fragments

   Includes all the very small to the very large pointed fragments. It is very probable that several of the small fragments are projectile point fragments, it does not seem possible at this point to separate those from the biface fragments.

   a. fragments where the point forms an angle of approximately 90^{0}. (These fragments are probably base fragments).
   b. fragments where the point forms an angle of less than 90^{0} (or a sharp angle).
   c. fragments where the point forms an angle of more than 90^{0} (or an obtuse angle). These fragments are probably base fragments also.

   A difference was made between 'small' fragments (maximum length shorter than 20 mm) and 'large' fragments (minimum length 20 mm or longer).

3. Medial fragments

   As for the top fragments, it is very probable that several of these fragments are projectile point fragments.

   a. narrow fragments, width less than 20 mm

b. medium wide fragments, width more or equal to 20 mm, and less or equal to 40 mm.
c. wide fragments, width more than 40 mm.
d. fragments with serrated edge(s).
e. extra long and narrow fragments, because of their width classified in category b.

4. Edge fragments

a fragment from the edges, without any angles

5. Unidentifiable fragments

XI. GOUGES

XII. AXES

1. Axes with a distinct and uniformly curved bit. The secondary retouch is unifacial.
2. Axes with a straight bit, bifacially retouched.
3. Axes which are more doubtful specimens, mainly becuase of their damaged bits.
4. "Planes", with a secondary unifacially retouched bit, as in type 1, but the bit is straight.

XIII. CHOPPING TOOLS

XIV. SCALED AND BATTERED PIECES

XV. UNIFACES

Tools with entirely covering retouch, but on one face only.

XVI. PROJECTILE POINTS (Chapter 14.1)

5.4 Experimental Field Methodology

Magnetometer Survey

Because many of the San Gabriel sites to be excavated had not been adequately tested previously, there was a good deal of uncertainty regarding the depth of cultural deposit, location of features and amount of artifacts. The obvious problem is the inability to visually define the subsurface composition of the site. One method of solving this problem is with a magnetometer study of the sites.

A proton precession magnetometer measures variations in the strength of the earth's magnetic field. Since the magnetometer senses differences in the magnetic intensity in the ground, man-made disturbances such as storage pits, burials, pit houses, and adobe walls could register on the magnetometer. In addition, remnant magnetization occurs when a material is cooled after being heated to a reasonably high temperature. Pottery, hearths, baked rocks, and burned walls exhibit this phenomenon most strongly (Breiner 1973).

The homogeneous alluvial deposits in which these sites were buried seemed well suited for magnetometer surveys. Magnetic anomalies could represent cultural features (i.e., fire hearths, burials, storage pits, etc.). If successful, the magnetometer surveys should allow mapping of the "features" which could then be tested through excavation. If the magnetometer could provide a reasonable picture of the subsurface composition of a site, obtaining a valid statistical sample with a minimum of excavation would be greatly facilitated.

Instrumentation

The magnetometer survey was accomplished using a Geometrics portable proton precession magnetometer. The proton precession magnetometer measures the strength of the earth's magnetic field. Distinctive disturbances or variations in the strength of that field, called "anomalies," can be caused by geological formations, man-made structures, as well as by ferrous objects (Breiner 1973). While the magnetometer can provide the location of magnetic anomalies, it does not allow for the direct identification of the cause of the anomaly.

Field Survey

Survey blocks were selected for each site based on the surface distribution of artifacts and results of previously excavated test

squares. Survey methods included setting the station spacing at one meter, optimizing the sensor height, establishing a base station for recording diurnal variation, and using a metal detector to eliminate effects of modern trash. The sensor height was adjusted to be as close to the ground as possible while providing a maximum noise level of $\pm$ 1 gamma. The selected sensor height was 35 cm above the surface of the ground.

The spacing of the grid was set at one meter intervals. This distance was chosen to maximize the probability of locating small buried cultural features such as fire hearths. A closer grid spacing would have provided better resolution, but would not have been as cost effective. The one meter grid spacing had been determined to be useful at other prehistoric sites containing relatively small features (Arnold 1974, Presslar 1977).

The survey procedure consisted of taking three magnetometer readings at each survey point on the grid. If differences in the readings occurred, an average reading was used. The magnetometer reading for each station was recorded on a gridded survey form representing the survey area. Control station readings were taken approximately every half hour to record any daily variation in the earth's magnetic field. One person took the reading from the magnetometer while a second person recorded the intensity data on grid paper. The person carrying the instrument had to be free of magnetic influences which normally meant removal of all metal objects. Freedom from magnetic interferences is essential for a survey of this type.

Numerous kinds of magnetic interference must be considered when planning a magnetic survey (Breiner 1973, Presslar 1977). In addition to the instrument man, the survey area must be free of extraneous metal objects. Otherwise, magnetic anomalies from buried features may be masked by the recent metal. Other types of interference can be caused by nearby alternating current power sources or even "magnetic storms" associated with sun spot activity. Overhead powerlines and electric generators can be avoided during survey. The occurrence of the unpredictable magnetic storms, however, renders the magnetic survey useless (Pressler 1977).

Data Reduction

The earth's magnetic intensity varies throughout the day. Generally, the magnetic field intensity decreases during the morning, then increases throughout the afternoon. The variation is caused by sunspot activity, solar wind variations, atmospheric tides, and other factors which are not well understood. This diurnal variation must be measured and corrected in order to obtain high sensitivity during a magnetometer survey. The variation of the earth's magnetic field is measured by repeating magnetic readings at specified control stations during the survey (Breiner 1973:12).

After collecting the data in the field, the time variations must be eliminated. All of the control station readings are adjusted to a constant value, then adjust all the magnetic readings. The constant value selected was the value of the highest control station reading. The other readings were adjusted by the appropriate amount to compensate for the recorded diurnal variation.

When the final corrected readings were available, a contour map was constructed to provide a basis for identifying magnetic anomalies. A contour interval of five or ten gammas was selected. Experience has shown that a cultural feature, such as a hearth, may be undetected using a larger interval.

Magnetometer Site Survey

A magnetometer survey was attempted at Site 41WM230 (Loeve-Fox) at Granger Lake, and at sites 41WM53, 57, and 56 at North Fork Reservoir. It was hoped that the magnetometer would locate anomalies caused by buried fire hearths, storage pits, etc. Unfortunately, the Loeve-Fox site had been subject to dumping of historic and modern trash. These small metal objects cause numerous "false anomalies." It was decided that this trash would obscure any prehistoric features so as to be meaningless, and the experiment was aborted at site 41WM230.

The second site to be examined with the magnetometer was 41WM53. This site had been tested previously (1976) by NTSU and was known to contain burned limestone hearths. It was anticipated that other similar features could be located with the magnetometer. In addition, the magnetic anomaly "signature" of the known features could be useful in interpreting anomalies at other sites.

The third site examined was 41WM57, which contained three burned rock areas. Site 41WM56 was also checked. Unfortunately, a magnetic storm caused that study to be aborted. Results of the magnetometer surveys at sites 41WM53 and 41WM57 are presented in the respective site reports (Chapters 8.1, 8.3).

Mechanical Trenching

Another method of quickly determining the potential depth and areal extent of a site is the use of mechanized trenching, as with a backhoe. The backhoe can rapidly cross a site, and provide a reasonable estimate of the cultural materials present. By carefully monitoring the backhoe, the archaeologist can direct the backhoe operator so as to minimize damage to uncovered features. This methodology proved to be essential to the success of this project. Without the backhoe investigations the cultural limits of some of the sites could not have been ascertained. In addition, this is a very cost effective testing technique when one considers the number of mandays to equal the excavations of the backhoe.

6.0 Pilot Study in Data Monitoring

by

T. R. Hays, Harold Hietala and James Thomson

6.1 Theoretical Perspective

Introduction

The excavation methodology for this project was designed to provide the data necessary for determining a "point of diminishing returns" (COE 1977). Consequently, valid statistical sampling techniques were necessary to insure that the data recovered was representative of the site being studied. In order to determine a point at which the data become redundant, it was necessary to closely monitor the excavations. This monitoring was accomplished by analysis of the recovered materials concurrently with the field work. Sample size increases were in standard increments so that accurate monitoring could be facilitated.

The sites studied in the San Gabriel project can be considered as: 1) surface sites (lithic scatters and quarries); 2) surface and subsurface (BRM and some alluvial terrace sites); and 3) subsurface (buried alluvial sites). Different sampling strategies had to be applied to each of these differing site situations.

The goal of this pilot study was to evaluate a technique which could be used to limit the amount of effort at a particular site, yet still obtain adequate data recovery. It was recognized that cultural resource management should "preserve" archaeological and historical resources. It was hoped that a methodology could be developed which would reduce excavation at a site to preserve the site,and to reduce public expenditures for cultural resource management.

The concept of archaeological redundancy maintains that it is possible to obtain more than is necessary of certain kinds of archaeological data. This proposition derives from the idea that excavations should sample the salient aspects of a site in much the same way that statistical samples are drawn from some other universe. Ideally, a variety of features would be examined at a site. Consequently, not all hearths (for example) would be excavated. The basis for the decision had to be statistically valid, which required adequate sample sizes. The most numerous artifacts in Central Texas sites are the debitage (unmodified flakes and blades). These artifacts served as the first indication that an area of the site was not producing new information. Obviously, debitage was not the only

criterion used. It was fully realized that other more subjective criteria must be considered in any decision to cease work at a particular level or area of a site (COE 1977). It was hoped, however, that a less subjective data set could be used in conjunction with the archaeologists' intuitive decision making process.

Data Base

In order to facilitate statistical comparisons, reasonable sample sizes are needed. To achieve this end, emphasis must be given to those artifact classes which generally are well represented. For the San Gabriel Project, this limits us generally to lithic assemblages. Two artifact sets were utilized; one associated with lithic reduction activities, and the other associated with undefined functional activities represented by unambiguous "tool" classes. The classes within each artifact set are defined as follows:

A. Tool Classes (Chap. 5.3)

1. Scrapers
2. Denticulates
3. Notches
4. Perforators
5. Truncations
6. Backed pieces
7. Burins
8. Composite Tools
9. Retouched Pieces
10. Bifaces
11. Gouges
12. Axes
13. Chopping Tools
14. Scaled Pieces
15. Unifaces
16. Projectile Points

The tool classes may be collapsed together when sample sizes are small. For example, notches and denticulates are similar. On the other hand, some classes may be occasionally subdivided. For example, projectile points may be one such class.

B. Technological Reduction (Table 6.1-1)

1. Primary elements
2. Secondary elements
3. Tertiary elements
4. Microelements (excluding microburins)
5. Bifacial Thinning Flakes
6. Cores

The primary, secondary and tertiary elements were defined as a percent cortex with categories: no cortex, 1-25% cortex, 26-50% cortex, 51-75% cortex, 76-99% cortex, and 100% cortex with categories collapsed as needed. The element categories also could be subdivided into flakes and blades. Core types could be subdivided in some cases.

Table 6.1-1 DEBITAGE DEFINITIONS

DEBITAGE	- The result of the intentional breaking of a nodule of lithic raw material in order to use the products (flakes, blades, etc.) as they are, or to convert these products into tools by retouch.
FLAKE	- A fragment of raw material intentionally detached from: - A core in the course of preparing it - A core with the intention of later turning it into a tool. - A tool in the course of shaping it by retouch.
WHOLE PIECE	- Contains both proximal and distal ends. The proximal end has a striking platform. The ventral surface has waves and ripples and a bulb of percussion. The dorsal surface may have ridge scars from previously removed flakes and/or cortex.
BROKEN PIECE	- Any part of a whole piece.
BLADE	- A flake, the length of which is greater than 50 mm and is at least twice the width.
PRIMARY	- Flakes and blades having 100% cortex on the dorsal face.
SECONDARY a	- Flakes and baldes having more than 50% cortex on the dorsal face.
SECONDARY b	- Flakes and blades having less than 50% cortex on the dorsal face.
TERTIARY	- Flakes and blades having no cortex at all on the dorsal face or platform.
MICROFLAKE	- A small, whole flake whose maximum measurement (length or width) is smaller than 15 mm.
BLADELET	- A small blade whose maximum length is between 30 and 50 mm.
MICROBLADE	- A small blade whose maximum length is less than 15 mm.
BTF	- (Bifacial Thinning Flake) A BTF is a flake removed from a bifacial tool or preform edge with the intent of thinning and further shaping the bifacial artifact.
CORE	- A nodule of lithic raw material from which flakes, blades, bladelets, etc., were removed.
CORE FRAGMENT	- A broken core.
CORE TRIMMING FLAKE	- A flake removed from a core edge to renew the striking platform. The flake has a characteristic triangular cross section and contains the former platform edge of the core. Most core trimming flakes are removed by a side blow, perpendicular to the direction other flakes were detached from the core.
BURIN SPALL	- The part of a flake, blade or bladelet detached by the Burin Blow Technique, which removes a spall from the flake edge or tool fragment. A primary spall has a triangular cross section, and a renewal spall usually has a quadrangular cross section. (cf. Tixier, 1974, pp.)
CHIPS	- Small flake fragments whose maximum measurement is less than 15 mm.
CHUNKS	- Usually angular flint fragments, greater than 15 mm, not otherwise classifiable.

Kinds of Statistical Comparisons

Surface Sites

Because of probable surface disturbance, no intrasite comparisons were made and the sites were surface collected according to standard archaeological considerations. Intersite comparisons were made only on the technological reduction variables to ascertain if additional surface sites by region or ecozone need to be considered.

Buried sites (includes subsurface burned rock middens)

a) within cluster (series of contiguous grid units) should demonstrate some heterogeniety for complete documentation and/or excavation to continue in the same area. Otherwise, if homogeniety should exist for the technological and the tool component data sets, then either:

   i) excavation should move to another area if excavation is not required below the present level, or

   ii) the other adjacent units that need to be excavated in order to proceed to deeper levels should be "bagged", but not lab analyzed.

b) Between non-contiguous clusters, (some clusters may be contiguous and defined as different clusters if different activities are obvious) units should demonstrate heterogeniety. If two cluster units are homogeneous, then redundant information is likely.

c) Site excavation should be modified according to the principle of heterogeniety. Thus, if one site has yielded three heterogeneous cluster units while another has yielded three homogeneous cluster units, it may be reasonable to stop excavation in the site yielding redundant information and place the manpower into sites which are yielding non-redundant information sets.

Statistical Techniques for Comparison

Chi-square

The standard Pearson's chi-square statistic can be employed to measure homogeniety. If two or more assemblages are yielding redundant configurations, then the hypothesis of equal proportions for the artifact categories across the assemblages should not be rejected.

Artifact category

Date unit, cluster, or assemblage number	1	2	3	. . .	C	
1	n_{11}	n_{12}	n_{13}	. . .	n_{10}	n_{10}
2	n_{24}	n_{22}	n_{23}	. . .	n_{20}	n_{20}
⋮	⋮	⋮	⋮	. ⋮ .		
r	n_{r1}	n_{r2}	n_{r3}		n_{rc}	$n_{r.}$
	n_{11}	n_{12}	n_{13}		$n._{c}$	$n_{r.}$

Hypothesis:

H_o: Homogeniety or Redundancy

H_1: Heterogeniety

Statistic:

$$X^2 = \Sigma_i \; \Sigma_j \frac{(n_{ij} - E_{ij})^2}{E_{ij}}$$

where

$$E_{ij} = \frac{n_{ii}\, n_{ij}}{n_{ii}} \text{ , } difi = (I-1)(J-1)$$

Rule

Reject H_o if X^2 is too large

Considerations

At least 80% of the cells should have at least 5 observations and no more than 1 or 2 cells should be empty.

Data Follow Up

If differences exist, find out which categories cause them and ascertain the interpretative nature of such differences.

Note Well:

Be careful to distinguish between a statistical difference and a practical difference. For example a difference between secondary and tertiary elements may not be as strong as a difference between tertiary elements and cores.

Kendalls tau-b (Same data base as chi-square):

Kendall's tau-b statistic can also be employed to judge homogeniety or heterogeniety. The difference between this statistic and the chi-square statistic is that a large degree of homogeniety will be reflected in a correlation statistic which is large and positive. The null hypothesis in this instance is the hypothesis of "no association". This statistic is useful only for a comparison of two "data units", clusters or assemblages.

Hypothesis:

H_o: Independent information in the data sets under comparison

H_1: Homogeniety if Kendalls $T >> 0$

H_2: Strong heterogeniety if $T << 0$

Statistic:

$$t_b = \frac{C - D}{M}$$

where C = # concordances

D = # discordances

M = a function of the # of comparisons with a correction factor for ties

(See the SPSS manual for an exact definition)

	Tertiary elements	Cores
1st data unit	20	5
2nd data unit	10	6

yields a concordance

Tertiary elements	Cores
20	5
6	10

Rules

i) Reject H_o in favor of H_1 if t_b large positive

ii) Reject H_o in favor of H_2 if t_b large negative

iii) Acceptance of H_o may mean "heterogeniety."

6.2 Field Procedure

Introduction

During the 1978 field season, approximately sixty-five percent (64.6%) of the Granger Laboratory Supervisor's time was applied toward manual data file manipulation and Chi-square testing of the debitage information for the San Gabriel Archaeological Project. It was thought that a microcomputer, purchased by NTSU would be available for the field lab to provide a more efficient method of record keeping and automatic data analysis. Unfortunately, the unit did not arrive until after the close of the field season. Therefore, all data files were updated by hand and all calculations were performed with the aid of a Texas Instruments Programmable/59 Calculator equipped with an Applied Statistics Solid State Software Module with output provided by a PC-100 Thermal Paper Printer. Program ST-14, Contingency Table Analysis (the standard Pearson's Chi-square statistic) from the module, was found to be most useful in measuring homogeniety (redundancy) between excavation units by means of the debitage frequencies.

Chi-square, a non-parametric significance test applicable to nominal data (Doran and Hodson, 1975:54-56), such as debitage categories of sufficient quantities, was chosen to measure the significance of the differences between two independent samples. Given the definitions that follow,

Universe - All artifacts created by a culture under investigation

Target Population - Artifacts created by the culture at a given location (Site).

Unstratified Sample - All artifacts of the target population found within a given location (Area).

Stratum - A sub-set of artifacts from the unstratified sample (Debitage Categories).

then "independent samples" are those chosen debitage categories from the available strata found in each 1 meter x 1 meter cell of the excavated areas within a site. The debitage categories that provided sufficient quantities to work with and that were present throughout most of the sites investigated were:

1) Primary and Secondary a flakes combined
2) Secondary b flakes
3) Tertiary flakes

4) Microflakes
5) Bifacial thinning flakes

Based on the debitage definitions, it was decided that each category was independent, although the lithic reduction sequence might suggest otherwise. The frequency of occurrence for any debitage category within any excavation unit (cell), however, is not dependent upon the lithic reduction sequence used to produce those categories.

The Chi-square null hypothesis may be tested, as per Siegel (1956), by

$$X^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \quad , df = (r-1)\,(k-1)$$

where H_0 = Homogeniety (redundancy)

H_1 = Heterogeniety

O_{ij} = Observed number of cases in the i^{th} row of the j^{th} column

E_{ij} = Expected number of cases in the i^{th} row of the j^{th} column

r = row maximum

k = column maximum

Σ = To sum over all cells

df = degrees of freedom

The general rule was to accept heterogeniety if the X^2 value was greater than the value given at the .05 level of significance for the respective degrees of freedom (df). In the data base under test, at least 80% of the cells had to have five (5) or more observations and no more than one cell could be empty. If these requirements were not met, the test was not performed.

Given that a Type I error is to reject H_0 when in fact it is true and that a Type II error is to accept H_0 when in fact it is false, then the .05 level of significance, mentioned above, is the arbitrary consideration of the limit of Type I errors that would be accepted in order to avoid as many Type II errors as possible (Cowgill, 1977). It is better to have a data base with fewer possible homogeneous relationships, than to have a larger data base that may contain Type II error situations which would eventually distort the dichotomous assumptions. The cumulative distribution function of the Chi-square statistic, $P(X^2)$ was calculated to test the probability of committing a Type I error. For our purposes, the 95% confidence level is where $P(X^2)$ for H_0 = .95 and as long as $P(X^2) \leq .95$ in homogeneous situations, then H_0 was accepted.

Analytical Procedure

Each area of the excavated sites had a file that was continuously updated as debitage information was obtained. The structure of the file was based on the excavation units within an area. Quadrant information was collapsed to form 1 meter by 1 meter cells and all data from the chosen debitage categories were kept according to the excavated level sequence. The ideal plan was to move the excavators between two areas, excavating horizontally, which would enable the laboratory to process, analyze and compile Chi-square results on the recovered materials (Fig. 6.2-1), then make recommendations based on its findings.

As the excavation progressed, units with homogeneous Chi-squares were combined to form group (marginal) totals which were used to test against new units as they were encountered. Heterogeneous units were kept separate from these group totals. New homogeneous group totals were created from these separate, heterogeneous units if, between themselves, homogeniety could be established. However, once homogeniety was achieved, and the excavation reached a minimum of 8 square meters, work could be shifted to another level, area, or site (Fig. 6.2-2). Eight square meters was considered the minimum size unit needed for an area to demonstrate its heterogeniety. As an area expanded horizontally, if homogeniety was persistent up to this mimimum limit, then expansion on that level was to cease to avoid gathering redundant information.

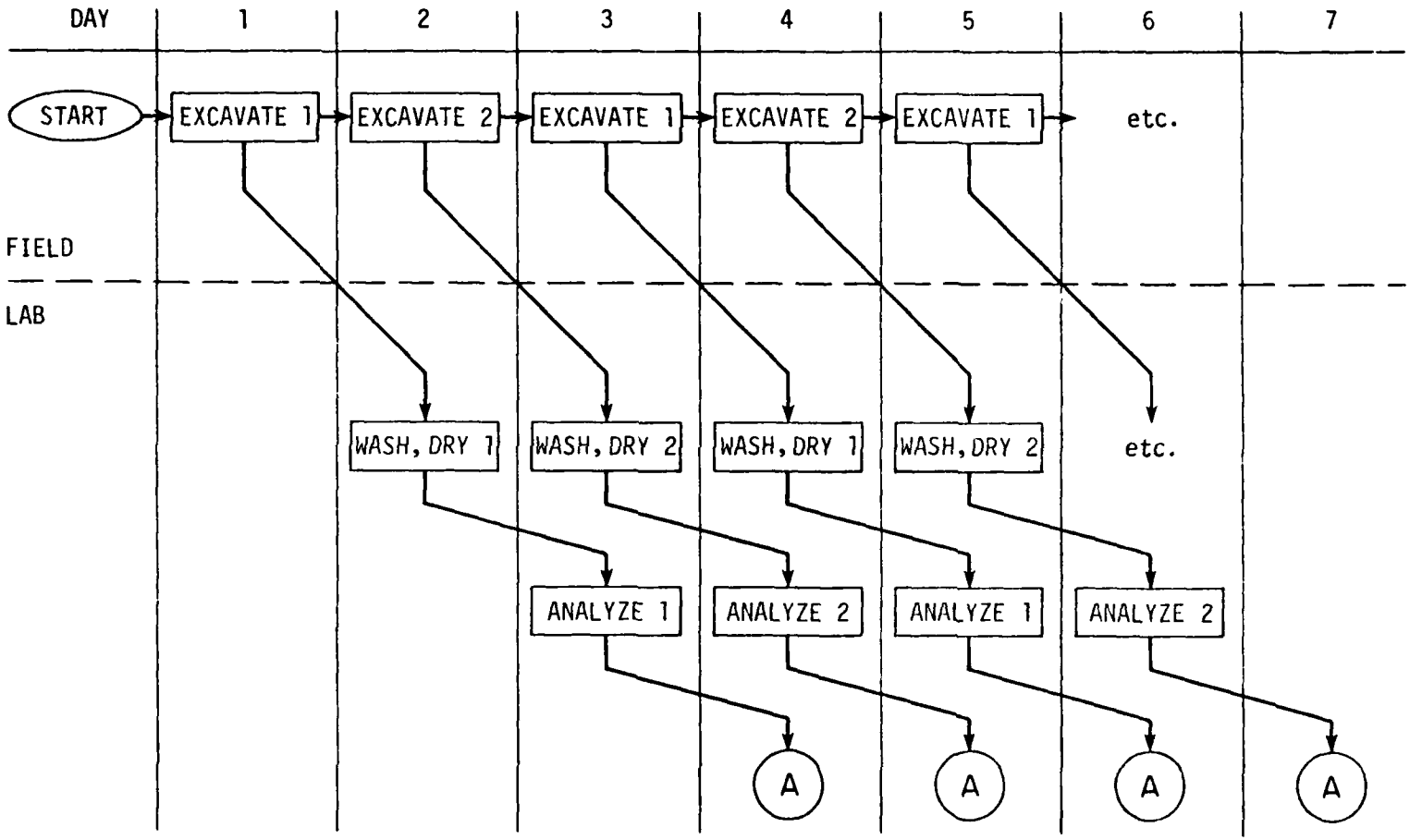


Figure 6.2-1. Laboratory Artifact Processing Procedure.

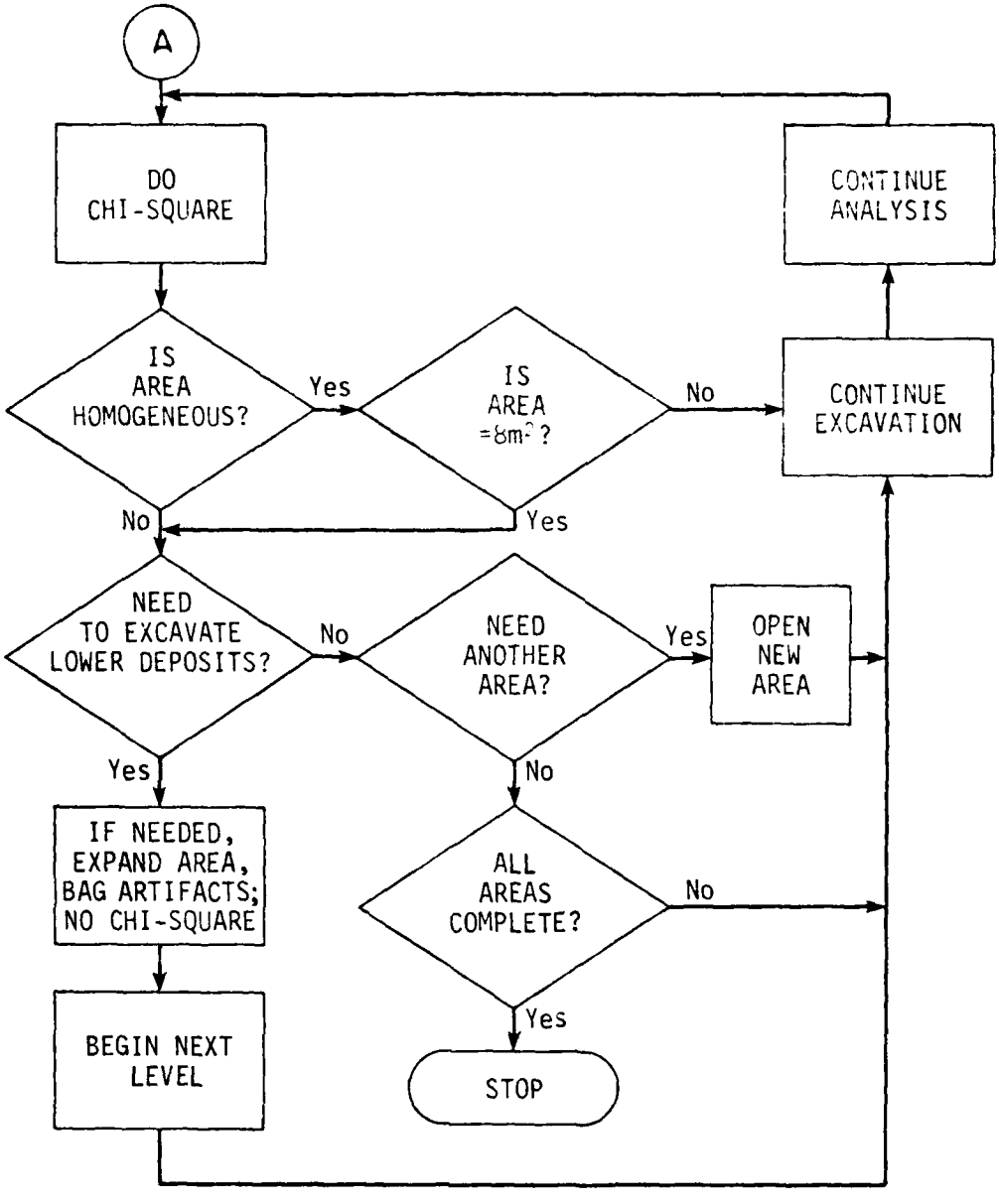


Figure 6.2-2. Flow Chart for Chi-Square Analysis Procedure.

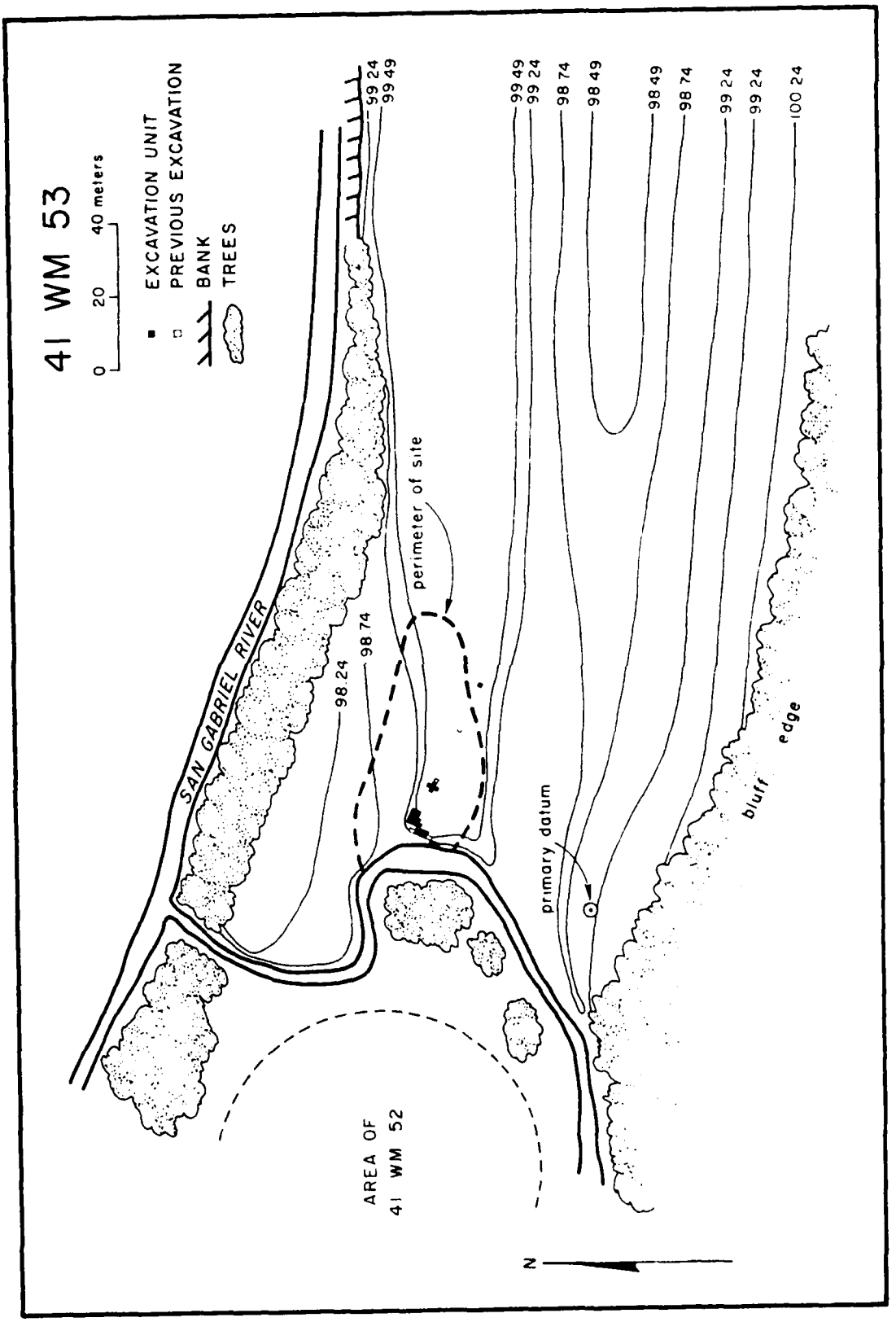


Figure 6.3-1. Site Map, 41WM53

6.3 Experimental Results

North Fork Reservoir

It was hoped that more meaningful archaeological data could be obtained by not expanding in areas or levels of redundant information. At some sites field excavations proceeded based on other criteria because the testing was to act only as an aid, not as a determinant, to the decision-making process of the Field Archaeologist. At a few sites, this did not happen because the reporting of information necessary for testing fell behind schedule. Consequently, two sites (41WM53, 57) were tested by chi-square after excavation.

The first task of the analysis was to reconstruct the day-to-day excavation process on completed sites. The date of excavation by unit/level was included in the data files for this purpose. Since information about the sites was known in advance, the testing could be concentrated on those levels and areas which contained undisturbed and high cultural densities. The first site to be investigated in this manner was 41WM53 which was divided into three areas (A, B, and C). Areas A, B, and C contained, respectively, 11.25, 10, and 4.25 units measuring 1 meter x 1 meter. Hearths were encountered in areas A and B and in a test pit excavated by NTSU adjacent to area C (Sullivan, Hays and Humphreys 1976)(Figure 6.3-1).

Areas A, B, and C were found to be homogeneous at the 70-80 cm BD level on an Intra- (Table 6.3-1) and Inter- (Table 6.3-2) area basis and excavations could have ceased after both areas A and B had reached 8 units each. It was noted that micro-element densities increased in the direction of the hearths and that flakes with cortex increased in frequency away from the hearths (to the west). If additional investigations occur at this site in the future, placement of any new units should be considered to the south and west of those excavations. Based on the current information these new areas should be high in cortical debitage.

In contrast, the 80-90 cm BD level was found to be heterogeneous on an inter-area basis (Table 6.3-3). The extreme value of B → C (2049.59) is the result of the differences in the tertiary flake (647 to 143) and the bifacial thinning flake frequency (36 to 5). Again, area C is to the south and west of the hearths which have tertiary and micro-element concentrations.

Site 41WM57 also was studied during this first phase. The procedure was the same as that followed at 41WM53, although the area designations for 41WM57 were formalized after this first phase was completed. Arbitrary area names A, B, and C were assigned, respectively, for Chi-square

Table 6.3-1 41WM53, 70-80 cm BD X^2 values at .05, Areas A, B and C
Critical values for df of 2=5.99, 3=8.82,4=9.49, 6=12.59

A			B			C		
X^2	df	$P(X^2)$	X^2	df	$P(X^2)$	X^2	df	$P(X^2)$
.06	2	.96	4.56	2	.11	5.55	4	.24
2.10	3	.56	7.80	6	.26			
3.25	2	.20	5.76	4	.22			
.27	4	.46	1.93	2	.38			
.21	2	.91	5.23	4	.27			

Table 6.3-2 41WM53, 70-80 cm BD, Areas A, B and C
X^2 values: df = 6, .05 = 12.59

	X^2		$P(X^2)$	
	B	C	B	C
A	11.36	6.16	.92	.59
B	-	6.24	-	.60

Table 6.3-3 41WM53, 80-90 cm BD, Areas A, B and C
X^2 values: df = 6, .05 = 12.59

	X^2		$P(X^2)$	
	B	C	B	C
A	24.22*	22.48*	.999	.999
B	-	2049.59?	-	1.79 ?

*Heterogeneous

testing of areas later designated as areas D, E, and G (Figure 6.3-2).

Area D contained insufficient amounts of debitage, so testing by Chi-square was directed towards areas E and G. Area E, Level 2, had values of 1.43, 1.52, and 1.04--all with 3 df. Level 3, using a 4 x 6 table, had a value of 24.14 with 15 df, and Level 4 returned a value of 22.19 with 15 df. All of these values are homogeneous at the .05 level of significance.

Area G, however, contained heterogeneous units. Values of 54.71 with 16 df for Level 3 and 37.14 with 12 df for Level 4 were well beyond the limits at .05. Inter-area comparisons for E and G returned a value of 70.52 with 5 df.

Unfortunately, it was later decided that areas D and G were of a mixed nature as a result of non-professional intervention by local artifact collectors. Emphasis of the results has shifted away from these areas and are now questionable and were only provided here as a matter of course. No recommendations for future investigations are made for this site.

A second phase began in March, 1978, and attempted to follow the daily excavations of three sites simultaneously. Providing information on the first site (41WM56) was the responsibility of the North Fork Laboratory Supervisor. On several occasions, this information either fell behind schedule in reporting or failed to contain the correct context or format. This hampered the ability to update files and perform Chi-square testing as planned although every attempt was made to present the results as quickly as possible.

Site 41WM56 was divided into six areas labelled A-F (Figure 6.3-3). Chi-square values are given in Tables 6.3-4 - 6.3-9. Area F did not provide enough lithics to warrant investigations below Level 1 at the time of analysis. Area A appeared to be homogeneous both horizontally and vertically, and additional investigations were not recommended because of the high probability of redundant data. Areas B and D each demonstrated that heterogeniety had been achieved and further horizontal or vertical excavations were not recommended.

Finally, the decision to expand rest d in Area C. Actually it was a choice between C and E, but E was adjacent to a back-hoe trench which cut through the preferred direction of expansion. Due to the micro-element densities and other variables (Chapter 8.1), the indications were that a possible hearth lay to the north of C. The original 2 m x 2 m unit was expanded to the east, west, and south by 1 meter and to the north by 2 meters. The indicators proved correct when, in fact, multiple hearths were encountered to the north. Homogeneous Chi-square values for the expanded Area C, Levels 4 and 6 around Features 6 and 5 are provided in Table 6.3-10.

Unfortunately, again, it was subsequently decided that the first

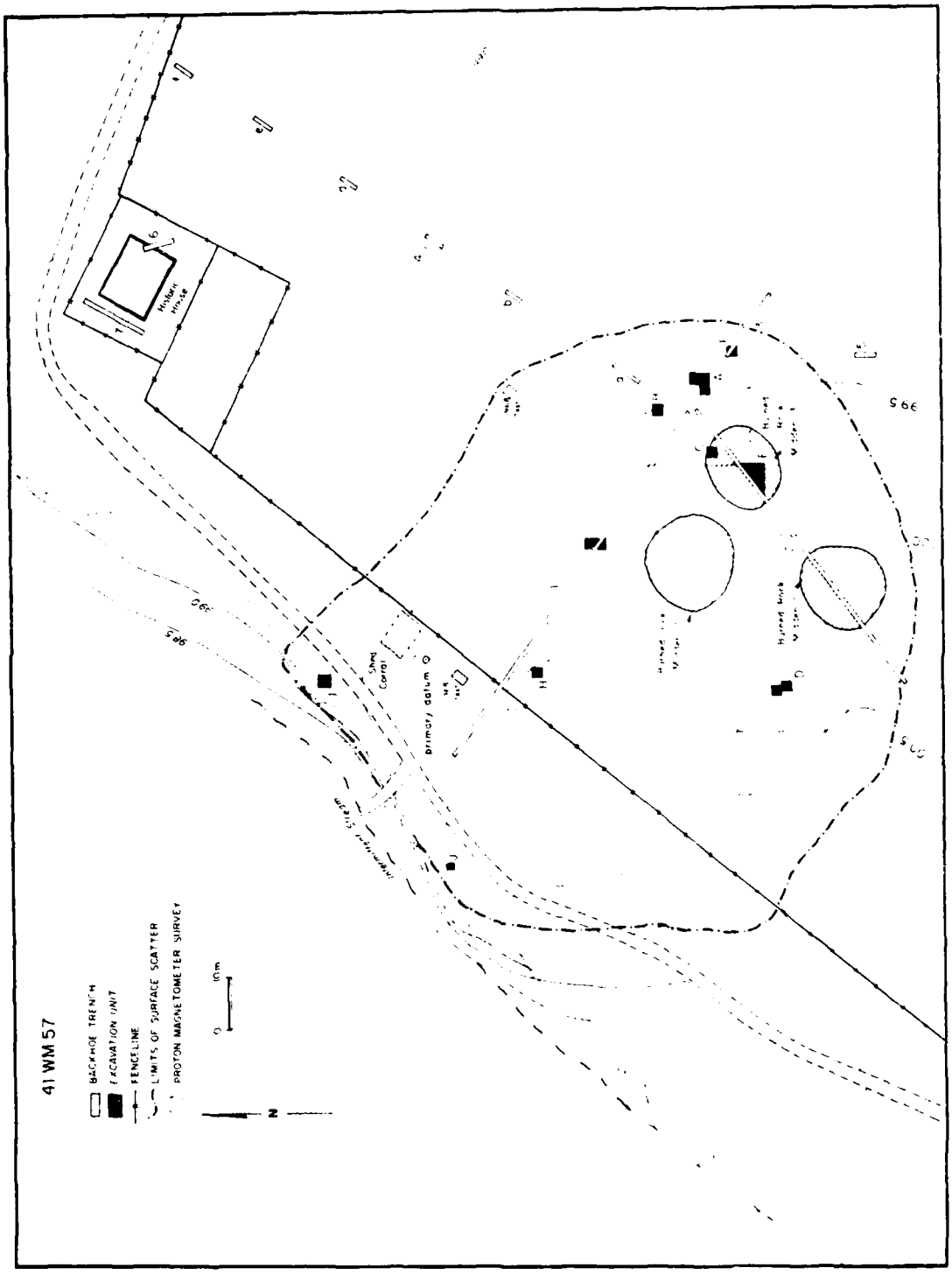


Figure 6.3-2. Site Map, 41WM57.

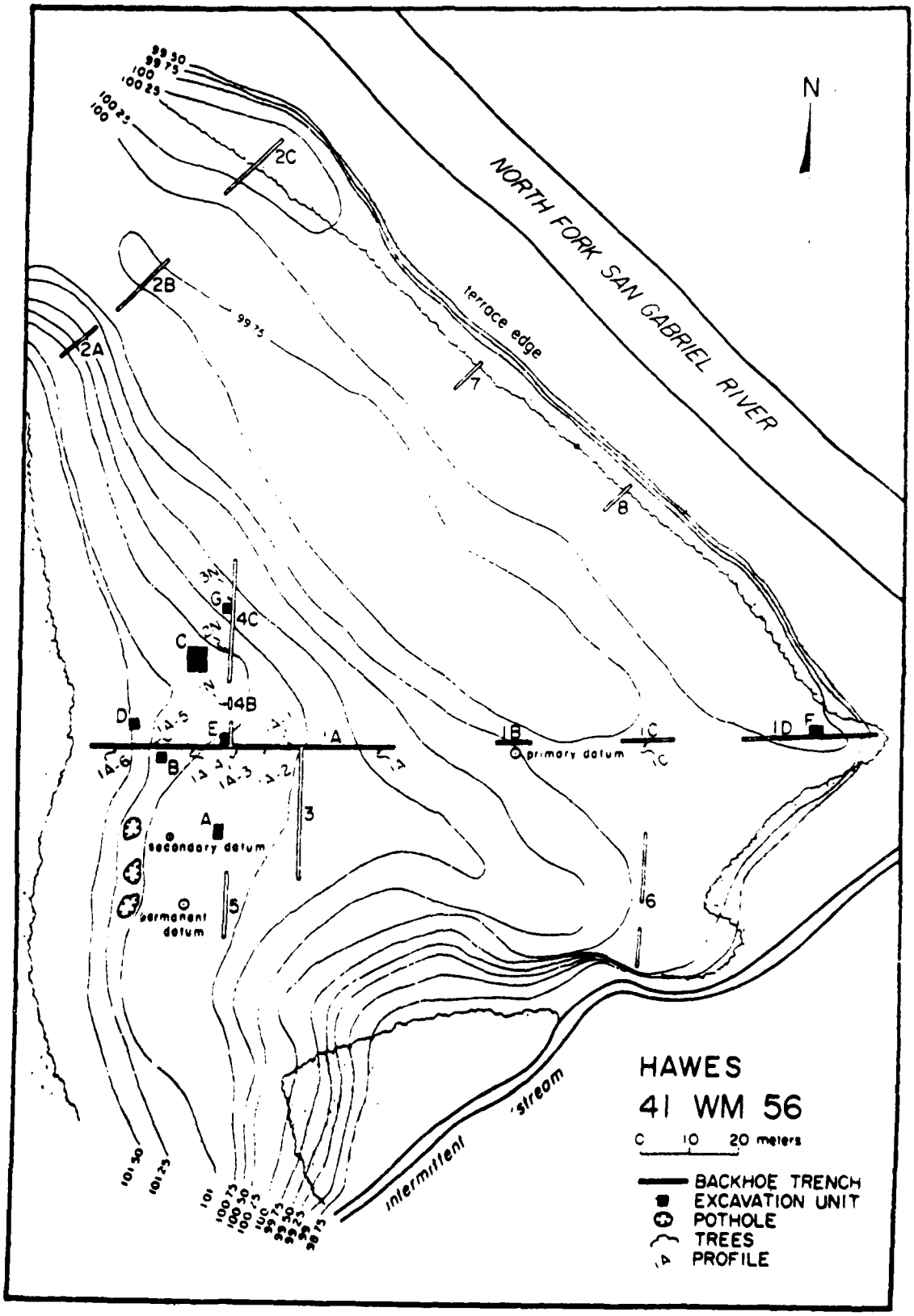


Figure 6.3-3. Site Map, 41WM56

Table 6.3-4

41WM56, Area A, X^2 values (.05), Horizontal
Critical values for df of 3=7.82, 4=9.49, 5=11.07

LEVEL											
1		2		3		4		5		6	
X^2	df	X^2	df	X^2	df	X^2	df	X^2	df	X^2	df
2.49	3	6.71	3	2.91	3	26.00*	3	14.71*	3	7.34	3
7.72	3	5.34	3	4.98	3	45.55*	5	4.60	4	3.77	3
2.74	3	4.34	3	2.31	3	5.14	3	2.93	3	12.99*	4
				4.81	4						
				10.71*	4						
				3.47	3						

*Heterogeneous

Table 6.3-5

41WM56, Area B, X^2 values (.05) horizontally among units.
Critical values for df of 3=7.82, 4=9.49

LEVEL							
3		4		5		6	
X^2	df	X^2	df	X^2	df	X^2	df
35.96*	3	29.23*	3	1.92	3	6.19	3
		55.56*	4	4.44	3	.48	3
		22.89*	4	5.88		12.39*	3

*Heterogeneous

Table 6.3-6

41WM56, Area C, X^2 values (.05) horizontally among units.
Critical values for df of 2=5.99, 3=7.82, 4=9.49, 5=11.07

LEVEL											
1		2		3		4		5		6	
X^2	df	X^2	df	X^2	df	X^2	df	X^2	df	X^2	df
42.32*	4	13.21*	4	3.16	3	2.56	3	7.98*	3	4.99	3
4.07	4	9.65	5	12.26*	5	2.44	3	5.05	3	8.29*	3
				6.05	3	13.15*	3	9.33*	3	1.84	3
				4.42	4	16.90*	3	3.72	3	18.05*	3
				6.55	4	38.17*	4	9.56*	4	10.98*	4
				21.99*	3						
				32.10*	3						
				5.12	3						
				10.56*	2						
				25.22*	3						
				16.24*	4						
				19.00*	5						
				8.38	4						
				2.90	4						
				3.49	3						

*Heterogeneous

Table 6.3-7

41WM56, Area D, X^2 values (.05) horizontally among units.
Critical values for df of 2=5.99, 3=7.82, 4=9.49

LEVEL							
2		3		4		5	
X^2	df	X^2	df	X^2	df	X^2	df
1.53	3	6.44	3	7.89*	3	.85	3
.70	3	2.15	3	9.50*	3	4.39	4
11.71*	2	3.11	3	28.76*	4	3.94	4

*Heterogeneous

Table 6.3-8

41WM56 Area E, X^2 values (.05), horizontally among units. Critical values for df of 3=7.82, 4=9.49

LEVEL									
1		2		3		4		5	
X^2	df	X^2	df	X^2	df	X^2	df	X^2	df
82.55*	3	17.21*	3	130.67*	3	7.29	3	1.73	3
						3.77	3	1.40	3
						7.82	4	3.79	4
						6.25	3	20.00*	3
								10.59*	4

*Heterogeneous

Table 6.3-9

41WM56 Area F, X^2 values (.05), horizontally among units. Critical value for df of 3=7.82

Level 1	X^2	3.73
	df	3

Debitage densities too low ∴ No further Chi-square tests.

Table 6.3-10

41WM56 Area C, X^2 values (.05), horizontally among units with features. Critical values for df of 2=5.99, 3=7.82.

Level 4, F-6			Level 6, F-5		
X^2	df	$P(X^2)$	X^2	df	$P(X^2)$
7.56	3	.94	4.23	3	.76
3.66	3	.70	1.93	3	.41
6.01	3	.89	2.76	3	.57
2.28	3	.48	3.31	3	.65
3.00	3	.61	.95	3	.19
3.91	3	.73	3.56	2	.83
			1.23	3	.24
			1.45	2	.52
			7.18	3	.93

four levels of Area C might be of a mixed nature. However, Levels 6 - 7 and Levels 10-11-12 are intact and homogeneous (Chapter 8.2).

Levels 8 and 9 contain the highest concentration of microflakes in this area, and it is assumed that this is the reason for the heterogeneous results on the vertical comparisons. On an inter-area basis, at Level 5 Areas A, B, C, and D are homogeneous (Table 6.3-11). Lower level intra- and inter-area Chi-squares were not performed in the field since the last day of excavation was known and would not be affected by any statistical results. No further work is recommended at this site.

Granger Reservoir

Site 41WM230 (Loeve-Fox) had previous field seasons in 1972-74 and was divided into six excavations units (XU-1 thru XU-6). The site report (Prewitt, 1974:108) gives a brief description of the flint "waste" flakes and states that 11,918 specimens were collected. These specimens were finally analyzed in early February, 1978, by NTSU with the following results: 11,374 pieces of debitage; 212 additional tools not listed in the 1974 site report; 332 pieces of burned rock. The tools from the previous field seasons were not provided for observations in 1978, but the combined results (site report + new information) are provided in Tables 6.3-15 through 6.3-18.

Excavations in 1972-74 were conducted using elevations measured in feet and inches. Since the 1978 excavations used overlapping metric 10 cm level measurements, it was decided that coordinating the information from the old units with the new metric units for Chi-square testing would be too time consuming if dealt with during the field season (see Table 6.3-17). Therefore, Chi-squre testing at 41WM230 on the new units does not include any combined information from the old units.

As an indication of what might be expected at 41WM230, some of the previous season's debitage and tool information was tested for homogeniety before any new information was compiled. One test of eight tool classes between XU-2 and XU-3 proved to be homogeneous with a value of 6.81, df = 7, and $P(X^2) = .551$. A vertical investigation of XU-3 proved to be mostly homogeneous for Levels 2 through 12 (Table 6.3-12).

As the field season for 41WM230 progressed (January through May, 1978) with an expanded XU-3, continued Chi-square testing further indicated homogeniety in the upper levels (Figure 6.3-3 and Tables 6.4-13,14). In addition to the homogeneous findings, the lithic density north of the N1024 line was half that found south of the N1024 line. The suggestion was given to concentrate the excavations in the southern half of XU-3 in order to attempt to locate the lower limits of the site without a massive loss of man-days in regions of low lithic density. Efforts were shifted to the southern half of XU-3 after excavating an additional four levels (6.4 cubic meters). The lower levels of XU-3 continued to show homogeniety as did other areas of the site. In mid-April, Chi-square

Table 6.3-11 41WM56 X^2 values (.05) Inter-area/Horizontal, Level 5
Critical values of df of 4=9.49, 5=11.07 Code = X^2/df

	B	C	D	E
A	3.25/4	5.20/4	3.54/4	15.19/4*
B	-	7.56/4	7.50/5	21.64/5*
C	-	-	7.29/4	11.37/4*
D	-	-	-	20.74/5*

*Heterogeneous

Table 6.3-12 41WM230 XU-3, 1972-73-74, Vertical Chi-square at .05, df=3 (7.82) (.5 to 6.0 feet or 15.2 to 182.8 cm below surface

LEVELS	X^2	$P(X^2)$	LEVELS	X^2	$P(X^2)$
2-3	3.59	.69	7- 8	3.37	.66
3-4	7.47	.94	8- 9	3.02	.61
4-5	5.10	.83	9-10	2.38	.50
5-6	7.31	.94	10-11	8.28*	.96
6-7	4.26	.77	11-12	5.17	.84

*Heterogeneous

Table 6.3-13 41WM230 (1978) XU-3, X^2 values at .05, horizontally among units.
Critical values for df of 2=5.99, 4=9.49

LEVEL	UNITS	X^2	df	$P(X^2)$
6	1,2,4	1.91	4	.247
	3,5,6	1.42	4	.159
	7,8	2.28	2	.680
7	1,2,4	4.15	4	.614
	3,5,6	3.00	4	.442
	7,8	3.29	2	.807
8	5,6	1.52	2	.531
	7,8	.91	2	.367

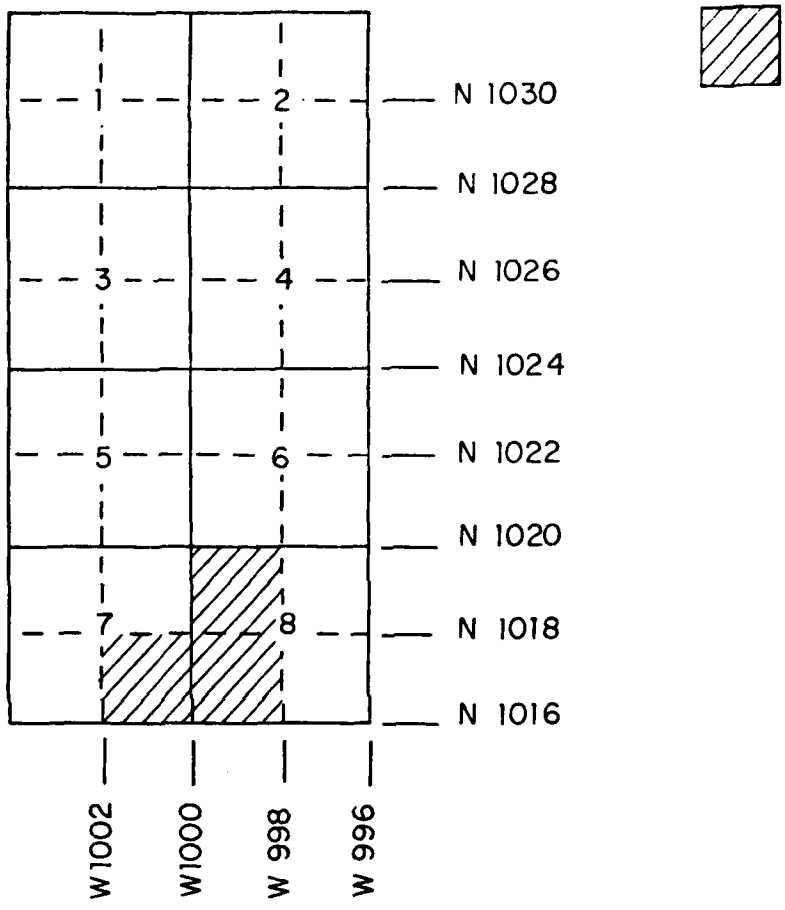


Figure 6.3-4. 41WM230 unit numbers for Chi-square testing, (XU-3).

Table 6.3-14

41WM230 (1978), Vertical XU-3 (.05) among units.

Units 5,6: Levels 6, 7, 8 df=2 (5.99)

Levels	7		8	
	X^2	$P(X^2)$	X^2	$P(X^2)$
6	2.27	.322	3.50	.826
7	-	-	.61	.263

Units 7,8: Levels 6, 7, 8 df=2 (5.99)

Levels	7		8	
	X^2	$P(X^2)$	X^2	$P(X^2)$
6	2.40	.302	2.83	.757
7	-	-	2.93	.769

Table 6.3-15

Flint tool inventory for Loeve-Fox site (41WM230) 1972-73-74.

TOOLS	QTY.	%
Projectile Point	32	8.06
Point Parts (tips, stems)	38	9.57
Biface	36	9.07
Biface fragments	63	15.87
Preform	4	1.01
Scraper	20	5.04
Burin	11	2.77
Denticulate	5	1.26
Notch	16	4.03
Borer	2	0.50
Backed piece	1	0.25
Truncation	3	0.76
Gouge	1	0.25
Unifacial	1	0.25
Chopper	3	0.76
Rough Tools	1	0.25
Retouched piece	142	35.77
Retouched flake (bec)	1	0.25
Retouched blades	15	3.78
Battered core	2	0.50
TOTAL	397	100.00

Table 6.3-16

Debitage inventory for Loeve-Fox site (41WM230) 1972-73-74.

DEBITAGE-DEBRIS	QTY.	%
Primary Flakes	206	1.81
Primary Blades	2	0.02
Secondary Flakes	1,508	13.26
Secondary Blades	25	0.22
Teritary Flakes	3,778	33.22
Teritary Blades	17	0.15
Micro Primary Blades	7	0.06
Micro Secondary Blades	18	0.16
Micro Teritary Blades	81	0.71
Bifacial Thinning Flakes	118	1.04
Core	23	0.23
Core Fragments	8	0.07
Chunks	94	0.83
Chips	5,475	48.14
Bifacial Thinning Blade	2	0.02
Burinspall	4	0.04
Core-edge Trimming Flake	8	0.07
TOTAL	11,374	100.00

Table 6.3-17

Total Loeve-Fox site (41WM230) - 1972-73-74.

	DEPTH		DERITAGE		TOOLS		TOTAL LITHICS	
LEVELS	FEET	CENTIMETERS	TOTAL	%	TOTAL	%	TOTAL	%
	Surface	Surface	69	0.82	72	20.15	141	1.45
1	0.0-0.5	0.0- 15.2	41	0.36	5	1.26	46	0.39
2	0.5-1.0	15.2- 30.4	635	5.58	23	5.79	658	5.59
3	1.0-1.5	30.4- 45.7	968	8.51	34	8.56	1002	8.51
4	1.5-2.0	45.7- 60.9	781	6.87	34	8.56	815	6.92
5	2.0-2.5	60.9- 76.2	984	8.65	44	11.08	1028	8.73
6	2.5-3.0	76.2- 91.4	2029	17.84	33	8.31	2062	17.52
7	3.0-3.5	91.4-106.6	2649	23.29	46	11.59	2695	22.90
8	3.5-4.0	106.6-121.9	869	7.64	20	5.04	889	7.55
9	4.0-4.5	121.9-137.1	551	4.84	22	5.54	573	4.87
10	4.5-5.0	137.1-152.4	694	6.10	21	5.29	715	6.07
11	5.0-5.5	152.4-167.6	199	1.75	7	1.76	206	1.75
12	5.5-6.0	167.6-182.8	107	0.94	6	1.51	113	0.96
13	6.0-6.5	182.8-198.1	16	0.14	1	0.25	17	0.14
14	6.5-7.0	198.1-213.3	20	0.18	-	-	20	0.17
15	7.0-7.5	213.3-228.6	28	0.25	-	-	28	0.24
16	7.5-8.0	228.6-243.8	40	0.35	1	0.25	41	0.35
17	8.0-8.5	243.8-259.0	73	0.64	1	0.25	74	0.63
18	8.5-9.0	259.0-274.3	101	0.89	5	1.26	106	0.90
Burials			325	2.86	9	2.27	334	2.84
FP #3			140	1.23	2	0.50	142	1.21
FP #4			20	0.18	3	0.76	23	0.20
Feat. 1			3	0.03	-	-	3	0.03
Feat. 12			1	0.01	-	-	1	0.01
Feat. 24			9	0.08	-	-	9	0.88
TOTAL			11374	100.03	397	99.98	11771	100.01
%			96.63		3.37		100.00	

Feat. = Features FP = Floor Plan

Table 6.3-18

Total Loeve-Fox site (41WM230) 1972-73-74

UNITS	DEBITAGE		TOOLS		TOTAL LITHICS	
	Total	%	Total	%	Total	%
Surface	69	0.61	72	18.14	141	1.20
N895/W990	1,622	14.26	63	15.87	1,685	14.31
N895/W1000	3,766	33.11	92	23.17	3,858	32.78
N1000/W1000	1,979	17.40	39	9.82	2,018	17.14
N1030/W1000	4	0.04	1	0.25	5	0.04
N1050/W1000	167	1.47	4	1.01	171	1.45
N1060/W990	3,112	27.36	98	24.69	3,210	27.27
N1060/W1000	368	3.24	14	3.53	382	3.25
N1070/W1000	80	0.70	1	0.25	81	0.69
N1080/W990	35	0.31	1	0.25	36	0.31
N1080/W1000	31	0.27	0	0.00	31	0.26
N1090/W990	25	0.22	3	0.76	28	0.24
N1090/W1000	60	0.53	1	0.25	61	0.52
"Rest" (6 units)	56	0.49	8	2.02	64	0.54
TOTAL	11,374	100.01	397	100.01	11,771	100.00
%	96.63		3.37		100.00	

testing was abandoned at site 41WM230 in order to concentrate efforts on other excavations in progress.

Additional backhoe trenches were being dug by the subcontractor during this period to explore the site more fully. In the south profile of BHT-19 , two bifaces (fragments?) were noted, along with several pieces of debitage, less than two meters apart at the same depth. It was projected that a strip 5 cm wide by 2 meters in length along this profile would represent .10 of a square meter in which the two bifaces were located. This would calculate into a biface per square meter density of 20 along this BHT. Admittedly, this calculation was somewhat unreliable, although it did cause further attention to be drawn to this area.

The suggestion was made to investigate this area of the site because of the high density of tools, debitage and other cultural indicators observed in the BHT profile. After discussions were completed, a backhoe ramp was excavated in the direction of BHT-19. Multiple hearths were encountered and a new unit, XU-9, was opened at the bottom of the ramp area. Although excavations never reached the BHT, XU-9 uncovered higher tool debitage densities than any other area of the site. Additional artifacts were verbally reported to the field laboratory, but actual samples from XU-9, if taken, never reached the lab for analysis or cataloging.

In view of the tool and debitage densities in other areas of the site (Tables 6.3-19, 20), it is quite clear that there is an increase in both categories to the southwest of the existing excavation units, which is in the direction of BHT-19. One final comment was made on the possible significance of this area of the site by using a Poisson distribution which gives approximately the same probabilities as a binomial distribution and is used with small sample sizes (Dixon and Massey, 1969: 418).

Given the assumptions: 1) depth is negligible; 2) bifaces are of equal size; and 3) the site is homogeneous and. . . .

A = unit area or 1 square meter
a = study area or .10 square meter
c = constant (over area A) or $\frac{1}{2}$ biface/M^2
$\lambda = ca/A = 1/2(1/10)/1 = 1/20$
$e = 2.7182818$

then the probability of encountering two bifaces in one square meter in any given BHT wall at site 41WM230 would be . . .

Table 6.3-19

41WM230 Tool/Debitage Ratios-Density (less surface, BHT's, Cores).

EXCAVATION UNIT	TOOLS	DEBITAGE	TOOL/DEBITAGE RATIO	M^3	DENSITY/M^3	
					TOOLS	DEBITAGE
XU-1	59	4,277	1: 72.5	5.0	11.8	855.4
XU-3	287	35,052	1:122.1	36.5	7.9	960.3
XU-5	24	1,423	1: 59.3	5.0	4.8	284.6
XU-8	9	84	1: 9.3	1.2	7.5	70.0
XU-9	25	3,628	1:145.1	1.4	17.9	2591.4
TOTALS/AVGS.	404	44,464	1:110.1	49.1	8.2	905.6

Table 6.3-20

41WM230 Biface (+ Fragments) Density.

EXCAVATION UNIT	BIFACES	M^3	BIFACE DENSITY/M^3	DEBITAGE DENSITY/M^3
XU-3	85	36.5	2.3	960.3
XU-1	22	5.0	4.4	855.4
XU-9	9	1.4	6.4	2591.4

$$\text{Prob}(X) = \frac{\lambda^X e^{-\lambda}}{X!}$$

$$\text{Prob}(2) = \frac{\lambda^2 e^{-\lambda}}{2!} = \frac{(1/20)^2 e^{-(1/20)}}{2} = .001189$$

On the 14th of April, 1978, when this quick comment was given by Dr. Harold Hietala, it was assumed that the justification for testing around BHT- was because it had encountered an event, the two bifaces, whose probability of occurrence was low (.001189). Upon further reflection, after the field season, two hypotheses are apparent: 1) this is a rare event, or 2) assumption 3 above is invalid--i.e., the site is not homogeneous due to a cluster of bifaces (c would be higher than 1/20). It is assumed that hypothesis number 2 cannot be true because of the Chi-square debitage homogeniety and the further Poisson test where a cluster is defined as 10 times the density of a "non cluster". The new $\lambda = 1/2$ and the Prob (2) = .0758125, still low. At this point it would be safe to conclude that hypothesis number 1 is probably true. Even if the biface density across the site was 10 times that given. the probability of two bifaces appearing in one square meter in any given BHT wall is still very low.

Perhaps the Poisson distribution contains some bias in its use under these circumstances, but the combination of observations proved fruitful by the results of XU-9. It could also be taken as a statement of the predictability and usefullness of backhoe trenching as a method of site investigation. Unless future investigations are aimed either in the area around BHT- or for the purpose of locating the depth of the deposits, no further work is recommended for this site.

The third site dealt with during this phase was 41WM267 (Cervenka) which was divided into four areas (A, B, C, and D). The final Chi-square tests were performed during July, 1978, on areas A, B, and C. It should be stated at this point that horizontal sampling was determined to be less important than the location of the depth of the site and that efforts were directed towards controlled vertical excavations (Figure 6.3-5). Consequently, data for horizontal Chi-square testing was, in the beginning, very minimal and was limited to five 1 meter x 1 meter excavation units. Areas A and B contained originally two units each and Area C began with only one. Horizontal Chi-square results for areas A and B are provided in Tables 6.3-21 and 22. Since Area C began with only one unit, only vertical Chi-square results could be obtained (Table 6.3-23).

Area A was homogeneous throughout, as was Area B, except for Level 9 which contained an increase in tertiary flake and micro-element densities. Area C's vertical investigation returned mixed results since Feature 3, a

Table 6.3-21

41WM267 Area A N1000W989/N1000W990
Chi-Square Values (.05), Horizontal
Critical values for df of 2=5.99, 3=7.82

LEVEL	X^2	df	$P(X^2)$
4	6.00	3	.889
5	1.42	3	.300
6	5.25	3	.846
7	2.15	3	.457
8	4.83	3	.816
9	1.97	3	.421
10	1.58	2	.545
11	2.86	2	.761
12	1.52	3	.321

Table 6.3-22

41WM267 Area B N1017W987/N1018W987
Chi-Square Values (.05), Horizontal
Critical values for df of 2=5.99, 3=7.82, 4=9.49

LEVEL	X^2	df	$P(X^2)$
5	5.49	3	.861
6	3.62	3	.694
7	.43	2	.195
8	5.62	2	.940
9	16.94*	3	.999
10	3.41	3	.668
11	-	-	-
12	6.75	4	.850

*Heterogeneous

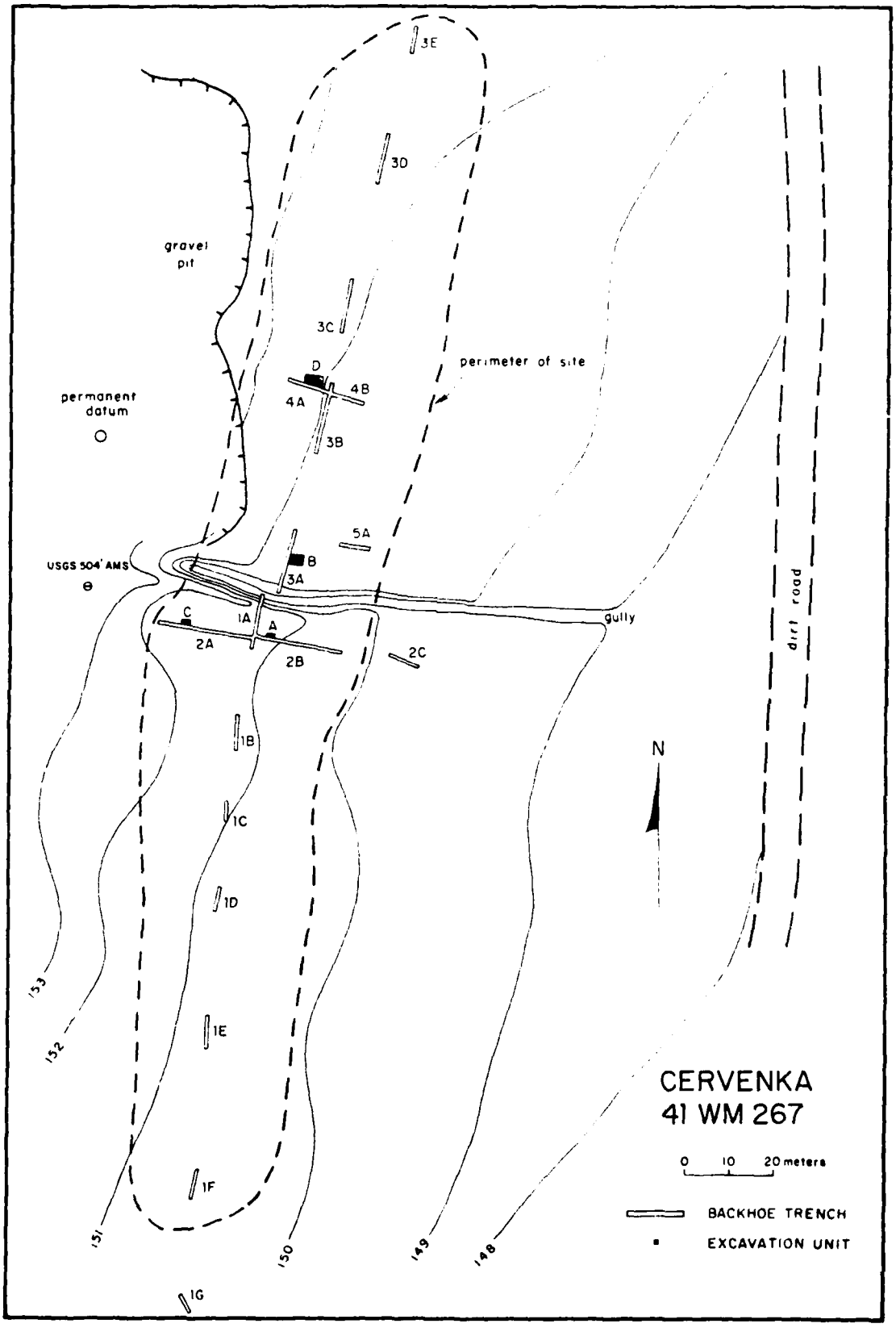

3E
3D
gravel pit
3C
D
4B
4A
3B
perimeter of site
permanent datum
5A
B
3A
USGS 504' AMS
C
1A
A
2A
2B
2C
gully
dirt road
1B
N
1C
1D
153
152
1E
CERVENKA
41 WM 267
0 10 20 meters
1F
BACKHOE TRENCH
EXCAVATION UNIT
151
150
149
148
1G

Figure 6.3-5

Table 6.3-23

41WM267 Area C N1001/W1009
Chi-square values (.05), Vertical
Critical values for df of 2 = 5.99, 3 = 7.82

LEVEL	X^2	df	$P(X^2)$
2 → 3	3.22	3	.642
3 → 4	7.54	3	.943
4 → 5	23.10*	3	.999
5 → 6	8.47*	3	.963
6 → 7	11.39*	3	.990
7 → 8	1.10	2	.424
7 → F3†	1.16	3	.238
6 → 7 + F3	11.72*	3	.992
5 → 7 + F3	1.58	3	.335

†F3 = Feature #3, a burned rock scatter.

*Heterogeneous.

Table 6.3-24

41WM267 Inter-Area Chi-square values (.05)
Critical value for 3 df = 7.82

LEVEL	AREA	X^2	df	$P(X^2)$
3	A → C	2.72	3	.563
5	A → B	15.52*	3	.999
6 → 5	A → B	2.39	3	.505

*Heterogeneous

burned rock scatter, caused an expected heterogeneous value due to the decrease in tertiary and micro-element densities. Inter-area results for three of the upper levels are provided in Table 6.3-24.

With the exception of a few Chi-square comparisons where possible, testing on 41WM267 ceased altogether on July 13, 1978. The decision was made that due to the approaching end of the field season (August 18th) no more man-days could be saved because of the need to determine the depth of cultural materials at the site. On July 15th Area D was begun and the expansion of Areas A and B started on July 24th. An intra-unit test of Area D for Levels 4, 5, and 7 proved to be mostly heterogeneous with values of 3.52, 12.47, and 8.78, respectively (3 df at .05). Because of the limited Chi-square investigations on 41WM267, recommendations for further work were determined by other factors (Chapter 8.10).

With the end of formal Chi-square examinations, limited testing of the remaining sites began. Excavations at these sites continued without regard to the Chi-square results, but are provided here for further evaluation of the methodology. Site 41WM124, Area A vertical values are found in Table 6.3-25, while site 41WM163 and 41WM258 are shown in Table 6.3-26. Two remaining sites, 41WM328 and 41WM304, did not have any field Chi-square investigations performed due to low numbers of debitage.

The final site to be discussed is 41WM73. Although excavations and Chi-square testing occurred earlier,its treatment was like that performed during the above sites. Areas A thru E (Figure 6.3-6) were investigated statistically on the 5th of June, 1978, and the results are provided in Tables 6.3-27 through 6.3-30. Area E did not contain debitage amounts large enough to work with and Area B, for six of the units, had the first nine levels scraped away, also due to low debitage frequencies. This was the method chosen for this area in order to reach the Middle and Early Archaic deposits beneath the burned rock midden (Chapter 8.4). Areas A, B, and D are mainly homogeneous through Level 8 on the intra- and inter-area Chi-square comparisons. Area B reached the eight unit maximum while remaining mostly homogeneous and Areas A, C, and D each had low debitage amounts. No additional excavations are needed for Area B and Area A, C, and D recommendations for further work can be found in the same section given above.

Conclusions

The major classifiable categories, as given in the beginning of this section, proved to be useful in determining areas or levels of homogeniety within the sites investigated. The use of the Texas Instruments Programmable/59 Calculator, although somewhat repetitive in its data entry, was an invaluable piece of equipment and saved an immeasurable amount of time over the manual method of Chi-square calculation. Data files could have been better organized, but the updating of information by hand was the major cause of any loss of time.

Table 6.3-25

41WM124 Vertical Chi-square Values Area, A (.05)
Critical values for 3df = 7.82, 4 = 9.49

LEVEL	X^2	df	$P(X^2)$
1 → 2	2.23	3	.473
2 → 3	5.76	3	.876
3 → 4	.74	3	.135
4 → 5	.22	3	.026
5 → 6	2.42	4	.340
6 → 7	.63	3	.111
7 → 8	.96	3	.188
8 → 9	1.88	3	.402
9 → 10	6.87	3	.924
10 → 11	18.76*	3	.999
11 → 12	3.27	3	.648
12 → 13	5.33	3	.851
13 → 14	2.92	3	.596
14 → 15	6.21	3	.898
15 → 16	7.30	3	.937
16 → 17	11.61*	3	.991
17 → 18	38.48*	3	.999
18 → 19	20.89*	3	.999
19 → 20	.65	3	.115
20 → 21	.57	3	.097

*Heterogeneous

Table 6.3-26

Phase Three Chi-Square Values (.05)
Critical value for 3df = 7.82

SITE	UNIT	LEVEL	X^2	df	$P(X^2)$
41WM163	N1001W1004/N999W1056	2	1.67	3	.356
41WM163	N99W1056	2 → 3	6.50	3	.910
41WM163	N1001W1004/N999W1056	2 → 3	4.06	3	.745
41WM163	N999W1056	1 → 2	.33	3	.046
41WM258	N976W956	4 → 5	5.76	3	.876
41WM258	N976W956	5 → 6	1.44	3	.304
41WM258	N976W956	6 → 7	5.58	3	.866
41WM258	N976W956	7 → 8	.93	3	.183
41WM258	N976W972	4 → 6	2.68	3	.557
41WM258	N976W972	6 → 7	2.94	3	.599
41WM258	N976W972	7 → 8	2.78	3	.574
41WM258	N976W972	4 → 8	9.75	3	.979
41WM258	N976W956/N976W972	5 → 4	11.14*	3	.989
41WM258	N976W956/N976W972	5 → 8	2.55*	3	.534

*Heterogeneous

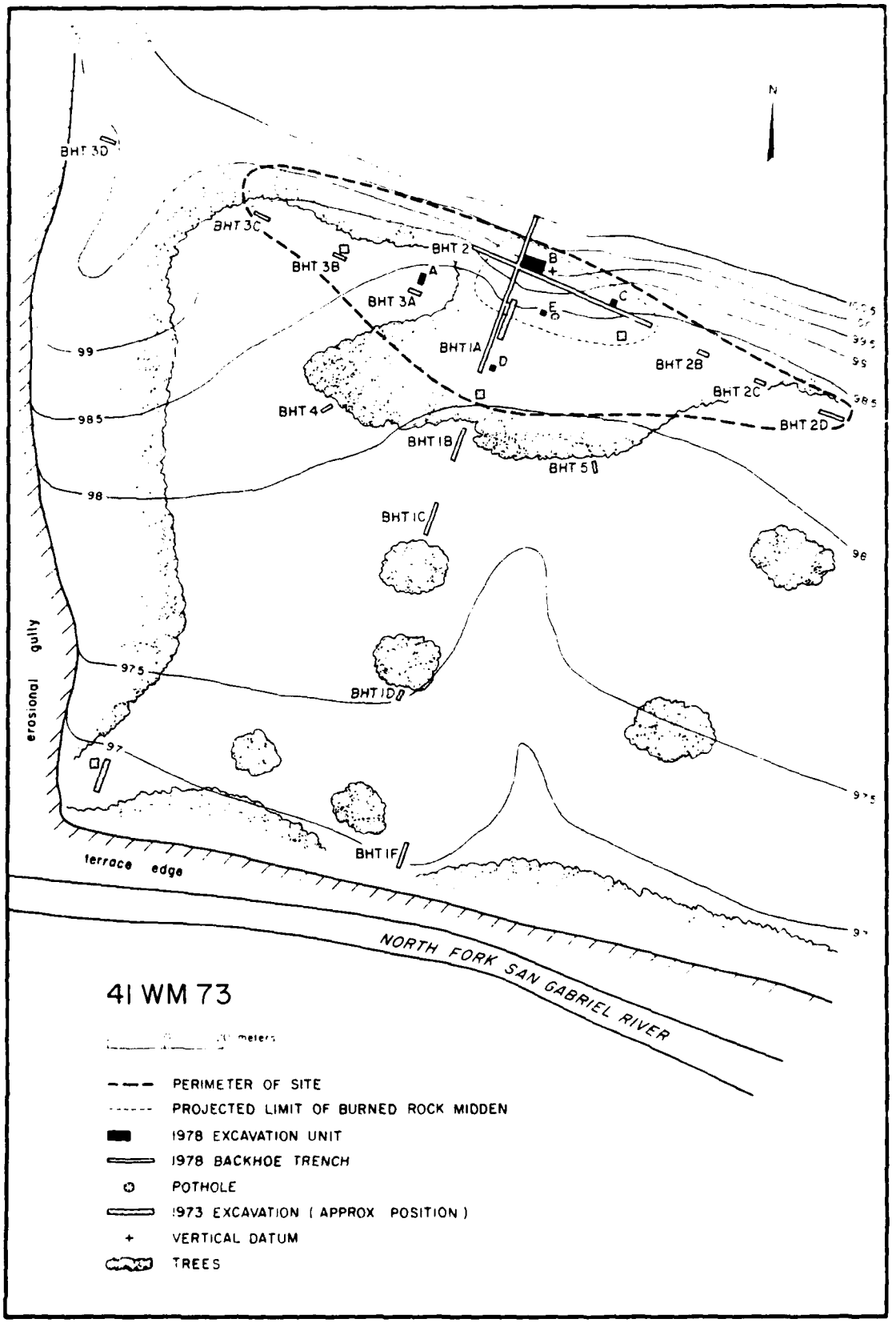

N
BHT 3D
BHT 3C
BHT 3B
BHT 3A
BHT 2
BHT 2B
BHT 2C
BHT 2D
BHT 1A
BHT 1B
BHT 1C
BHT 1D
BHT 1F
BHT 4
BHT 5
A
B
C
D
E
99
985
98
975
97
erosional gully
terrace edge
NORTH FORK SAN GABRIEL RIVER
41 WM 73
PERIMETER OF SITE
PROJECTED LIMIT OF BURNED ROCK MIDDEN
1978 EXCAVATION UNIT
1978 BACKHOE TRENCH
POTHOLE
1973 EXCAVATION (APPROX POSITION)
VERTICAL DATUM
TREES

Figure 6.3-6

Table 6.3-27

41WM73 Chi-Square Values (.05) Area B, Horizontal Marginal Totals (MT)
Critical values for df of 2 = 5.99, 3 = 7.82

LEVEL 10			LEVEL 11			LEVEL 12			LEVEL 13		
UNIT	X^2	df	UNIT	X^2	df	UNIT	X^2	df	UNIT	X^2	df
N1040 W1048 → N1040 W1049	.78	2	N1040 W1048 → N1040 W1049	1.92	2	N1040 W1050 → N1040 W1051	3.57	2	N1041 W1048 → N1040 W1051	.71	3
MT-1 → N1040 W1050	7.31	3	MT-1 → N1040 W1050	5.97	2	MT-1 → N1041 W1048	.78	3	MT-1 → N1041 W1049	1.96	2
MT-2 → N1040 W1051	1.96	2	MT-2 → N1041 W1049	2.55	2	MT-2 → N1041 W1049	2.29	2	MT-2 → N1041 W1050+ 51	1.66	3
MT-3 → N1041 W1048	.47	2	MT-3 → N1041 W1051	.33	2	MT-3 → N1041 W1050+ 51					
MT-4 → N1041 W1049	.08	2									
MT-5 → N1041 W1051	5.03	3									
MT-6 → N1041 W1051	4.65	2									

Table 6.3-28

41WM73 Chi-Square Values (.05), Area B, Vertical
Critical values for df of 2 = 5.99, 3 = 7.82

UNIT: N1041/W1050			UNIT: N1041/W1051			UNIT: N1041/W1050 → N1041/W1051		
LEVEL	X^2	df	LEVEL	X^2	df	LEVEL	X^2	df
1 → 2	5.12	2	1 → 2	4.79	2	1	15.61*	3
2 → 3	1.30	2	2 → 3	1.30	2	2	2.73	3
3 → 4	2.89	2	3 → 4	.93	2	3	4.23	2
4 → 5	2.12	2				4	3.67	2
5 → 6	-	-				5	2.93	2
6 → 7	-	-						
7 → 8	-	-						
8 → 9	5.22	2						
5 → 9	1.89	2						

*Heterogeneous

Table 6.3-29

41WM73 Chi-square Values (.05) Vertical by Area (less E).
Critical values for df of 2 = 5.99, 3 = 7.82

	AREA A		AREA C		AREA D	
LEVEL	X^2	df	X^2	df	X^2	df
1 → 2	2.68	3	2.31	2	2.45	2
2 → 3	6.49	3	27.02*	3	2.63	2
3 → 4	17.49*	3	-	-	8.81*	2
4 → 5	29.20*	3	-	-		
5 → 6	30.59*	3	12.33*	3		
6 → 7	4.63	3				
7 → 8	1.43	3				
3 → 6	.70	3				

*Heterogeneous

41WM73 Chi-square Values (.05) Horizontal Inter-Area
Critical values for df of 2 = 5.99, 3 = 7.82

		B		D	
		X^2	df	X^2	df
Level 1	A	5.76	3	-	-
	B	-	-	.49	2
Level 2	A	3.75	3	.08	2
	B	-	-	2.24	2
Level 3	A	2.19	2	25.99*	3
	B	-	-	10.45*	2
Level 4	A	7.69*	2	15.11*	3
	B	-	-	1.91	2
Level 5	A	6.99*	2	1.83	2
	B	-	-	5.53	2
Level 6	A	12.10*	2	-	-
	B	-	-	11.57*	2
Level 7	A	11.80*	2	-	-
	B	-	-	-	-
Level 8	A	5.99	2	-	-
	B	-	-	-	-

*Heterogeneous

The test of this methodology was successful in that a non-intuitive reason for moving excavation units has been found. It must be stressed that any decisions to locate or expand excavation units was not based solely on the Chi-square results. These results should be used only to augment other criteria which the excavator might have.

III. EXCAVATION RESULTS

This section consists of two chapters which present the results excavations of sites under the initial contract. Chapter 7 establishes a radiocarbon based chronology for the San Gabriel sites. The site reports are presented in Chapter 8.

7.0 Chronological Framework for the San Gabriel Studies

by

Duane E. Peter and T. R. Hays

7.1 Culture/Time Stratigraphic Constructs

A primary goal of this research is to provide an understanding of man's adaptations within the San Gabriel River Valley through time. Ideally, discrete occupational surfaces and associated radiocarbon dates are necessary for such an endeavor. Unfortunately, sites in Central Texas rarely contain discrete living surfaces. As Johnson (1967:1-10) aptly notes, the nature of Central Texas midden deposits frequently renders the recognition of cultural associations between artifacts an almost impossible task. Consequently, the definition of distinctive archaeological components is severely hindered. The lack of sufficient radiocarbon samples, due to either poor preservation or unsuitable collection techniques, has hampered comparative efforts from both a diachronic and a synchronic perspective.

To analyze the diachronic trends within the overall cultural record, however, it is necessary to delimit relatively homogeneous archaeological units or components within archaeological assemblages. In Central Texas this need has been satisfied by the development of chronological constructs. These chronological constructs (Kelly 1947a, 1947b, 1959; Suhm, Krieger and Jelks 1954; Johnson 1967; Prewitt 1976; Weir 1976; Patterson 1977), which have long been an important aspect of Central Texas studies, have been based upon gross temporal changes in archaeological traits, particularly those of projectile point styles. Projectile points are still used as primary fossil indicators or index markers of cultural components.

It was originally planned that the chronological construct for the San Gabriel project would be based upon radiocarbon dates rather than the traditional projectile point index markers. Unfortunately, the number of available radiocarbon samples of sufficient size to date was smaller than anticipated, especially for the earlier periods. Nevertheless, sufficient radiocarbon dates were obtained to provide a more substantive basis for the presently available chronology for Central Texas.

The lack of sufficient radiocarbon dates together with the often massive midden accumulations of Central Texas sites makes any determination of relative contemporaneity between assemblages a very difficult task. The correlation of numerous individual arbitrary levels both within and between sites was impossible except through an examination of the relationships between artifact content and stratigraphic context. The relative contemporaneity (in a very general sense) of the assemblages was accomplished analytically by reducing the number of arbitrary excavation levels to units known as "culture/time stratigraphic units" (McMillan 1976:211).

Ideally, culture/time stratigraphic units are chronologically discrete horizons which contain levels that display some degree of cultural homogeneity (based on subsistence data and activity indicators) when compared with units above them or below them. In practice, the delineation of such units relies heavily on the presence of artifact index markers even though numerous proclamations claim otherwise. Within the San Gabriel sites, the stratigraphic association of hearths, related occupational debris, previously recognized index markers, and radiocarbon dates were the desired data for assigning arbitrary levels to a culture/time stratigraphic unit. Stratigraphic relationships and radiocarbon dates provided the basis for these designations at many of the sites. However, within the massive midden accumulations the distribution of the projectile points became a primary source of information for such decisions.

A review of the literature pertaining to the previous definitions of archaeological units for Central Texas (Jelks 1962; Weir 1976; Prewitt 1976, 1981) revealed that the culture/time stratigraphic units developed for the San Gabriel sites were generally representative of the presently recognized "phases" for Central Texas. Therefore, the individual culture/time stratigraphic units for each site will be referred to as "components" of the recognized phases. Of course, there is an apparent danger of circularity to one's logic when the recognition of the culture/time stratigraphic units is so dependent upon the defining characteristics of the cultural phases. In this situation, however, an examination of the stratigraphic association of features, associated occupational debris, radiocarbon dates, and projectile points from a new data set was undertaken to evaluate the previously designated archaeological units. Given the limited number of radiocarbon dates for many of the assemblages, this approach was an expedient and necessary method to provide manageable units for the examination and explication of chronological changes in the cultural record. These units provide the basis for independent tests of the viability of the presently recognized phases through an examination of the chronological variability of the lithic debitage and tool assemblages.

The accompanying table (Table 7.1-1) provides information concerning the proveniences of the sixteen radiocarbon samples processed from the San Gabriel sites and their relationship to the chronological construct as proposed by Prewitt (1976), Weir (1976), and Patterson (1977). The index markers presented are those found only in stratigraphic association with the processed radiocarbon samples from the San Gabriel assemblages. In many cases the assignment of culture/time stratigraphic units to many of the levels of the San Gabriel sites necessarily depended upon the more complete list of index markers as presented by Patterson (1977:58). Recent radiocarbon dates for the Loeve-Fox site in Granger Reservoir are presented elsewhere (Appendix J).

Although some variations were noted within the San Gabriel assemblages, the presently available construct for Central Texas was generally supported by the stratigraphic and chronological data collected. The most notable contribution of the San Gabriel data is the radiocarbon sequence and the contextual information concerning the Early Archaic occupation of the region. The previously hypothetical time frame for the Early Archaic now is provided some substance by radiometric dates from Central Texas, itself. The traditional and rather questionable, reliance upon correlations with the sites of the Amistad Reservoir area of Southwest Texas to date early Central Texas components is no longer necessary.

The Cervenka Site (41WM267) provided three important dates concerning the Clear Fork and San Geronimo components in Granger Reservoir. Since the Cervenka Site is to the east of the Balcones Escarpment, the predominant projectile point types are not typical for Central Texas as a whole. Bulverde and Travis point types are minimally represented within the Clear Fork component. Nevertheless, the two dates from levels 63/64 and 69/70 (Table 7.1-1), respectively, denote a transition point in projectile point styles and the intensity of occupation of the Cervenka Site at approximately 5000 B.P. Dawson points and other previously undefined point styles (Chapter 14.1) predominate after 5000 B.P. Hoxie, Andice, and other previously undefined point forms occur before this date. Uvalde, Wells and Tortugas points appear even earlier, but subsequent to 5700 B.P. (Table 7.1-1). One projectile point, representative of Group 12 as presented in a later chapter, appears earlier than this date. Unfortunately, the two specimens of Group 12 were relatively isolated finds with little associated material.

One additional date, from the base of site 41WM73, suggests an equally early component within the North Fork Reservoir. However, the large sigma value ($\pm$700) for this date raises serious questions concerning the actual date of this occupation. Given the association of Bulverde, Nolan, and Group 2 projectile points a Clear Fork component is much more likely.

The sequence of dates from the Hawes Site (41WM56) documents occupation of the site from late Clear Fork to Round Rock. Although isolated Pedernales points are present in the levels dated to 4000 B.P. or older, they are not a significant portion of the assemblage until 3500 B.P. Whether or not this pattern is true for other assemblages is unknown, for the sites which provided more impressive Round Rock components did not yield sufficient radiocarbon samples.

Like many other sites in Central Texas radiocarbon samples of sufficient size for dating are most easily recovered from the Twin Sisters and Austin components. Eight of the available samples provide a consistent series of dates encompassing the Twin Sisters Phase and the early Austin Phase. The one sample (RL-1088) from the Bigon-Kubala site (41WM258) yielded a large sigma value which is disconcerting given its stratigraphic position beneath levels containing Scallorn and Darl points. A Twin Sisters component is most likely; however, the date does little to clarify the situation.

An additional seventeen dates are also available from these components at the Loeve-Fox Site (see Appendix J) for discussion of these dates). This tightly dated series of occupations from the Loeve-Fix Site provides an important diachronic perspective for these components. These components are also dated at the Dobias-Vitek site (41WM118) (Eddy 1973:34-36).

Perhaps one of the latest prehistoric occupations of the Granger Lake area is documented by a date from the Bigon-Kubala Site (41WM258). The association of Perdiz points, Leon Plain ceramics, and bison bones with a radiocarbon date of 480 $\pm$ 70 B.P. (UGa-2477) is very characteristic of the Toyah Phase in Central Texas. The Bigon-Kubala Site may contain the only remaining intact Toyah component within either reservoir.

This array of dates, although small for the number of sites investigated, provides an important framework for many of the transitions within the cultural history of the San Gabriel River valley. Although this discussion has focused on the index markers, much more than changes of projectile point styles accompany these transitions. Settlement patterns, resource utilization, site structure, intensity of occupation, and population levels change throughout this occupational sequence. The diachronic fluctuations of these variables will be discussed later in this report (Chapter 18.0).

One important cautionary note is necessary concerning the usual dependence upon index markers for the assignment of assemblages to a certain cultural phase. Although a gross temporal sequence is apparent for Central Texas, establishing the relative contemporaneity of assemblages on the basis of projectile point distributions is a risky enterprise. The depositional processes, both cultural and natural, of Central Texas middens contribute to the stratigraphic association of several index markers regardless of whether they were

	Radiocarbon Years B.P.	Corrected Dates* B.P.	Provenience of Radiocarbon Samples	*Predominant Index Markers* in Stratigraphic Association	Phase **
	430 ± 70 (UGa-2477)	510 ± 80	Bigon-Kubala (41WM258) Feature 1-hearth	Perdiz arrow points *Leon Plain ceramics*	Toyah
650					----------
	990 ± 290 (RI-1088)	979 ± 292	Bigon-Kubala (41WM258) Hearth 3, BHT		
	1155 ± 95 (UGa-2471)	1136 ± 108	41WM53 Feature 4 (hearth)	Darl, Scallorn	Austin
	1260 ± 150 (UGa-2484	1238 ± 158	41WM53 Feature 3 (hearth)	Fairland/Ensor	
	1290 ± 100 (UGa-2470)	1267 ± 112	41WM328 Feature 2 (hearth)	Scallorn	----------
1250					
	1460 ± 80 (UGa-2481)	1439 ± 83	41WM328 Feature 17 (hearth)	Darl	
	1610 ± 165 (UGa-2483)	1595 ± 167	41WM328 Feature 15 (hearth)	Darl	
	1620 ± 70 (Tx-2539)	1605 ± 142	41WM53 Hearth, Test Pit E	Fairland/Ensor	Twin Sisters
	1700 ± 120 (RI-1586)	1690 ± 123	Cervenka (41WM267) Feature 16 (hearth)	?	
	1745 ± 85 (UGa-2476)	1737 ± 89	Bryan Fox (41WM124) Feature 1 (hearth)	Fairland/Ensor, Montell	----------
1750					
					San Marcos

2600					
	3225 ± 75 (UGa-2480)	3533 ± 93	Hawes (41WM56) Level 5, Area C	Pedernales, Bulverde	Round Rock
4000					----------
	3615 ± 60 (UGa-2485)	4044 ± 143	Hawes (41WM56) Level 7, Area C	Group 14, Bulverde	
	3750 ± 90 (UGa-2473)	4224 ± 130	Hawes (41WM56) Feature 14b, Level 8, Area C	Nolan, Bulverde Group 7, Group 14	
	5285 ± 726 (UGa-2482)	6090 ± 736	41WM77 Level 19, Area B	Bulverde, Nolan Group 2	Clear Fork
	4280 ± 240 (RI-1087)	4907 ± 267	Cervenka (41WM267) Feature 9 (hearth), Level 63/64, Area D	Dawson, Groups 2, 4, 7	
5000					----------
	4330 ± 420 (RI-1086)	4970 ± 436	Cervenka (41WM267) Level 69/70, Area D	Hoxie, Groups 1, 9, 10	
				Uvalde Wells, Tortugas	San Geronimo
	4970 ± 90 (Tx-3684)	5738 ± 139	Cervenka (41WM267) Feature 19 (hearth) Level 117/118, Area D	?	
				Group 12	
7000					---------
					Circleville
					---------

* (Damon, Ferguson, Long, Wallick 1974:350-366) ** (Prewitt 1976a, 1976b; Weir 1976)

Table 7.1-1. Radiocarbon Assays, North Fork and Granger Reservoir Districts. Radiocarbon Assays from Loeve Site (41WM133) and Loeve-Fox Site (41WM230) are presented in Appendix J.

associated within a behavioral context. Some index markers are more restricted temporally than others. Also, the concurrent utilization of several point styles is not unexpected. Consequently, the assigning of culture/time stratigraphic units and deciding whether assemblages are "mixed" or "transitional" is a very subjective exercise. Lacking discrete occupational episodes, however, it is necessary to delimit relatively homogeneous archaeological units for the analysis of diachronic trends. The basis for the delimitation of the culture/time stratigraphic units for the San Gabriel sites is presented with each site discussion. Other researchers may have differing views concerning the assignment of these units. Some would argue that finer divisions are possible. However, the behavioral and depositional environments of the index markers of the majority of the sites within the San Gabriel River Valley were not so discrete that finer divisions are necessarily justified.

8.0 Site Excavation Reports: Primary Contract

by

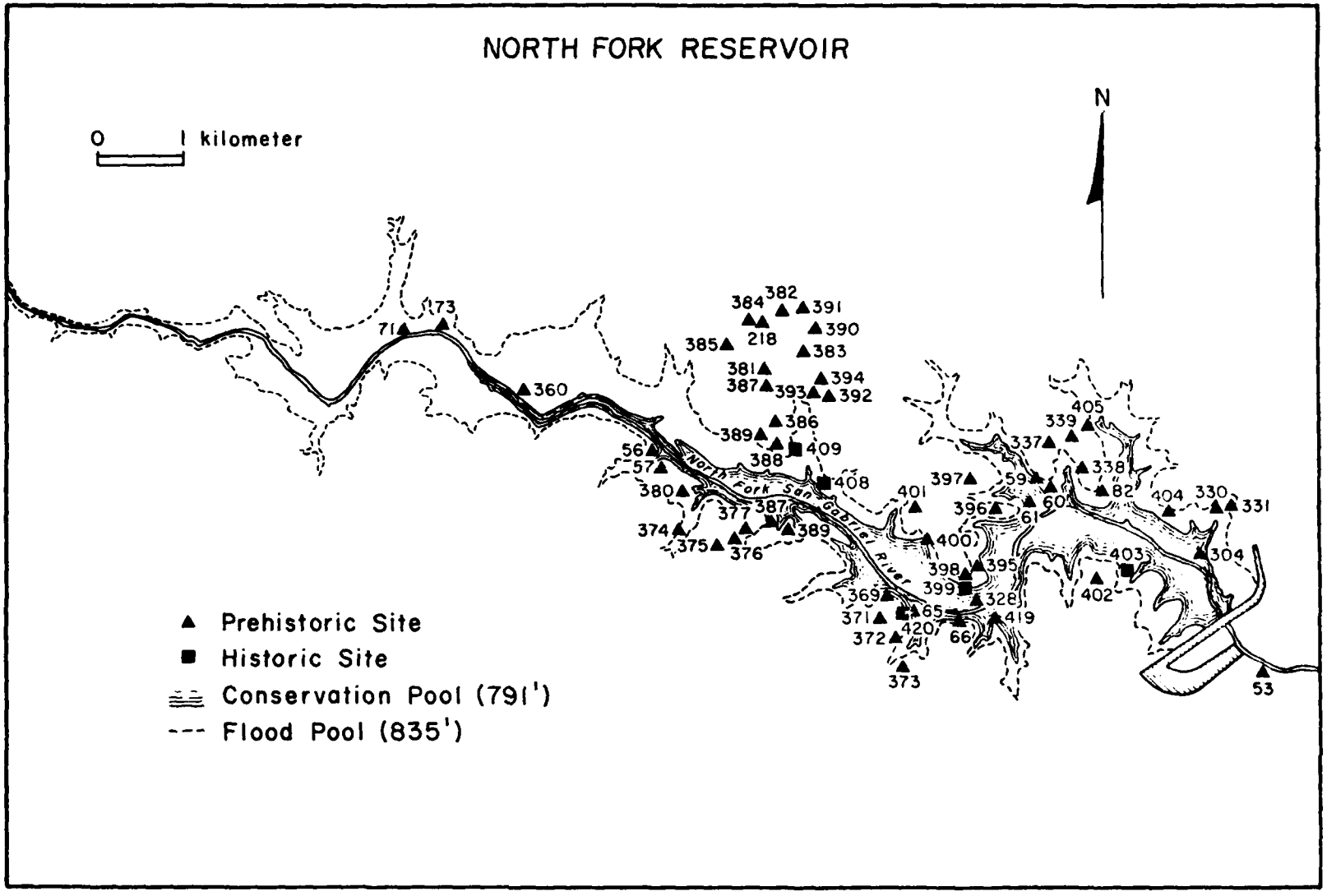
Duane E. Peter, Dan Prikryl, Olin F. McCormick
and Marie-Anne Demuynck

The purpose of this chapter is to present the results of site excavations required by the initial Corps contract. The site reports are arranged in numerical order by site number. The sites from North Fork Reservoir (Fig. 8.0-1) are presented first, followed by sites in Granger Reservoir.

These site reports describe the field work at each site, and present a summary of the results of analyses of the recovered cultural materials. The detailed analyses of the artifacts are presented in Chapter 14, while the environmental analyses are in Chapter 15.

A standardized format has been used in the presentation of the data in the site reports in an effort to facilitate comparisons of the sites. Our interpretations of the relationships of the sites in and between reservoirs is presented in Chapters 16 - 18.

Figure 8.0-1. Location Map of Archaeology Sites in North Fork Reservoir Investigated by NTSU.



North Fork Reservoir

8.1 Site 41WM53

Site Situation

Site 41WM53 is situated on a natural levee on the right bank of the North Fork of the San Gabriel River. The site location is approximately 800 meters southeast of the tower of the North Fork Dam (Fig. 8.0-1). Site 41WM52 lies to the northwest across an erosional gully. This erosional gully presently forms the western boundary of site 41WM53. During the testing phase (Sullivan, Hays, and Humphreys 1976) the representative boundaries of these two sites were unclear due to the construction activities between them. Subsequent examination of the borrow pit and the cut banks of the erosional gully, however, demonstrated that two distinct clusters of cultural material were present. Occupational debris from site 41WM53 is limited to the right bank of the gully and the natural levee which parallels the river (Fig. 8.1-1). The surface scatter occupies an area of approximately 1000 square meters.

The site area has been cultivated in the recent past. Coastal bermuda grass and weeds comprise the vegetation of the terrace surface. A variety of oaks, juniper, sycamore, and pecan trees occupy the terrace edge. Juniper trees are predominant on the steep upland slope 100 meters south of the site. In addition to the agricultural activities, the site has been more recently disturbed by construction machinery. Approximately 20 to 30 cm of sediment were stripped from certain areas of the site. Since most of the site area had been cultivated, probably very little in situ cultural material was disturbed by this activity.

Prior Investigations

Site 41WM53 was first located in 1963 by the Texas Archeological Salvage Project survey (Shafer and Corbin 1963:15-16). Diagnostic projectile points of the Twin Sisters Phase and several other bifacial artifacts were collected from the surface. Recognizing the importance of the buried cultural material and the possibility that the site area might become a borrow area for dam construction, Shafer and Corbin recommended that site 41WM53 be tested.

Test excavations were not conducted at site 41WM53 until the Fall of 1976 (Sullivan, Hays and Humphreys 1976:19-26). A North Texas State

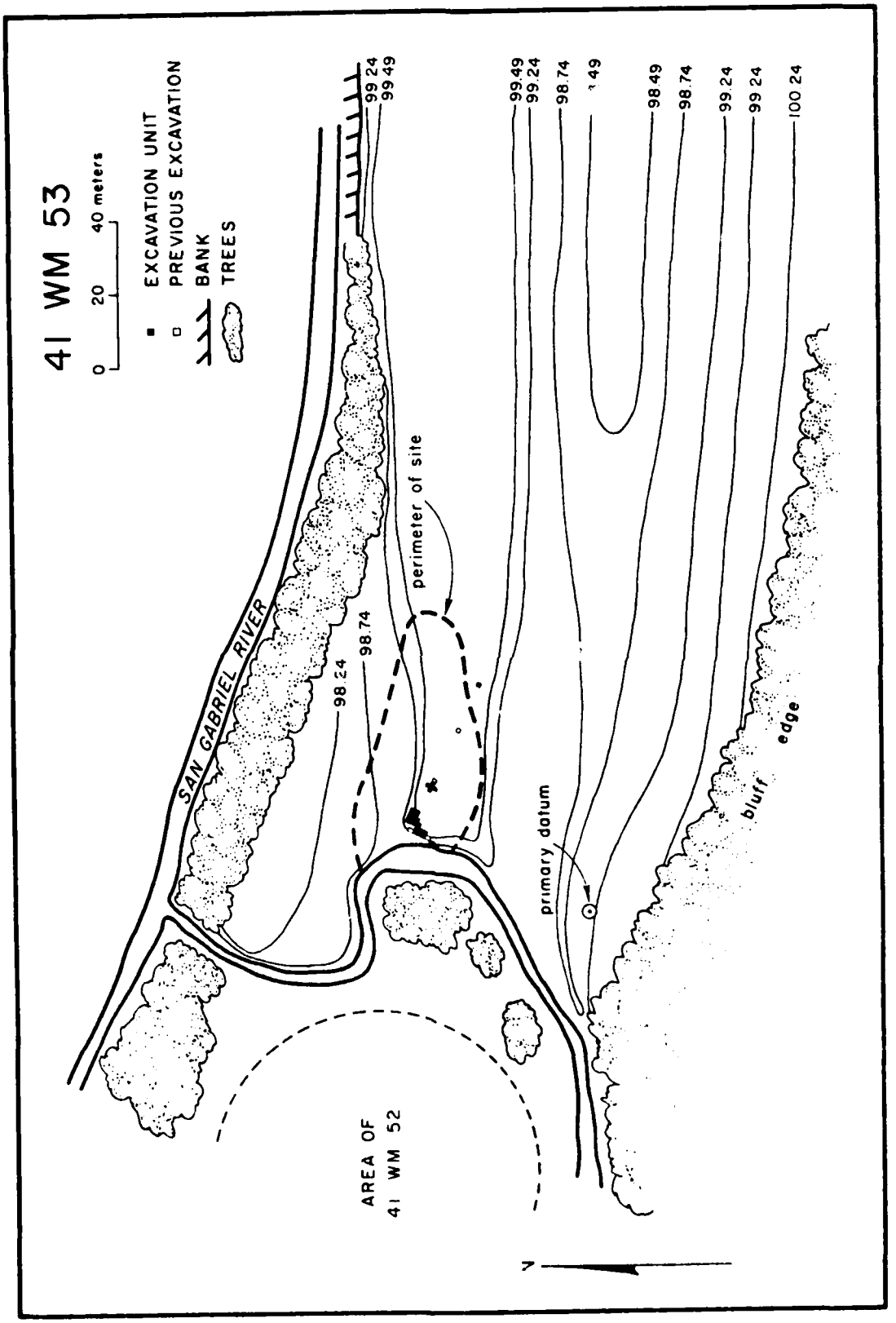


Figure 8.1-1. Site Map, 41WM53

University crew excavated five $1m^2$ test units both within and outside the surface scatter of occupational debris (Fig. 2). Hearths were located in units C, D, and E. A radiocarbon sample from level 5 (40-50 cm. B.S.) in unit D provided a date of 1620 ± 70 B.P. (TX-2539). Although this radiocarbon date denotes a Twin Sisters Phase occupation at that level, the diagnostic projectile points recovered from the test excavations suggested that the 80 to 100 centimeters of cultural deposit at site 41WM53 were the result of occupation during several of the phases recognized within Central Texas.

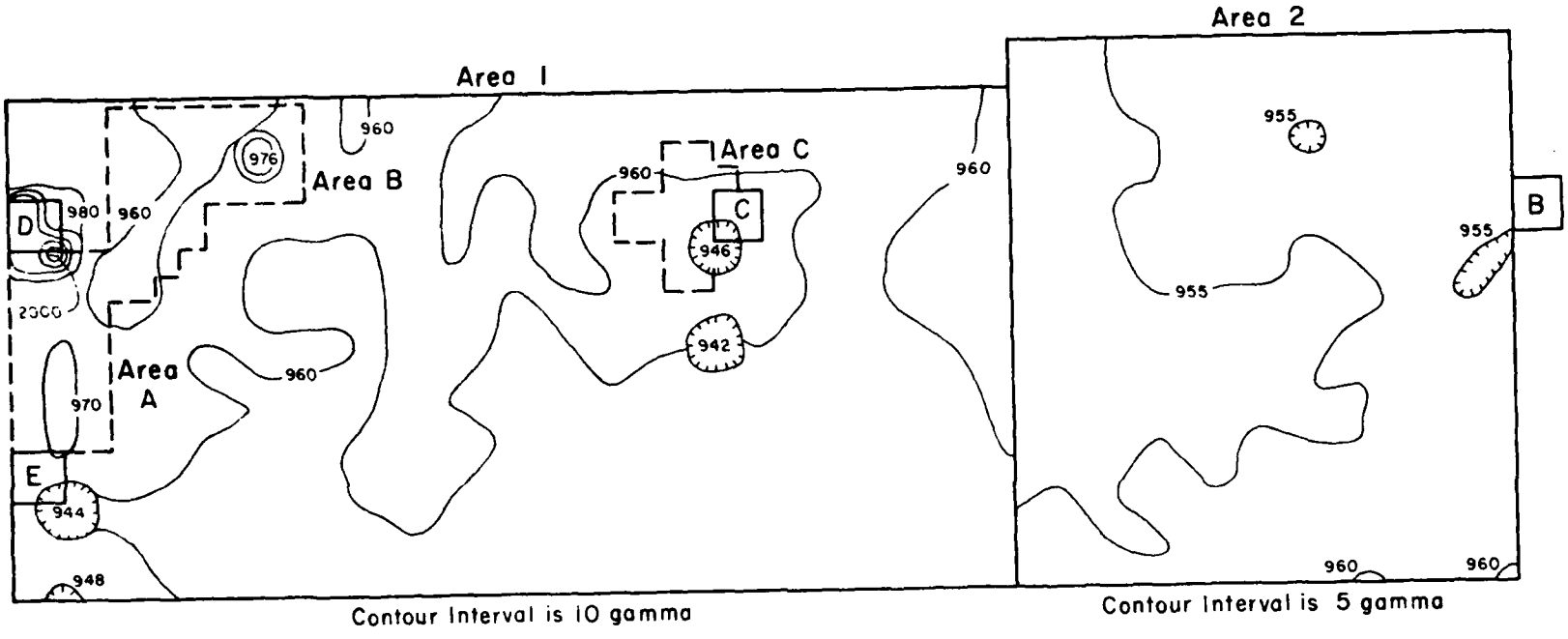
Site 41WM53 was subsequently recommended for further investigation because of its contextual integrity and the presence of recognizable features. The possibility of recovering Twin Sisters and Austin Phase assemblages was also an important consideration, for such assemblages had not been adequately investigated in the North Fork Reservoir. The recognition of hearths in the dense accumulation of burned rock in test units D and E also indicated that further investigation might provide data useful for the recognition of burned rock midden formation processes.

Excavation Methodology

In an attempt to efficiently recognize areas of the state that would most likely yield hearths and hearth related activities, a proton magnetometer survey of two areas of the site was conducted prior to excavation during the 1978 field season. Area 1 was a 20 x 10 meter grid adjacent to the erosional gully. Area 2, a 10 x 11 meter square grid, was located along the southern boundary of the site near test excavation unit B. Magnetic intensities were plotted for both areas (Fig. 8.1-2). Since the gamma range for Area 2 was very limited, it was decided that excavation of magnetic anomalies in Area 1 would be most productive. The previous test units had also demonstrated that this area contained the highest density of cultural material. Three excavation areas were designed to explore either areas of high (Areas A and B) or low (Area C) magnetic intensity. As the excavations soon demonstrated, the magnetometer successfully located hearths or dense accumulations of burned rock in both Areas A and B; however, in Area C no feature was discovered where an anomaly of low magnetic intensity had been recorded. The lack of an associated feature within Area C may be due to the strong association of the low intensity anomalies with previously excavated test pits or vandal holes. These voids in the survey area apparently created false anomalies.

The excavation units at site 41WM53 were placed according to the $1m^2$ grid system established during the testing phase. Initially, five $1m^2$ units (N98/W129, 130: N97/W129, 130: N96/W129) were opened in Area A and two units (N100/W117, N101/W117) were opened in Area C. The minimal unit of horizontal spatial control was the 50 cm^2 quadrangle. However, the need to expand these units and begin excavations in Area B placed a strain upon the time structures imposed by the contract. In an attempt to make the recovery process more time efficient, the minimal unit of horizontal spatial control was changed to a one meter square.

Figure 8.1-2. Magnetic Intensity Contour Map



Enclosed Low Reading

1976 Test Excavation Unit

1978 Excavation Unit

N

0 2 4 meters

41 WM 53

In order to achieve a broader horizontal plan view of the burned rock pavement in Area A, the unit was expanded to the north. It was thought that the exposure of a larger segment of this feature would yield evidence for both structural and functional interpretations. The initial unit within Area B (the eastern 2 x 2 meter square) was also expanded to provide a broader horizontal view of Feature 4 and associated artifacts. In the process of expanding both these areas, other smaller features, undetected by the proton magnetometer survey, were discovered.

Area C was initially expanded to the north to reveal the remainder of the hearth that had been exposed in unit N101/W117-Level 4. Although the original test unit C had revealed a hearth in Level 9, the adjacent units in Area C revealed very little associated cultural debris. Excavation unit N101/W118 was excavated to determine if artifact density increased to the west. Since the amount of lithic debitage remained low and no features or diagnostic elements were revealed, Area C was not expanded beyond the four 1 meter square units.

Stratigraphy

In order to better understand the sedimentary history of the natural levee formation at site 41WM53, the right bank of the erosional gully was cut back and profiled to a depth of two meters (Fig. 8.1-3). The west wall of excavation Area A was also profiled to document the cultural and natural stratigraphy (Fig. 8.1-4). The following strata were recognized.

Stratum 1: This stratum is the result of the testing activities in 1976. This pale brown (10YR 6/6) clayey loam is backdirt from the excavation of test unit D.

Stratum 2: This very dary grayish brown (10YR 3/2) clayey loam is the humic zone present in the western portion of the site. The boundary between strata 2 and 3 is not very distinct or even; nevertheless, diagnostic elements of the Austin Phase occur primarily within Stratum 2.

Stratum 3: This dark brown (10YR 3/3) clayey loam is most distinct in the southwest portion of Area A. The high density of artifacts and burned rock and the high charcoal and humic content of this stratum are characteristic of a midden. The greasy texture of this stratum also distinguishes it from the surrounding units.

Stratum 4: This stratum is a yellowish brown (10YR 5/4) compact silty loam. The matrix is of a more coarse grain than that of the overlying sediments. Scattered burned rock and artifacts are still present within this stratum, but their density decreases significantly within this zone.

Stratum 5: This light yellowish brown (10YR 6/4) clayey loam exhibits a high percentage of calcium carbonate precipitates. This factor, together with the higher clay content and a lack of moisture, makes this

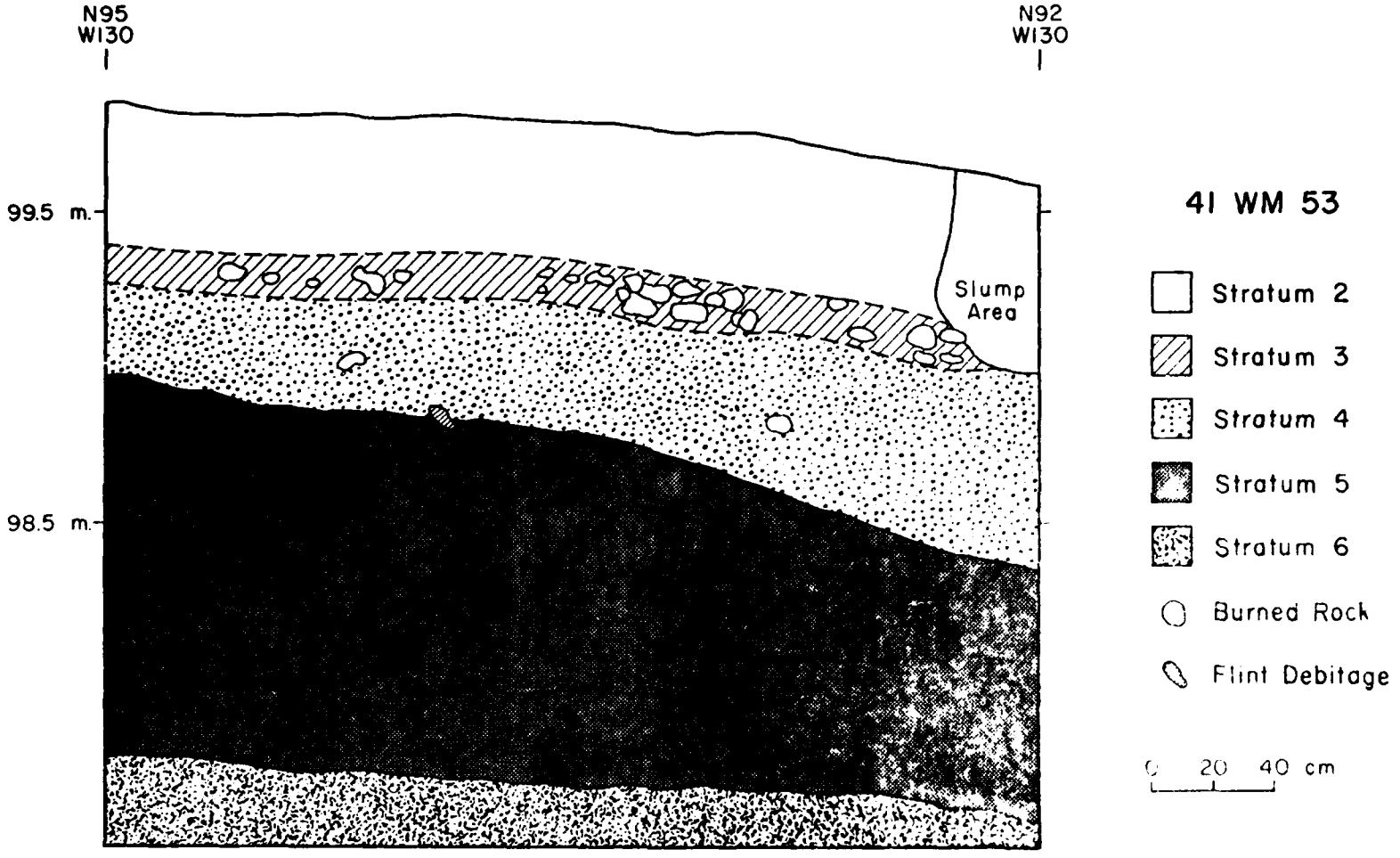


Figure 8.1-3. Profile of Bank of Gully at Site 41WM53

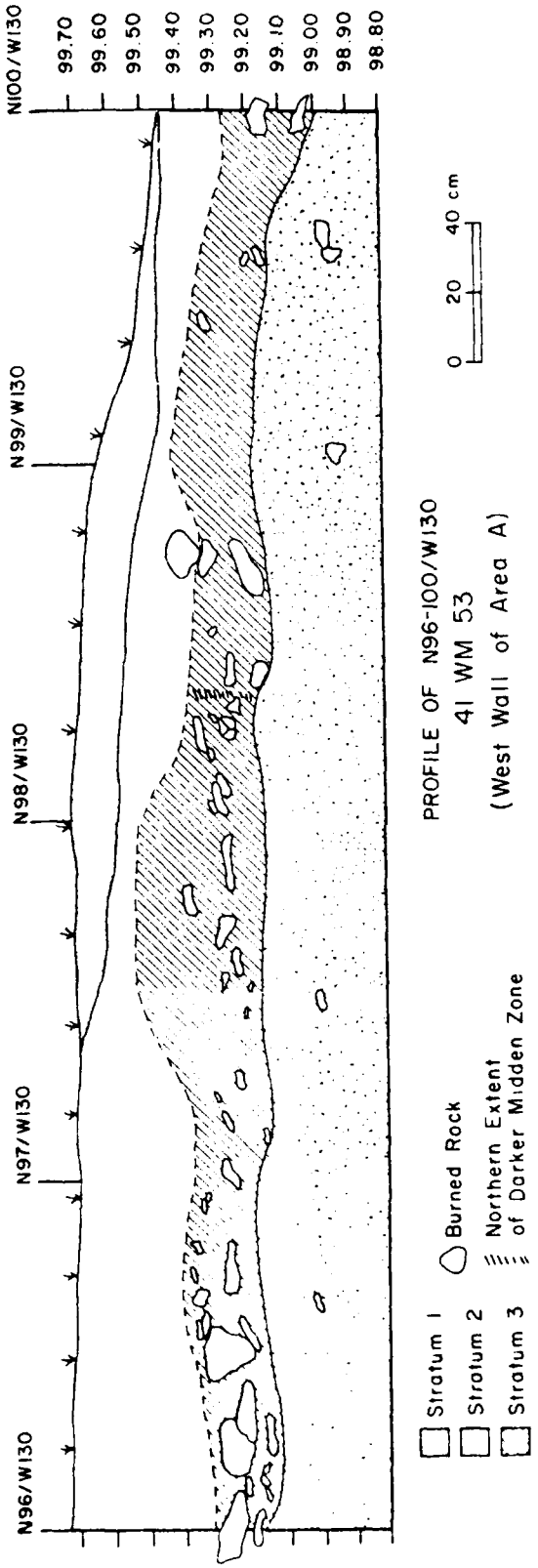

N100/W130
N99/W130
N98/W130
N97/W130
N96/W130
99.70
99.60
99.50
99.40
99.30
99.20
99.10
99.00
98.90
98.80
0
20
40 cm
PROFILE OF N96-100/W130
41 WM 53
(West Wall of Area A)
Stratum 1
Stratum 2
Stratum 3
Stratum 4
Burned Rock
Northern Extent
of Darker Midden Zone

Figure 8.1-4.

stratum very dense and compact. The stratum is culturally sterile except in Area C where a sparse scatter of debitage appears within the upper 20 centimeters.

Stratum 6: Mixed river gravels comprise this stratum. Size of the gravels varies from 2 to 15 cm in breadth. A dense clay was interspersed between the gravels. A few flint flakes (5) were found within the gravels. Since no cultural features were present and the deposition environment for such large gravels is a very dynamic situation, the flakes are not likely the result of an occupation of the gravel bar. They most likely represent secondary deposits from upstream.

The revealed strata indicate that the river channel had once cut through the present site area, for gravel bar deposits are present at 2 meters depth. The river then likely meandered northward toward its present channel. Once the river meandered, the levee formation processes began. During the early stages of the levee formation, the site area was apparently not utilized by man, for most of Stratum 5 is culturally sterile. Flooding was probably too frequent during this period for the site area to be very desirable for habitation. Once the new channel was cut deeper, the levee formation was likely a preferred site location. Riverine and upland resources were both readily available. Although more trees may have occupied the terrace surface in the past and the gully had not developed yet, the site locality probably looked much as it does today.

The profile depicted here (Fig. 8.1-4) is accurate for only the western portion of the site adjacent to the erosional gully. Within Area C, the humic and midden zones are not present. The clayey silty loam matrix of Area C is very homogeneous from the surface to a depth of 110 centimeters. The appearance of calcium carbonate precipitates in Level 8 (98.9-98.8 m.) of Area C provides the only recognizable change within the entire profile. This is likely the upper surface of Stratum 5. The presence of a Darl point in Level 7 (99.0-98.9 m) of Area C indicates that the arbitrary levels of the various areas of the site correspond quite well stratigraphically. Nevertheless, the tracing of actual occupational surfaces between the areas is impossible.

Culture/Time Stratigraphic Units

The chronological trends within site 41WM53 are best viewed by reducing the number of arbitrary excavation levels to three culture/time stratigraphic units (McMillan 1976:211). Assignment of the levels to the culture/time stratigraphic units recognized for Central Texas was based on the stratigraphic association of hearths and related occupational debris with previously recognized temporal markers (i.e., the projectile points). Three radiocarbon dates, one from the testing phase and two from the excavation of the site, provided a minimal chronological framework for the relative sequence suggested by the projectile points.

The distribution of the identifiable projectile points (Table 8.1-1) indicates that the site was occupied during the Twin Sisters Phase of the Archaic and the Austin phase of the post-Archaic period. Although testing of the site in 1976 recovered diagnostics of the Round Rock phase (Sullivan, Hays, Humphreys 1976:25-25), excavation of the site revealed no evidence of such a component. It is not unlikely that inhabitants of site 41WM53 picked up projectile points from the nearby earlier assemblages (41WM52) and subsequently deposited them along with their own expended tools.

An examination of the horizontal distribution of the projectile points clearly demonstrates that the Austin phase occupation of the site was centered within excavation unit A. Whether similar occupational debris once existed within Area B is a moot question, since an unknown quantity of topsoil had been removed by construction activities. Area C, peripheral to the central area of occupation through all periods and unaffected by construction activities, produced no diagnostics of the Austin phase. However, this may be due to sampling error rather than the non-utilization of this area during the Austin phase.

Scallorn, Darl, and Fairland/Ensor points are found intermixed in Levels 3 and 4 of Areas A and B. Some archaeologists would suggest that these levels represent a "mixed assemblage" of several occupational episodes. Indeed, they may; however, it is equally likely that the "mixed" nature of the diagnostic elements is due to the gradual acceptance of the bow and arrow (Scallorn point) and the gradual decline of the atlatl and dart (Darl, Fairland/Ensor). Thus, these levels are viewed as a logically expected "transitional" period. The radiometric dates from Features 3 and 4 within these levels do not rule out the "mixed assemblage" interpretation. Nevertheless, the temporal period is that expected for a "transitional assemblage." The respective dates, 1260 ± 150 B.P. (UGa-2484) and 1155 ± 95 B.P. (UGa-2471), fall at the presently recognized temporal boundary between the Twin Sisters and Austin Phases (Prewitt 1976:71; Weir 1976; Patterson 1976:11).

Below Level 4 within Areas A and B, diagnostics of the Twin Sisters Phase predominate. With increasing depth the Darl point decreases in number while the Fairland/Ensor point becomes the primary index fossil. The radiometric date of 1620 ± 70 B.P. (TX-2539) from the sample within test excavation unit D (Fig. 9.1-3) lies well within the presently recognized temporal boundaries of the Twin Sisters Phase. The presence of Feature 9 (earliest occupational feature) within the arbitrary 10 cm level below that of the above date indicates that the site was occupied periodically throughout the Twin Sisters Phase.

Area C, peripheral to the main occupation area, exhibits a different pattern. The "transitional" assemblage noted in Areas A and B is not present. As noted above, sampling error could be a contributing factor to this inter-areal discrepancy. It is more likely, however, that Area C was only utilized during the Twin Sisters Phase. Subsequent utilization of the site appears to have been limited to a more restricted area to the west.

TABLE 8.1-1. Provenience of Projectile Points from Areas, A, B, and C of Site 41WM53.

Culture/Time Stratigraphic Unit	Austin		Austin/Twin Sisters		Twin Sisters				Austin/Twin Sisters		Twin Sisters				?					Twin Sisters		
Levels	1	2	3	4	5	6	7	8	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Scallorn	2	5		1						1	2											
Scallorn Eddy		1																				
Frio																						
Darl			1	6	3	1			1	6				1							1	
Ensor											1											
Fairland/Ensor				1	2	4		2			1	4								1		

Features

Areas A and B

Due to the dense accumulation of burned rock that was encountered with Area A, feature designation was both more difficult and more arbitrary than usual. All of the clusters of rock uncovered between 99.4 and 99.2 m did not exhibit characteristics that distinguished them as truly distinctive cultural features such as formal hearths. Nevertheless, feature designations have been given to all clusters of burned rock that were distinguishable from the more generalized scatter of burned rock. Relative spatial segregation and compactness of a given cluster with the remainder of the burned rock accumulation were the main criteria for such designation. Individual clusters were noted in both of the arbitrary 10 cm levels. To avoid the arbitrary creation of isolated clusters, all burned rock wwere mapped as found. In other words, if more than one layer of burned rock was present within a 10 cm level, each layer was mapped separately. No horizontal differentiation in clustering was noted between rock layers within either 10 cm level. Differential patterning between the levels, however, was readily apparent.

Figure 8.1-5 depicts the accumulation of burned rock as it was first viewed within Area A. Two informal hearth areas (Features 1 and 2) were immediately recognized. Feature 1, a circular cluster of burned rock (60 cm in diameter) appears at the northern end of the excavation unit. This cluster consists of burned rocks which are from 4 to 14 cm in breadth. One of the largest stones is situated in the center of the cluster within the second layer of burned rock. Charcoal flecking was present within the cluster; however, the quantity was not sufficient for a radiocarbon date. Although Feature 2 also failed to provide a radiometric date, its dark colored, organically enriched matrix was clearly distinguishable from the remainder of the midden accumulation. Since the feature extended into the wall of the excavation unit, its full size could not be determined. Interestingly, this cluster of burned rock and organic debris lay isolated within a semicircle of burned rock. This accumulation of burned rock likely represents refuse from Features 1 and 2 and possibly from other hearths lying outside the excavation area. This refuse is notably most dense in the area between Features 1 and 2.

Removal of this layer of rock within Level 3 (99.4-99.3 m) revealed a new pattern of burned rock clusters within Level 4 of Area 4 and the profile trench (Fig. 8.1-6). Two formal basin-shaped hearths, Features 4 and 6 (Fig. 8.1-7) were also uncovered within the same stratum in excavation Areas B and A, respectively. Four informal rock clusters (Features 3a, 3b, 7 and 8) were recognized as possible hearths. The lack of any vertical definition, other than the mere accumulation of burned rock, of these clusters suggests, however, that they may have functioned only as refuse piles. The substantial amount of charcoal within these clusters could be expected within either a hearth of a refuse area. The clustering of such refuse within distinct and

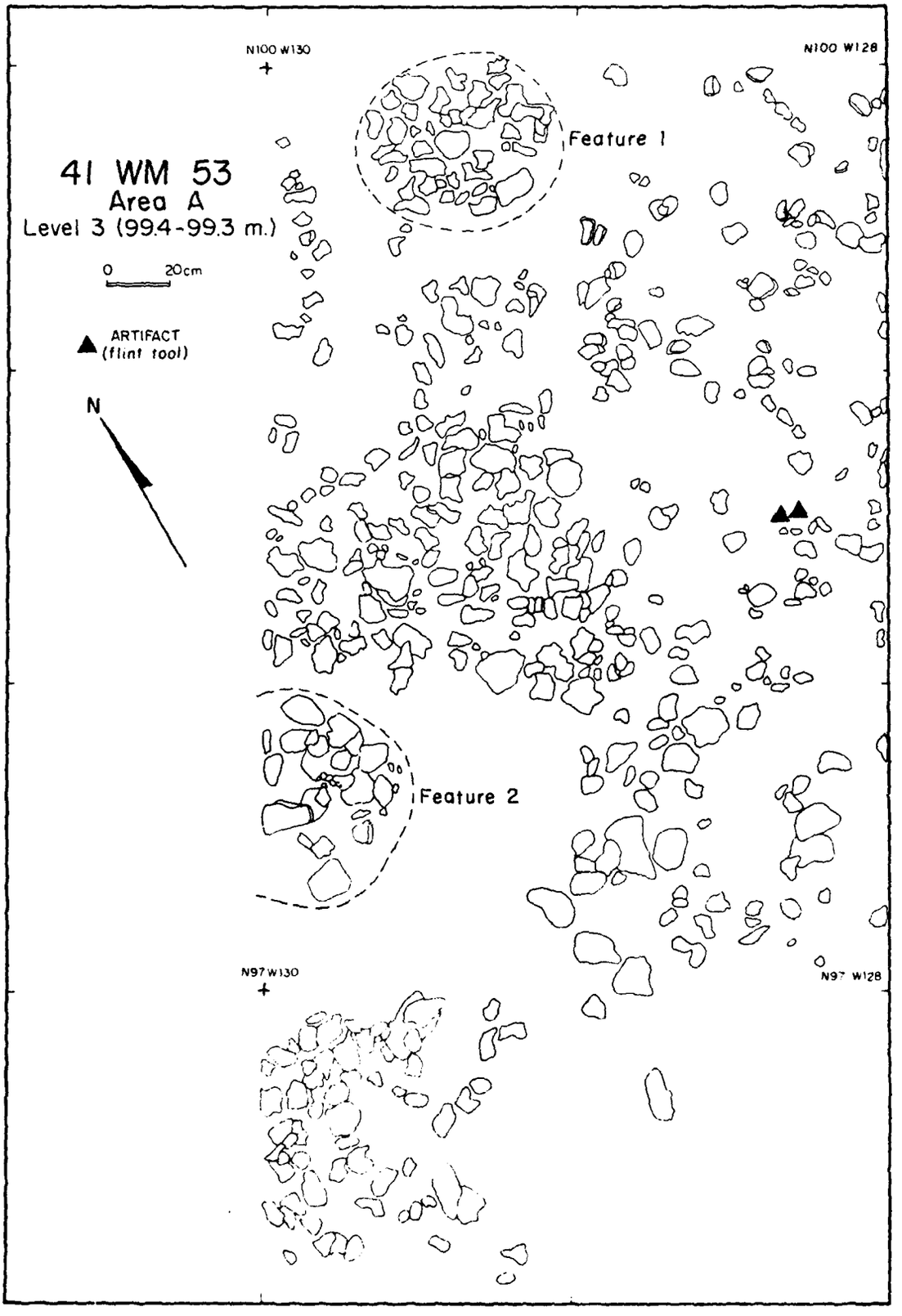

N100 W130
N100 W128
Feature 1
41 WM 53
Area A
Level 3 (99.4-99.3 m.)
0 20cm
ARTIFACT
(flint tool)
N
Feature 2
N97 W130
N97 W128

Figure 8.1-5.

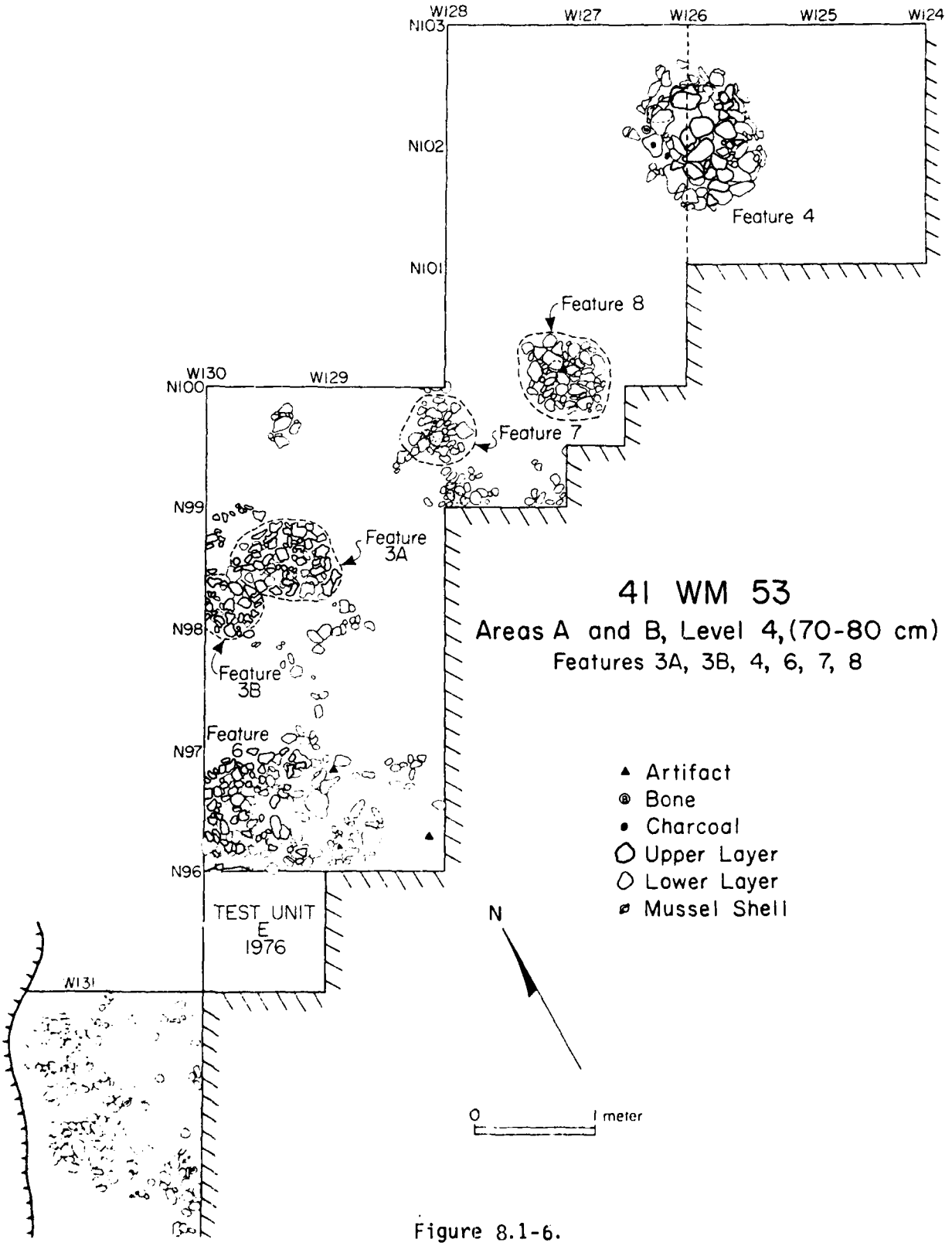

W128
W127
W126
W125
W124
N103
N102
N101
Feature 4
Feature 8
W130
N100
W129
Feature 7
N99
Feature 3A
41 WM 53
Areas A and B, Level 4, (70-80 cm)
Features 3A, 3B, 4, 6, 7, 8
N98
Feature 3B
Feature 6
N97
Artifact
Bone
Charcoal
Upper Layer
Lower Layer
Mussel Shell
N96
TEST UNIT E 1976
N
W131
0
1 meter

Figure 8.1-6.

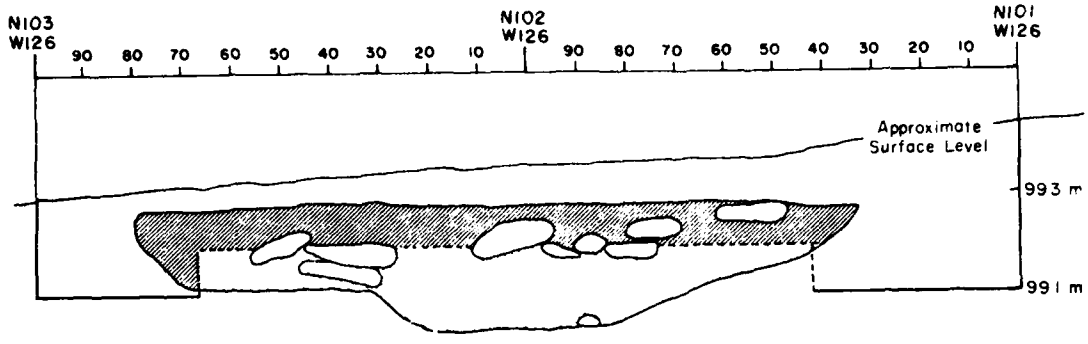
patterned formations, however, is unlikely if they functioned only as refuse areas. Clusters of burned rock, such as those in the southernmost excavation unit (Fig. 8.1-6), were recognized as refuse areas, for the density of burned rock and charcoal was significantly less than that exhibited by the clusters between the two larger hearths.

The four informal hearths (Features 3a, 3b, 7 and 8) within Areas A and B exhibit many common traits. They are all comprised of a dense cluster of burned rock ranging in size from 2 to 15 cm in breadth. The diameters of the clusters vary from 50 to 80 centimeters. Although the depth of the rock accumulation in Features 7 (30 cm) and the orientation of the rocks within Feature 3b both indicate that shallow basins may have been prepared, the feature matrix is not distinguishable from the surrounding matrix. Consequently, no basin outline is observable. Charcoal flecking was present within all these clusters. Feature 3a provided a charcoal sample of sufficient size for radiometric dating. It yielded a date of 1260 $\pm$ 150 B.P. (UGa-2484).

A radiometric date is also available from one other feature within this stratum of the midden. Feature 4 (Fig. 8.1-7), a distinctive basin-shaped hearth, has yielded a date of 1155 $\pm$ 95 B.P. (UGa-2471). Oval shaped in outline, Feature 4 measures 130 cm across its N-S axis and 100 cm across its E-W axis. The prepared basin is 25 cm in depth and is overlain by one to two layers of large (8-20 cm in breadth), flat, limestone river cobbles. The high organic content of the feature fill causes the feature matrix to be much darker than the surrounding matrix.

Feature 6 (Fig. 8.1-7), similar in structure to Feature 4, is the largest formal hearth uncovered at site 41WM53. The circular cluster of large burned limestone cobbles is 140 cm in diameter. The individual cobbles vary in a size from 8 to 20 cm in breadth. The slope of several of the burned cobbles (Fig. 8.1-7) indicated that this feature might represent two adjacent basin-shaped hearths rather than a single occurrence. The cross-section of the feature, however, revealed only a single prepared basin.

Like Feature 4, the matrix within the 30 cm deep depression of Feature 6 exhibits a much darker color and a more greasy texture than the surrounding matrix. Flotation of the matrix (Chapter 15.2) of these two hearths revealed the charred remains of acorns, an Aster sp. seed, a Compositae seed, and a hedgehog (Echinocerus sp.) cactus seed. The presence of several charred acorn fragments in areas adjacent to these two hearths indicates that the parching or roasting of acorns may have been one of the functions of such features. Charred acorn fragments are not limited to the basin-shaped hearths, however. The same floral elements are found within the less formal burned rock clusters within Area A. Consequently, a functional classification of the hearths cannot be based upon the association of selected floral remains alone. The size and structural variability of these hearths, however, suggest a functional dichotomy. The larger, formal features likely served as



0 10 20 cm

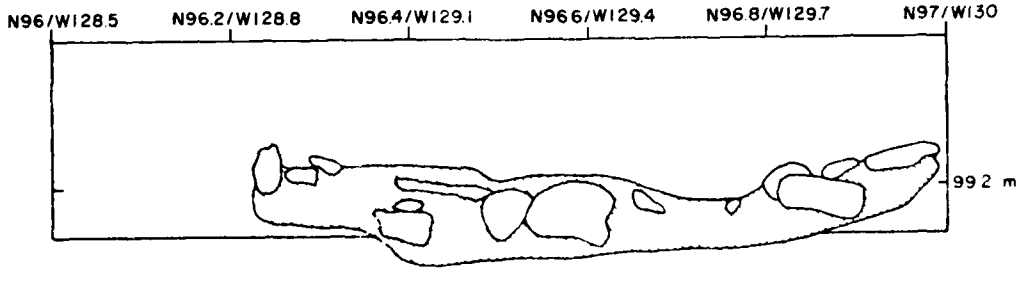
41 WM 53

FEATURE 4

Profile Along W126 Line

APPROXIMATE UPPER EXTENT OF HEARTH FILL

HEARTH FILL



0 10 20 cm

HEARTH FILL

FEATURE 6

Profile Along a Line from N96/W128.5 to N97/W130

Figure 8.1-7

central cooking and heating hearths while the smaller burned rock clusters were utilized for the production of a lower intensity heat which would be ideal for the parching or roasting of acorns. Unfortunately, verification of such inferences awaits future experimentation regarding the reconstruction of such hearths and their utility in parching acorns.

Charcoal samples from within Feature 4 have yielded a radiometric date of 1155 ± 95 B.P. (UGa-1471). Since this date overlaps that from Feature 3a within the same stratum within Area A, two alternative inferences concerning the depositional history of the site are possible. The first is that Feature 4 is contemporaneous with the burned rock clusters found within the same stratum in Area A and is an integral part of a set of maintenance or extractive activities performed at the site. The laternative inference is that Feature 4 is indeed the result of a later occupational episode. As such, it would represent a functionally specific utilization of the site or a temporally unique occurrence. Although Johnson (1967) has aptly outlined the problems concerning the establishment of cultural associations within Central Texas sites, the viability of the latter inference is weakened by several pieces of evidence. The stratigraphic relationship of these features, the radiometric dates, and the associated projectile points (Table 8.1-1) within both areas indicate the features are all the result of a transitional Twin Sisters/Austin Phase occupation. Admittedly, this contemporaneity is measured on a rather generalized scale. Nevertheless, the presence of Feature 6 (similar in formal structure to Feature 4) in close association within the burned rock clusters within Area A demonstrates that Feature 4 is not necessarily functionally or temporally unique. Although it cannot be definitely stated that a single occupational episode produced all of the hearths within Level 4, it appears that such an inference is highly probable.

Removal of the numerous hearths and clusters of burned rock within Level 4 of Areas A and B revealed three clusters of burned rock within Levels 5 and 6. Two of these clusters, Features 5 and 10 are recognized as probable hearths. The remaining cluster (Fig. 8.1-8) is likely refuse from activities performed at Feature 10. Interestingly, no formal rock lined basin-shaped hearths are present below Level 4.

Feature 5 (Fig. 8.1-9) , a small and isolated cluster of burned rock located in excavation Area B, consists of only a single layer of burned rock. No prepared basin is present. Even though charcoal is present within the central area (60 cm in diameter) of the scatter, the conclusion that this feature served as a primary hearth area is largely conjectural. The lack of any more formal hearths at this level, however, weighs in favor of such an interpretation.

Approximately 3.5 meters to the southwest a larger cluster of burned rock has been designated Feature 10. Feature 10, one meter in diameter, consists of burned rock fragments which range in size from 4 to 14 cm in breadth. Within this cluster charcoal staining was evident.

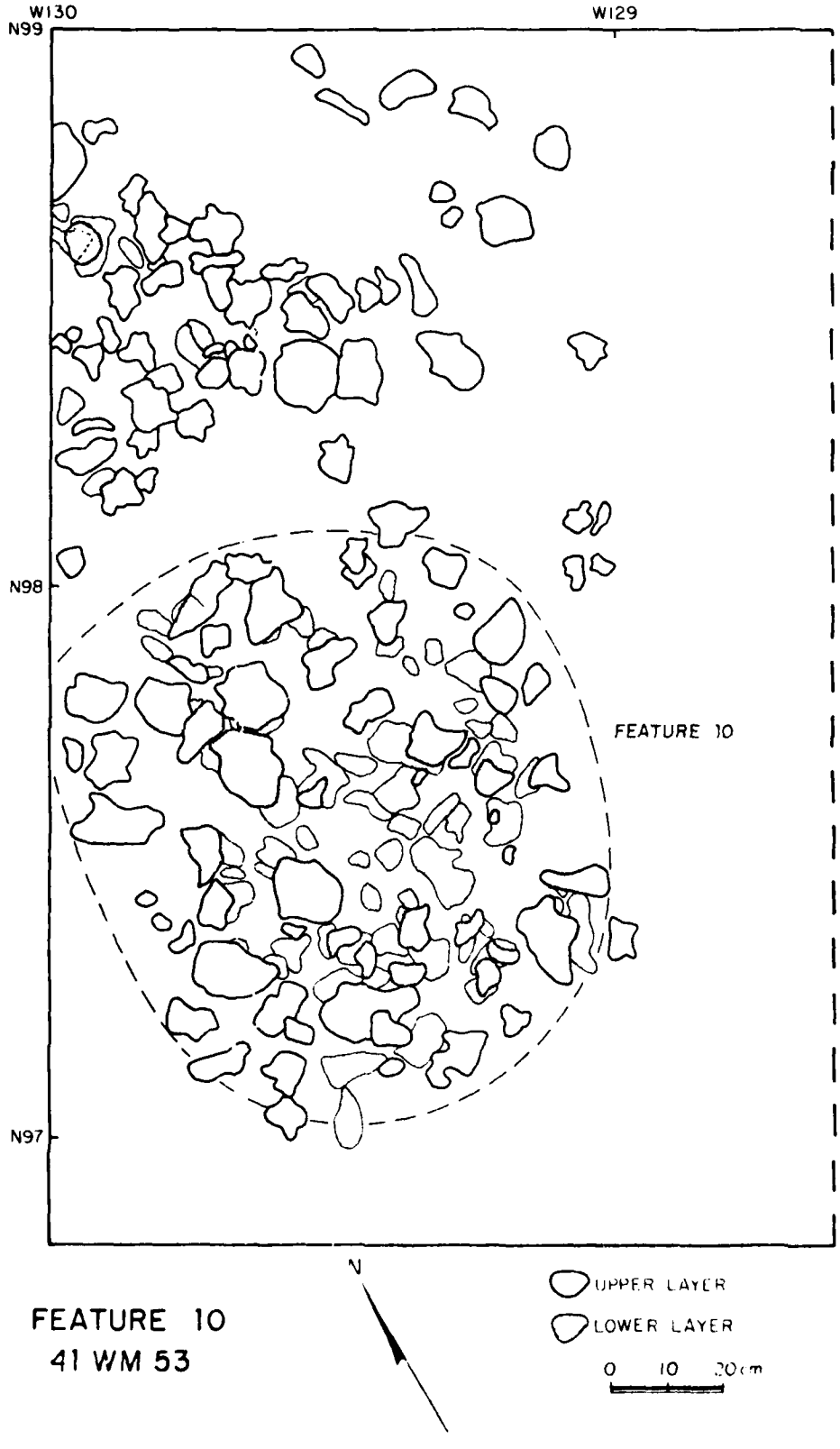

W130
W129
N99
N98
N97
FEATURE 10
N
UPPER LAYER
LOWER LAYER
0 10 20cm
FEATURE 10
41 WM 53

Figure 8.1-8.

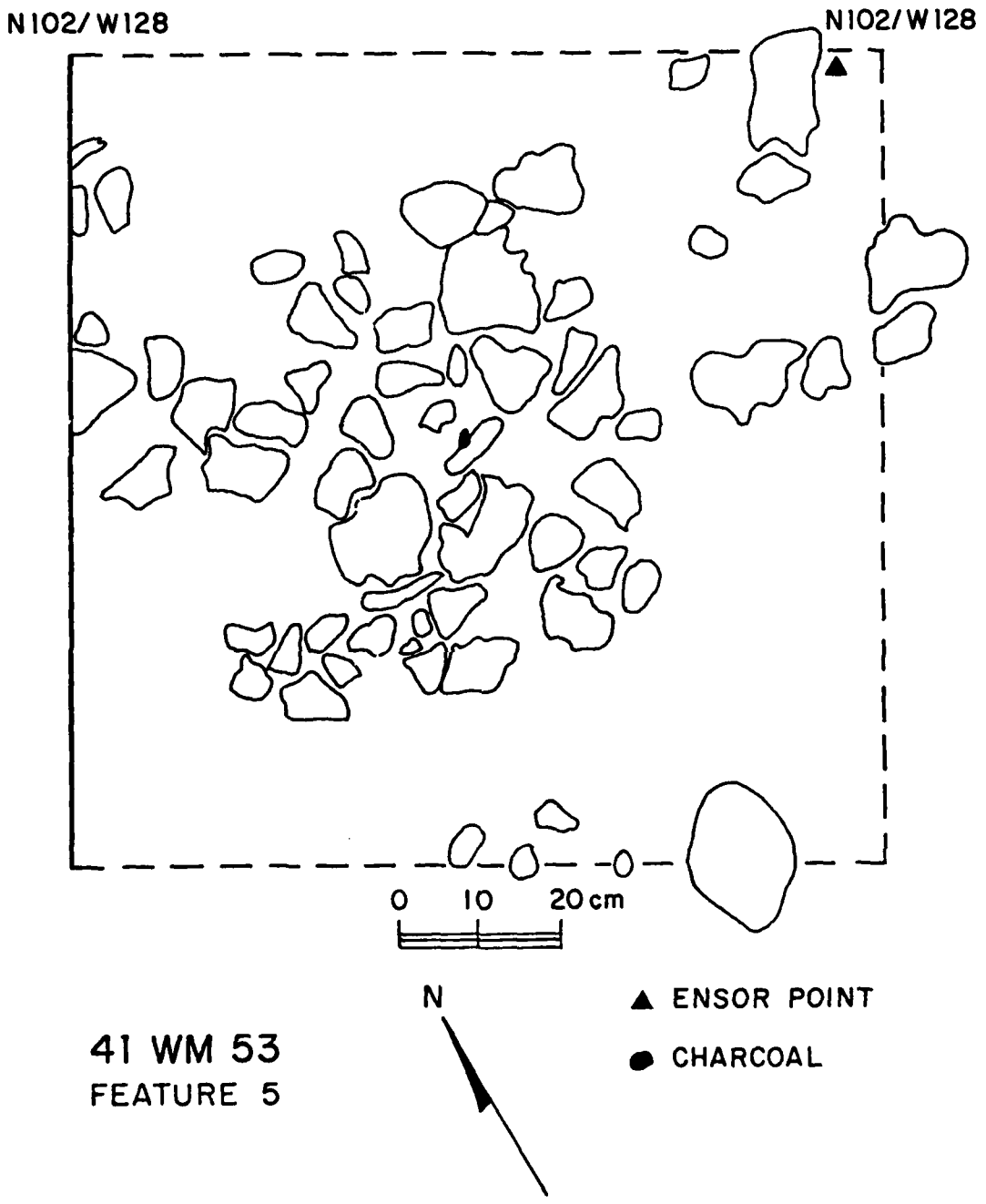

N102/W128
N102/W128
0 10 20 cm
N
▲ ENSOR POINT
● CHARCOAL
41 WM 53
FEATURE 5

Figure 8.1-9.

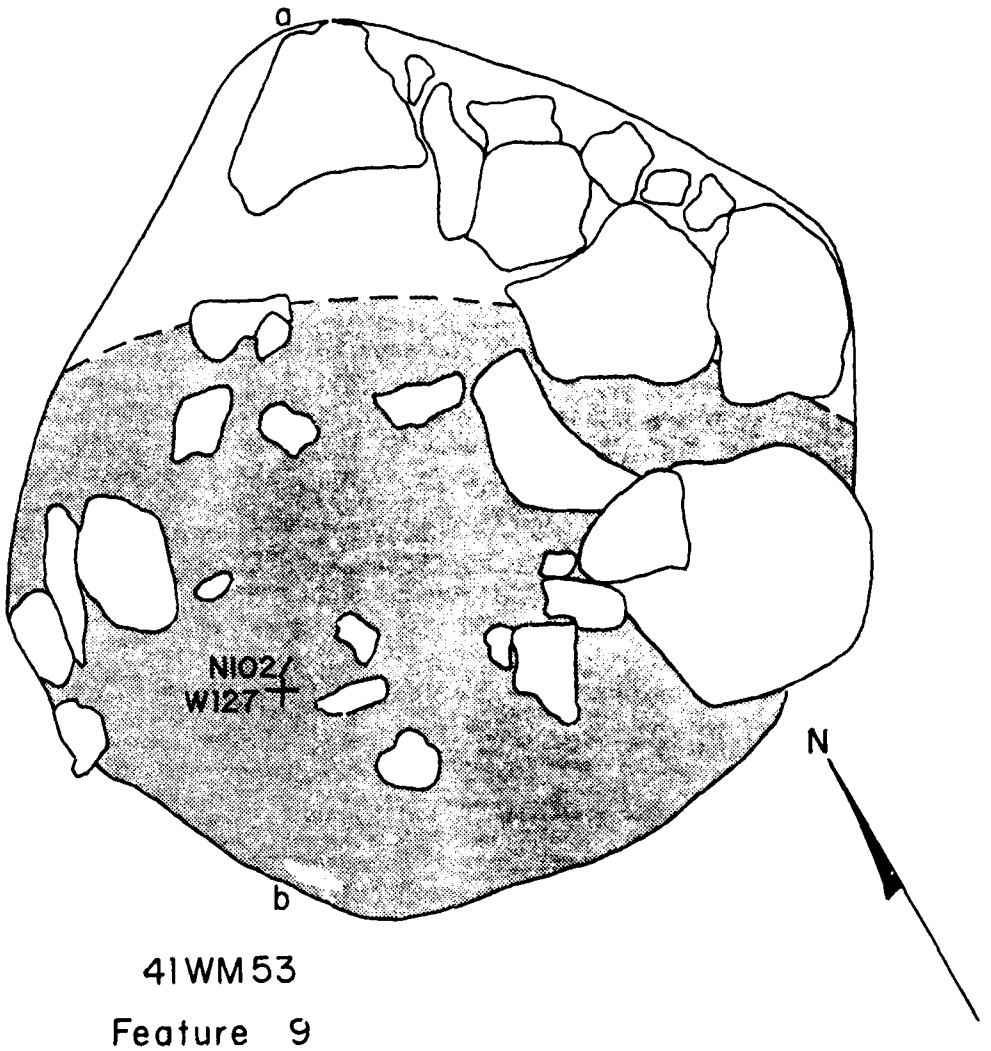
Although the accumulation of burned rock within Feature 10 is 15 cm in depth, no outline of a prepared basin was evident during excavation. The direct association of an Ensor point within Feature 5 and the predominance of Darl and Fairland/Ensor projectile points within Levels 5 and 6 (Fig. 8.1-9) indicate that these features are the result of a Twin Sisters Phase occupation.

Deeper yet within Area B, but still associated with diagnostic elements of the Twin Sisters Phase (Fig. 8.1-10) is Feature 9, a small circular hearth (65 cm in diameter). This hearth represents the earliest occupation of site 41WM53. Unlike other hearths at site 41WM53, Feature 9 lacks the characteristic dense scatter of burned rock. Cross-sectioning of the feature (Fig. 8.1-10) revealed that many of the larger rocks (4-16 cm in breadth) were peripheral to the most well defined portion of the prepared basin. This southern portion of the basin contained a charcoal and humic enriched matrix with numerous inclusions of fine shattered rock. The largest burned rock (20 cm in breadth) slopes downward into this matrix.

Although the overall depth of the feature is 22 centimeters, excavation of the darker matrix revealed that the original prepared basin (as presently defined) was no more than 10 cm in depth. The addition of the layer of large limestone cobbles and subsequent accumulation, both cultural and natural, have contributed to the overall depth of the feature. Unfortunately, this situation points to the ever present problem of determining the approximate ground surface level at the time of the utilization of the hearth. As archaeologists, we often overlook the difficulties of associating particular artifact samples with the utilization of a given feature. This is especially true when cultural or natural stratification is not readily apparent and arbitrary stratification must be utilized. Unfortunately, this is a common situation in many Texas sites. Future experimentation with the actual construction and utilization of basin-shaped hearths is needed to clarify this situation.

Area C

The small size of this excavation unit and its location peripheral to the central occupation area led to the discovery of only one feature within this portion of the site. This feature (Fig. 8.1-2) , an isolated cluster of heat discolored, limestone river cobbles, has been designated Feature 11. The small size of the cluster (45 cm in diameter) and the lack of any associated charcoal or prepared basin render any functional interpretation of this feature quite difficult. It is highly unlikely that it served as a cooking hearth. It may have functioned as a warming or drying locus. The unfragmented state of the cobbles weighs against the interpretation that Feature 11 is merely the refuse from a nearby hearth that lay outside the excavation area. Nevertheless, similar clusters of burned rock were found in association with larger hearths in a similar Twin Sisters Phase context at site 41WM328.


a
N102/
W127
b
N
41WM53
Feature 9

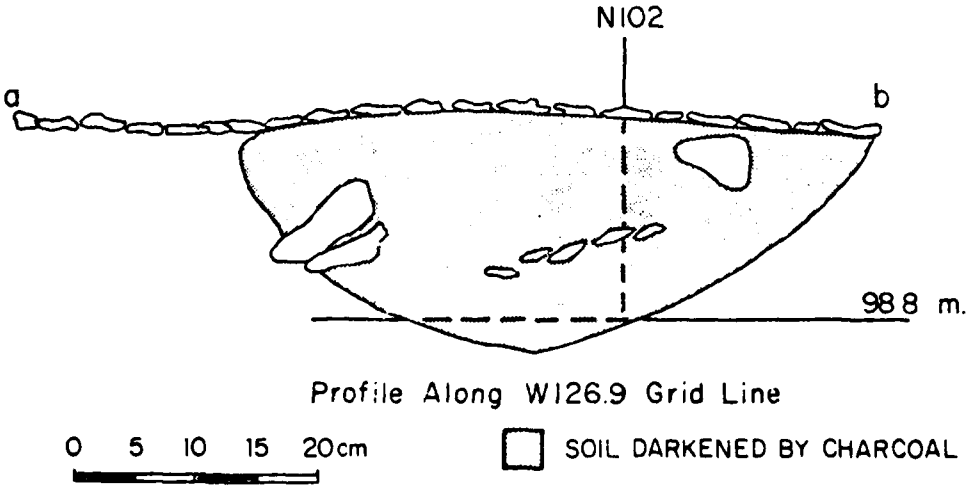

N102
a
b
98.8 m.
Profile Along W126.9 Grid Line
0 5 10 15 20cm
SOIL DARKENED BY CHARCOAL

Figure 8.1-10.

Unfortunately, the actual function of such clusters is no more apparent at site 41WM328 (Chap. 8.6).

Lithic Tools

A total of 414 tools was collected from site 41WM53. Ten of the analysed tools were collected from the surface and backhoe trenches, while the other 404 were recovered during the excavations. Table 8.1-2 presents the vertical and horizontal distribution of all tool classes organized by area and cultural components.

Axes, gouges, unifaces and chopping tools are entirely absent from the site's assemblage; some other tool classes are only scantily represented (eg. denticulated tools). Seven other major tool classes are present, although not in any great number. The major classes excluding retouched pieces and biface fragments are projectile points and notched pieces.

All tools and tool fragments recovered from Area C represent only six tool classes, while in Area A all but one tool class (scaled pieces) is represented. Area A is also the part of the site which has the highest overall densities (Table 8.1-3) while Area C has the lowest densities for both tools and debitage elements. The figures for Area B are very close to those for Area A, which was expected since both areas are connected. But Area A is the only area of the site where cores were found. All were collected from the central part of the area, one from each cultural component.

When examining the same data presented by cultural component, there is an important increase during the Austin/Twin Sisters transition over the Twin Sisters component. The tool density is nearly four times higher during the Austin/Twin Sister transition, and the debitage density almost doubles. However, a sharp decrease occurs during the subsequent Austin Phase (Table 8.1-4).

All the major tool classes are present in the identified cultural components except two. The denticulated pieces are present in the Austin component only, but are very scarce altogether. Burins were not found in an Austin component context.

The greatest variety in subtypes occurs during the Twin Sisters Phase, closely followed by the transition period, while there is a substantial drop in the Austin Phase. The cumulative diagram (Figure 8.1-12) shows the above data graphically. The results of statistical analysis on the measurements of complete tools can be found in Appendix H-1.

Table 8.1-2. Tool Classes, 41WM53

			TOOL CLASSES																					
COMPONENT	AREA	LEVEL	SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT	COMPONENT TOTAL	COMPONENT
Austin	A	1	1		2	1	1				8	2	9	2						26				
		2		1	1		1	1			17		13	9						43	69	29.24	69	16.67
Austin/	A	3	1		4		3	1	1		14	1	17	4						46				
Twin Sisters		4	2		1				3		20	1	13	9						49	95	40.25		
Transition	B	3			2						3	1	4							10				
		4			5	2	1	1			28		19	9				1		66	76	65.52	171	41.30
Twin	A	5			2		1	1	2		8	1	8	9						32				
Sister		6	1					1	2		6		6	8						24				
		7	1		1		1			1			3							7				
		8					1				3		2	2						8				
		9									1									1				
		10																		-				
		11																		-	72	30.51		
	B	5	1					1			4	1	5	5						17				
		6						1			4		3	3						11				
		7	1				1				1		7							10				
		8											1	1						2	40	34.48		
	C	3			3						8		2							13				
		4			1	1					3		1							6				
		5									1									1				
		6				1					4		4	1						10				
		7							1		1		3							5				
		8											1							1				
		9																		-				
		10																		-				
		11												1						1	37	71.15	149	35.99
Unknown	C	1									3		1							4				
		2			2	1	1				5		2							11	15	28.85	15	3.63
Surface BHT					1	3		1			5									10			10	2.42
TOTAL			8	1	25	9	11	8	9	1	147	7	124	63	-	-	-	1	-	414			414	100.00
%			1.93	.24	6.04	2.17	2.66	1.93	2.17	.24	35.51	1.69	29.25	15.52	-	-	-	.24	-	99.99				
RESTRICTED																				143				
%			5.59	.70	17.48	6.29	7.69	5.59	6.29	.70		4.90		44.06	-	-	-	.70	-	99.99				

NOTE: Level 1 and 2 are non-existing in area B, excavation started at level 3.

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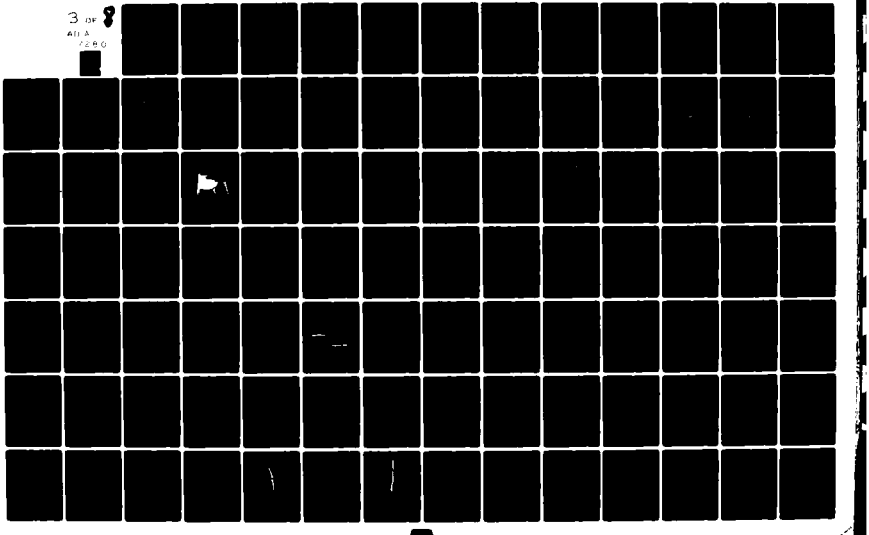

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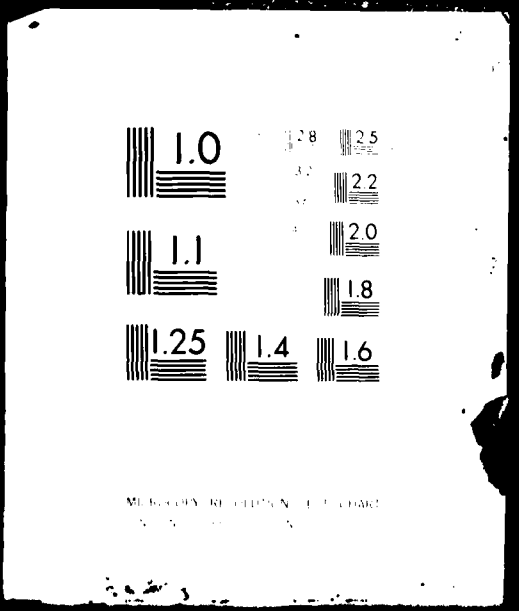


Table 8.1-3 : 41WM53

Area Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/Debitage Ratio
A Austin	2.2	31	1421	1:45
Aust/Tw. Sis. R.	2.0	48	2649	1:56
Twin Sisters	4.3	17	1310	1:78
Total area	*8.5*	*28*	*1654*	*1:60*
B Aust/Tw. Sis.	1.4	54	2243	1:41
Twin Sisters	4.0	10	1740	1:74
Total area	*5.4*	*21*	*1870*	*1:87*
C Twin Sisters	3.1	12	882	1:74
Unknown	.85	18	1302	1:74
Total area	*3.95*	*13*	*973*	*1:74*
Total site	7.85	23	1569	1:69

Table 8.1-4 : 41WM53

Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/Debitage
Austin	2.20	31	1421	1:45
Austin/Twin Sister T	3.40	50	2482	1:49
Twin Sister	11.40	13	1344	1:103
Unknown	.85	18	1302	1:74
Total site	17.85	23	1568	1:69

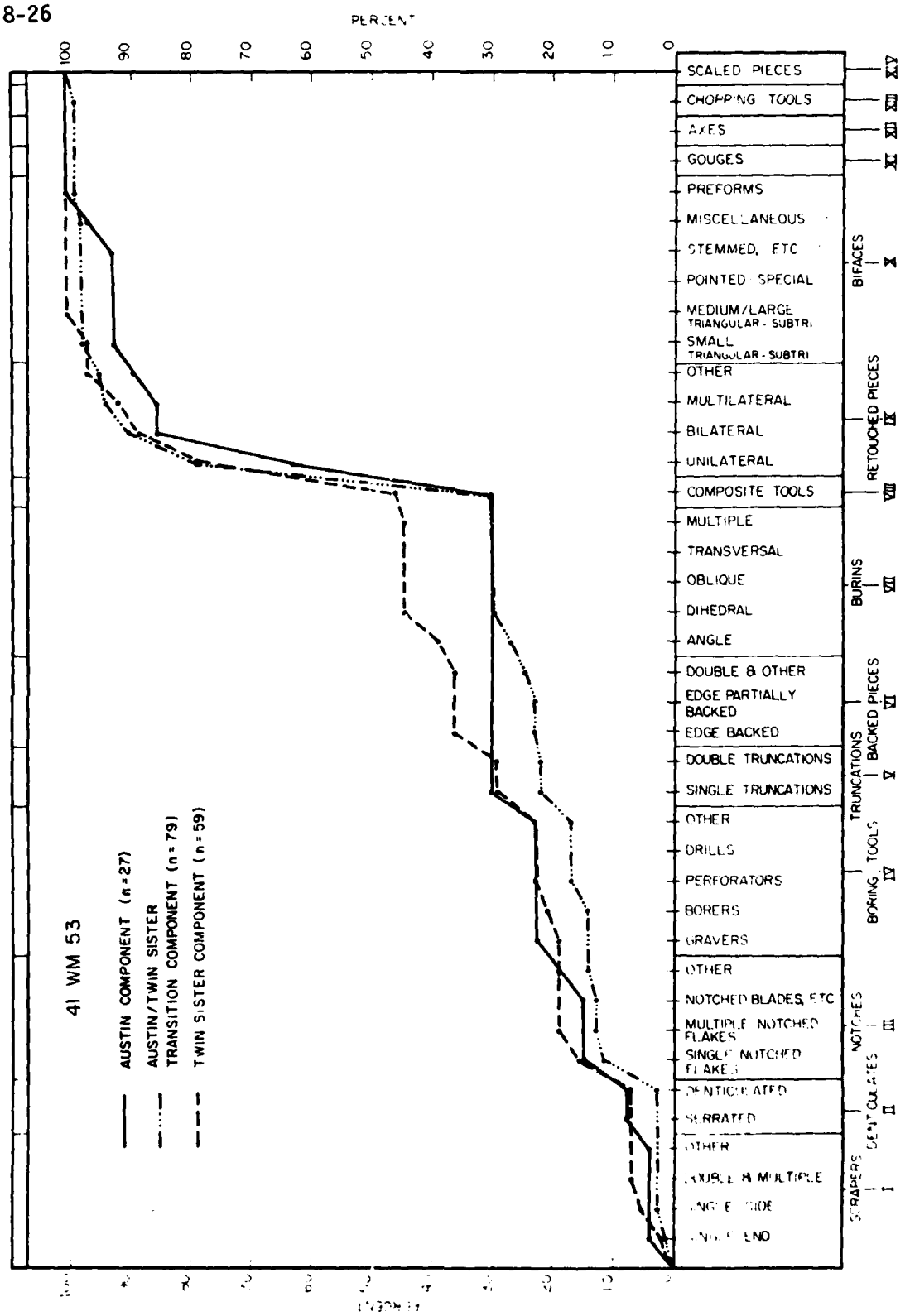


Figure 8.1-12. Cumulative Graph of Lithic Tools: Site 41WM53

Site Summary

Three characteristics of the earlier Twin Sisters Phase occupation (the number of hearths and their structure, and the density of associated artifacts) stand in sharp contrast to the later occupation of the site (Twin Sisters/Austin transition). It is apparent that the utilization of site 41WM53 was changing significantly. The sparseness of features and associated cultural debris during the earlier Twin Sisters occupations may indicate a less intense utilization of the site (e.g., a nuclear family or hunting party, rather than a larger band or extended family, may have occupied the site area). Alternatively, the site may have been occupied for longer periods or merely visited more frequently.

The significant increase in the density and formal variety of the hearths during the Twin Sisters/Austin Phase transition, however, suggests that the function of the site was changing. At the least, a more complex array of activities was being conducted. The density and variety of lithic remains directly associated with such features increases also (Table 8.1-4, 5). The formal, rock lined basin-shaped hearths, Features 4 and 6, appear for the first time. Unfortunately, the formal differentiation of the basin-shaped hearths and the clusters of burned rock are not paralleled by a similar differentiation of associated lithic debris or floral remains. Perhaps, these feature types were integral segments of a single process such as acorn processing. Such an hypothesis is suggested by the simultaneous appearance of formal basin-shaped hearths and charred acorn remains within the site matrix. Such a relationship is clouded, however, by the overall increase in site utilization during the Twin Sisters/Austin transition. The entire function of the site may have been changing; consequently, the relationship between the greater variety of hearths and acorn processing may be fortuitous. Nevertheless, it is evident that some factor had enhanced the appeal of site 41WM53 as a habitation site.

The excavations at site 41WM53 were also important for the insights gained concerning the formation of burned rock middens. The excavations within Area A of site 41WM53 revealed a midden zone approximately 30 centimeters in depth. This mass of burned rock was not as dense or jumbled as that of a classic burned rock midden such as site 41WM73. The careful excavation and recording of the mass of burned rock revealed a pattern of dense burned rock clusters and associated sparse scatters of burned rock. A formal basin-shaped hearth was also present. The mass of burned rock was the result of the accumulation and intersection of numerous hearths and their associated debris through time. The continued scattering of the fire cracked rock between the hearth areas would eventually produce a homogeneous matrix of soil and fire cracked rock. As time passes, both natural and cultural processes would likely obliterate the structure of any formal feature. As noted in other site discussions (41WM57, 41WM73), no features were recognized within a midden zone; rather, they were all located at the base of the middens. The trash or dump areas at site 41WM53 appear to be interspersed between the formal features. Sorrow's (1969:45-51) concept of the midden as a dump area is, therefore, unacceptable for all site situations.

Table 8.1-5. Lithic material associated with features at site 41WM53.

Culture/Time Stratigraphic Unit	Twin Sisters/Austin Transition					TS/Austin Transition		Twin Sisters			?
FEATURES	1	2	3*	4	5	6	7	8	9	10	11
Primary flakes						1				1	
Secondary flakes (>50% cortex)	1	4	7(1)**	2		3	1	1		3	
Secondary flakes (<50% cortex)	2	19	56(3)	7(2)	1	16(2)	6	6	1	15(1)	
Tertiary flakes	24(3)	49(4)	85(14)	47(7)	13	58(15)	15	14	6(1)	61(6)	
Biface thinning flakes			1	3	2	2	2				
Microblades		1	2								
Chunks			1	2		1		1	1	2(1)	
Chips	10(2)	58(3)	88(1)	65(11)	13(3)	75(9)	13	25(4)	10(2)	48(9)	
Scraper			1								
Retouched pieces		4	3			1				2	
Bifaces						1					
Projectile points					1		1				

* Features 3a and 3b combined

** Heat altered specimens

8.2 41WM56

(Hawes Site)

Site Situation

The Hawes site (41WM56) is located approximately 2 km downstream from Hunt Crossing on the right bank of the San Gabriel River. Situated on the first terrace, the site is bounded on the northeast by the San Gabriel River and on the south by an intermittent stream (Fig.8.2-1). A steep upland slope forms the western boundary of the site. Site 41WM57 is 100 meters distant on the south side of the intermittent stream (Fig. 8.0-1).

The vegetation cover of the site is presently coastal bermuda grass. Niney percent of the site had been cultivated previously to a depth of 15 to 25 centimeters. Juniper, oak, hickory, and elm trees comprise the overstory vegetation along the terrace edge and slope to the river. Buckeye, elm, hackberry and juniper cover the less precipitous portions of the otherwise barren upalnd ridge.

Previous Investigations

The Hawes site was first recorded during the initial survey of the North Fork reservoir in 1963. Since the site area was under cultivation, occupational debris was noted along the higher portion of the terrace at the base of the upland ridge. A wide variety of tools and an obsidian flake were recovered. The promise of additional trade materials (such as the obsidian) and possibly stratified deposits led the investigators to recommend test excavations (Shafer and Corbin 1965: 17).

In 1968, the Texas Archeological Survey excavated two 5-foot square test units on the "presumed undisturbed part of the terrace" (Sorrow 1973: 23) at the confluence of the river and the intermittent stream. Unfortunately, no test units were placed at the back of the terrace where the site was first recognized. Nevertheless, cultural debris was found in the upper 3 levels (1½') of the test units. Ground stone, bifaces, and a variety of scrapers were found in association with diagnostic dart points of the Late and Terminal Archaic periods. Due to the need to examine sites of this time period on the North Fork and the possible functional specificity of the site (presence of grinding implements and a wide variety of scrapers), the Hawes site was recommended for mitigation (Sorrow 1973: 23-27).

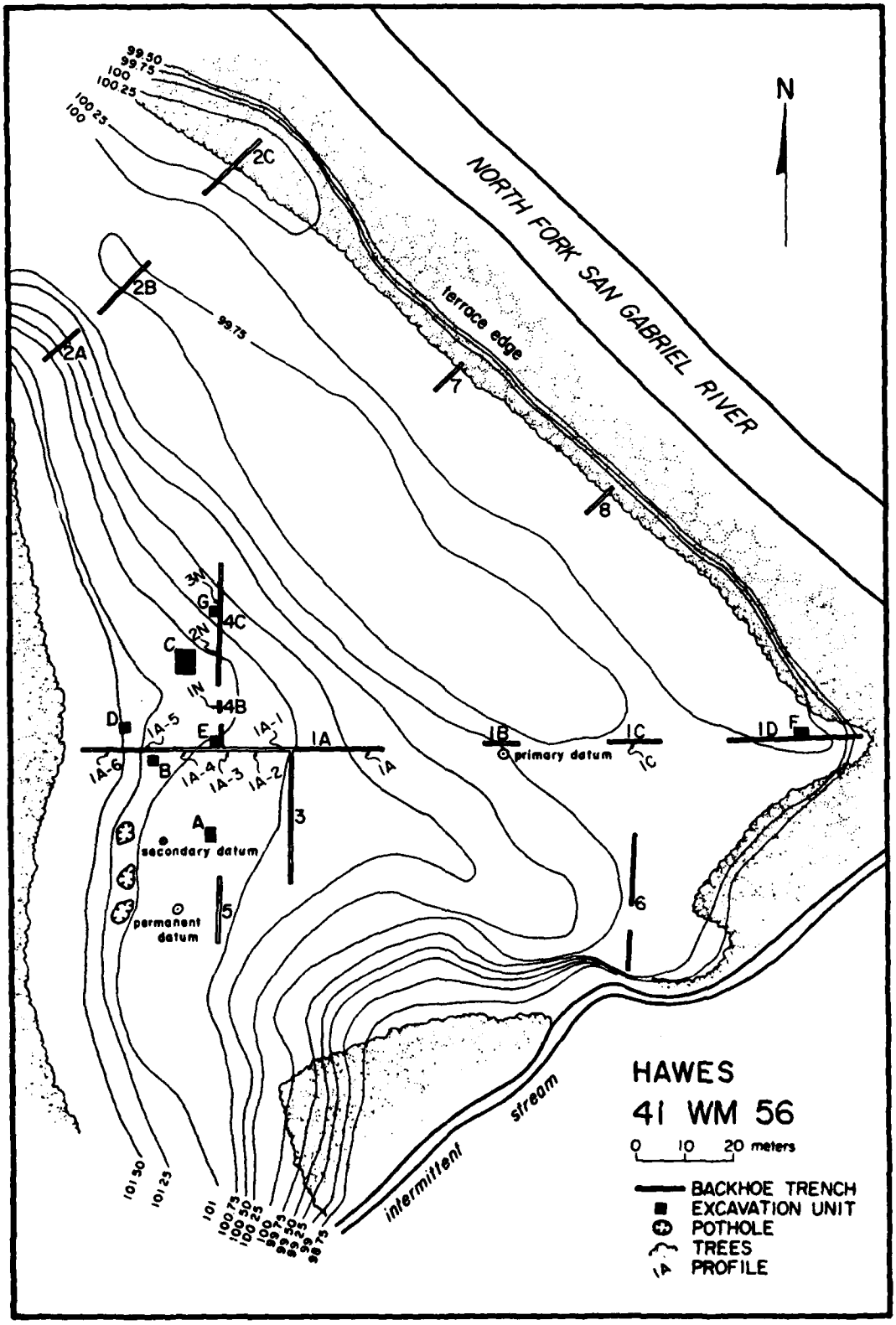


Figure 8.2-1. Site Map, 41WM56

Excavation Methodology

It was not until the Spring of 1978, however, that actual excavation was initiated. In the meantime local collectors had dug holes at the base of the slope (Fig.8.2-1)which revealed a concentration of burned rock and cultural debris. Consequently, it was realized that further testing was needed before any decision on the placement of excavation units could be made. Initially, a proton magnetometer survey had been planned to facilitate this goal. Unfortunately, a malfunctioning magnetometer determined that only the more traditional method of exploratory backhoe trenches would be utilized.

The backhoe trenches were placed so that the horizontal and vertical limits of the site could be determined and the nature of the cultural deposits examined throughout the site area. Backhoe trench 1 (Fig. 8.2-1) was placed along an east-west axis to determine if the cultural remains were continuous between that area tested by Sorrow (1973: 23-27) and the site as it was originally defined (Shafer and Corbin 1965: 17). The backhoe trench revealed that the major accumulation of burned rock and artifacts was on the higher portion of the terrace to the west (Fig. 8.2-1). Very few cultural remains were recovered from the eastern end of backhoe trench 1A or backhoe trenches 1B and 1C. Burned rock clusters and associated Austin phase materials were recovered in trench 1D. This area was particularly interesting, for Neo-American material had not been previously recovered or noted. The density of cultural material, however, was significantly lower than that of the western protion of the terrace.

Since cultural remains had been noted along both the terrace edge and the base of the upland ridge for over 200 meters, trench 2 (Fig. 8.2-1) was placed upstream to determine the northern extremity of the site. Trench 2 demonstrated that surface materials can be misleading. This trench also verified that the swale in the center of the terrace was not an abandoned meander scar as originally thought. The developed soil profile across the entire span of the terrace suggested that the terrace developed as a single unit (S. A. Hall, personal communication).

Backhoe trenches 3,4, and 5 (Fig.8.2-1)delineated the major concentration of the cultural debris at site 41WM56. Occupation of the terrace definitely centered upon the higher expanse at the base of the upland slope. Backhoe trench 6 along the intermittent stream produced no cultural material at all. Trenches 7 and 8 (Fig.8.2-1)reavealed a very sparse scatter of cultural debris along the terrace edge. The sparseness of cultural material precluded any further investment of time in that area.

The exploratory trenches, therefore, focused our attention on two areas: 1) the eastern periphery of the terrace, and 2) the broad expanse at the base of the upland slope. Because of the significantly lower density of cultural material in the eastern area, one 2 x 2 meter excavation unit was determined sufficient for the initial phase of excavation. The main

area of the site, however, presented a more difficult decision. The broad and dense accumulation of occupational debris dictated that several excavation units would be needed to properly sample intra-site variability. Initially, four 2 x 2 meter units were utilized. Sampling of the most dense concentration of burned rock, artifcats, and faunal material was accomplished by the units of Areas B and E. The northern and southern peripheries of this concentration were sampled by units in Areas A and C. The exploratory trenches had indicated that recognizable features would be most easily detected in these areas.

All excavation units were set up from reference points on the N-S and E-W base lines of a rudimentary grid system (Fig.8.2-1). Individual 1 x 1 meter excavation units were designated by the grid coordinates of their northwest corners. For purpose of vertical control three datum points were placed across the site. The primary datum, arbitrarily assigned an elevation of 100 meters, was placed at the center of the east-west transect of the site. A secondary datum (100.93 m) was established along the fenceline at the back of the terrace. The third datum (100.93 m) was placed approximately 1 meter above the ground in a large cedar tree (Fig.8.2-1). This datum served as a checkpoint for the other less permanent datum points.

Initial excavations at 41WM56 involved the utilization of 1 x 1 meter square units as the minimal unit of horizontal spatial control. Once the high density and variability of the cultural materials had been recorded, however, it was realized that the Hawes site was the best representative of a terrace occupation during the Archaic period. Since this site would be used for comparisons with similar sites in the Granger Lake Reservoir, the more conservative horizontal spatial control of 50 cm square quads was used. Intra-site variability could be more accurately assessed with the tighter horizontal control, also. Otherwise, normal excavation procedures, as described in the methodology section, were employed at the Hawes site.

Since all of the original excavation units were placed in the cultivated portion of the terrace, the Neo-American assembalge was consistently intermixed with Archaic materials. Consequently, a 2 x 2 meter square unit was placed in Area D outside the cultivated field. Unfortunately, an isolated Neo-American component was not present in Area D, either. Slope wash from the upland ridge had effectively mixed Archaic and Neo-American materials in this area, also.

Area G was opened initially for the purpose of examining an Early Archaic hearth and the associated assemblage. Sixty centimeters of overburden were removed with shovels for this purpose. Unfortunately, time structures prevented any further exploration of this area. The continuing analysis of the data from the other units also indicated that other areas were more important. Consequently, it was decided that the expansion of appropriate areas to provide a broader horizontal plan view of the site would be more productive than the excavation of several isolated units.

Stratigraphy

The backhoe trenches at the Hawes Site exhibited a stratigraphic profile that is characteristic of the North Fork river valley. Three alluvial zones are recognized over a major portion of the terrace. Colluvial materials are intermixed at the back of the terrace near the based of the upland ridge. These colluvial gravels appear no farther east than the intersection of trenches 1 and 3 (Fig.8.2-1).The density of the gravels increases gradually as one approaches the upland slope. Section 1A-6(Fig.8.2-2)of trench 1 exhibits a particularly high density of colluvial gravels which are 2 - 5 cm in diameter. Three stratigraphic zones are still recognizable, but their definition is blurred by the high gravel content.

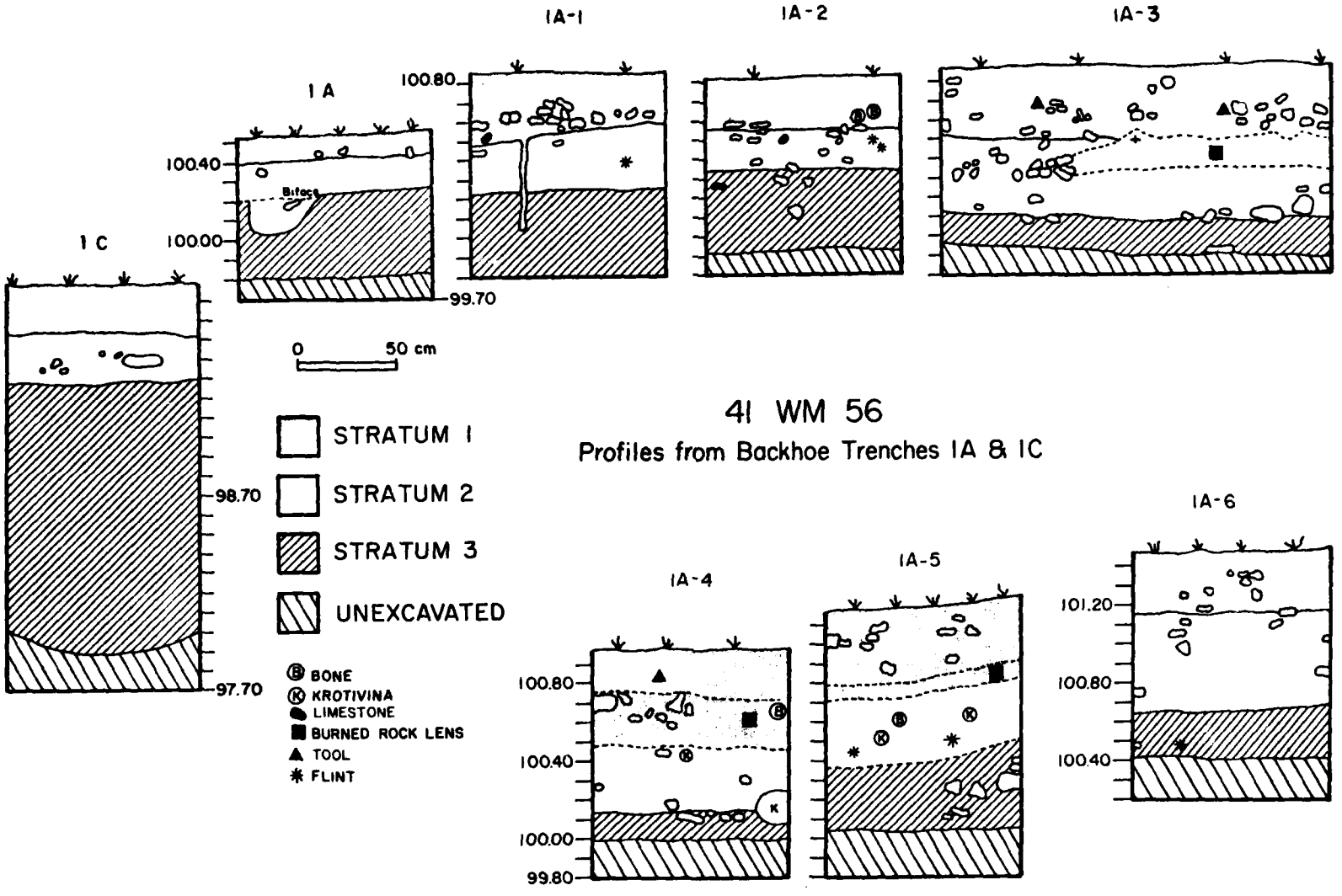
The stratigraphy of 41WM56 is further complicated by the dense accumulation of burned rock within the western portion of the terrace. This accumulation of burned rock exhibits the typical characteristics of a burned rock midden except that the mound feature is not present. The density of burned rock is as great as that at 41WM57, 41WM73, and 41WM304. Although the formal structure of the burned rock accumulation at the Hawes Site is different, it may be the result of similar cultural processes.

An additional lens of alluvial material appears only in the eastern half of Area C and in profile section 2N (Fig.8.2-3). The first impression is that this lens represents flood deposition on the lower portion of the terrace. The localized nature of this lens, however, raises some doubts about the validity of such an interpretation. Flooding should have deposited similar sediments over a much larger portion of the terrace. A more likely interpretation is that this sediment, which is structurally homogeneous with the zone beneath it, merely represents an hiatus in the occupation of this portion of the terrace. The organic debris, burned rock, and other cultural debris that would have altered the color and makeup of the sediment were not deposited in this limited area.

The profile descriptions shown below are representative sections of the trenches or excavation units that transect the site along both the east-west and north-south axes. One meter sections of the trenches walls were trowelled and straightened for profiling. Localized variability appears in certain excavation units, but the depositional history of the Hawes Site is well represented by the trench profiles. The observed strata are as follows:

Stratum 1: The uppermost zone is a black (10YR 2/1) clayey loam with occasional burned rocks present outside the more dense midden. Humic content is quite high and grass roots are prevalent throughout stratum 1. Stratum 1a most likely represents the recent plow zone over much of

Figure 8.2-2


1A-1
1A-2
1A-3
1A
100.80
100.40
100.00
99.70
Biface
1C
0
50 cm
STRATUM 1
STRATUM 2
STRATUM 3
UNEXCAVATED
98.70
97.70
B BONE
K KROTIVINA
LIMESTONE
BURNED ROCK LENS
TOOL
FLINT
41 WM 56
Profiles from Backhoe Trenches 1A & 1C
1A-4
1A-5
1A-6
100.80
100.40
100.00
99.80
101.20
100.80
100.40

41 WM 56

PROFILE OF N/S TRENCHES
(West Wall)

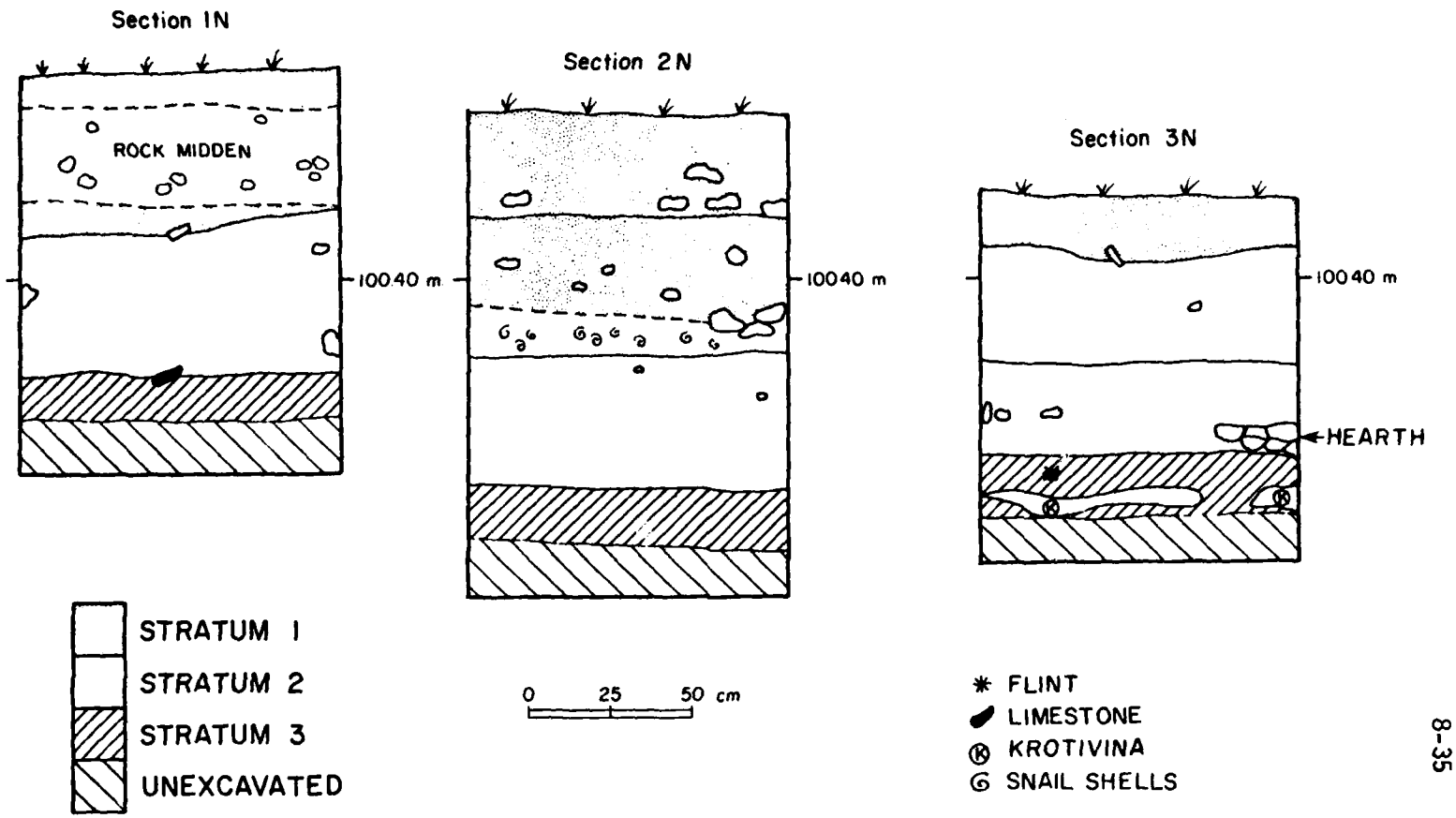


Figure 8.2-3

the site. Stratum 1b is the dense accumulation of burned rock along the western protion of the terrace. Stratum 1 is sharply defined at the base of this accumulation. Elsewhere the base of stratum 1 is not so distinct. The calcium carbonate content of stratum 1 varies from 34 (1a) to 53 percent (1b).

Stratum 2: This stratum is a silty loam. Burned rock fragments are still numerous, but they are smaller in size and more dispersed. Stratum 2a, as mentioned earlier, is found in a limited area. Inclusions of burned rock, artifacts, or snails are rare. The color of this stratum, like that of stratum 3, is a yellowish brown (10YR 5/4). Stratum 2b, however, is characterized by a high density of lithic debitage and snails. Burned rock fragments are also present. The same silty loam sediment is present, but a darker brown color (10YR 3/3) is evident. Organic debris may have contributed to this color difference. The calcium carbonate content of strata 2a and 2B, respectively, is 50 and 53 percent.

Stratum 3: This basal stratum is also a yellowish brown (10YR 5/4), silty loam. The quantity of burned rock, lithic debitage, and snails decreases significantly in this stratum. Numerous krotivina, the result of rodent activity, are found throughout this zone. The calcium carbonate content of this zone is 48 percent.

Culture/Time Stratigraphic Units

The diachronic variability within the Hawes Site is more easily perceived by reducing the number of arbitrary excavation levels to a lesser number of culture/time stratigraphic units (McMillan 1976: 211). Assignment of the levels to the culture/time stratigraphic units recognized for Central Texas was based on the vertical distribution of projectile points within each excavation unit. Assingment of several levels to a culture/time stratigraphic unit was not always an unbiased decision. Some levels which contained diagnostic artifacts from more than one culture/time unit were often arbitrarily assigned on the basis of the numerically predominant type. If the predominance of the diagnostics of any one period was not clear-cut, especially in the upper levels, no culture/time stratigraphic unit was designated.

Three radiocarbon dates from excavation unit C provide an absolute chronological framework for the middle section of the cultural deposits. A charcoal sample from Feature 14b (Level 8, 100.4-100.3 m) provided a radiocarbon age of 3750 $\pm$ 90 B.P. (UGa-2473). In levels 5 and 7 above this feature, radiocarbon dates of 3225 $\pm$ 75 B.P. (UGa-2480) and 3615 $\pm$ 60 B.P. (UGa-2485), respectively, were obtained. Although the two latter dates were not obtained from feature associated samples, the surprising consistency of this chronometric sequence gives cause for confidence in the contextual integrity of the samples. All of these dates (when corrected: Table 7.1-1) and the associated projectile points correlate well with the present chronological model for Central Texas (Weir 1976;

Patterson 1976: 11). Level 5 which contains almost equal proportions of Pedernales and Bulverde points likely represents an early Round Rock phase occupation as it is presently modeled. The overwhelming dominance of levels 6 through 9 by Bulverde, Group 14 (Bulverde-like), Travis, and Nolan points clearly denotes an earlier culture/time unit--the Clear Fork Phase.

Below these levels in Area C, the drastic decline of the Clear Fork diagnostics and the presence of a Martindale point denote an even earlier San Geronimo stratigraphic unit. Above the Clear Fork and Round Rock units, the situation is not so clear. The mixture of San Marcos, Twin Sisters, and post-Archaic diagnostics renders any designation of culture/time stratigraphic units extremely risky. A similar situation exists in excavation units B, D, and E. The plow zone which negatively affected the context of the upper two to three levels of each unit within the field is largely responsible for this mixture. However, the slow aggradation fo the terrace surface (less frequent flooding) within this later time period was also a probable contributing factor. A ten centimeter increment of the terrace surface could easily encompass the cultural refuse of several occupations spanning two or more culture/time stratigraphic units. In Area D the plow zone is not a factor, but the hillslope situation has effectively produced a similar mixed context.

Within Area A the situation is not so confusing; nevertheless, arbitrary decisions were still necessary. Levels 1 through 3 have been designated as belonging to the Twin Sisters phase even though Montell (2) and Nolan (2) points are present within level 3. The association of Montell and Fairland/Ensor points is not surprising. The presence of the Nolan points, however, is not so easily dismissed. These points are likely associated with the Round Rock diagnostics within level 4, but they appear to be misplaced within the stratigraphic sequence in that San Marcos phase diagnostics also are present within level 4. For the purposes of analysis, level 4 is designated as a mixed assemblage. This does not resolve the problem of the contextual integrity of the Nolan points. Our present knowledge of the temporal span of their utilization, however, suggests that they are not in a primary depositional context.

The remaining levels of Area A have been designated to the San Geronimo stratigraphic unit. The basis for the designation is the presence of a Wells point and a Group 10 specimen (Chapter 14.1) which shares characteristics with the previously defined Hoxie points. The Clear Fork materials which are so abundant in much of the remainder of the site are not well represented within Area A.

All of the culture/time stratigraphic units represented at the site are not equally represented within each excavation unit. Perdiz, Fresno, and Maud/Talco points, diagnostic of the Toyah phase of the post-Archaic period, are present in Areas B and C only. Scallorn points, diagnostic of the earlier Austin phase, were recovered in Areas B, C, D, and F.

Twin Sisters and San Marcos phase diagnostics were recovered from all areas of the site. Apparently, the terrace edge itself (Area F) was not judged suitable as an occuaption area until the late Archaic period. Why this area was not extensively utilized during the post-Archaic phases is unclear, for the pattern of site selection for this period elsewhere along the San Gabriel River is consistently on the terrace edge adjacent to the stream.

Diagnostics of the Round Rock, Clear Fork, and San Geronimo phases are found in the units at the back of the terrace adjacent to the hillslope. Within the North Fork drainage, the Early and Middle Archaic sites are consistently located at the juncture of the upland slope and the alluvial terrace. The apparent need for a large quantity of limestone cobbles for cooking hearths required that the sites be close to the upland slopes where limestone was readily available.

On the basis of the projectile points alone, it is apparent that the Hawes Site (41WM56) was most intensively utilized during the Clear Fork, Round Rock, San Marcos, and Twin Sisters phases. Although the utilization of the site area during the San Geronimo phase was extensive (spatially), the "visibility" of these occupations within the archaeological context is quite low. Cultural remains of the post-Archaic phases, on the other hand, are even less visible, for they are found in a limited area of the site. Any relationship to features has also been destroyed by agricultural activities. Nevertheless, the few sherds of pottery and the arrow points (Peridz, Fresno, Maud/Talco) denote one of the latest prehistoric occupations anywhere in the North Fork and Granger Reservoirs.

Features

Twenty features were designated within the six excavation units at the Hawes Site. Area C, the largest excavation unit, yielded eleven (11) features. The remaining features were equally distributed among the other five excavation units (Area A, 2; Area B, 1; Area D, 3; and Area F, 2). Features were recognized within all of the culture/time stratigraphic units represented at the Hawes Site except for the Neo-American period. The Neo-American period features were likely destroyed by agricultural activities. The features will be presented according to their association with a culture/time stratigraphic unit. The order of presentation will be from oldest to most recent.

San Geronimo Phase

Three hearths (Fig. 8.2-4) all from within excavation unit C, comprise the total sample of features associated with this stratigraphic unit. Other hearths, noted within backhoe trench 4, are likely the product of a San Geronimo phase occupation also. An additional excavation unit (G) was laid out for the purpose fo investigating one of these hearths.

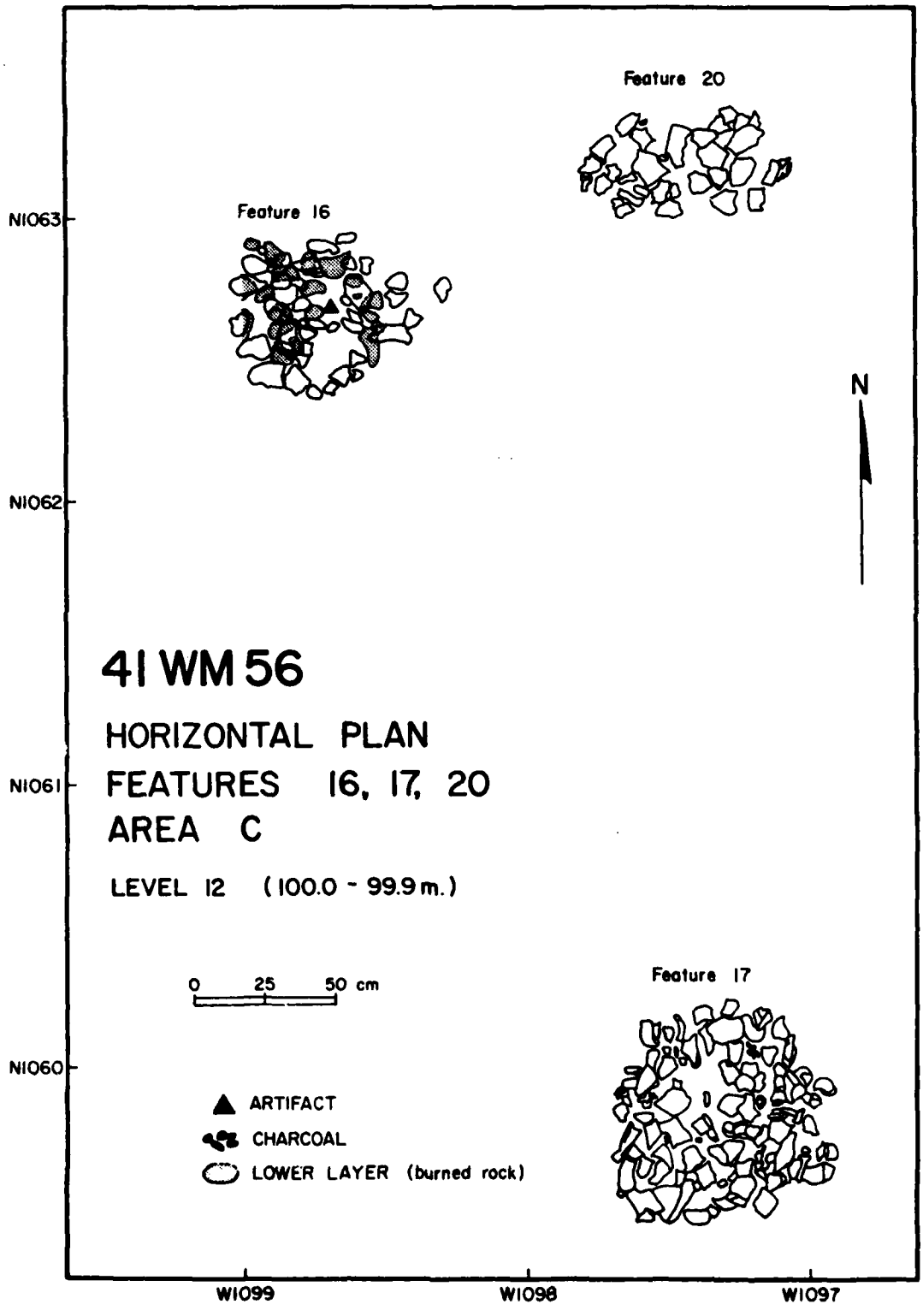

Feature 20
Feature 16
N1063
N1062
N1061
N1060
N
41 WM 56
HORIZONTAL PLAN
FEATURES 16, 17, 20
AREA C
LEVEL 12 (100.0 - 99.9 m.)
0 25 50 cm
Feature 17
ARTIFACT
CHARCOAL
LOWER LAYER (burned rock)
W1099
W1098
W1097

Figure 8.2-4

None of the hearths exhibited evidence of a prepared basin. The hearth areas were distinguished by little more than the burned rocks themselves. Apparently, the intensity of the fires were insufficient to produce an underlying layer of burned earth. The relatively low density of associated cultural materials indicates a short-term occupation of the site.

Feature 16 (Area C). Feature 16, although very similar to Feature 15 (Clear Fork Phase), appears 30 cm deeper in Level 11. This hearth consists of two layers of burned rock (5 - 8 cm in breadth) within a circular concentration which is 55 cm in diameter. Although the cluster of burned rock is 12 cm thick, no basin-shaped depression is recognizable. A darker colored, organic fill is present within a narrow pocket in the southeast quadrant of the feature. The localized nature of this matrix, however, denotes rodent disturbance rather than a feature-related activity.

A Nolan point, diagnostic of the Clear Fork Phase, was lying among the burned rocks. The projectile point was apparently placed within the hearth following any fire-related activities, for the point exhibits no characteristics of thermal alteration. Sufficient charcoal samples were not present within the hearth for a radiometric date of this occupation of the site.

Feature 17 (Area C). Feature 17, stratigraphically associated with Features 16 and 20, is a similar cluster of burned rocks (3 -12 cm in breadth) within a circular formation. The hearth is 80 cm in diameter. The downward slope of some of the rocks toward the center of the concentration suggests that the hearth was built in a very shallow depression. Although the overall depth of the hearth is 16 cm, no vertical definition of the depression, other than the burned rock themselves, is recognizable. Charcoal flecking and small pieces of burned clay were noted throughout the matrix surrounding the rocks.

Although Feature 17 contained no diagnostic elements, its stratigraphic relationship to Feature 16 which is 2.5 meters to the northwest suggests that the two hearths are contemporaneous. The Nolan point within Feature 16 suggests a Clear Fork Phase occupation. The presence of a Martindale point in the level above these hearths, however, suggests that the temproal specificity of the Nolan point or the Martindale point itself is in question. At a broader level of interpretation, this situation points out our lack of knowledge concerning the cultural historical framework of man's occupation of Central Texas during the Early Archaic. It also reflects our meager understanding of the relationship between the archaeological context and the behavioral context. Until an adequate framework, based on more than projectile points, is developed, an understanding of the cultural processes involved will remain a difficult research objective. Unfortunately, the lack of radiometric dates from these hearths precludes any rigorous conclusions concerning their temporal affinities. Nevertheless, their relative position to Features 14

and 15 is still valuable information. This stratigraphic separation and the differences in the associated projectile points suggest an earlier San Geronimo Phase occupation.

Feature 20 (Area C). Feature 20, like many of the other hearths within Area C, consists of a single layer of burned rock. The burned rocks (4 -12 cm in breadth) occupy an area 75 cm long (E-W axis) and 40 cm wide (N-S axis). The verical definition of the hearth (10 cm in depth) exhibits no evidence that a basin-shaped pit was prepared before the rocks were placed. Unlike Feature 17 which is three meters to the south, Feature 20 exhibits no flecks of charcoal or burned clay. Small angular limestone fragments in the matrix surrounding the burned rock, however, were likely produced by the heating of the rocks in situ.

Clear Fork Phase

Eight features, recognized within a Clear Fork stratigraphic unit, were recorded in excavation units C, D, and E. Three of these features are stratigraphically related within Area C; two others are superpositioned above these. Fortunately, a sequence of radiocarbon dates within Area C provides an important chronological scale for these features. Elsewhere in the site the association of diagnostic projectile points is the only determinant of temporal association. Greater variability in the formal structure of features is evident during the Clear Fork Phase. Basin-shaped hearths, informal burned rock clusters, and a probably storage pit are present.

Feature 14 (Area C). This feature (Fig 8.2-5) consists of two adjacent concentrations of large burned rocks (8 - 20 cm in breadth) situated in oval to circular shaped depressions. These two hearths (Feature 14a and 14b) were utilized either contemporaneously or within a relatively short time span, for the basin-shaped depressions intersect in the area between the two concentrations of burned rock. The stratigraphic cross-section of the hearths revealed no disturbance of either hearth by the placement of another hearth depression. Consequently, the two basin-shaped depressions were likely prepared simultaneously.

The two hearths are very similar in structure except that Feature 14b is smaller (90 cm in diameter) and more regular in outline. The larger hearth (Feature 14a) is oval shaped with a long axis (NE-SW) of 140 cm and a shorter axis of 120 centimeters. Within both hearths the presence of a depression was indicated by the downward slope of the outer rocks toward the center of the cluster. Cross-sectioning of the feature also demonstrated that the lens of burned rock lay 8 to 15 cm above the bottom of the basin-shaped depressions. Scattered burned rock were also present at the base of the depressions. The fill within the depressions was much darker colored than the surrounding matrix. Little else distinguished the feature fill from the surrounding matrix, for charcoal was not overly abundant and no heat-altered soil was present (Fig. 8.2-6).

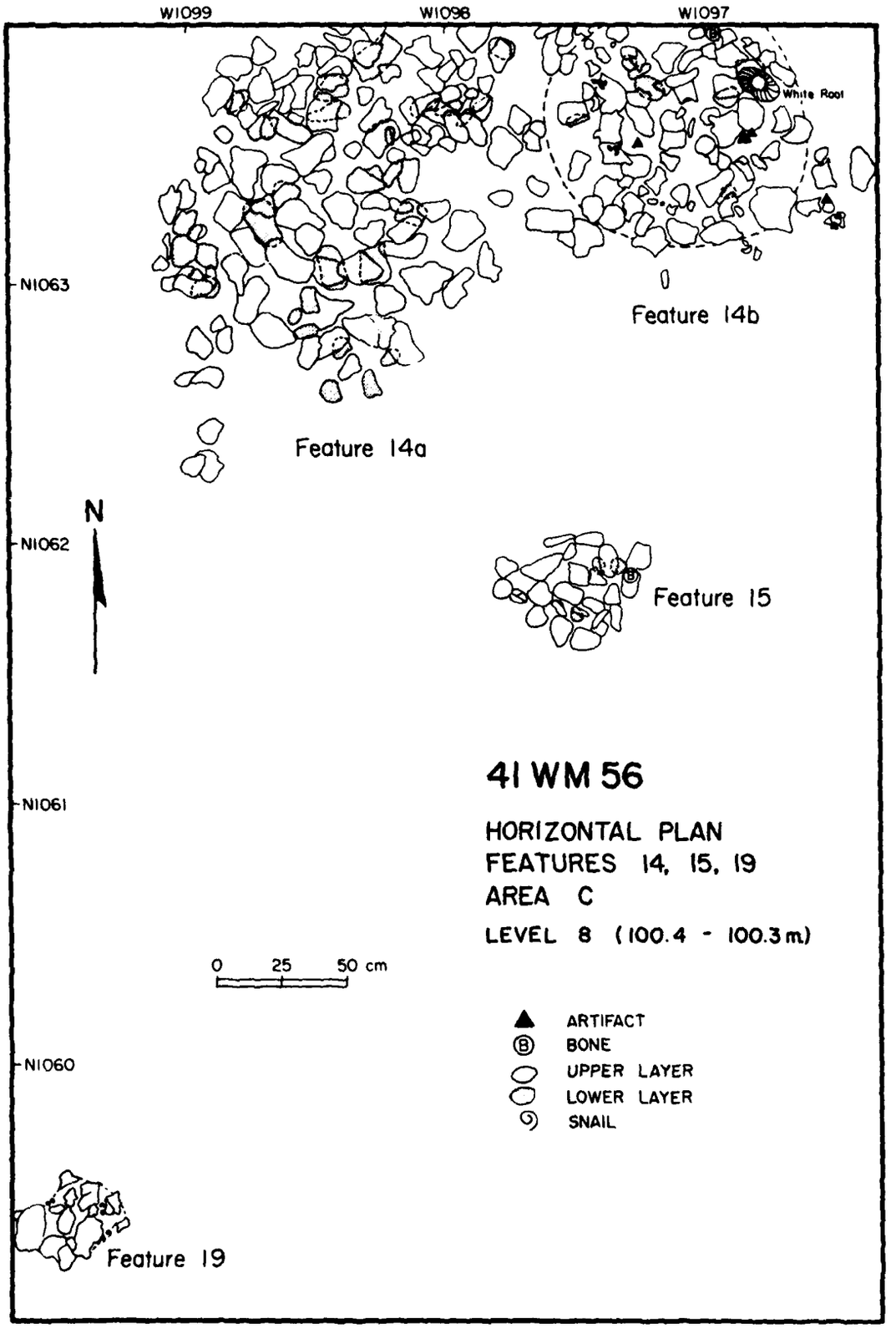

W1099
W1098
W1097
White Root
N1063
Feature 14b
Feature 14a
N
N1062
Feature 15
41 WM 56
HORIZONTAL PLAN
FEATURES 14, 15, 19
AREA C
LEVEL 8 (100.4 - 100.3 m)
N1061
0 25 50 cm
ARTIFACT
BONE
UPPER LAYER
LOWER LAYER
SNAIL
N1060
Feature 19

Figure 8.2-5.

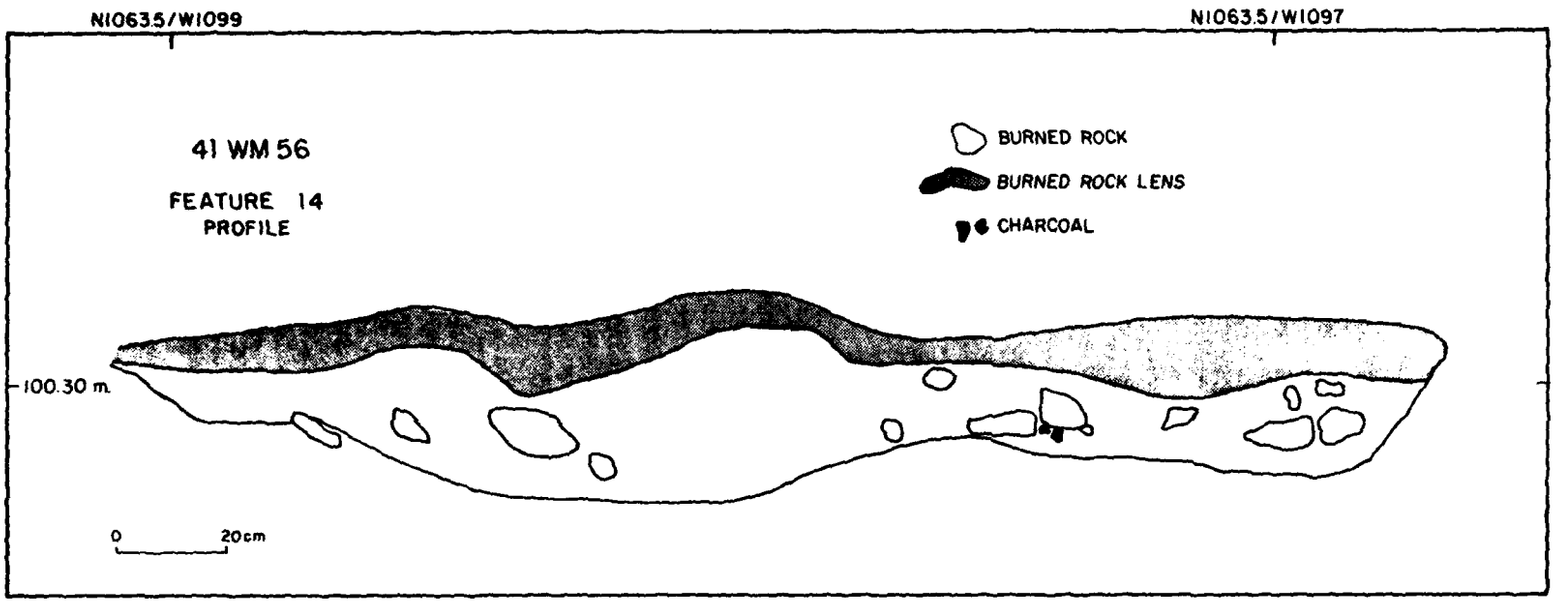

N1063.5/W1099
N1063.5/W1097
41 WM 56
FEATURE 14
PROFILE
BURNED ROCK
BURNED ROCK LENS
CHARCOAL
100.30 m
0
20cm

Figure 8.2-6

Feature 15 (Area C). Feature 15 (Fig.8.2-5)is situated one meter south and east of Feature 14. Although its stratigraphic position suggests contemporaneity with Feature 14, the overall form and size of Feature 15 are quite distinct from the adjacent hearths. Feature 15 lacks the vertical definition of a basin-shaped depression. The cluster of burned rocks is also much smaller than those within Feature 14, for it measures 60 cm across its east-west axis and 43 cm across its north-south axis. The feature fill surrounding the rocks contains a dense accumulation of lithic debitage. If this hearth is indeed contemporaneous with those within Feature 14, the form and size differences of Feature 15 may reflect functional differences.

Feature 19 (Area C). Feature 19 (Fig.8.2-5)is a small cluster of burned rock appearing in Level 8 (100.40 - 100.30 m) of Area C. The rocks vary in size from 4 to 15 cm in breadth. The single layer of burned rock is 37 cm across its north-south axis. No other factor, other than the presence of the rocks themselves, distinguishes this feature from the surrounding matrix. Neither the inclination of the rocks nor the cross-sectioning of the hearth revealed any evidence of a basin-shaped depression. No charcoal was observed in the fill between the rocks.

These four hearths are stratigraphically associated within Level 8 of Area C. Feature 15 (Fig.8.2-5) a smaller cluster of burned rock and associated faunal elements, lies 115 cm. south of Feature 14b. Feature 19 (Fig.8.2-5)an even smaller cluster of burned rock, appears 3.5 meters southwest of Feature 14a. A charcoal sample from Feature 14b has provided a radiocarbon age of 3750 + 90 B.P. (UGa-2473) for its utilization. Feature 14a was also likely utilized at the same time. The projected living surfaces associated with these hearths are all within a 5 centimeter increment; hence, it is highly probable, but not certain, that these hearths represent a single occupational episode. The above date and the presence of Bulverde, Group 14 (Bulverde-like), and Nolan points within Level 8(Table 8-2.1)indicate that this occupation may be labeled as Clear Fork.

Whether or not these hearths were used simultaneously is open to speculation. Nevertheless, the distinctive size and form of Features 15 and 19 in relation to Feature 14 may reflect functional variability. Features 15 and 19 likely represent the product of a short-term utilization of a small fire, since little preparation was involved and the end products of a larger fire, such as charcoal and matrix alteration, are not present. The hearths within Feature 14, on the other hand, are much larger and are the product of a more involved preparation process. Perhaps, this form and size differentiation indicates that Features 15 and 19 were not utilized as hearths, but rather as warming or drying areas. The rocks may have been heated elsewhere and placed in a cluster to provide a warming or drying feature.

Table 8.2-1. Projectile Point Distribution, 41WM56.

Culture/Time Stratigraphic Unit	AREA A							AREA B										AREA C											AREA D										AREA E							AREA F				
	Twin Sisters	?	SN/RR	San Geronimo				Mixed			Round Rock		Clear Fork		San Geronimo ?			Mixed				Round Rock ?	Clear Fork			San Geronimo			Mixed	RR/SM		Clear Fork		San Geronimo				Mixed	RR ?	Clear Fork		San Geronimo			Twin Sisters		?		San Marcos
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	7	11	1	2	3	4	5	6
Maud/Talco																		1																																		
Fresno								1	2	1																																										
Perdiz								1										1	1		1																															
Scallorn								3	2	2		1						1	1										1	1	4	1														1					
Darl								1	1											3		1								1															1					
Frio																		1	1	2	2																														
Ensor			1					1	1									1	2	5																														
Fairland/Ensor	1		1					*										3	12	8										1	1										1					1	3	1			
Fairland										1									1																																
Edgewood																																																		
Montell			2	1				2		2*										4	2																						3							1	
Marcos				1														*	4	1	1								1	1		1																
Castroville				2						1		1						2	6	1	1	1									1																	1	
Williams				1														1		2																														
Marshall									1		1*								5+	1†	2								1													*								
Pedernales				5				1			2	1			1			1	2	2	4		1		1	1				1		3									2								
Bulverde				1					2		1										5	2	2	2									1									1							
Nolan			2																2	1	2	5		4	2		1								1								1	1					
Travis																					1	1			2																		1	1						
Dawson												1																																					
Uvalde																	1																																	
Wells						1																								1																		
Buda										1													1																										
Martindale																										1										1							1						
Tortugas															1																					1								1					
Hoxie														1																	▽												▽					
Group 2													1										1		1																									
Group 3				1																						1																						
Group 4																			1		1		1		1																		1						
Group 5																							1																										
Group 7																							1	2																									
Group 10				1																																													
Group 11													1																																				
Group 14																						1	3	2	2							5			1														
Unidentified	1	2	3		4	1	1	2	2	1	3	3	3			1	1	5	7	11	7	4	5	5	8	6	2	1	1	4	1	2					1	1				4	1	2	1		1	1				

*1 Preform; ‡2 Preforms; ▽1 Hoxie-like

Immediately above these hearths in Levels 6 and 7, irregular clusters of burned rock were uncovered. No formal basin-shaped hearths were recognized. These irregular scatters of burned rock likely represent repeated utilization of the site over a given time span. Formal hearths, if constructed, were probably obliterated during subsequent habitation of the site. Consequently, a burned rock midden begins to accumulate. Weir's Type 4 midden (1976: 38) may indeed be an incipient stage of the more recognized Type 1 burned rock midden. The accumulation of burned rock at the Hawes Site is similar to that of the Type 1 burned rock midden, except that it lacks the regular mound structure.

Feature 18 (Area C). Feature 18 (Fig.8.2-7) designates several clusters of burned rock found in Level 7 of Area C. None of the clusters had any regular form that is traditionally associated with recognized hearths within Central Texas. All of the rocks are fragmented and vary in size from 4 to 14 cm. in breadth. The size of the clusters within Level 7 vary greatly.

The clusters within units N1061-1063/W1100 and N1062/W1097-1098 may represent the juxtaposition of separate hearths. Unfortuantely, cross-sectioning of these clusters reveal no vertical definition of intersecting prepared basins. Other than the burned rocks and charcoal flecking in the surrounding matrix, there is no evidence of an intense fire. Charcoal was more abundant in the areas of Level 7 outside the clusters than within them.

Feature 5 (Area C). A non-patterned scatter of burned rock appears throughout Level 6 within Area C. Within units N1062/W1098-1099 and N1061/W1098-1099, however, the association of large samples of charcoal with the burned rock suggests the presence of a disturbed hearth area. Charcoal samples No. 1 and 3 (Fig.8.2-8) both represent the remains of a well-charred log. Although no basin-shaped depression was observed, the vertical orientation of three limestone slabs likely denotes an improvised windbreak for a hearth. No heat altered soil was associated with this feature.

The distribution of projectile points within Area C (Table 8.2-1) indicates that these latter two features were also the result of a Clear Fork phase occupation. The presence of radiocarbon dates from Levels 5 and 7 bracket the deposition of these features between 3500 and 4000 B.P. The dates of 3225 $\pm$ 75 B.P. (UGa-2480) and 3615 $\pm$ 60 B.P. (UGa-2485) from Levels 5 and 7, respectively, indicate that the Clear Fork phase, as it is presently recognized, does not give way to the Round Rock phase at 4000 B.P. The evidence from the Hawes Site suggests that the cultural continuum might be better segmented at 3500 B.P. when Pedernales points first appear in the stratigraphic sequence within excavation unit C. It is apparent that the assignment of assemblages to an absolute temporal period on the basis of diagnostic elements alone is risky at best.

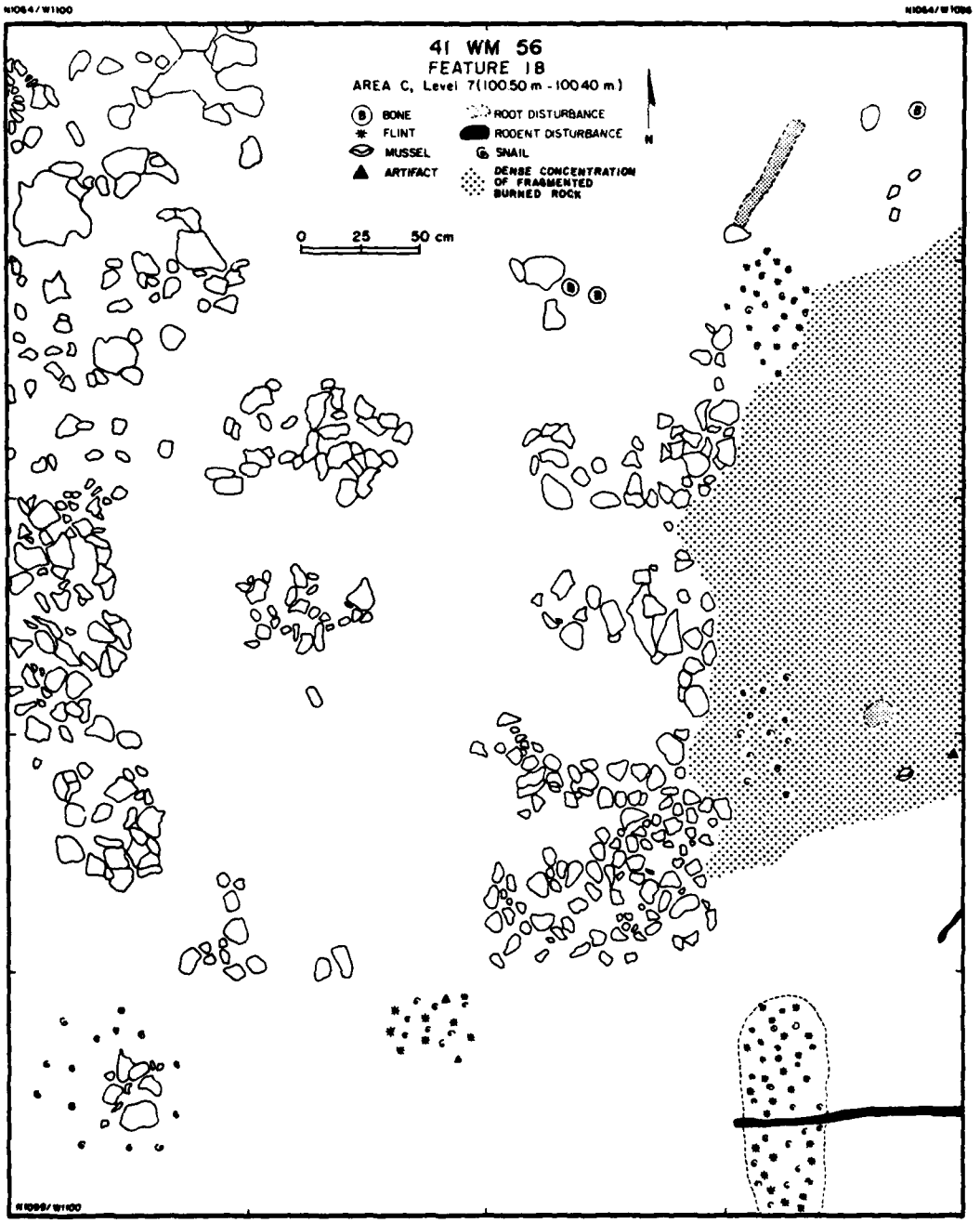

41 WM 56
FEATURE 18
AREA C, Level 7(100.50 m - 100.40 m)
BONE
FLINT
MUSSEL
ARTIFACT
ROOT DISTURBANCE
RODENT DISTURBANCE
SNAIL
DENSE CONCENTRATION OF FRAGMENTED BURNED ROCK
N
0 25 50 cm

Figure 8.2-7

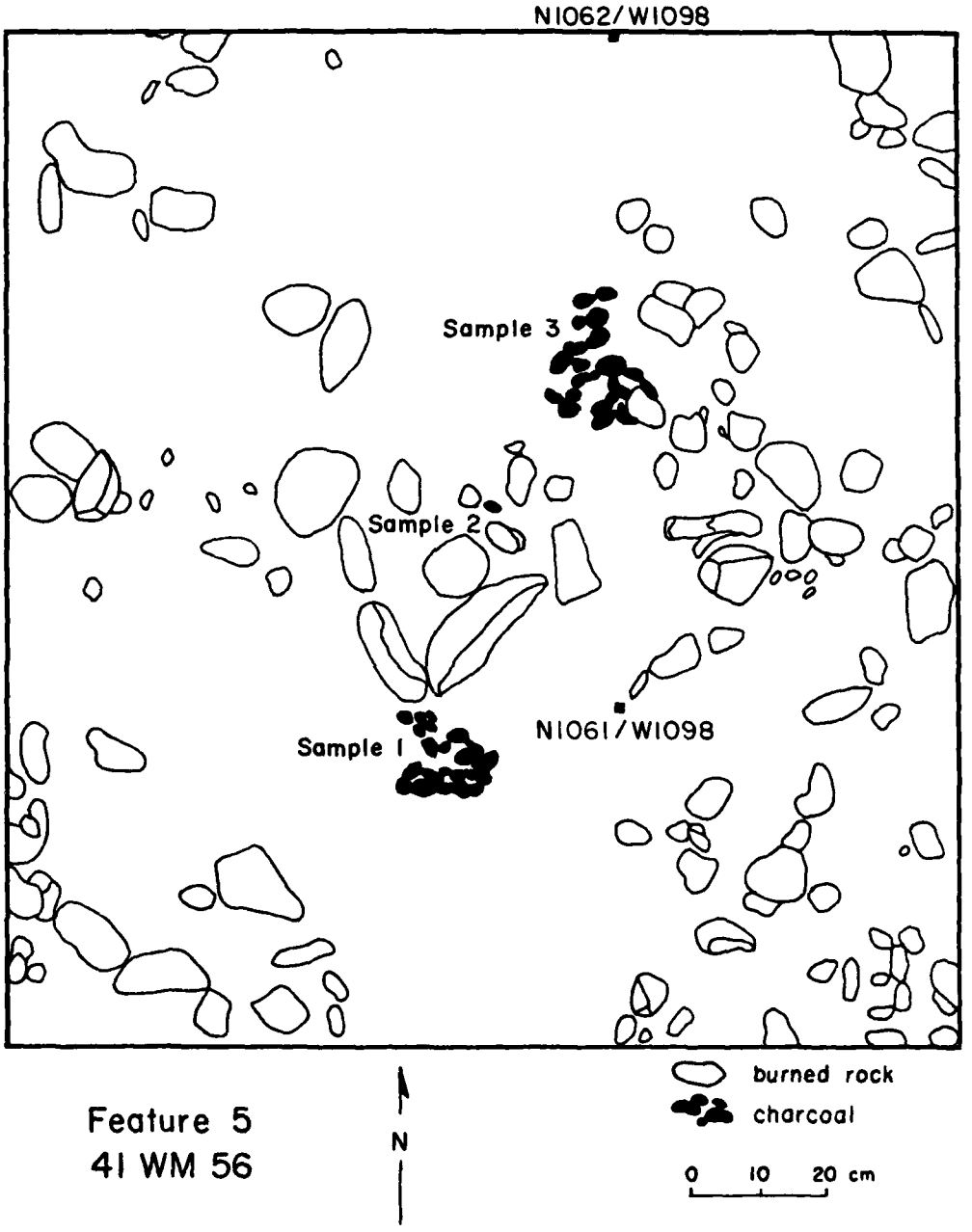

N1062/W1098
Sample 3
Sample 2
Sample 1
N1061/W1098
Feature 5
41 WM 56
N
burned rock
charcoal
0 10 20 cm

Figure 8.2-8

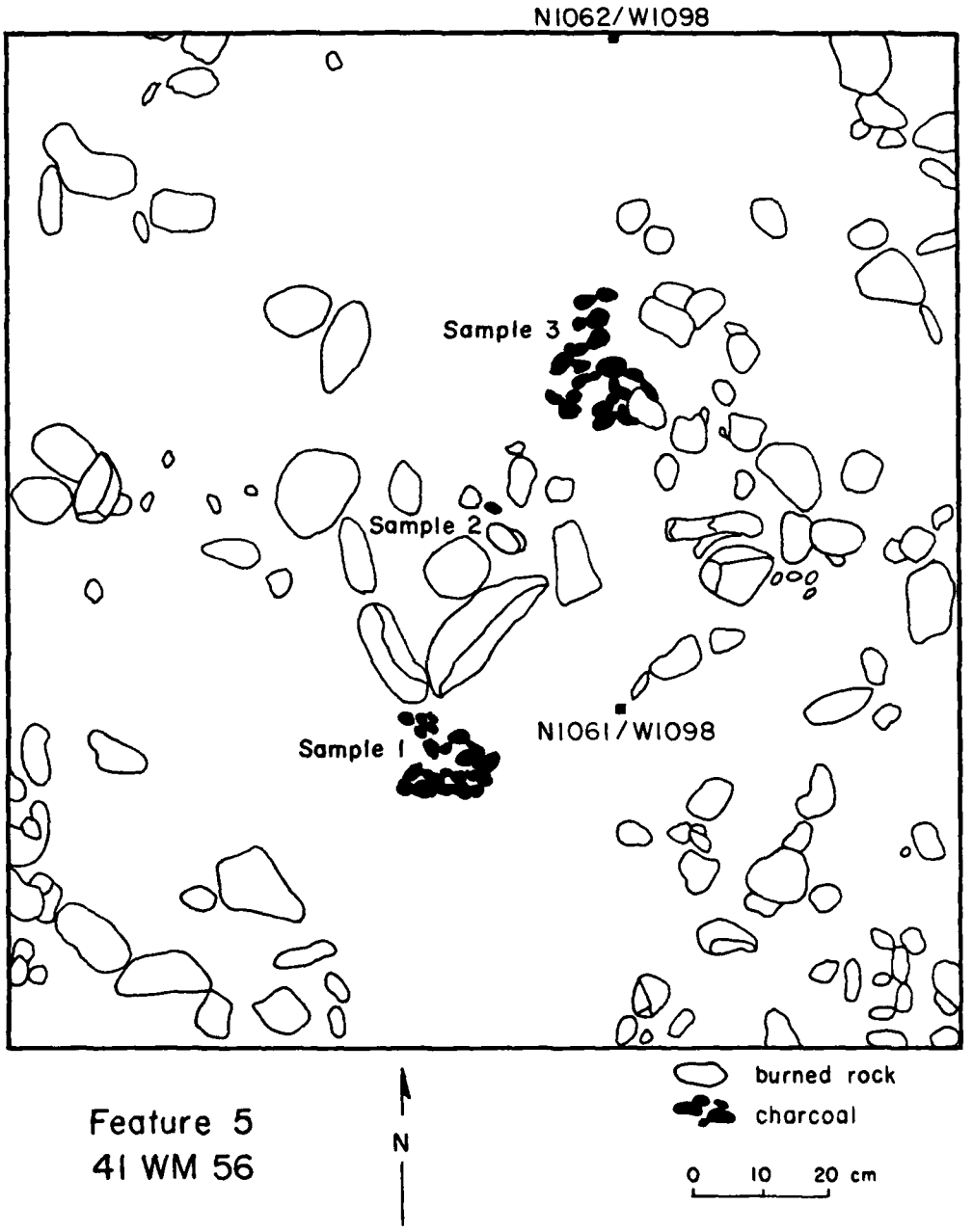

N1062/W1098
Sample 3
Sample 2
Sample 1
N1061/W1098
Feature 5
41 WM 56
N
burned rock
charcoal
0 10 20 cm

Figure 8.2-8

Both a basin-shaped hearth and an irregular cluster of burned rock were recognized within the Clear Fork stratigraphic unit of Area D. The context of associated cultural material is somewhat questionable due to the hillslope situation. The colluvial matrix surrounding these features indicates that most artifacts are likely in a secondary context.

Feature 12 (Area D). Feature 12 was exposed along the north wall of Area D. Located 63 cm below the surface, this feature consists of a compact cluster of burned rocks and associated faunal elements. A very sparse scatter of burned rock and faunal material lies to the south and west of the feature. The dense cluster of burned rock measures 88 cm across its east-west axis. Fifty-two centimeters of the cluster were exposed to the south of the wall of the excavation unit (Fig. 8.2-9).

Like many of the features at site 41WM56, this feature exhibits no vertical definition other than the accumulation of burned rock (10 - 12 cm in depth). The lack of charcoal or burned earth may indicate that an intense fire was not needed for the purposes of this hearth (?). However, the hillslope situation is ideal for sheet erosion to remove all evidence of an intense fire. Unfortunately, the actual situation remains in the realm of speculation. The only direct evidence of disturbance within the feature is the presence of rodent grawing marks on the faunal elements.

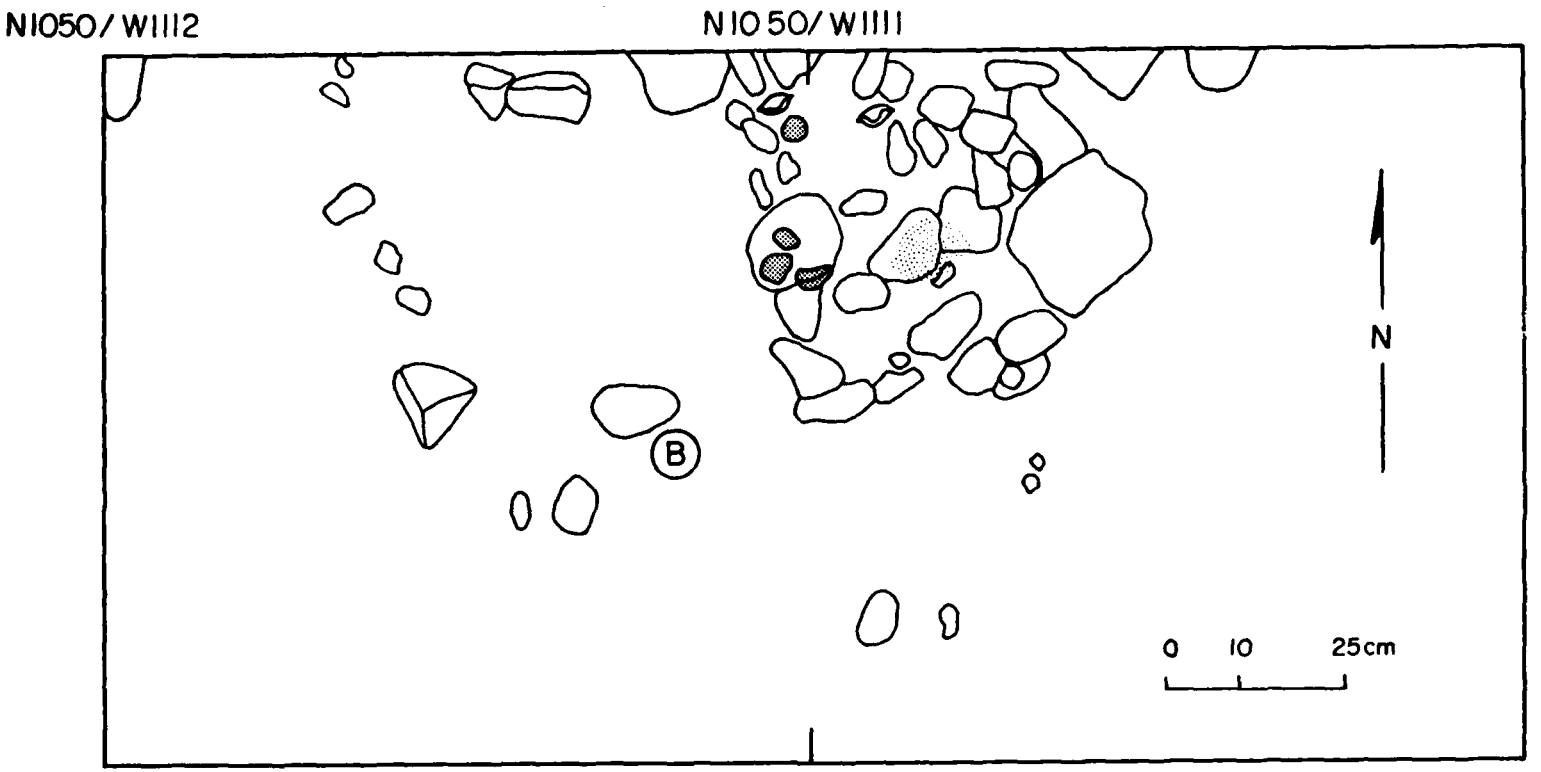
The presence of a Bulverde-like point within the level that the feature appears (Level 8) and the occurrence of both a Nolan and a Tortugas point in Level 9 indicate that the cluster of burned rock was likely deposited during the Clear Fork phase of the Archaic period. Sufficient samples of charcoal for radiometric dating were not recovered from Area D.

Feature 13 (Area D). Like Feature 12, Feature 13 was only partially exposed in the wall of excavation Area D (Fig. 8.2-10). This small cluster (70 cm in breadth) of burned rocks lay in Level 9 of unit 1049N/1111W. Although this feature appears one level (Level 9) lower than Feature 12, its actual stratigraphic position on the hillslope indicates that Feature 13 was the result of cultural activities subsequent to the deposition of Feature 12. The distribution of projectile points in Area D (Table 8.2-1) indicates that Feature 13 may be the result of a Clear Fork phase occupation of the site.

The actual form of this probably hearth was not ascertained until the concentration of burned rocks was removed and the feature could be viewed in profile. The hearth was 14 to 20 cm in depth and exhibited a basin-shaped profile. The fill within the feature was of a much finer texture and darker color than the colluvial matrix surrounding it.

Feature 10 (Area E). Feature 10 is the only true pit discovered at site 41WM56. Exposed only in the northwest corner of the excavation unit, the pit was not noticed until the base of Level 9 (100.0 m) had been trowelled clean. At that point, the dark brown matrix of the feature

Figure 8.2-9



B bone

mussel shell

stain (possible rodent disturbance)

lower layer

upper layer

Feature 12
41 WM 56

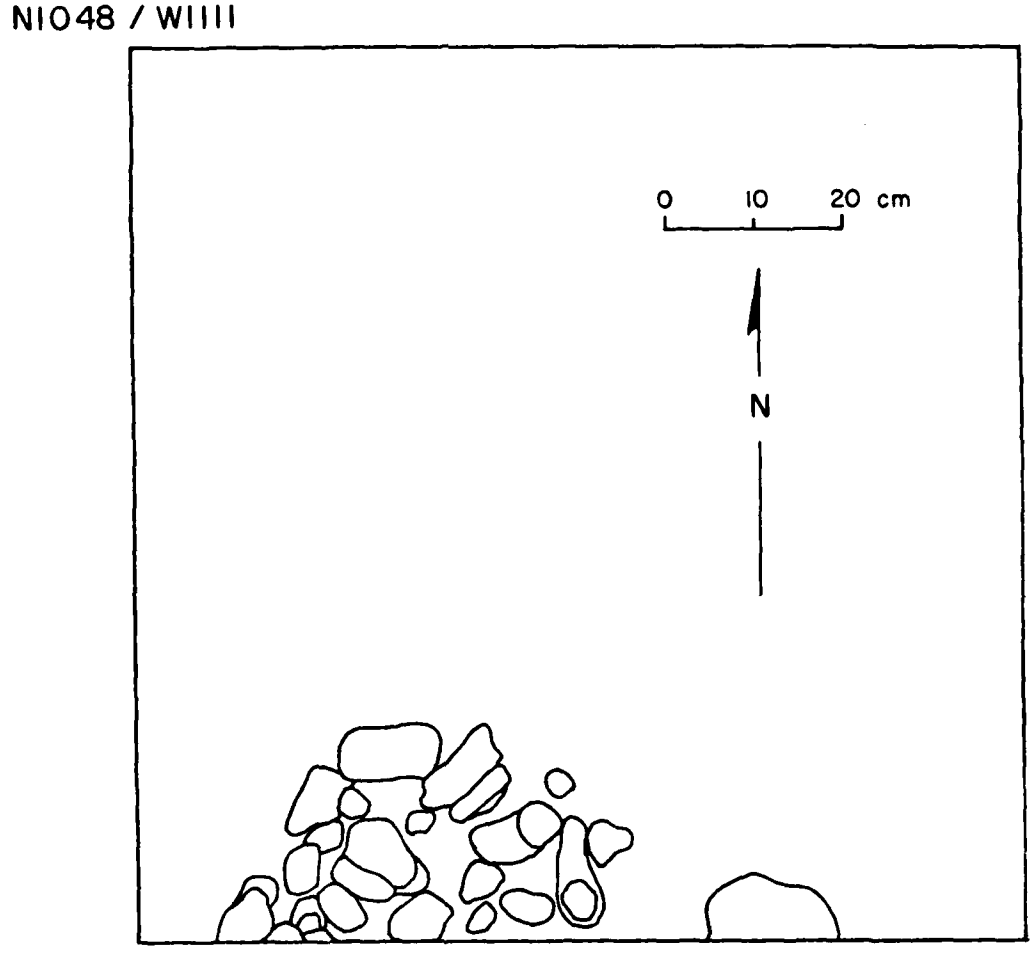


Figure 8.2-10

contrasted with the sterile, yellow (10YR 7/6) clayey loam soil surrounding it. The exposed protion of this feature measured 68 cm and 33 cm along its E-W and N-S axes, respectively, although neither axis was fully exposed.

The feature fill is distinguished by a darker brown color, the presence of burned and unburned bone, mussel shell, lithic debris, and burned rock fragments. Gastropods were also significantly more numerous within the feature. The orifice of the feature and the associated living surface were not so easily distinguished. It is evident that the pit extends downward from the base of stratigraphic unit 2. The matrix of stratum 2 is so homogeneous, however, that the orifice of the pit could not be determined with any degree of reliability. The distribution of projectile points (Table 8.2-1) above the feature in Levels 6 and 7 (Stratum 2) places the feature within the Clear Fork Phase of the Archaic period or possibly earlier. Neither charcoal nor diagnostic artifacts that would provide a more accurate temporal designation were recovered from the feature itself.

Although the feature contained small flecks of burned clay and charcoal, it is doubtful that the pit was used as a hearth for any length of time. Neither a lens of burned rock nor a lens of heat altered soil were associated with the feature (Figure 8.2-11).

Round Rock Phase

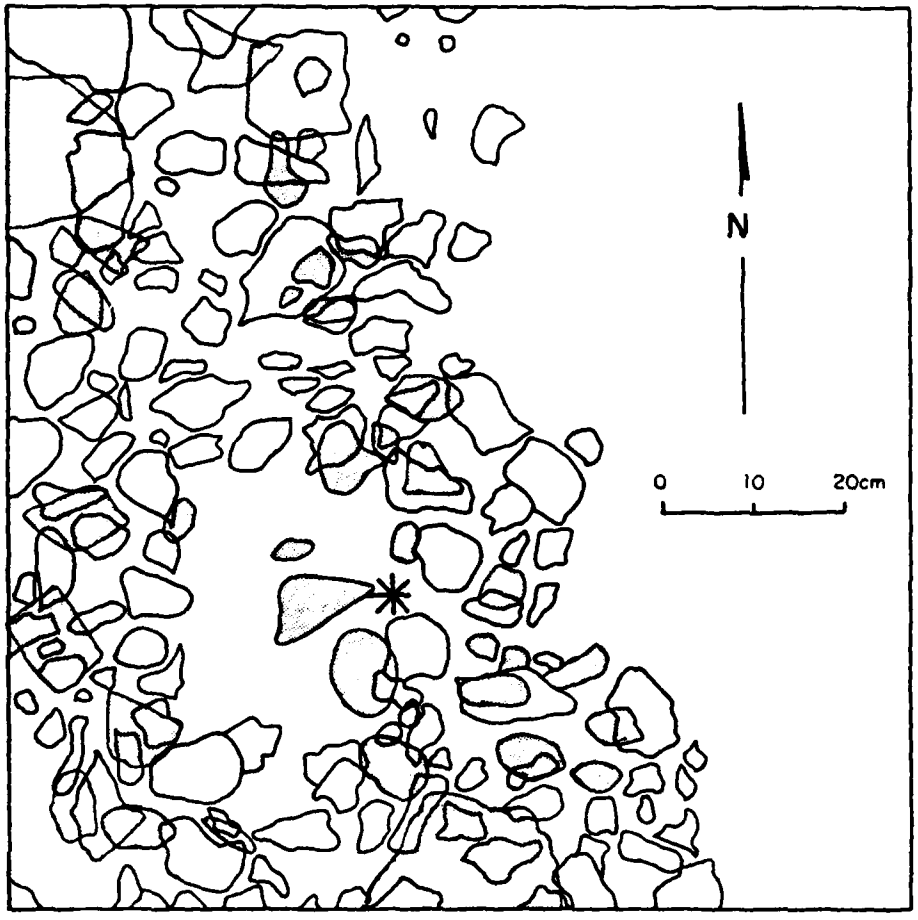
Only two features were associated with diagnostic projectile points of the Round Rock phase. Only the one feature within Area D was truly identifiable as an isolated hearth area. The feature within Area B is surrounded by an amorphous accumulation of burned rock. A similar accumualtion of burned rock is also present within Level 5 of Area C. The associated projectile points (Table 8.2-1) and the radiocarbon age of 3225 $\pm$ 75 B.P. (UGa-2480) from Level 5 indicate a Round Rock phase occupation. Unfortantely, no recognizable features, other than the massive lens of burned rock, were present.

Feature 2 (Area B). Feature 2 was uncovered in the southwest corner of excavation unit N1041/W1106 at a depth of 45 cm below surface. Although burned rocks were present throughout much of Level 4 in Area B, Feature 2 (Fig. 8.2-12) was distinguished by a tightly clustered group of rocks forming a ring around a central basin depression. The exposed portions of the feature measured 68 cm along the E-W axis and 60 cm along the N-S axis. The central depression which was devoid of rocks was 23 cm deep. It measured 20 and 25 cm along its E-W and N-S, respectively.

The form of the rock cluster and the slope of many of the rocks inward toward the central depression were the only factors denoting the area as a possible feature. The matrix within the rock cluster was identical to that outside it. The position of the cluster in the corner of the excavation unit further hindered its identification as an isolated feature.

Figure 8.2-11. Photograph of Feature 10, 41WM56.

N1041/W1106



Feature 2
41 WM 56

flint

lower layer

Figure 8.2-12.

The presence of this cluster within the large mass of burned rock may have been a fortuitous happening rather than the product of a specific cultural activity, although this seems unlikely given the patterned orientation of the rocks.

Feature 8 (Area D). Feature 8 (Fig. 8.2-13) was discovered within colluvial deposits in the easternmost excavation unit at site 41WM56. Partially exposed in the east wall of the excavation unit, the major concentration of burned rocks measures 1 meter along its N-S axis and 50 cm along its E-W axis. The diameter of the entire feature would be approximately 1 meter. Scattered burned rocks lie outside this denser cluster.

The only distinguishing characteristic of this feature is the dense cluster of burned rock itself. The concentration primarily consists of a single layer of limestone fragments exhibiting angular fractures and discoloration caused by heat alteration. Neither burned earth nor charcoal flecking are associated with this concentration. Slopewash may have removed all traces of evidence that htis cluster may have once served as a hearth, for the elevation of the rock cluster dips 13^{o} to the east.

San Marcos Phase

Three features were recognized within levels of excavation units A and C that have been interpreted as "probably" part of the San Marcos stratigraphic unit. The two features with Area C are shallow, basin-sahped hearths; the third feature, only partially exposed in Area A, may be a refuse heap only.

Feature 9 (Area C). Feature 9 (Fig. 8.2-14) is a shallow, basin-shaped hearth lined with several large ($\geq$ 10 cm in diameter) burned limestone fragments. Being quite regular in form, the hearth measures 85 cm and 90 cm across its E-W and N-S axis, respectively. Although the burned rocks dip toward the center of the feature, the shallow depression into which the rocks had been placed was only 8 to 12 cm in depth. Like many of the probable hearths at this site, very little evidence of burning, other than the burned rocks themselves, is present. The soil around the rocks has not been baked and no charcoal was observed within Feature 9.

A scatter of burned rock and flint debitage is associated with Feature 9 to the east. Sixty centimeters to the southwest Feature 6 is present. Although both hearths represent a San Marcos Phase utilization of the site, the burned rocks within Feature 6 are more fragmented than those in Feature 9. Feature 9 is also smaller in size than Feature 6. This, perhaps, means that Feature 9 was utilized for a shorter period of time or served a different function than Feature 6.

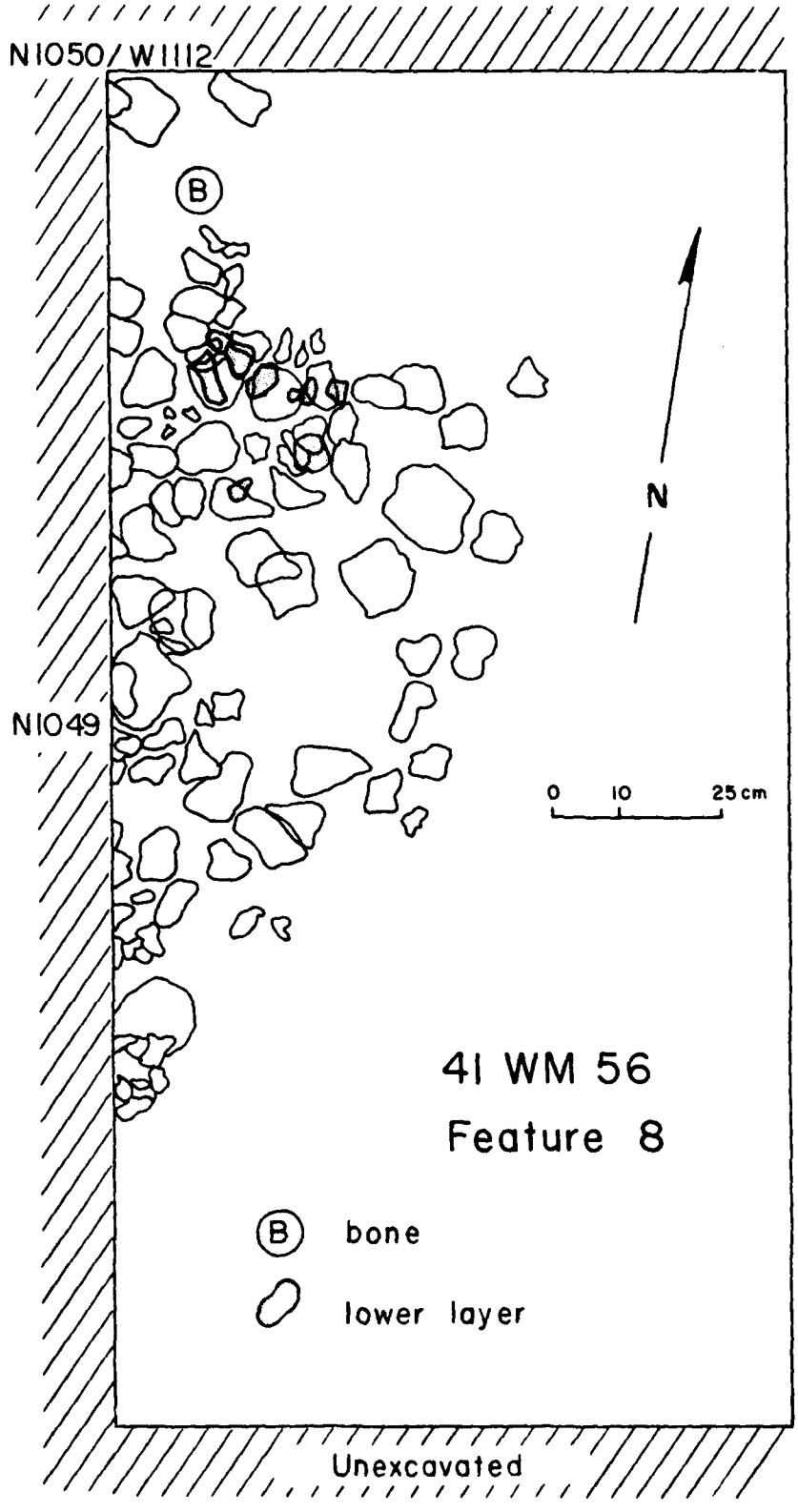

N1050/W1112
B
N
N1049
0 10 25cm
41 WM 56
Feature 8
B bone
lower layer
Unexcavated

Figure 8.2-13

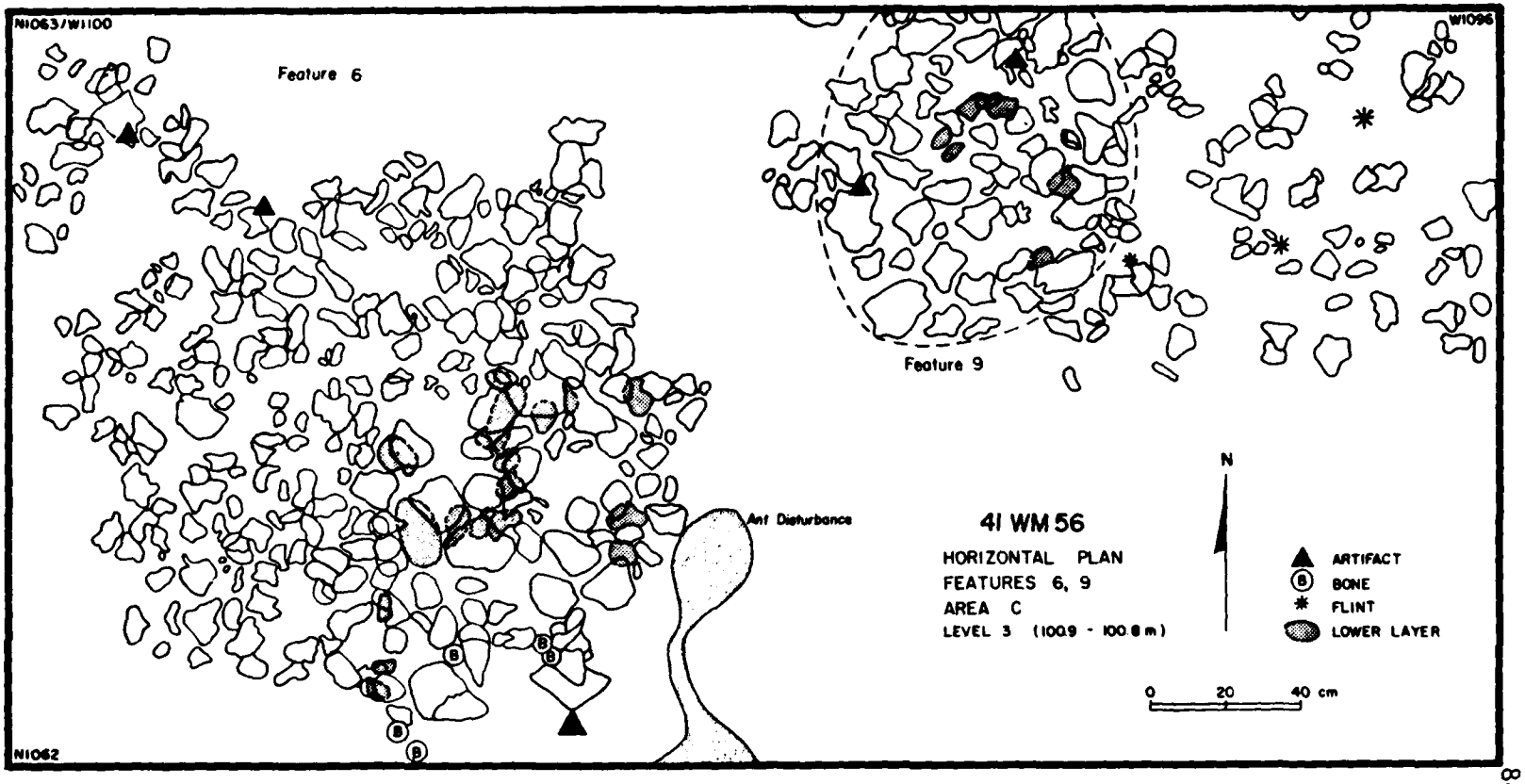

N1063/W1100
W1096
Feature 6
Feature 9
Ant Disturbance
N1062
41 WM 56
HORIZONTAL PLAN
FEATURES 6, 9
AREA C
LEVEL 3 (100.9 - 100.8 m)
N
ARTIFACT
BONE
FLINT
LOWER LAYER
0 20 40 cm

Figure 8.2-14

Feature 6 (Area C). This basin-shaped hearth was exposed only 25 cm below ground surface in the northwest corner of Area C. Its proximity to the surface caused some concern regarding its contextual integrity. Although the upper layer of rocks may have been disturbed, the regular form of the burned rock accumulation indicates that the hearth remained intact. The hearth is 140 centimeters in diameter and 16 centimeters in depth (Figure 8.2-14).

Like many of the features at site 41WM56, the isolated context of the concentration of burned rock and associated cultural debris is the only factor that distinguishes it from the surrounding matrix. The feature fill is indistinguishable fromthe matrix surrounding the hearth. Charcoal is present both within the feature fill and outside it. The fire was apparently not hot enough to bake the soil around the basin.

Although neither of these hearths contained diagnostic elements, the distribution of diagnostic projectile points suggests that the hearths are representative of a San Marcos Phase occupation. The presence of Castroville, Marcos, and a possible Williams point either adjacent to or beneath these hearths indicates that the hearths are no earlier than the San Marcos phase. However, the large number of Twin Sisters phase diagnostics in Level 3 (the living surface associated with Feature 6 and 9) implies that the hearths may be the result of a later occupation. A consideration of the probable introduction of the Twin Sisters phase diagnostics into Level 3 through agricultural activities and the overall distribution of projectile points in Levels 2 through 4 (Table 8.2-1), however, points to the San Marcos phase as the most likely period of utilization for Features 6 and 9.

Features 4 (Area A). This feature was partially exposed in the north wall of the excavation unit. The feature consists of a scatter of burned rock with associated faunal fragments. A metate fragment is also present. The more dense portion of the scatter is 82 cm in breadth along its east-west axis. Only 30 cm of the concentration was exposed along its north-south axis.

As with many of the other features, this feature is indistinguishable from the surrounding matrix except for the presence of the burned rock. The lack of charcoal flecking within this distinct cluster of burned rock, however, suggests that Feature 4 may have been a refuse area rather than a hearth (Fig. 8.2-15).

Temporal placement of Feature 4 is rather difficult. Associated in the same arbitrary level are 5 Pedernales, 1 Bulverde, 2 Castroville, 1 Marcos, 1 Montell, and 1 Williams point. Immediately above this feature, 2 Montell, 1 Fairland/Ensor, and 1 Ensor point are found. The lack of any vertical definition for this feature hinders any determination of the actual living surface associated with the feature. If one assumes that the feature merely represents a scatter of trash, an earlier Round Rock Phase occupation is likely. On the other hand, if a depression was dug for a hearth or trash pit, the later San Marcos Phase diagnostics would be associated with the upper surface.

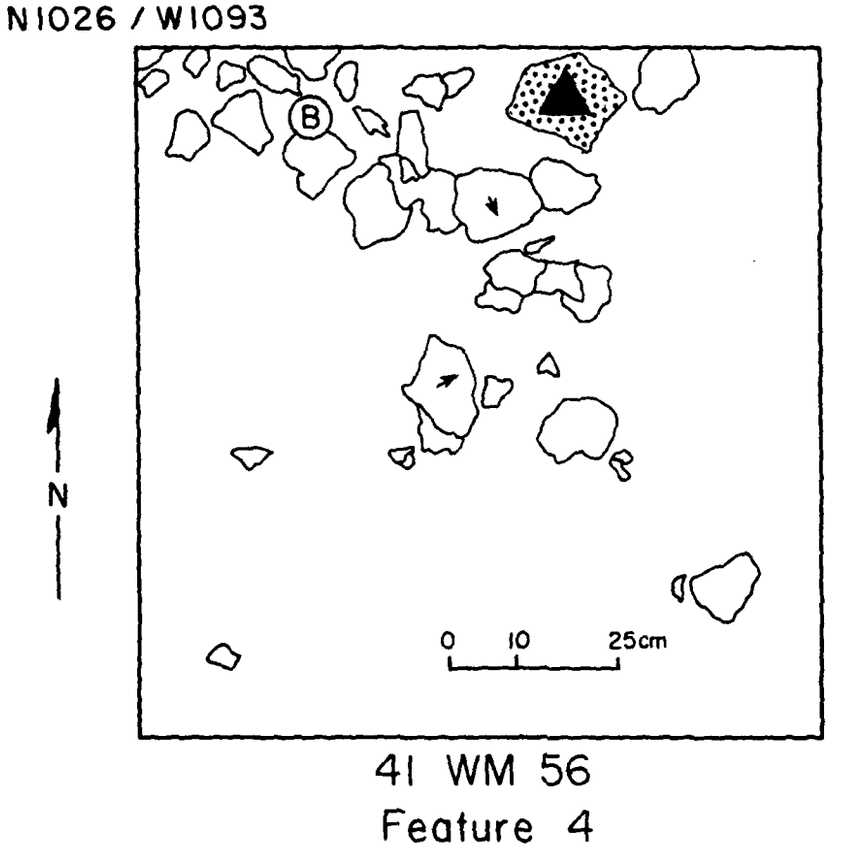

N1026 / W1093
B
N
0 10 25cm
41 WM 56
Feature 4
artifact (Metate)
B
bone
direction of slope
of burned rock

Figure 8.2-15

Twin Sisters Phase

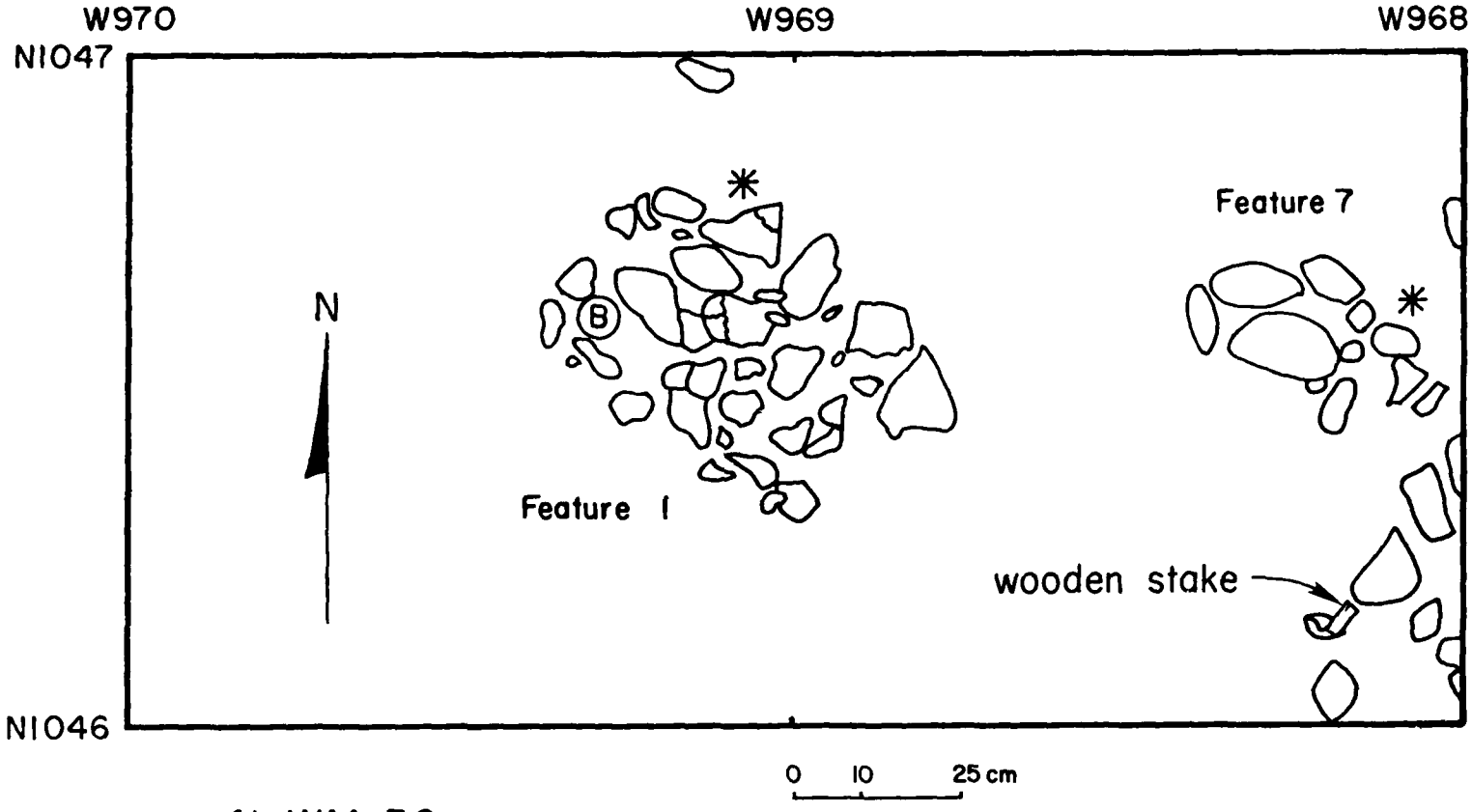
Three features from the Hawes Site may be attributed to Twin Sisters phase occupations of the site. Two of these features are associated within Area F which is quite distant from the central site area. In fact, the terrace edge could be designated as a site separate from the major accumulation of cultural debris near the base of the upland ridge. The remaining feature associated with diagnostics of the Twin Sisters Phase is a shallow, basin-shaped cluster of burned rock uncovered in excavation unit A. All of the features of the Twin Sisters phase lack formal structure.

Feature 1 (Area F). Feature 1 (Fig.8.2-16) located 17 to 25 cm below the surface, consisted of an isolated cluster of burned rocks. The cluster is oval in form and measures 56 cm across its long axis (NW-SE) and 44 cm along its short axis (NE-SW). Other than the single layer of burned rock, the feature is not easily distinguished from the surrounding matrix. A few bone fragments, lithic debitage, and a piece of burned flint were all that was associated with the burned rocks.

Feature 7 (Area F). Feature 7 was only partially revealed along the east wall of excavation unit N1047/W969. The exposed portion of the feature consisted of a cluster of burned rocks with a flint core and the remains of *pelecypods in association. Charcoal flecking* was quite sparse. Exhibiting no regular form, the exposed portion of this cluster measures 79 cm in breadth along its north-south axis and 39 cm along its east-west axis. A wooden stake, possibly from the 1968 test excavations, intrudes into the feature (Fig. 8.2-16).

Feature 1, which is similar in form to Feature 7, is located 44 cm to the west in the same stratigraphic position. The predominance of Fairland/Ensor points (Table 1) within this same stratigraphic zone denotes a Twin Ssiters phase occupation of this portion of the terrace. Only one other feature (Feature 3) within the excavated portions of the site can be attributed to the Twin Sisters phase. Twin Sisters phase diagnostics are present, however, within other areas of the site.

Feature 3 (Area A). Feature 3 (Fig.8.2-17) located in Levels 2 and 3 of Area A, is a shallow, basin-shaped cluster of burned rock. This cluster, irregular in outline, measures 59 cm across its east-west axis and 46 cm from north to south. This feature exhibits no vertical definition other than the accumulation of burned rocks (14 cm) and associated cultural debris. The downward slope of many of the burned rocks toward the center of the cluster is the only indication that a shallow depression was formed in preparation for the hearth. Charcoal flecking is present within the dark, clayey loam matrix of the hearth. A sufficient charcoal sample for radiometric dating was not available. However, diagnostic projectile points (Ensor and Fairland/Ensor) found above and adjacent to the hearth indicate a Twin Sisters phase occupation.

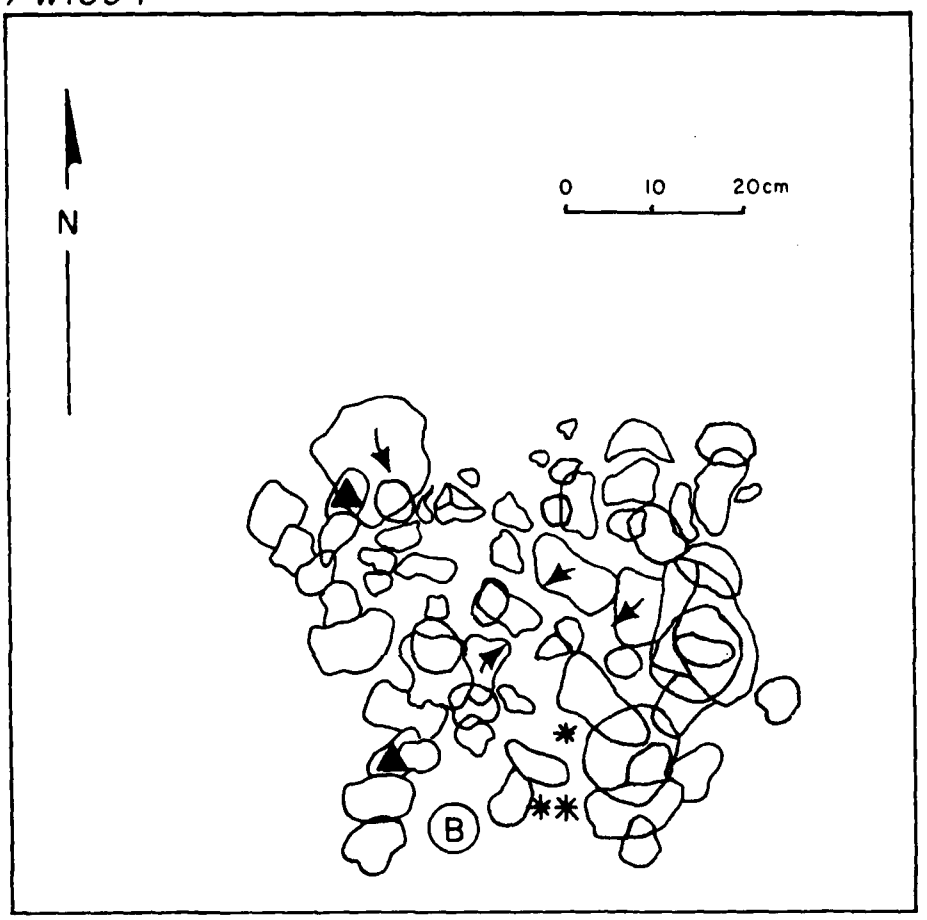


41 WM 56
HORIZONTAL PLAN
FEATURES 1, 7
AREA F

(B) bone
* flint debitage
mussel

Figure 8.1-16

N1025/W1094



Feature 3
41 WM 56

▲ artifact
Ⓑ bone
✳ flint debitage
⬭ lower layer of rock
→ direction of slope of rock on which arrow appears

Figure 8.2-17

Unknown Temporal Association

Feature 11 (Area C). This feature (Fig.8.2-18)was 22cm below the present ground surface. The feature consists of a scatter of burned rock and concentrations of burned soil. Large concentrations of charcoal were found adjacent to the burned soil. Although this feature was originally thought to be culturally produced, the linear form of the concentrations of burned soil and their downward extension through Level 4 suggest that this feature represents the burning of a tree root system or of debris within a rodent burrow. The areas of loosely compacted soil within this feature may have been the location of the roots or burrows. There is no indication whether the burning took place in prehistoric or historic times. The proximity to the present ground surface within the plowzone suggests that the burning may have been the result of relatively recent clearing activities.

Feature Summary

Variability of feature type is extremely limited within any given temporal period at the Hawes Site. The Clear Fork stratigraphic unit is the only period in which more than one type of feature is represented. Basin-shaped hearths, informal burned rock clusters, amorphous masses of burned rock, and a probable storage pit are represented. Interestingly, this variability encompasses the total range of feature variability for the entire site. The Clear Fork stratigraphic unit also contains the largest number of isolable features.

From a diachronic perspective the structure of features is cyclical in appearance. In the earliest occuaptional phase (San Geronimo) features are very informal clusters of burned rock. Preparation of such hearths was a simple task. During the Clear Fork phase, the informal burned rock clusters remain, but formal basin-shaped hearths are also utilized contemporaneously. During the later Clear Fork occupations, individual hearths are no longer recognizable. Instead, massive accumulations of burned rock are present. This accumulation of burned rock, together with the additional presence of a probable storage pit, suggest that the Hawes Site was more intensively utilized during the latter portion of the Clear Fork phase. Whether the site was utilized for extended periods of time as a base camp or merely seasonally reoccupied more frequently is unclear. Whatever the reason for the increased utilization of the site, the seemingly amorphous character of the burned rock accumulation offers no indication that the function of the site has changed. The first impression is that the function of the site has changed. The first impression is that the mass of burned rock is merely the result of the intersection of many previously isolated hearths. Since this massive accumulation of burned rock continues throughout the Round Rock and into the San Marcos occuaption of the site, a sizeable lens of burned rock is present within the profiles of most of the excavation units. This accumulation of burned rock may be classified as being a part of the continuum between Weir's Type 4 and Type 1 middens.

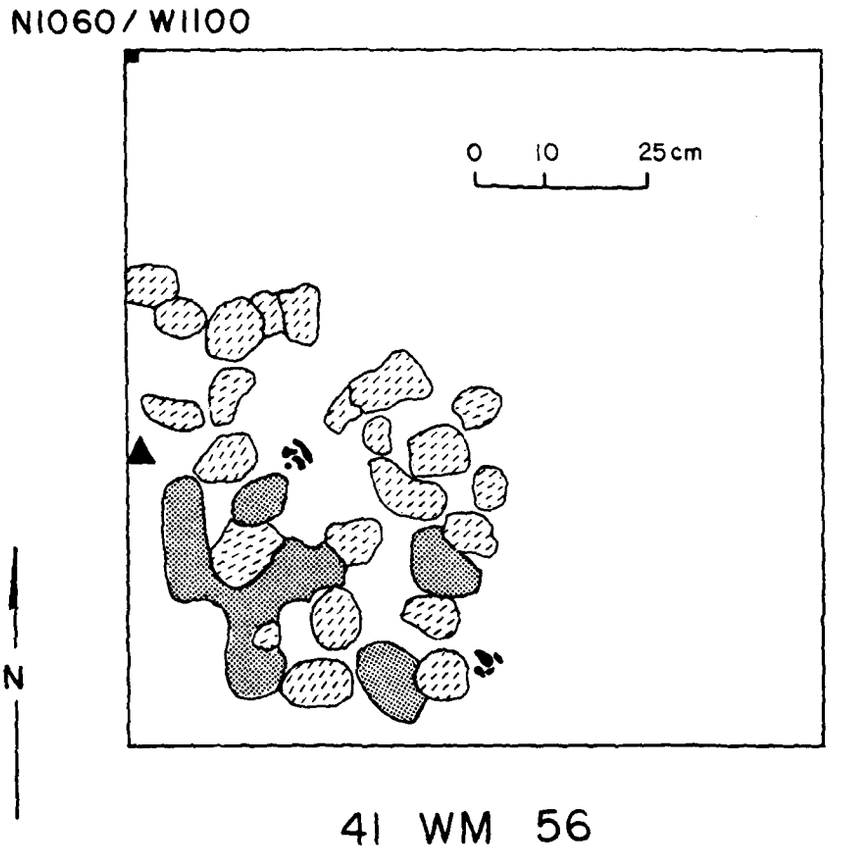

N1060/W1100
0 10 25cm
N
41 WM 56
Feature 11
artifact
burned clay
burned limestone
charcoal

Figure 8.2-18

The patterning of the lithic material associated with the features (Table 8.2-2) shows the changing utilization of the site, also. During the San Geronimo phase the density and variety of lithic materials directly associated with the features is very low. The features within the Clear Fork stratigraphic unit contain a much higher density of lithic remains. Not all exhibit a wider range of remains than the San Geronimo phase features, however. The formal basin-shaped hearths clearly contain the widest range of lithic artifacts. The remaining features which are similar in structure to those of the San Geronimo stratigraphic unit display a more limited sample of lithic artifacts. Feature 18 is clearly an exception to this pattern. The wider variety of lithic remains is biased, however, by the large number of informal burned rock clusters included in this feature designation. This differentiation of the associated lithic artifacts may reflect the functional differences of the feature types. The basin-shaped hearths were clearly a focal point of activity. Whether or not they merely served as handy trash pits in addition to their primary function is unclear. Nevertheless, the structural differences and the effort involved in their preparation denote a specialized function. Neither the associated lithics nor the floral remains (Chapter 15.2),however, provide sufficient evidence for the determination of that function.

During the San Marcos culture/time stratigraphic unit, the massive accumulation of burned rock ceases to grow. Once again individual hearths are recognizable. Again, the reasons for this change are unclear. The function of the site may have been changing during the San Marcos period; however, the return of the informal burned rock clusters and very shallow basin-shaped hearths indicates a continuity of hearth structure and, perhaps, associated function. The shallow basin-shaped hearths of the San Marcos stratigraphic unit (Features 6 and 9) exhibit a wide range of associated artifacts similar to the basin-shaped hearths of the Clear Fork stratigraphic unit. Whether this pattern contrasts with the pattern of the informal burned rock clusters is difficult to evaluate since only a portion of an informal feature (Feature 4) has been exposed for this time period. Interestingly, Feature 6 yielded the largest quantity and variety of floral remains of any matrix sample within the site. Charred prickly pear seeds, acorns, pecans, and amaranth or Lamb's Quarters seeds were recovered.

Within the Twin Sisters stratigraphic unit the features also reflect the dichotomous pattern of shallow basin-shaped hearths versus the informal burned rock clusters. Although the sample (3 features) is small, the informal burned rock clusters (Features 1 and 7) display a more limited inventory of lithic artifacts. Feature 3 contains a higher density and greater variety of lithic artifacts. Since these features do not represent a single occupation of the site, the feature type and the associated artifacts likely represent the length of occupation of the site and the related function of that occupation rather than specific activity areas within the site.

Table 8.2-2.

Lithic material associated with Features 1-20, Site 41WM56.

Culture/Time Stratigraphic Unit	Twin Sisters	Round Rock	Twin Sisters	San Marcos	Clear Fork	San Marcos	Twin Sisters	Round Rock	San Marcos	Clear Fork	?	Clear Fork	Clear Fork	Clear Fork	Clear Fork	Clear Fork	San Geronimo	San Geronimo	Clear Fork	Clear Fork	San Geronimo
FEATURES	1	2	3	4	5	6	7	8	9	10	11	12	13	14a	14b	15	16	17	18	19	20
Primary flakes					**	5		1													
Secondary flake >50%	1		7(1)*	1		32(1)			4(1)	5	1			9(2)	8(3)	5(1)	2		3	2	
Secondary flake <50%	1		25(3)	4		87(10)		8	31(2)	4	5(1)	3		39(9)	23(3)	9	1	3(2)	12(4)	10(3)	
Tertiary flakes	11		87(13)	28(5)		398(64)	5	31(4)	139(20)	75(14)	50(5)	12(3)	2	407(126)	115(27)	15(12)	16(2)	2(1)	672(7)	52(15)	3
Micro flakes	6		36(4)	5		234(16)	5	36	34	15(1)	7	12(3)		99(18)	139(20)	20(1)	3		57(6)	51(11)	3(1)
Micro blades						1		1													
Biface thinning flakes			1			6		4	2	1				5(1)	3	2			5	1	
Core fragments	1		2	1					1												
Chunks	2(1)		1			1										1(1)			1		
Burin spalls																					
Chips	5(1)		99(17)	17(3)		678(136)	9(1)	37(2)	260(37)	76(6)	71(10)	27(13)		393(125)	164(69)	34(10)	13(2)	1(1)	47(12)	43(10)	2
Blade fragments			1						2						5				1	1	
Quartzite chip						1			1												
Core trimming element														2							
Biface			1			2															
Biface fragment			3			12(2)			2					2	3				2		
Retouched piece			2	1							1			2	1				2		
Projectile point						1											1				
Point fragments						2								1			1		1	1	
Varia																			2		
Ground stone								1													
Hammerstone							1														
Metate fragments				1																	

* Heat altered specimens

** Probable disturbed hearth area; lack of separation from surrounding burned rock scatter prevented separate collection of hearth related material.

This site, like others within the North Fork Reservoir, did not exhibit the deep, oval pits with the associated layer of heat-altered soil that have been reported from various sites within the Granger Reservoir (41WM258, 41WM124, 41WM230, and 41WM130) (Bond 1978: 68-114). Whether this difference in the formal structure of hearths is related to social or techno-functional variables is unclear at this time.

Lithic Tools

A total of 2780 tools was recovered from site 41WM56. Only 31 (1.12%) of the analysed artifacts come from the surface or from backhoe trenches, but 1338 tools (48.13%) were from zones with mixed cultural components. The upper levels of Area C were very rich, but could not be ascribed to any one cultural time period. Table 8.2-3 shows the vertical and horizontal distribution of all the analysed tools.

Most of the recognized tool classes are present at the site at some one time. The exception is gouges, none of which were found at this site. Using the restricted total and percentage, tool representation seems very low, but the absolute tool class totals are often very satisfactory. Scrapers, notches, burins and complete bifaces and preforms each have more than 100 artifacts. Scrapers are predominant over the other classes.

A large number of tools are from undatable levels at the site. The next largest number of tools (21.69%) are dated in the Clear Fork component. All other Archaic cultural components also are present.

Tool and debitage densities vary within the site and the cultural components. Area F always appears different from the other areas, and is lower in tool and debitage density than the other areas of the site (Table 8.2-4, 8.2-5).

Little or no significant variations can be found for the four latest cultural components, but some interesting spatial patterns show up for the Clear Fork and San Geronimo periods. In the Clear Fork component the density of the lithic remains was highest in Area C, less in Areas B and E, and relatively low in Area D, while absent in Areas A and F. From the site map, (Figure 8.2-1) it is clear that the lithic artifact density decreases from the northern to the southern part of the site. During the San Geronimo period this pattern developed in a different direction. The lithic remains were most dense in Areas A and E, were relatively low in Area C, and lowest in Area D. San Geronimo lithic materials were absent in Areas B and F. Apparently, the intensity of the lithic artifacts decreases drastically towards the NW part of the site. In general, the San Geronimo component has the lowest lithic artifact density at this site. The patterning found in the lithic artifact distribution of the Clear Fork and San

Table 8.2-3. Tool Classes, 41WM56

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
Twin	A	1	1		1	1	1		1		5		8	3						21				
Sisters		2	1		4	1		1	1		3	1	3	6						21				
		3	1	1	5	1					7	1	9	10				1		35	77	35.98		
	F	1	2	1		1	1	2	9		12	1	23	6						58				
		2	2		3		2	1	3		2	2	13	6						34				
		3						1			7	1	5	1						15	107	86.29	184	6.62
San	B	3	3	1	1	2	1				11		15	10		1				45	45	14.38		
Marcos	F	6									1	1	1	2						5				
		7																		..	5	4.03	50	1.80
Round Rock/	D	4	2			1					5		10	4		1				23				
San Marcos		5		1	1	1					8	2	8	6		2				29				
Transition		6	1	1	2				1		6		9	3						23				
		7							2		3		7	1						13	88	37.61	88	3.17
Round Rock	B	4	2	3				1	1		13	2	10	6						38				
		5	1					1	2		4	2	8	7						25	63	20.13		
	C	5	14	1	5	1	1		4		33	3	41	26		2	1		1	133	133	8.17	196	7.05
Clear Fork	B	8							1		1	1	3	1						7				
		9	1								3		9	1						14				
		10											4	2						6				
		11	1										2	1						4	31	9.90		
	C	6	5	1	1	1	2	1	2	1	20	2	38	17						91				
		7	6	2	3				5		32	1	41	20						110				
		8	1	1	4		2	1	6		41	3	80	23					1	163				
		9	4		3	1		2	3	1	36	6	60	19				1		136	500	30.73		
	D	8											6	1						7				
		9										1	2	3						6	13	5.56		
	E	4	1	1	2		1		1		11	3	3	5						28				
		5			1						5		9	4						19				
		6							2		2		5	3						12	59	24.89	603	21.69
San	A	5	1		3		1	2	2		8	1	7	5						30				
Geronimo		6			2						3		10	1						16				
		7			1			1			4		3	1						10				
		8						1	1		6		9							17				
		9											1							1	74	34.58		

Table 8.2-3. Tool Classes, 41WM56 (continued)

COMPONENT	AREA	LEVEL	TOOL CLASSES																		TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT	COMPONENT TOTAL	COMPONENT
			SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS					
San Geronimo, continued	C	10		2	3	2	1		3		13	2	18	4							48				
		11		1			1		1		2		9	2							16				
		12						1			5		8								14				
		13											2								2				
		14																			-				
		15																			-				
		16																			-				
		17																			-	80	4.92		
	D	11																			-				
		12												1							1	1	.43		
	E	7				1					6	2	8	5							22				
		8		1		1					3		8								13				
		9									4		2								6				
		10																			-	41	17.30	196	7.05
Unknown, no diagnostics	B	6			2		1		2		8	2	11	5							31				
		7	3					1			4	1	4	2							15	46	14.70		
	D	10											2	1							3	3	1.28		
	E	3	3		2	1			1		13	2	9	2							33	33	13.92		
	F	4	1								2		3	1							7				
		5						1	1				2	1							5	12	9.68	94	3.38
Mixed	A	4	2		2			1	4	1	15	8	17	13							63	63	29.44		
	B	1	3		6	2		2	1		21	4	25	21							85				
		2	2		2			1	1	1	10	1	14	10					1		43	128	40.89		
	C	1	17	4	16	9	4	7	8		58	6	72	21					1		223				
		2	20	2	13	9	2	8	15	1	80	6	92	46			1	1	1		297				
		3	22	1	2	3	1	1	6	4	60	12	75	60		2					249				
		4	12	3	3			1	3	1	28	8	56	26		1	1	2			145	914	56.18		
	D	1		1	2				1		1		3	2							10				
		2	4	2	5	1	3	1	2		18	3	35	12				1			87				
		3			2	1			1		5		11	11		1					32	129	55.13		
	E	1	5	1	5	1	5	2	4		19		14	2			1				59				
		2	3	1	1			1	1		12	1	12	12		1					45	104	43.88	1338	48.13

Table 8.2-3. Tool Classes, 41WM56 (continued)

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT
																3				31			31	1.12
Surface BHT			4	2	1	2		1	2		4	12								2780			2780	100.01
TOTAL			151	35	109	44	30	44	104	10	683	104	973	464	-	14	4	6	5	99.98				
TOTAL %			5.43	1.26	3.92	1.58	1.08	1.58	3.74	.36	24.48	3.74	35.01	16.66	-	.50	.14	.22	.18	1124				
RESTRICTED																				100.00				
RESTRICTED %			13.43	3.11	9.70	3.91	2.67	3.91	9.25	.89		9.25		41.28	-	1.25	.36	.53	.45					

Table 8.2-4 : 41WM56 Artifact Density's by Area

Area	Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/ Debitage
A	Twin Sisters	1.8	43	3876	1:91
	Mixed	.6	105	5032	1:48
	San Geronimo	2.5	30	2382	1:80
	Total area	4.9	44	3257	1:74
B	Mixed	.8	160	7959	1:50
	San Marcos	.4	113	8105	1:72
	Round Rock	.8	79	6160	1:78
	Unknown	.8	57	3751	1:65
	Clear Fork	1.5	21	3577	1:69
	Total area	4.3	73	4578	1:63
C	Mixed	8.0	114	8746	1:76
	Round Rock	2.0	66	4052	1:61
	Clear Fork	8.0	63	7918	1:127
	San Geronimo	6.7	12	1652	1:138
	Total area	24.7	66	6174	1:94
D	Mixed	1.2	108	3260	1:30
	SM/RR Trans.	1.6	55	4009	1:73
	Clear Fork	.8	16	910	1:56
	San Geronimo	.4	2	2798	1:48
	Total area	4.0	48	2798	1:48
E	Mixed	1.2	87	6225	1:72
	Unknown	.6	55	4708	1:86
	Clear Fork	1.8	33	2898	1:88
	San Geronimo	1.9	22	2450	1:114
	Total	5.5	43	3667	1:85
F	Twin Sisters	1.8	59	4913	1:83
	Unknown	1.2	10	425	1:43
	San Marcos	.7	7	184	1:26
	Total area	3.7	34	2563	1:76
	TOTAL SITE	47.1	58	4861	1:83

SM/RR Trans.: San Marcos/Round Rock Transition

Table 8.2-5: 41WM56 Artifact Density by Component

Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/ Debitage Ratio
Twin Sisters	3.6	51	4395	1:86
San Marcos	1.1	45	3065	1:67
SM/RR Trans.	1.6	55	4009	1:73
Round Rock	2.8	70	4654	1:66
Clear Fork	12.1	50	5904	1:118
San Geronimo	11.5	17	1893	1:111
Unknown	2.6	36	2458	1:68
Mixed	11.8	113	7689	1:68
	47.1			

Geronimo components could reflect areal activity differentiation within the site.

The cumulative graph (Figure 8.2-19) shows the wide variability between the cultural components at the site. No two components follow the same general trend. Small samples for the San Marcos and San Marcos/Round Rock transition produce the two outlying curves. Scrapers are relatively high in the Round Rock assemblage, less in the Twin Sisters and Clear Fork ones, while low in the San Geronimo assemblage. Denticulates are moderately present in all four components. Notches are high during the Twin Sister period, less high during the Clear Fork and San Geronimo times, while relatively low for the Round Rock period. Boring tools are low in all periods. Of the few truncations, more were identified in the Round Rock period. Backed pieces also are relatively low in all periods. Burines are important in all components, less in the San Geronimo, more in the Twin Sister component. Composite tools could be identified for the Clear Fork period only. As usual, retouched pieces make up a large part of every assemblage, but are slightly less abundant during the Twin Sister occupation. This difference shows mainly in the unilaterally retouched pieces. Bifaces are relatively well represented in all components.

It is unfortunate that the upper four levels in Area C proved to have such a mixed cultural context. Over 30% of the total amount of artifacts from this site were found in those levels. Several tool types occurred only here. Large numbers of tools also were collected from other undatable and mixed areas in the site, but none was as dense as Area C. The areas and levels which could be dated, however, also were very dense. In fact, for many cultural components, the highest tool and debitage density was at site 41WM56. Statistical data on measurements are available for all tool classes with four or more complete tools (Appendix H-2).

Ceramics

Two ceramic artifacts were recovered from the Hawes site. One, which was a unique find for the North Fork area, was a ceramic pipe bowl fragment. The other was a sherd which exhibited characteristics which are atypical for Central Texas. Unfortunately, both artifacts were recovered from the plowzone of Areas B and C, respectively.

The pipe bowl was fragmented at its base where the stem would have been inserted. Conical in shape, the bowl is widest at its orifice. The sides of the bowl taper gently inward toward its base. The bowl was made of a reddish-yellow, very snady paste. Other inclusions for tempering were not noticeable in the field. Unfortunately, this artifact was found to be missing prior to a more detailed analysis.

The other small sherd (27 x 15 x 5 mm) exhibits a gray paste with grog temper. A white slip is present on both the exterior and interior

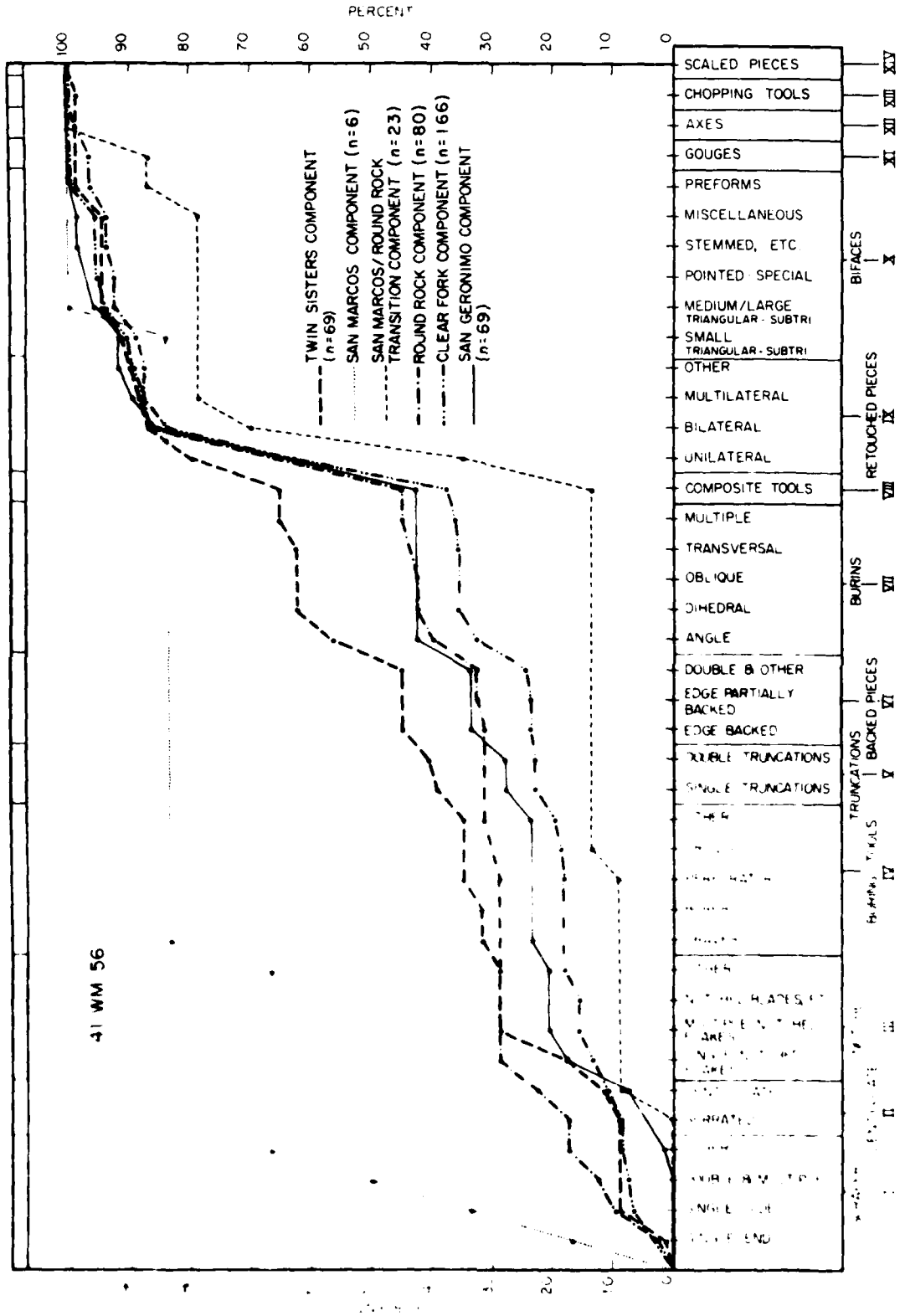


Figure 8.2-19. Cumulative Graph of Lithic Tools: Site 41WM56

surfaces. The exterior surface is slightly polished. Two parallel lines are also engraved on the exterior surface. The grog temper and the engraved lines are very characteristic of the Caddoan ceramics to the east; however, the white slip is not. Whether this trait denotes contact with the Southeast or the Southwest is unclear. The presence of obsidian at the Hawes Site indicates that contact with the Southwest, however indirect, did exist. Nevertheless, the techniques of construction and decoration reflect influences from the Caddoan area for the most part.

Site Summary

The Hawes Site has one of the largest deposits of cultural refuse within the North Fork Reservoir. Except for the Paleo-Indian period, the entire span of prehistory within Central Texas is represented within the Hawes Site. Unfortunately, the Late Archaic phases (San Marcos, Twin Sisters) are not represented within distinctive stratigraphic units everywhere in the site. The recent agricultural activities have totally destroyed the primary context of all the post-Archaic occupations (Austin and Toyah phases).

Interestingly, the main locus of cultural activity at the Hawes Site remained at the back of the terrace throughout its long history of occupation. Only during the San Marcos and Twin Sisters components is there evidence of occupation at the terrace edge. Excavation unit F and the adjacent backhoe trenches documented a very sparse scatter of occupational debris during these periods. Whether or not this activity locus at the terrace edge is directly related to the more intensive utilization of the posterior protion of the terrace is a moot point. Perhaps, the terrace edge locality deserves a separate site designation.

As previously noted in the discussion of the features recognized at the Hawes Site, the intensity of utilization of the main activity area increases greatly during the late Clear Fork, Round Rock and early San Marcos phases. The greater variability of feature forms, and possibly related function, during the Clear Fork period and the massive accumulation of burned rock associated with the above-mentioned phases indicate that the site was either utilized as a base camp or was reoccupied more frequently during the yearly cycle. Unfortuantely, a lack of information regarding the rate of alluvial deposition during this time span detracts from the interpretation that the massive accumulation of burned rock merely represents a more intensive utilization of the site. Three radiocarbon dates from Area C (Levels 5, 7, and Feature 14b) document only a small portion of the depositional sequence. The corrected calibrated radiocarbon dates of 3533 $\pm$ 93 B.P. at the base of Level 5 (elevation = 100.61 m) and 4224 $\pm$ 130 B.P. from Feature 14b, whose orifice is at the boundary of Levels 7 and 8, suggests an estimated depositional (natural and cultural) increment of 2.8 cm/100 years. The lack of radiocarbon dates above or below these precludes any judgment concerning the probability of a change in this depositional rate.

Geomorphological studies by Stephen Hall have offered no conclusive data regarding this problem.

The massive accumulation of burned rock at the Hawes Site is not that dissimilar from other more classic middens (41WM73, 304, and 57) within the North Fork Reservoir. The density of burned rock is equally as great as that displayed by the other sites. However, the accumulation at the Hawes Site lacks the oval, mounded shape that is usually thought of when the term "burned rock midden" is used. The relationship to site 41WM57 is especially intriguing since the sites are less than 200 meters apart and each contain coeval materials. However, three classic burned rock middens, or mounds, are present at 41WM57. Why such features are non-existent at the Hawes Site is presently unclear. Admittedly, the Round Rock phase, which is usually the most preductive period of burned rock accumulation, is not well represented at the Hawes Site. However, the one mound which was well sampled at site 41WM57 was initiated during the preceding Clear Fork phase. The reasons for this variability within the formal structure of burned rock accumulations remain obscure. This issue will be discussed further when the intersite variability is assessed.

It is readily apparent that the post-Archaic occupations of the Hawes Site were of a more limited nature. Cultural refuse from these two phases, Austin and Toyah, is small in quantity and spatially limited. The low level or archaeological visibility of these phases may be related to the relatively short temporal span which was involved; nontheless, it is important to note that the combined temporal span of the Austin and Toyah phases is not significantly less than that of either the Twin Sisters or San Marcos phase. Furthermore, the small number of post-Archaic assemblages throughout the North Fork Reservoir suggests that the area was not intensively utilized after 1200 B.P. The basis for this conclusion is less impressionistic when comparisons are made with the distribution of post-Archaic assemblages to the northeast within the Brazos River drainage. Post-Archaic assemblages are much more numerous and more visible there.

Although the North Fork drainage was utilized less during the post-Archaic phases, the Hawes Site likely contains the refuse of one of the latest prehistoric occupations within the area. The presence of ceramic sherds together with Perdiz, Fresno, and Maud/Talco points denotes a late Toyah phase occupation. Unfortunately, all of this material was recovered within the plowzone. No associated features were preserved.

8.3 Site 41WM57

Site Situation

Site 41WM57 is located on a broad alluvial terrace on the right bank of the San Gabriel River. The Hawes Site (41WM56) lies approximately 100 meters to the northwest across an intermittent stream (Fig. 8.0-1). Site 41WM57 is unique within the North Lake Reservoir, for it consists of a cluster of burned rock middens situated halfway between the river and the upland slope to the southwest. All of the other middens in the area are located at the base of the upland slope nearer to a source of limestone.

Most of the site area (Fig.8.3-1) has been intensively cultivated in the past. Consequently, none of the middens is as distinct as they once were. Bermuda grass now flourishes in the cultivated portion of the site. Hugh oak trees are located in the area around the ranch buildings and the intermittent stream is bordered by juniper trees and yucca plants. The density of cultural material on the surface is highest in the immediate area of the middens, but the site extends northeastward to the intermittent stream. A sparse scatter of lithic debitage also appears along the field road north of the house. The resulting area of occupation is approximately 9,500 square meters.

Prior Investigations

Following the recommendations of the initial investigators (Shafer and Corbin 1965:17-18), a Texas Archaeological Survey crew tested site 41WM57 in 1968 (Sorrow 1973:27-35). Because the site area was under cultivation, only two peripheral areas were tested (Fig. 8.3-1). A Middle Archaic assemblage was discovered in the area near the ranch buildings. Unfortunately, its relationship to the remainder of the site remained unknown. Because of the disturbance by agricultural practices and local collectors within the central portion of the site, Sorrow (1935: 59) concluded that the site was not sufficiently intact to warrant further investigation. In 1967, however, staff archaeologists from the Texas A & M Anthropology Laboratory assessed the significance of site 41WM57 with this statement:

> 41WM57 is one of two burned rock middens, in its particular topographic setting, i.e., on the rim of a tributary. The site contains more than one midden and data return is thought to be sufficient on both a single site basis and as a intersite relationship with WM56 it would add to the total regional data base (Shafer 1967:6)

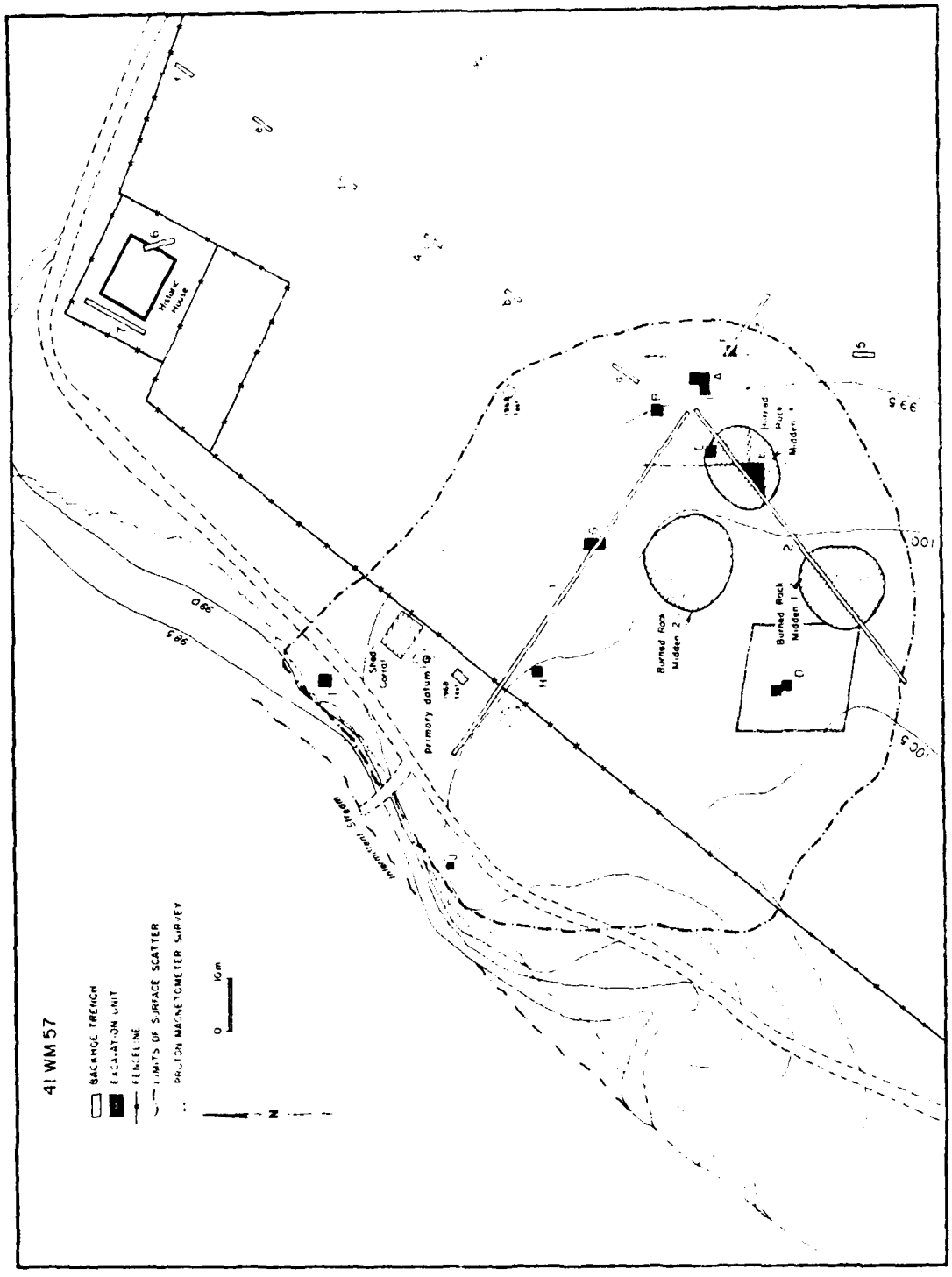


Figure 8.3-1. Site Map, 41WM57.

It was subsequently decided at a December, 1976, committee meeting involving representatives of the U. S. Army Corps of Engineers, the Interagency Archaeology Service of the National Park Service, the Texas Historical Commission, and the various institutions which had conducted research in the two proposed reservoirs that site 41WM57 would be included in the scope of work for mitigation of the cultural resources within the proposed North Lake Reservoir.

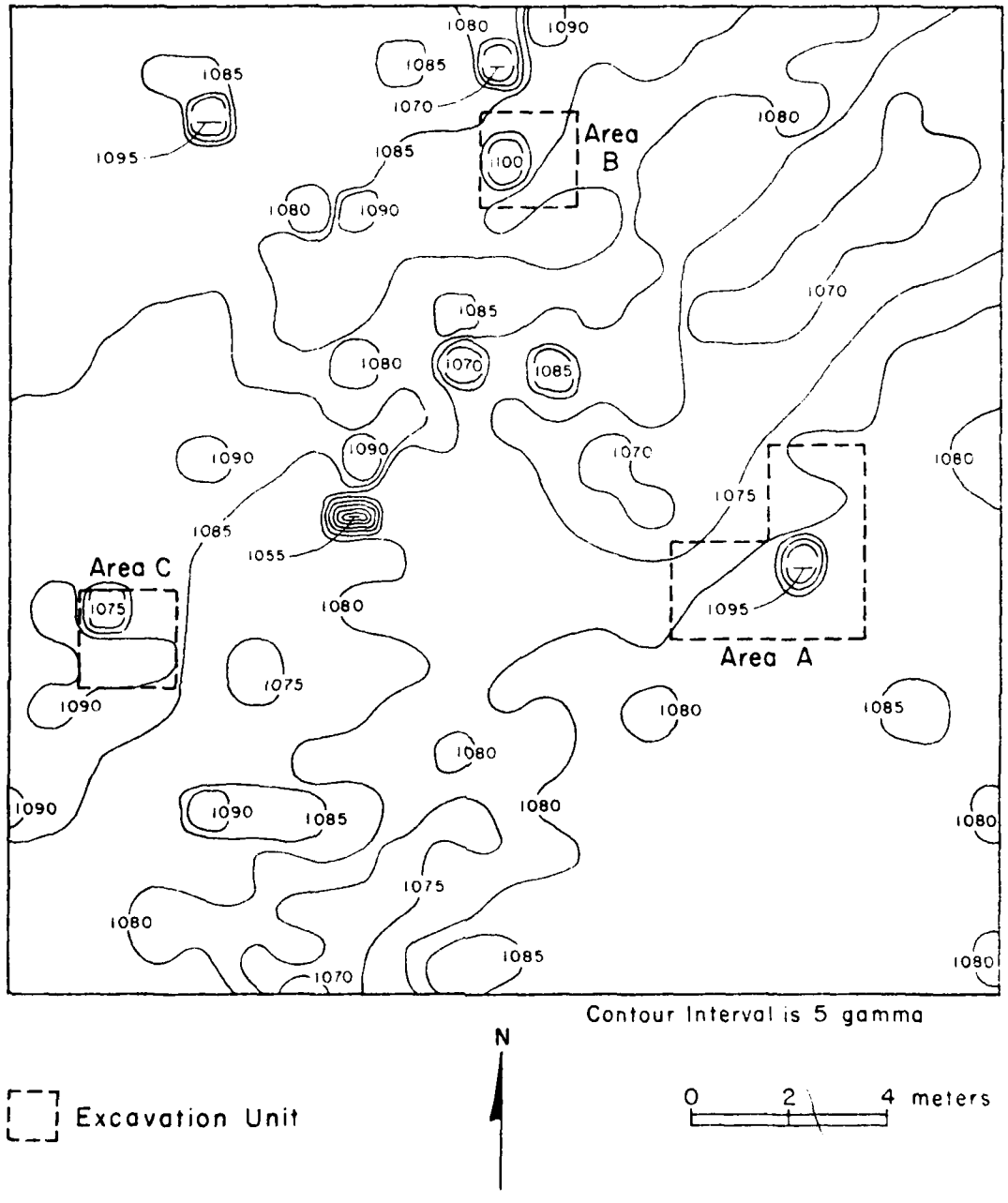
Excavation Methodology

The primary focus of the 1978 excavation of site 41WM57 was to isolate features or activity loci outside the most dense areas of the middens. A proton magnetometer survey was utilized as one means of achieving this goal. Two areas adjacent to the middens (Fig.8.3-1) were gridded and surveyed. Four excavation areas were designed to explore either areas of high magnetic intensity (Areas A and B) or areas of associated high and low magnetic intensities (Areas C and D) (Figs.8.3-2,3).

The presence of historic metal artifacts within the plowzone of Site 41WM57 made the interpretation of anomalies a more difficult task. In both Areas A and B, the high intensity anomalies are likely related to the historic metal artifacts recovered from the plowzone. There is little indication from the surrounding contours that the magnetometer readings reflect the outer perimeters of the massive burned rock accumulations that were recognized through subsequent excavation of each unit.

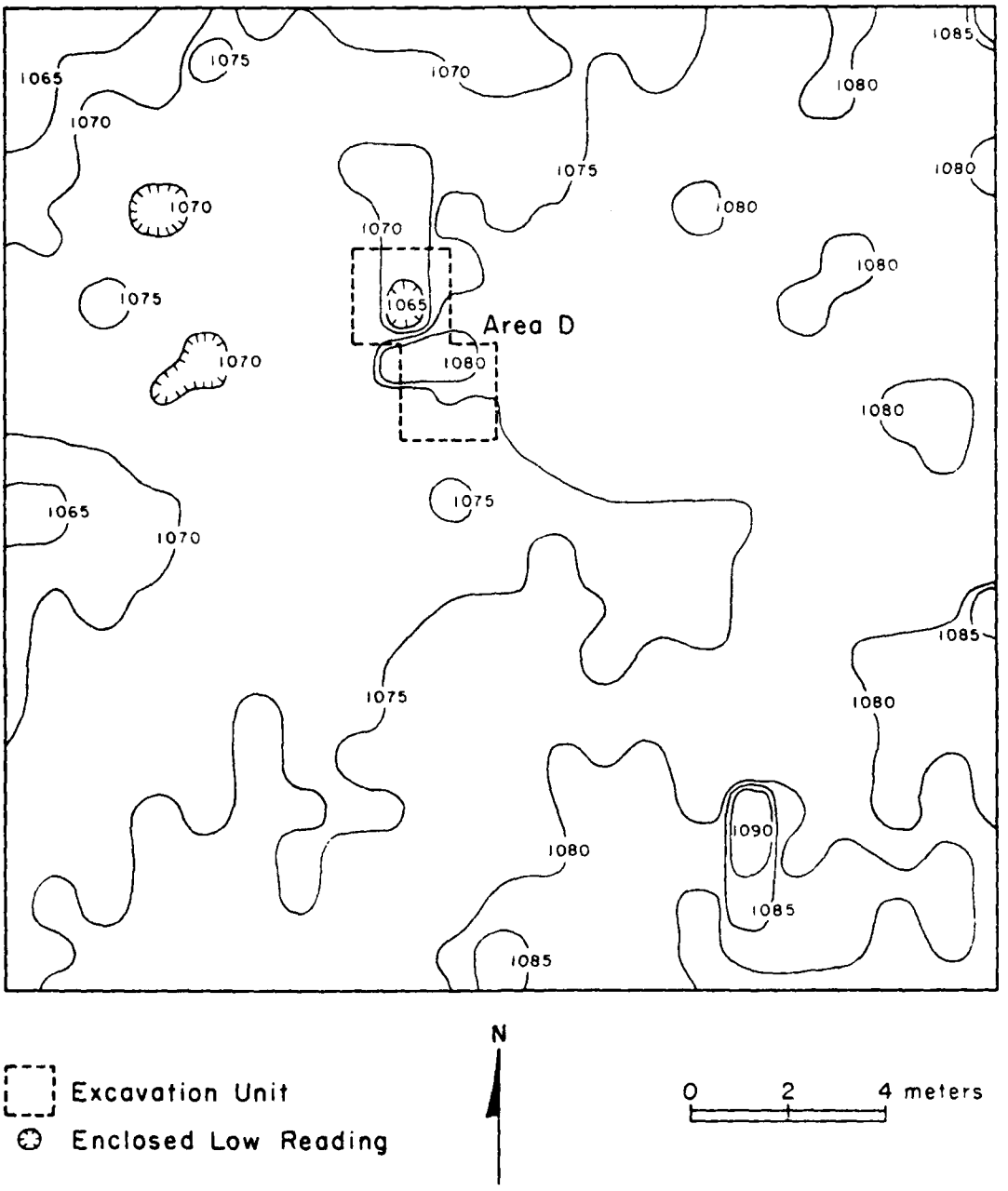
Interpretation of the associated high and low magnetic intensities within Area C is also clouded by the recovery of sheet metal within Level 1 of the unit. Nevertheless, the association of the high and low intensities corresponds very well with the outer perimeter of Midden 3. It is possible that the associated high and low magnetic readings reflect the differential masses of burned rock present within excavation unit C. A similar situation was revealed within excavation unit D where the associated high and low intensities apparently reflect the differential distribution of burned rock within the unit. In this circumstance interpretation is much less tentative since no metal was recovered during excavation. However, if this interpretation is correct, then similar magnetic intensity readings should have been obtained within Areas A and B, also.

It is apparent that the proton magnetometer survey of Site 41WM57 did not yield consistent results. Similar distributions of burned rock did not yield consistent patterns of magnetic intensity readings. Admittedly, the presence of historic metal artifacts biased the results; yet, the extensive nature of the burned rock accumulation was also a likely contributing factor. Distinct patterns reflecting the presence and/or absence of isolated features would hardly be expected. Of the four areas examined, only Area A exhibited any promise of isolated features. Consequently, it was the only area expanded beyond the original test excavation units.



41 WM 57
Area 1

Figure 8.3-2. Magnetic Intensity Contour Map.



41 WM 57
Area 2

Figure 8.3-3. Magnetometer Map.

Exploratory backhoe trenches were used to investigate areas outside the middens, to examine the stratigraphy, and to define the site limits. Trenches 1 and 2 were dug as continuous trenches in an effort to tie the various areas of the site together stratigraphically. Trench 1 indicated that both Areas G and H might yield isolated features and a high density of associated cultural material. A 2 by 4 meter unit was utilized in Area G to gain a broader horizontal view of the possible features and the associated faunal material. The profile of Trench 2 demonstrated that Midden 3 would likely provide evidence of distinct features. A 4 meter square unit was excavated for this purpose. Time strictures and the disturbed condition of the other middens, especially Midden 2, limited controlled excavation to Midden 3.

The remaining trenches and test excavation units were utilized to examine the northern, eastern, and western boundaries of the site. Only Trenches 3 and 4A exhibited a significant amount of cultural material. An isolated feature was uncovered at the west end of Trench 3; consequently, a 2 meter square unit was opened. Trenches 6 and 7 were placed next to the farmhouse to check the validity of local stories that human burials had been encountered during the construction of the house. Unfortunately, they revealed nothing more than the presence of a small cellar with materials of the post-World War II period. Along the northern perimeter of the site, excavation units (Areas I and J) revealed very shallow and possibly deflated cultural deposits. No further work was deemed necessary in these areas either.

All excavation units at site 41WM57 were set up from the N-S and E-W base lines of a 10 meter interval grid system. Each 1 meter square unit was designated according to the relationship of its northwest corner to the arbitrary grid reference point of 1000N/1000W. For the purposes of vertical provenience, a primary datum was established on the exposed root system of the large oak tree near the ranch building (Fig. 8.3-1). The 1 meter square excavation units served as the minimal unit of horizontal spatial control at this site.

Stratigraphy

Although site 41WM57 is situated very near the Hawes Site (41WM56), the deposition of sediments at 41WM57 is more complex. Alluvial gravels have been laid down in the southeastern portion of the site by upland drainages to the southwest. Massive colluvial deposits at the base of the upland slope and the presence of artificially constructed terraces above site 41WM57 demonstrate that slope wash has been quite intense at various times in the past. The proximity of the North Fork of the San Gabriel River, however, suggests that there were possibly two sources of alluvial fill. The following sedimentary units are recognized at 41WM57 (Fig. 8.3-4).

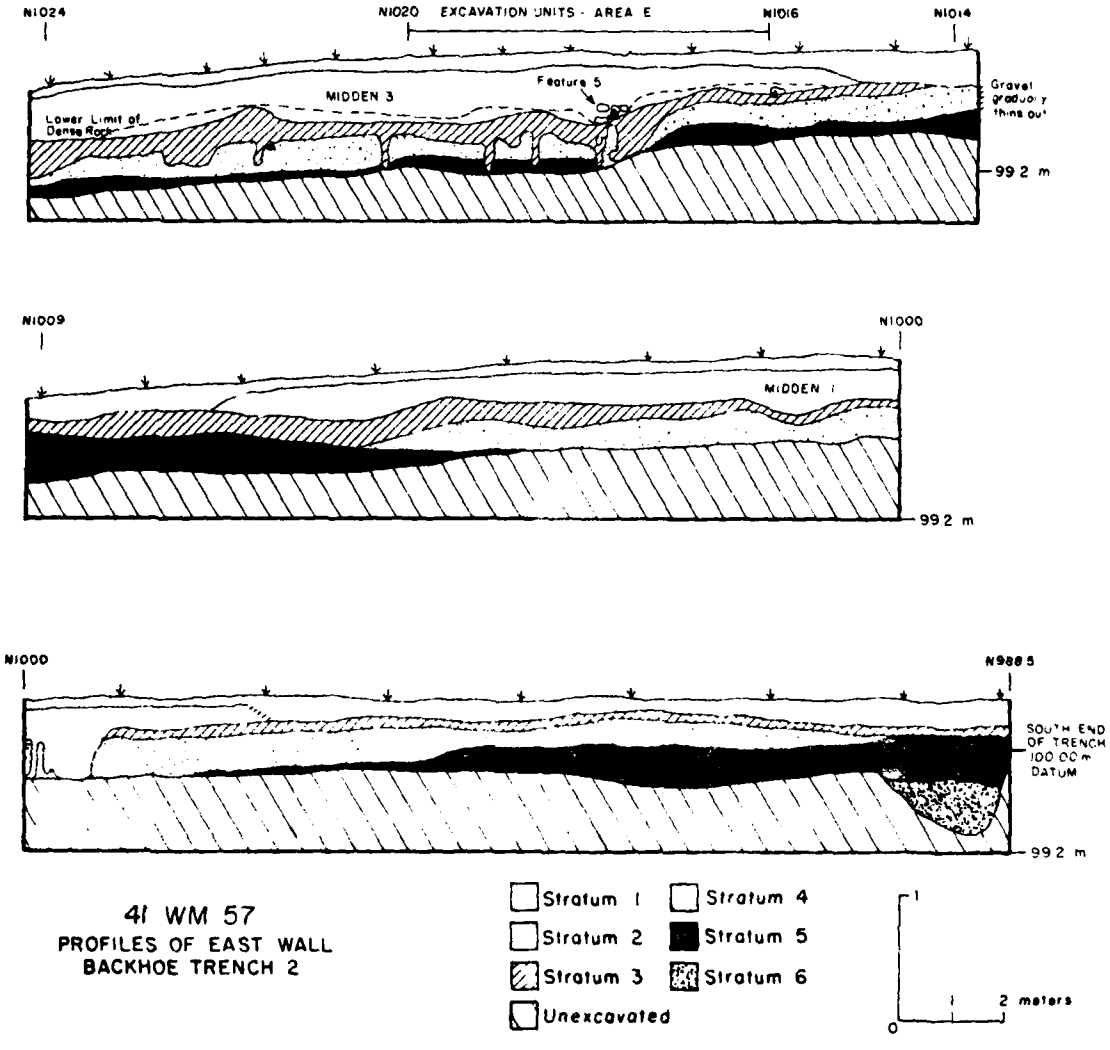

N1024
N1020 EXCAVATION UNITS - AREA E
N1016
N1014
MIDDEN 3
Feature 5
Lower Limit of Dense Rock
Gravel gradually thins out
992 m
N1009
N1000
MIDDEN 1
992 m
N1000
N988 5
SOUTH END OF TRENCH 100.00 m DATUM
992 m
41 WM 57
PROFILES OF EAST WALL
BACKHOE TRENCH 2
Stratum 1
Stratum 2
Stratum 3
Unexcavated
Stratum 4
Stratum 5
Stratum 6
1
2 meters
0

Figure 8.3-4.

Stratum 1: This dark brown (7.5YR 3/2) clay loam is an organic "A" horizon. Where the midden nears the ground surface this stratum is only a sod zone. Numerous inclusions of angular limestone fragments (1-5 cm in breadth) are present.

Stratum 2: This black (5YR 2.5/1) silty clayey loam is well represented throughout most of the site. The dense accumulation of burned rock and artifacts within this zone warrant its designation as a midden. The dense accumulation of rock is present everywhere except in the northwestern portion of the site and between Middens 1 and 3. The burned rock fragments range from 2 - 20 cm in size. Roots are evident throughout this zone. Burned Rock Midden 1 is not as well defined as the other middens. The burned rocks are less dense so that the limits of the midden are not as distinct.

Stratum 3: This clayey loam stratum is a transition zone which varies according to the sediments that appear above or below it along the trench. Where Middens 1 and 2 are located, this zone is a mixture of the midden matrix and the underlying gravel lenses. Elsewhere it is a blend of strata 1 and 5. The gravel inclusions within this stratum are limited to the southeastern portion of the site. Due to the mottled nature of this stratum, color varies greatly. Where the gravels are numerous, the color is a dark reddish brown (5YR 3/2). Otherwise, the color varies from a dark grayish brown (10YR 4/2) to a dark brown (7.5 YR 4/4).

Stratum 4: Brownish yellow (10YR 6/6) gravel lenses, consisting of sub-angular limestone fragments (5-50mm in breadth), comprise this stratum along backhoe Trench 2. The localized nature of these deposits suggests that they are the product of alluvial deposition from the upland drainages to the southwest.

Stratum 5: This stratum is a strong brown (7.5YR 5/6) clayey loam with very few limestone inclusions. Along Trench 2 cultural materials are quite sparse in this zone. Artifacts are present in this stratum where it appears in the eastern portion of Trench 1 and in Trench 3.

Stratum 6: This zone is a gravel bed consisting of numerous sub-angular limestone inclusions (2-10 cm in breadth) within a strong brown (7.5YR 5/6) clayey loam matrix. These alluvial deposits may have been the product of either the upland drainages or the San Gabriel River. The backhoe trenches were not extensive enough to make a definite determination; however, the area extent and slope of these gravels from the southwest end of Trench 2 to Trenches 1 and 3 suggest that the gravels are the result of alluvial deposition from the upland drainages.

The profiles of Trenches 1 and 2 and of excavation units in Areas A and B indicate that the initial occupation of the site was upon a knoll or alluvial fan deposit within the San Gabriel floodplain.

Wherever the upper gravel lenses (Stratum 4) are present, the midden zone is immediately above them. Furthermore, the profiles of Areas A and B demonstrate that the gravel lenses slope downward to the north and east beyond Trenches 1 and 2. The gravel lenses also disappear at this point, for Trenches 3 and 4a exhibited no gravel lenses. The midden zone follows this same slope; consequently, it is more deeply buried beneath alluvial sediments in this area. An apparent erosional feature is also present in Area A, for the strata drop sharply to the south and east (Fig. 8.3-5). Such an erosional feature would be expected along the lower edge of an alluvial fan.

Given that the occupation of the site was centered upon an alluvial fan with limestone gravels present (as there are today), the position of the middens halfway between the river and the upland slope is not so unusual. Since the upland drainages had deposited large gravels far beyond the base of the steep upland slope, there was really no need for the site to be closer to its base. The raw material for the cooking hearths was readily available without the site being any closer to the upland slope.

Culture/Time Stratigraphic Units

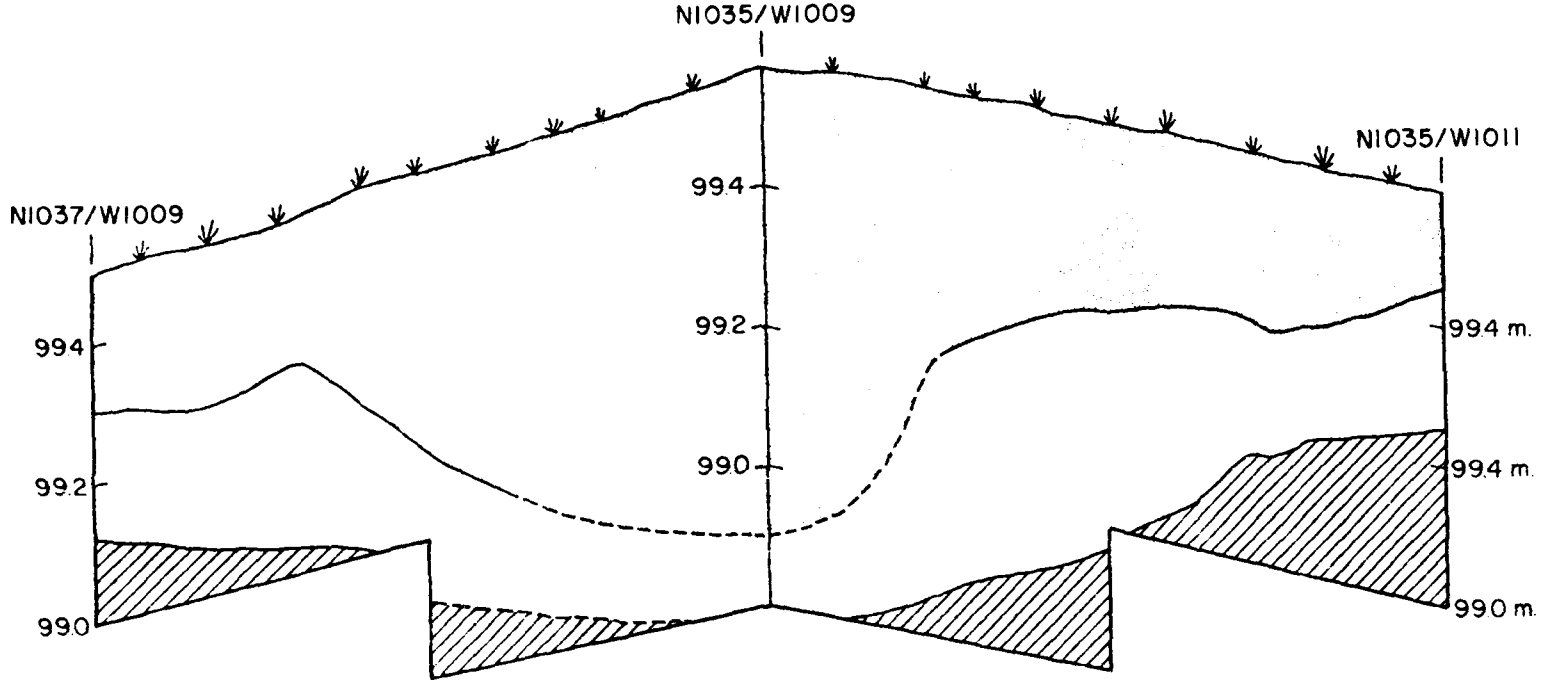
Assignment of culture/time stratigraphic units at site 41WM57 is made difficult by the disturbances of recent agricultural activities and the processes of accumulation of burned rock middens. From Table 8.3-1 it is readily apparent that the upper levels of most units contain diagnostic elements from as many as three phases. Due to these mixed contexts which were accurately predicted by Sorrow (1973:59), analysis was limited to those excavation units and levels which were judged to possess the greatest temporal integrity. Sufficient quantities of data for comparative purposes were an additional requirement for inclusion.

The following table presents the excavation units and their respective levels which were chosen for detailed analysis. The culture/time stratigraphic units are also designated.

Table 8.3-1

Culture/Time Unit	Excavation Areas and Levels							
	A	B	D	E	F	G	H	I
Round Rock/San Marcos	3-4	3-4			4-5	5-6	5-6	1-2
Round Rock			3-4	2-3				
Clear Fork				4-5				
San Geronimo						7-8		

Figure 8.3-5



41 WM 57

PERPENDICULAR PROFILES OF EAST AND SOUTH WALLS OF AREA A

Stratum 1

Stratum 2

Stratum 3

0 10 20 cm

Although the vertical integrity of designated elements within a burned rock midden is often suspect, the contextual association of Pedernales, Marshall, and Castroville points within site 41WM57 is not assumed to represent a mixed or disturbed context. Instead, the repeated association of these projectile point styles within several excavation units suggests the presence of an expected transitional assemblage. Other investigators (Weir 1976; Denton 1976) have noted previously that Marshall and Pedernales points are often contextually related. Since the Castroville point is viewed as one of the earlier diagnostics of the San Marcos phase, it is assumed that the co-occurrence of these three elements within site 41WM57 represents that vague transition between the Round Rock and San Marcos phases. Unfortunately, no radiocarbon samples were recovered that might have substantiated this assumption.

It is readily apparent from Table 8.3-1 that diagnostics of the Round Rock and San Marcos phases are dominant in all excavation units. Only excavation units E and G exhibit evidence of probable Clear Fork and San Geronimo stratigraphic units. Twin Sisters phase diagnostics, only minimally represented at site 41WM57, are all found in Areas A, C, G, and H. Unlike the Hawes Site which is less than 200 meters to the northeast, no diagnostic elements of the post-Archaic phases were recovered.

Features

The most prominent features of site 41WM57 are the multiple (3) burned rock middens. Backhoe trenches and excavation units demonstrate, however, that the massive accumulation of burned rock extends far beyond the perceptible limits of the three mounds. In fact, an incipient mound was evident in the area to the west and north of Middens 2 and 3, respectively. Other than the presence of this massive lens of burned rock in all but three of the excavation units, only seven isolable features were recorded. All of these features, except for one historic post hold, are informal or formal hearths. The discussion of these hearths will be organized according to their association with a given culture/time stratigraphic unit. The discussion will proceed from the earliest to the latest component.

Clear Fork Phase

Feature 6 was uncovered beneath the midden zone within excavation unit E. This cluster of burned rock is isolated, both vertically and horizontally, from the major midden accumulation. This separation, together with the stratigraphically associated Nolan point, suggests that this hearth represents the earliest occupation of this portion of the gravelly, alluvial fan (Fig. 8.3-6).

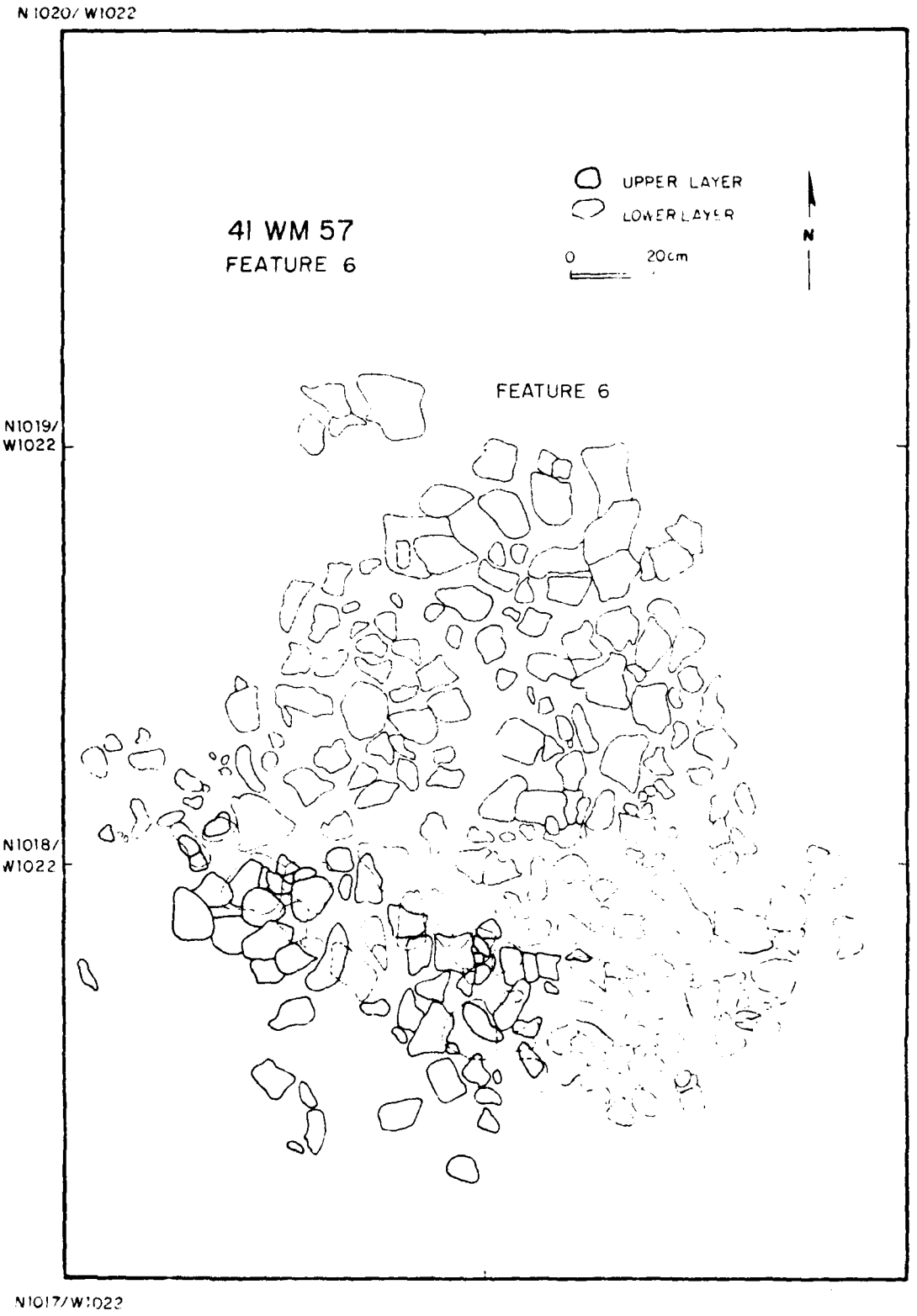

N1020/W1022
41 WM 57
FEATURE 6
UPPER LAYER
LOWER LAYER
0
20cm
N
FEATURE 6
N1019/
W1022
N1018/
W1022
N1017/W1022

Figure 8.3-6.

This concentration of burned rock is comprised of heat fractured limestone cobbles and slabs varying in size from 4 to 14 centimeters in breadth. The concentration measures 165 centimeters along its north-south axis and 122 centimeters along its east-west axis. The underlying clusters of burned rock and the irregular configuration of the basin or basins indicate that either more than one hearth or re-utilization of a hearth, may be represented. Whatever the case, a formal basin was apparently not prepared. Either the gravel was scooped to the side to form a depression or the hearth was prepared within a natural depression on the alluvial fan. The dark brown to black, silty matrix of the feature contained very little charcoal. Lithic debitage and fragmentary molluscan remains were the primary elements of cultural refuse (other than burned rock) within the feature matrix. Flotation of the feature matrix revealed a charred acorn fragment, amaranth seeds, and a single hackberry seed.

Round Rock Phase

Three features were identified within the Round Rock stratigraphic unit at site 41WM57. Two represent pit hearths at the base of the midden zone in excavation unit E. The other, a shallow, basin-shaped hearth, was uncovered in excavation unit H which is beyond the major accumulations of burned rock within the site (Figs. 8.3-7).

Features 5 and 7 represent a portion of the initial accumulation of Midden 3. Only one-half of each feature was documented, for Feature 5 was partially destroyed by the exploratory backhoe trench and Feature 7 appeared in the east wall of excavation unit E. Feature 5 is a circular, basin-shaped pit filled with heat-altered limestone cobbles ranging in size from 5 to 20 centimeters in breadth. The rocks were apparently laid within an irregular depression of the mottled clay and gravel alluvial fan. The resulting feature is 28 cm in depth. The projected diameter of the hearth is approximately 110 centimeters.

The generally larger size of the burned cobbles and their association with the depression outlined in the profile of the backhoe trench were the only factors which distinguished this feature from the midden matrix immediately above it. Immediately beneath the irregular basin, the mottled clay and gravel exhibited a distinctively darker orange color than the surrounding matrix. This color differentiation is likely the result of the heat generated within this pit hearth.

Although the number of projectile points recovered from Midden 3 were few (Table 8.3-2) their distribution indicates that the major midden accumulation occurred during the Round Rock phase. A Bulverde point was recovered from within the Feature 5 matrix. Unfortunately, no radiocarbon sample was recovered to provide a more firm temporal estimate of the initial accumulation of this midden.

Feature 7, located near the eastern extremity of the midden, exhibits a more complex formal structure. The exposed cross-section

Figure 8.3-7

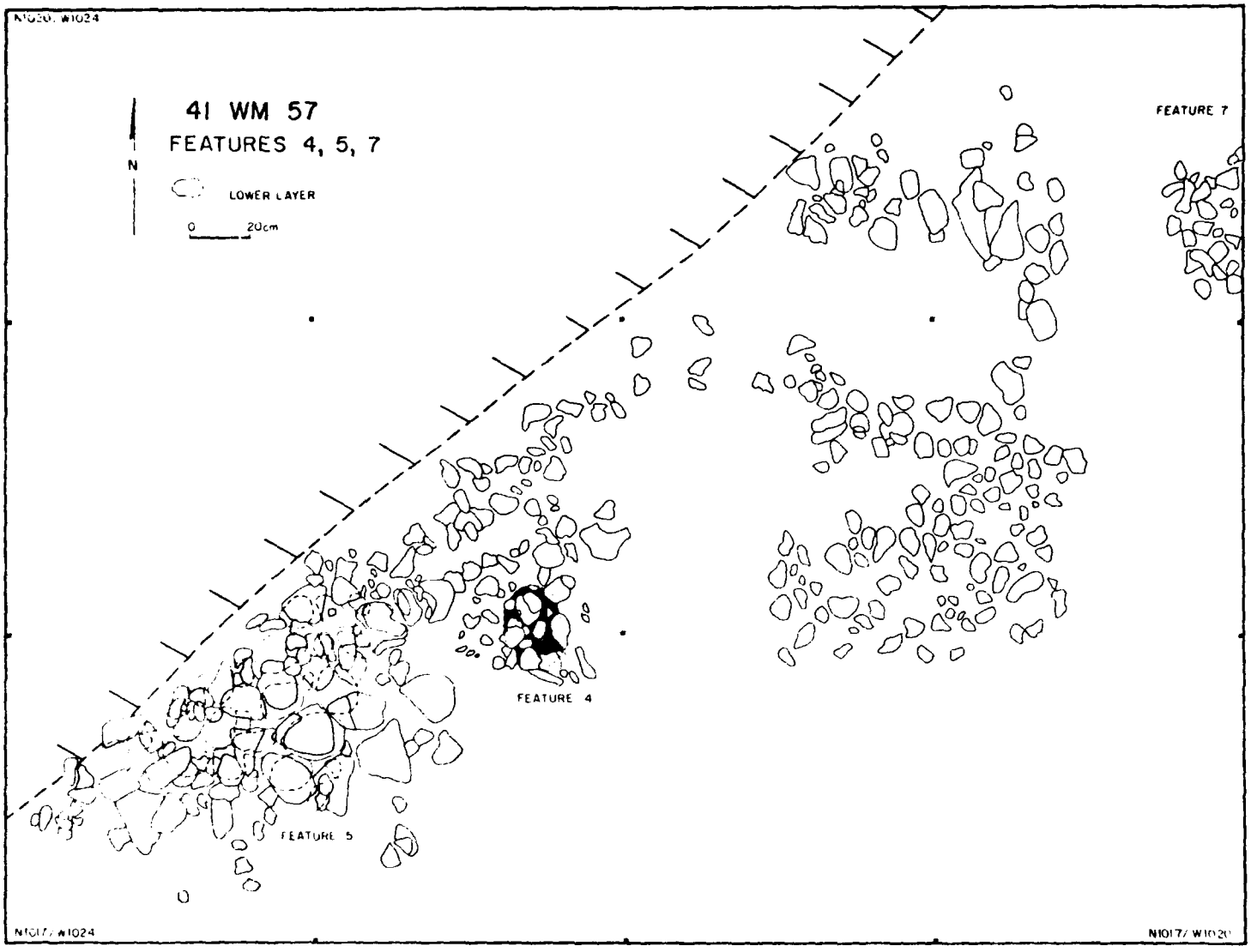

41 WM 57
FEATURES 4, 5, 7
N
LOWER LAYER
0 20cm
FEATURE 7
FEATURE 4
FEATURE 5
N1017/ W1024
N1017/ W1020

Table 8.3-2. Projectile Point Distribution By Area, 41WM57.

	AREA A				AREA B						AREA C					AREA D						AREA E					AREA F						AREA G								AREA H						AREA I		
	1	2	3	4	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5	6	7	8	1	2	3	4	5	6	1	2	3
Frio											1																							1	2	1								1					
Fairland Ensor	1																																1															
Ensor		1																															1		2													
Montell					1							1				1						1												1	2	1													
Marcos												1	1				1													1					2													
Castroville	1	2	4			1	1																							1					1								1	1				
Langie											1																																					
Marshall			2*	*		1	1																							1																	
Federales	1	1	2	2	1	2*	2	2				1	1	3		1	2	5	1	1			1							2					3	1	1							1	1		1	1
Bulverde													1	1		1		1		1		1	1		1																						
Nolan						1						1														1																					
Travis																																		1	1												
Wells																																															
Group 12																																								1							
Group 14																																			1												
Unidentified	4		3	1	1		1	1				1	2				1						2	1					2				2	2		2		1			1	1		1			1	

*1 Preform

•2 Preforms

of the pit hearth reveals an upper and lower basin (Fig.8.3-8). The upper basin, dug into the Stratum 2 matrix beneath the midden zone, exhibits a diameter of 80 cm. The lower basin, somewhat bell-shaped due to the constricted orifice, extends almost 30 centimeters deeper into Stratum 3. This basin exhibits a diameter of only 50 centimeters.

Whether or not both basins were utilized simultaneously with the lower basin serving as the heating chamber (hot coals) and the upper basin as the roasting chamber is unknown. The matrix of both basins is quite similar in that burned rock, lithic debitage, and faunal remains are quite scarce. With the exception of the burned rock density, however, the feature matrix is undifferentiated from that of the midden zone. Perhaps, the basins merely represent subsequent utilization of this area for cooking or roasting purposes. However they functioned, the size and formal structure of these pits have much in common with the pit hearth at the base of the midden zone at site 41WM73. Similar pit hearths were likely prepared within the midden zone, itself, as it accumulated. Their archaeological visibility, however, has been significantly lessened by subsequent cultural (re-utilization of hearth stones and mixing of midden matrix during construction and use) and natural (erosion, leaching, and weathering) processes. Perhaps our present archaeological techniques are also a limiting factor in identifying such archaeological phenomena.

During this same general time period isolated hearths were also being utilized outside the major accumulation of burned rock at site 41WM57. In excavation unit H feature 1, a circular cluster of burned rock (50 cm in diameter), was revealed in a natural depression in the underlying Stratum 5 sediments. This hearth consists of a single layer of burned rock. The rocks range in size from 4 to 15 cm in breadth. Lithic debitage, burned and unburned rock, and molluscan remains were associated with the hearth.

The lack of Bulverde points within excavation unit H suggests that Feature 1 may have been the result of a later utilization of the site than that which resulted in the accumulation of Midden 3. Given our knowledge of midden accumulation elsewhere during the Round Rock phase, however, it is probably safe to assume that the growth of the mounds at site 41WM57 was an ongoing process while area H was being utilized. Nevertheless, without radiocarbon dates to establish more absolute temporal parameters, it is equally possible that these two areas of the site represent temporally distinct utilizations of the site.

Flotation of the matrix from the Round Rock features reveal the remains of cedar, chenopodium, oak, and pecan (Chapter 15.2). Interestingly, all the flotation remains were recovered from the features within Midden 3. Such a difference might be related to differential preservation when only three features are involved; however, an examination of all the flotation remains (admittedly meager) from site 41WM57 demonstrates that only four acorn fragments were

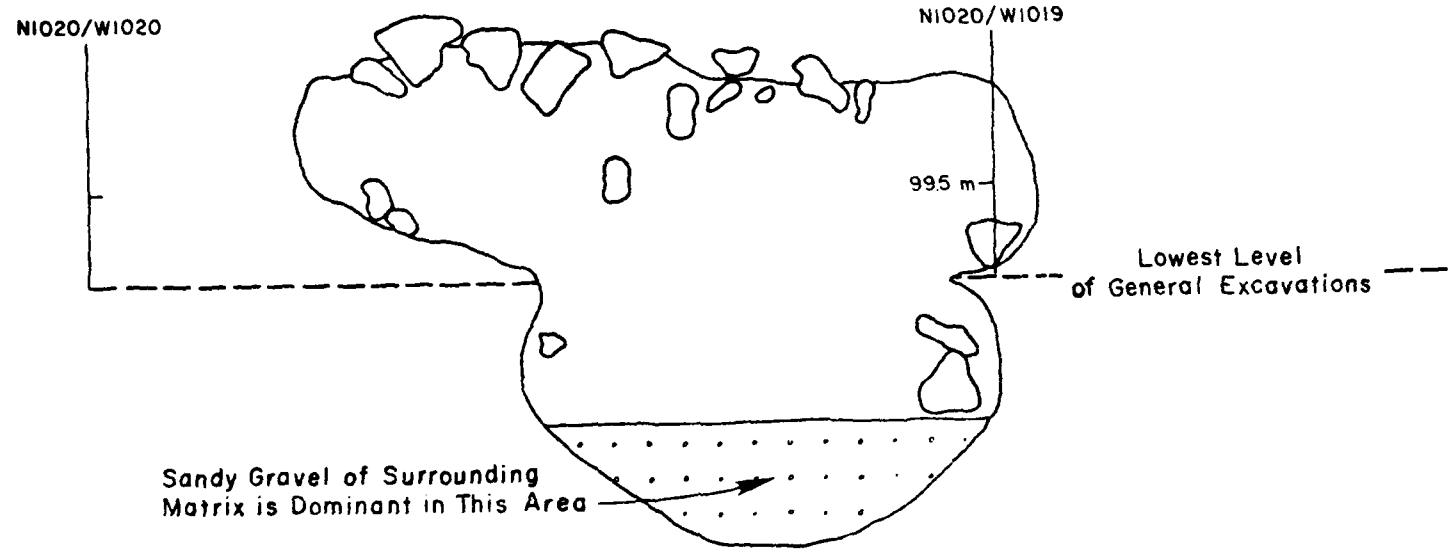

N1020/W1020
N1020/W1019
995 m
Lowest Level
of General Excavations
Sandy Gravel of Surrounding
Matrix is Dominant in This Area
41 WM 57
FEATURE 7
Profile
Burned Rock
0 10 20 cm

Figure 8.3-8.

recovered from other than Midden 3 in the entire site. Such a patterning of botanical remains suggests that the mounds may represent seasonally specific activity areas.

Round Rock/San Marcos

Two probable hearth areas from excavation units A and F were associated with projectile points which likely represent an arbitrary slice of the cultural continuum between the Round Rock and San Marcos phases. Although the formal structure of these hearths differs from the earlier features within Midden 3, their spatial relationship to the burned rock accumulation suggests that they may have been integral to the processes affecting midden accumulation.

Feature 2, an isolated cluster of burned rock within excavation unit A, is stratigraphically associated with a more massive lens of burned rock to the south and southwest (Fig. 8.3-9). The midden accumulation within this portion of the site slopes downward to the east. Feature 2 (Fig. 8.3-9) is an isolated and compact cluster of burned rock at the periphery of the major accumulation of burned rock. This cluster is made up of a single layer of burned rocks ranging from 5 to 25 centimeters in breadth. The compact cluster of rock measures 50 centimeters in diameter. Scattered burned rocks lie to the north of the cluster.

The spatial relationship of this hearth to the more massive accumulation of burned rock indicates that the lens of burned rock may be the result of the superpositioning of several such non-descript clusters in a limited area. Such a process, however, would not necessarily contribute to a mound formation. It may be that these less formal hearths at site 41WM57 served a different function than those at the base of Midden 3, even though burned rocks were a by-product of each.

Feature 3 (Area F) was totally isolated from the accumulation of burned rock. Unfortunately, it had been partially destroyed by the exploratory backhoe trench (Fig. 8.3-10). Whether or not a circular concentration of burned rock existed within the backhoe trench area is unknown. The denser concentration of rocks to the south of the backhoe trench indicates that a distinct hearth may have been present. The burned rocks ranged in size from 5 to 15 cm in breadth. The matrix surrounding the rocks was not heat altered; neither were there any traces of charcoal.

The low density of cultural debris associated with this feature denotes a very limited occupation of this area of the site. Whether or not the activities in this area contribute to the midden zone to the west is a moot point, for there are no means of determining the contemporaneity of such activities except through rather gross culture/time stratigraphic units.

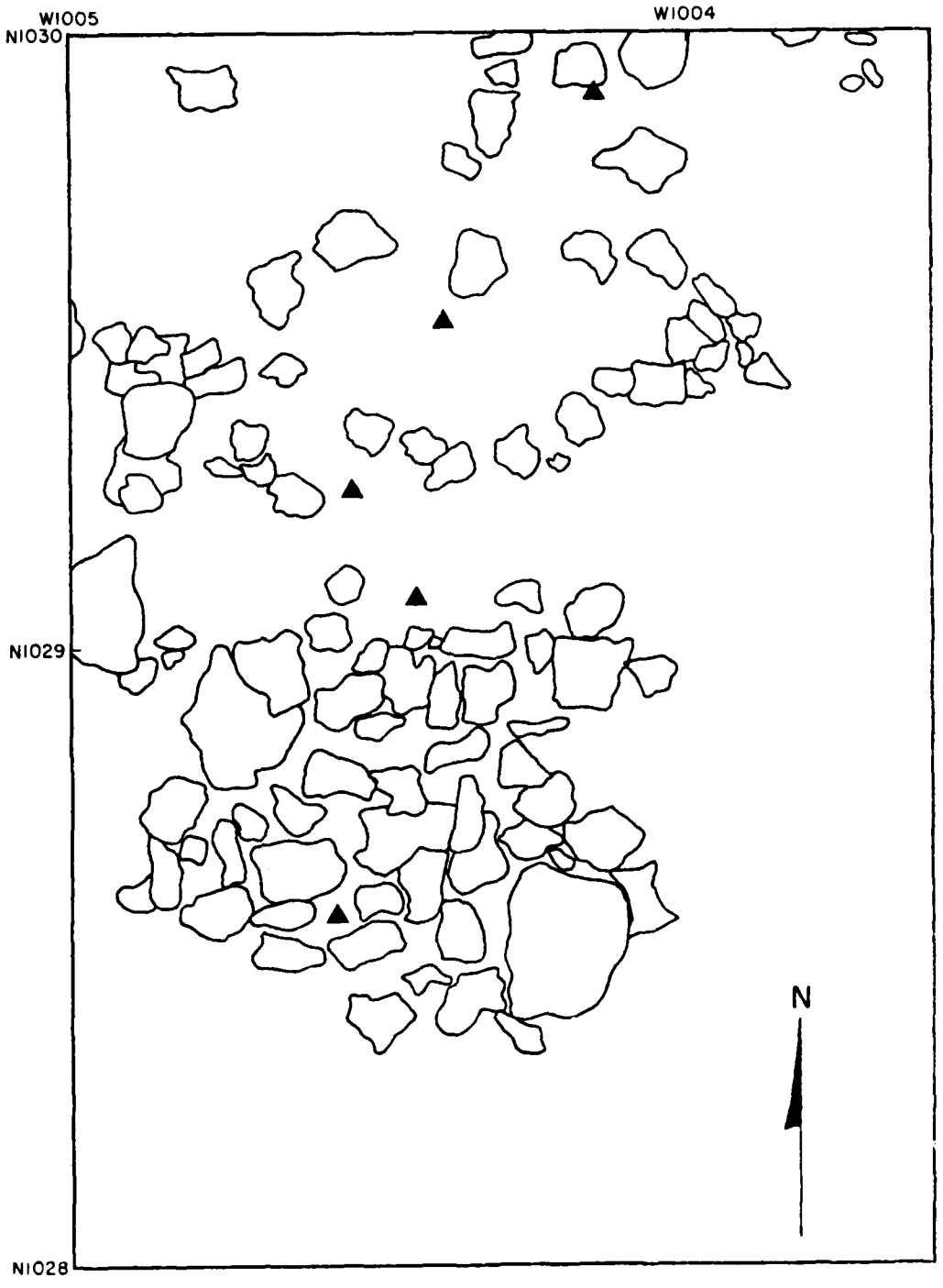

W1005
N1030
W1004
N1029
N1028
N
41 WM 57
FEATURE 2
Level 3, Area A
Burned Rock
Artifact
0
20 cm

Figure 8.3-9.

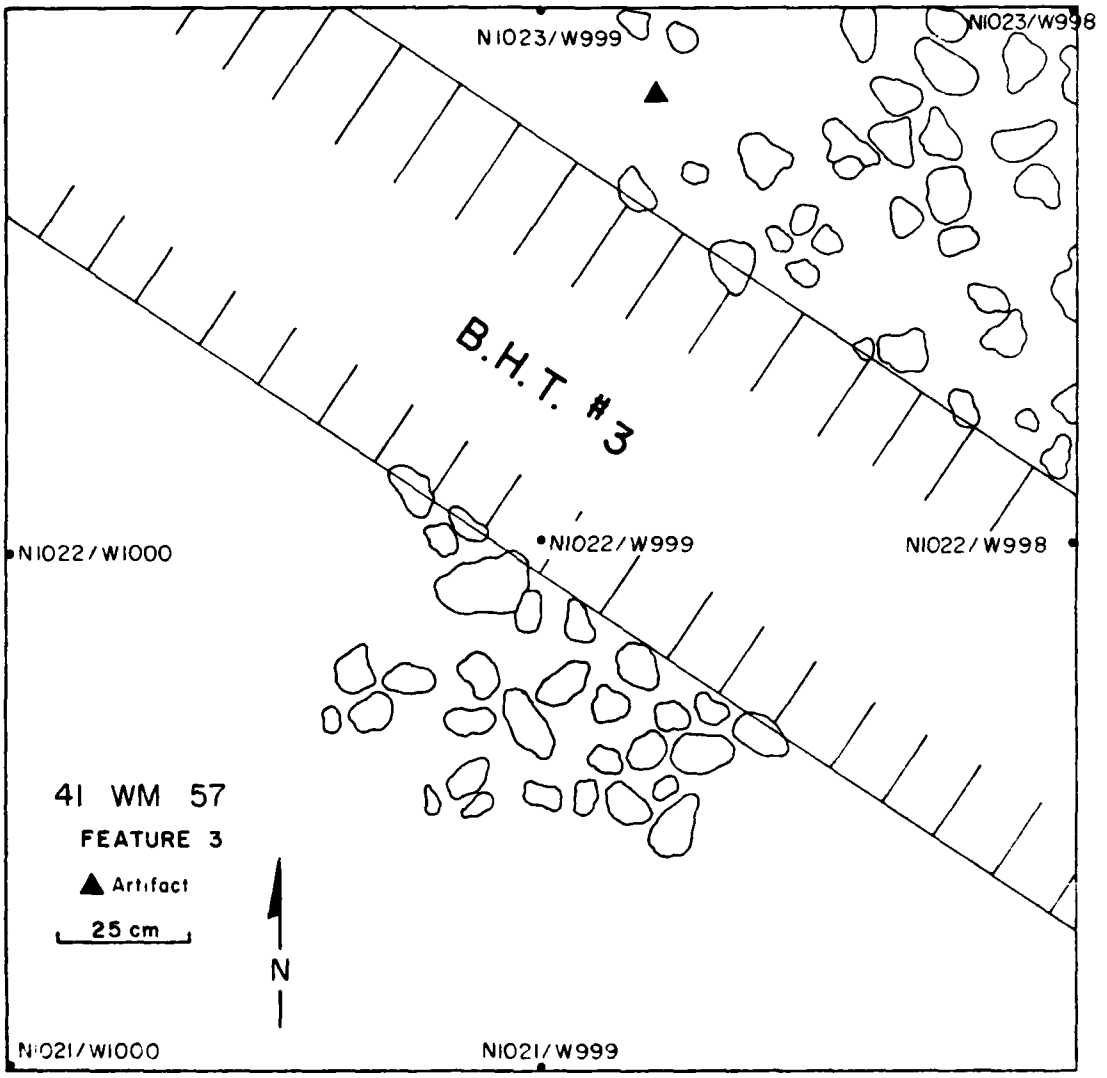

N1023/W999
N1023/W998
B.H.T. #3
N1022/W1000
N1022/W999
N1022/W998
41 WM 57
FEATURE 3
Artifact
25 cm
N
N1021/W1000
N1021/W999

Figure 8 3-10.

Modern

Feature 4. An historic feature (Fig.8.3-11), a hole produced by a posthole digger, was identified at the base of Midden 3 in excavation unit E. Although the cylindrical cavity had been cut through the lower levels of the midden and into the gravels and clays which lie beneath the midden, there were no indications of its presence, such as disturbed and mixed sediments, higher in the midden zone. Perhaps such a phenomenon is illustrative of how cultural and natural processes may obliterate evidence of isolated features within burned rock accumulations.

The cavity walls taper inward to a flat bottom at a depth of 50 cm below the point where it was first detected. The diameter of the cavity varies from 25 cm at its orifice to 14 cm at the bottom. The walls of the hole were marked by cuts of irregular depths and widths as one would expect from the blade of a posthole digger. Several of the rocks on the rim of the cavity exhibited striations and impact scars from the cutting of the hole through the midden zone.

The cavity, itself, was only partially filled with a loose matrix consisting of burned and unburned limestone cobbles and a fine dark silt. None of the cobbles extended into the wall of the cavity. Since there is no indication, such as decayed wood, that the hole ever contained a fence post, it is likely that someone had previously conducted a probe test of Midden 3.

Feature Summary

The number of isolable features uncovered during excavation of site 41WM57 was low relative to the area examined. Much of the burned rock accumulation at site 41WM57 may have been due to the eventual intersection of numerous individual hearths and their by-products (fire-cracked rock). The structural differences of those hearths associated with Midden 3, however, suggest that the mounds of burned rock may be the result of a more specialized process. The floral evidence (Chapter 15.2), although meager, tends to support such an hypothesis. A seasonally specific activity, such as the parching of acorns, may have contributed to the growth of the mounds. That the mounds might represent dump areas, as suggested by Sorrow (1969), seems highly unlikely. A similar mound or group of mounds should also be present at the Hawes Site if the mounds merely represent trash heaps.

The association of lithic debitage and tools with the several features also provide supporting evidence for this hypothesis (Table 8.3-3). Features 5 and 6 which are located at the base of Midden 3 exibit a limited variety of debitage. Feature 2, on the

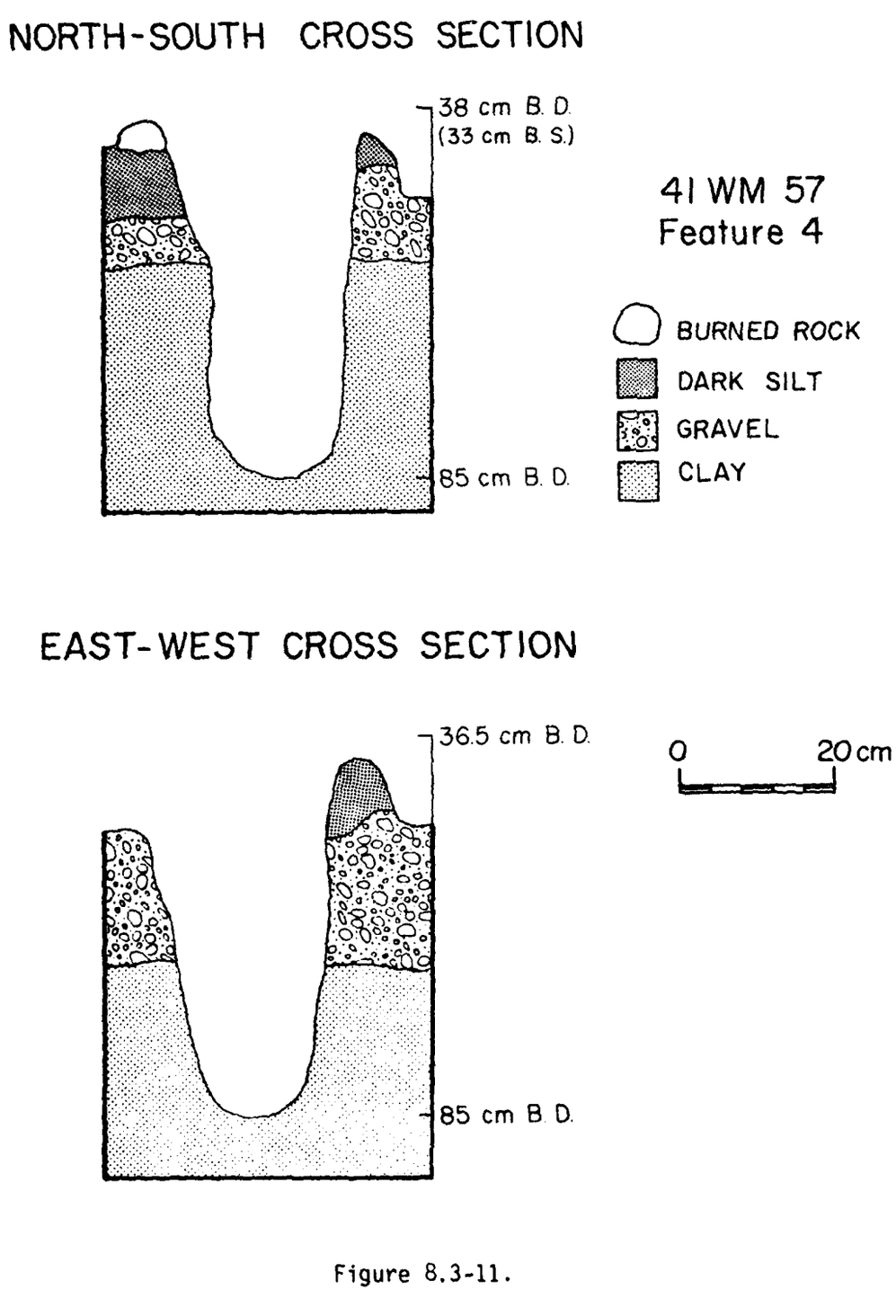

NORTH-SOUTH CROSS SECTION
38 cm B. D.
(33 cm B. S.)
85 cm B. D.
41 WM 57
Feature 4
BURNED ROCK
DARK SILT
GRAVEL
CLAY
EAST-WEST CROSS SECTION
36.5 cm B. D.
85 cm B. D.
0
20 cm

Figure 8.3-11.

Table 8.3-3 Lithic Material Associated with Features at Site 41WM57

LITHIC REMAINS	FEATURES					
	1	2	3	4	5	6
Primary flakes			2	-		
Secondary flakes (>50% cortex)		4(1)	1	-		4
Secondary flakes (<50% cortex)	1	28(3)	15	-	2	6
Tertiary flakes	3	140(22)	57(8)	-	27(4)	53(8)
Micro-flakes	7	43(3)	8	-	4	7
Biface thinning flakes		1		-	1	1
Core fragment				-	1	
Cnunks		5(1)	1	-	1	5
Chips	6	160(17)	32(3)	-	24(9)	41(6)
Blade fragment		1		-		
Secondary blade		1		-		
Biface		1		-		
Retouched piece		1		-		
Projectile point				-	1	

other hand, which is located at the periphery of the accumulation of burned rock, displays a much higher density of debitage remains. A variety of tools are also associated with Feature 2. Midden 3 likely represents a specialized activity area while the area surrounding Feature 2 is a living area. Not all of the features peripheral to the midden accumulation exhibit this same pattern, however. Features 1 and 3, even more removed from the midden accumulation, contain a more limited variety of debitage than those features associated with Midden 3. Nevertheless, the density and variety of artifacts contextually associated with these features is far greater than the associated densities within Midden 3.

Although two of the middens were not examined, it is apparent from the several excavation units that the major accumulation of burned rock at site 41WM57 was deposited during the Round Rock and later San Marcos phases. The prior Clear Fork occupation and subsequent Twin Sisters occupation are both minimally represented. No features specific to the Twin Sisters phase were identified. Whether the Twin Sisters elements are merely intrusive into the midden zone or are actually related to activities contributing to midden growth is unclear when examining site 41WM57 alone. The association of Twin Sisters diagnostics with the midden accumulation at site 41WM53, however, indicates that the Twin Sisters elements cannot be ignored as mere intrusives. Nevertheless, the disruption of the Twin Sisters stratigraphic unit by agricultural activities renders any diachronic assessment of changes in midden accumulation somewhat futile.

Lithic Tools

A total of 563 tools was analysed from site 41WM57. Since a large part of the site was disturbed, only the lithic materials recovered in those levels from the areas of the site that were in primary context were analysed. These tools were dated to four different cultural components (Table 8.3-4): the San Marcos/Round Rock Transition, with a total of 400 tools; the Round Rock component with 81 tools; the Clear Fork component with 41 tools; the San Geronimo component also with 41 tools.

In the San Marcos/Round Rock transition assemblage, all the major tool types are present. Burins are sparse, both notches and scrapers are well represented, as are the denticulates, with an unusually high number of serrated pieces. In the borer tools, drills are the most numerous type, which also is unusual. It is interesting to note that at this site borer tools as well as truncations are only found in this transition context and are completely absent in the other three cultural components. As is usually the case, retouched pieces form the largest tool class for all components. Unilaterally retouched pieces are more numerous than bilaterally retouched pieces.

Table 8.3-4. Tool Classes, 41WM57

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
San Marcos/	A	3	4	2	8	3	1	1	1		23	4	14	16		1				78				
Round Rock		4	1		2	1		1			12	1	7	5						30	108	100.00		
Transition	B	3		1	1						10	2	9	4						27				
		4			3						8		9	5						25	52	100.00		
	D	3	7	3	2	1	1			1	19	3	17	8						62				
		4									6		6	2						14	76	100.00		
	F	4	1				2				3		1	3						10				
		5					1						2							3	13	100.00		
	G	5									5	1	7	3						16				
		6	2					2			2		1	2						9	25	37.88		
	H	5	3	1	2						20	4	18	7						55				
		6				1	1				1		4	2						9	64	100.00		
	I	1	1		4		1				10	1	5	8						30				
		2	1	1	1		1				11	1	12	4						32	62	100.00	400	71.05
Round Rock	E	2		2	3			1			17	2	12	6						43				
		3	4		3			1	1		16		9	4						38	81	66.39	81	14.39
Clear Fork	E	4	2	2	1				1		11		2	6						25				
		5			1						7		3	5						16	41	33.61	41	7.28
San Geronimo	G	7	1								3	1	6	1						12				
		8		2					1		6	4	9	1						23				
		9	2	1									3							6	41	62.12	41	7.28
TOTAL			29	15	31	6	8	6	4	1	190	24	156	92	-	1	-	-	-	563			563	100.00
%			5.15	2.66	5.51	1.07	1.42	1.07	.71	.18	33.75	4.26	27.71	16.34	-	.18	-	-	-	100.01				
RESTRICTED																				217				
RESTRICTED %			13.36	6.91	14.29	2.76	3.69	2.76	1.84	.46		11.06		42.40	-	.46	-	-	-	99.99				

The Round Rock component did not have burins, truncations or complete bifaces and only notched pieces are present in any number. Both the Clear Fork and San Geronimo components were low in most tool classes. It is noteworthy that the San Geronimo period yielded five complete bifaces, a relative large amount compared with the other components at the site.

Table (8.3-5) shows medium densities throughout the site, with higher densities in Area I especially for debitage elements. A high tool and debitage density also was encountered in Area H. Comparing the same data grouped by cultural component (Table 8.3-6), the Clear Fork component shows low densities, the transition assemblage the highest ones.

The cumulative diagram for the site shows some evident facts (Figure 8.3-12). The small sample size for the Clear Fork and San Geronimo components probably accounts for some of the absent tool classes. Scrapers are present in all four components; only endscrapers for the Clear Fork, only sidescrapers for the San Geronimo component. Denticulated pieces are relatively important during all periods, but serrated pieces occurred only during the San Marcos/Round Rock transition. Notched pieces are numerous in the latter component and also in the Round Rock period. None were present in San Geronimo context while in Clear Fork context, two notched blades were found, which is unusual. Boring tools, especially drills, were only present in the San Marcos/Round Rock transition period. The same is true for truncations and backed pieces. Burins are rare at the site. Angle burins occurred in all but the San Geronimo component which yielded the only dihedral burinfrom the site. Retouched pieces are abundant in all components, especially unilaterally retouched pieces. Bifaces are unusually well represented during the San Geronimo period. Gouges, chopping tools and scaled pieces were not present. One axe was found in San Marcos/Round Rock transition context.

Very few tools were complete artifacts, and hence no separate statistical analyses on the whole tool measurements were made for this site. Measurements of the tools were incorporated with the appropriate cultural components by reservoir (Appendix H-4).

Site Summary

The multiple middens of site 41WM57 and the associated mass of burned rocks are the result of intensive utilization of the site during the Round Rock and early San Marcos Phases. Evidence of probable San Geronimo and Clear Fork phase occupations is meagerly represented in only two excavation units. Investigations of similar sites elsewhere in central and southwest Texas (Weir 1979:5-67; Hester 1970:237-250) have documented a wide range of intra-site variability concerning the formal structure of the middens and the associated diagnostic elements. Although all three of the middens

Table 8.3-5 41WM57 Artifact Totals by Area

Area	Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/ Debitage
A	SM/RR Trans.	3.3	33	2842	1:87
B	SM/RR Trans.	1.2	43	2509	1:58
D	SM/RR Trans.	2.5	30	1222	1:40
E	Round Rock	2.6	31	1533	1:49
	Clear Fork	3.4	12	587	1:49
	Total area	6.0	20	997	1:49
F	SM/RR Trans.	1.5	9	835	1:96
G	SM/RR Trans.	1.6	16	1663	1:106
	San Geronimo	1.7	24	1021	1:42
	Total area	3.3	20	1332	1:67
H	SM/RR Trans.	.9	71	3724	1:52
I	SM/RR Trans.	1.2	52	6580	1:127
	Total Site	19.9	28	1926	1:69

SM/RR Trans.: San Marcos/Round Rock Transition

Table 8.3-6: 41WM57 Artifact Totals by Component

Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool Debitage
SM/RR Trans.	12.2	33	2509	1:77
Round Rock	2.6	31	1533	1:49
Clear Fork	3.4	12	587	1:49
San Geronimo	1.7	24	1021	1:42
Totals	19.9			

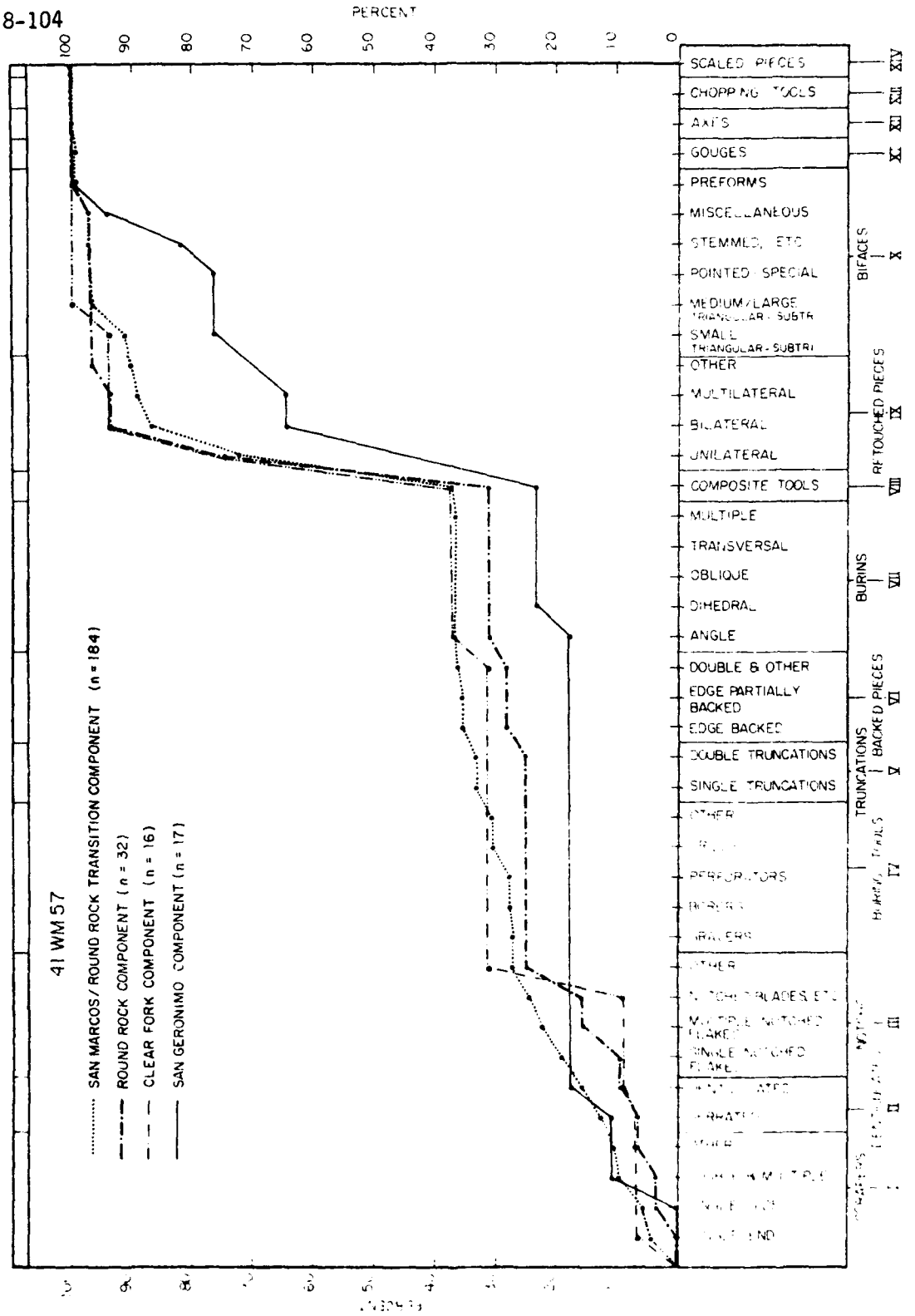


Figure 8.3-12. Cumulative Graph of Lithic Tools: Site 41WM57

were not examined at site 41WM57, the homogeneity of the material recovered from areas peripheral to the middens themselves suggests that all three middens are the result of Middle to Late Archaic occupation of the site. Structurally, Middens 1 and 3 are very similar, for both contained pit hearths extending beneath their respective midden zones. The disturbed nature of Midden 2 precluded an examination of its structure.

Intra-site variability at site 41WM57 is most notable when comparisons of the middens proper are made with the amorphous accumulation of burned rocks surrounding them. Excavations of Midden 3 revealed densities of lithic tools and debitage which are consistant with the several units which sampled the amorphous burned rock accumulation. More noteworthy, perhaps, are the structural differences exhibited by isolated features within each area. Pit heaths were observed only within the middens proper, while less formal hearths (circular clusters of burned rock) were recognized either beneath the midden zone or at the periphery of the burned rock accumulation. This structural difference, together with the differential densities of tools and debitage may reflect activity differences within the site. Although the exact activity associated with the middens remains unknown, the hypothesis that they served as specialized cooking or processing areas is certainly more justified than the hypothesis that they served as centralized disposal areas.

The midden accumulations at site 41WM57 are particularly interesting when one realizes that the Hawes Site (41WM56), which is less than 200 meters distant, contains a massive burned rock accumulation but no mounds. A similar temporal span is evident at the Hawes Site except that the Round Rock component is significantly less well represented. It could be argued that the lack of mounds at the Hawes Site is the direct result of the less intensive utilization of the site during the Round Rock Phase. In other words, the mounds denote a specialized behavioral process which is temporally limited. It is recognized that the accumulation of burned rock middens is primarily associated with the Round Rock Phase (Weir 1976). Such a view, however, provides an overly simplistic explanatory framework for such intersite differences. Since the Round Rock Phase is represented at both sites, it is more plausible to postulate that the mounds at site 41WM57 are the result of seasonally specific utilizations (the parching of acorns?) of the immediate area. The better drainage of site 41WM57 and its greater accessibility to the upland slopes may have enhanced its potential as an intensive, seasonal collecting and processing site.

Unfortunately, the distrubed nature of much of the site context prevents an understanding of the relationship of the Twin Sisters phase remains to the burned rock accumulation. Any attempt to explain the temporal variability of the utilization of site 41WM57 is extremely hampered. Sorrow's (1973:59) original conclusion that the site was

not sufficiently intact to warrant further investigation was correct in many respects, for only a limited tool and debitage assemblage can be assigned to a known culture/time stratigraphic unit. Furthermore, the lack of radiocarbon samples renders any assessment of the contemporaneity of the various areas of the site an extremely speculative exercise. Nevertheless, as Shafer (1976:6) later assessed site 41WM57, it does provide a limited set of data which, when combined with that of the Hawes Site (41WM56) and site 41WM73, does contribute to our knowledge of intersite variability within the San Gabriel River drainage.

8.4 Site 41WM73

Site Situation

Site 41WM73 (Fig. 8.0-1), a large burned rock midden, is located 1.4 kilometers upstream from Hunt Crossing on the North Fork of the San Gabriel River. Like many of the burned rock middens in this area, it is situated at the base of the upland slope. The river channel is approximately 115 meters southeast of the midden (Fig. 8.4-1). Juniper trees and various grasses are the predominant vegetation of the terrace area while oak and elm trees occupy the upland slope. Intermittent streams presently dissect the terrace on both sides of the site area.

Prior Investigations

This site was initially recorded in 1963 (Shafer and Corbin 1965: 25) and subsequently tested in 1968 (Sorrow 1973: 36-40). Four five-foot square excavation units and two backhoe trenches were dug (Fig.8.4-1). Diagnostic artifacts of the Middle and Late Archaic periods were found associated with the dense accumulation of burned rock. The undisturbed nature of this burned rock midden made it particularly desirable for extensive excavations.

Excavation Methodolgoy

Fortunately, the site remained undisturbed, except for one small ptohole, until excavation was begun in the Spring of 1978. Although the site had been tested, exploratory backhoe trenches were utilized to examine the structure of themidden more fully and to define the limits of the buried lens of cultural material surrounding the midden itself. Trenches 1 and 2 demonstrated that the cultural material was quite sparse outside the limits of the midden (Fig.8.4-1). Cultural material is present in an 1,800 square meter area at site 41WM73; however, the burned rock midden occupies only 320 square meters. The midden, itself, was apparently the focal point of activiity for no features were encountered in any of the trenches outside the midden area. Lithic debris was recovered form Trenches 2B, 2C, 2D, and 3C; however, the small quantities (10) recovered from each trench did not warrant further investigation. Only in the area of Trench 3D did the amount of cultural materials suggest that controlled excavation would be productive.

Initially, the research goals for site 41WM73 had focused upon the occupation surface peripheral to the midden. The isolation of cultural features and activity loci within this area were primary research objectives.

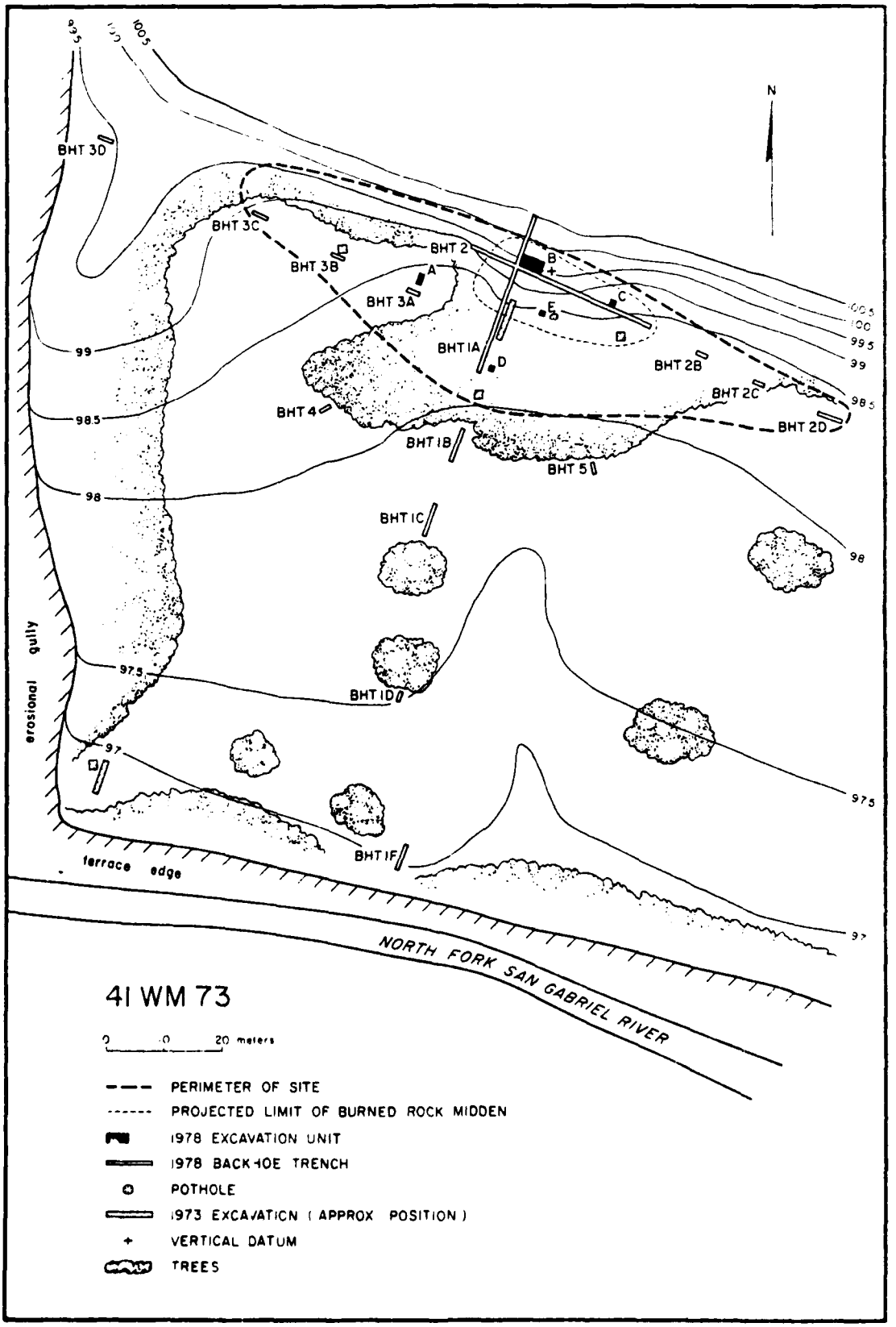

N
BHT 3D
BHT 3C
BHT 3B
BHT 3A
BHT 2
BHT 1A
BHT 2B
BHT 2C
BHT 2D
BHT 4
BHT 1B
BHT 5
BHT 1C
BHT 1D
BHT 1F
A
B
C
D
E
99.5
100
99.5
99
98.5
98
97.5
97
erosional gully
terrace edge
NORTH FORK SAN GABRIEL RIVER
41 WM 73
0 10 20 meters
PERIMETER OF SITE
PROJECTED LIMIT OF BURNED ROCK MIDDEN
1978 EXCAVATION UNIT
1978 BACKHOE TRENCH
POTHOLE
1973 EXCAVATION (APPROX POSITION)
VERTICAL DATUM
TREES

Figure 8.4-1.

Unfortunately, the backhoe trenches indicated that such goals would not be readily attained. Consequently, only two areas to the south and west of the midden were sampled by means of controlled excavation units (Fig. 8.4-1).

Instead, attention was directed to the midden itself, and the Early Archaic material beneath the midden zone. Three areas of the midden were initially investigated (Fig.8.4-1). Area B was tested because it exhibited the greatest accumulation of midden debris and the presence of an earlier component beneath the midden. Areas C and E, on the other hand, provided a sample of the outer regions of the midden where the accumulation of burned rock was not so great. Due to time structures and the lack of the earlier component elsewhere, Area B was the only area within the midden to be expanded. After digging the initial 1 x 2 meter unit in Area B to a depth of one meter and recognizing the paucity of artifacts and recognizable features, it was decided that a broader horizontal plan view of the lower components of the site would likely be more productive than any further excavation of the upper midden zone. In order to implement this decision, the upper nine levels of six adjacent 1 x 1 meter of cultural deposits lay under the major midden zone. Intact cultural features were also detected within these deposits.

The only other excavation unit to be expanded was Area A to the west of the midden. In the original 1 x 1 m square unit, a significant number of tools and debitage was recovered. Unfortunately, no diagnostic artifacts were present to help correlate the occupations represented with those of the midden. The stratigraphy, alone, in this area of the site would not allow a very strong correlation; consequently, an additonal unit was excavated with the hope that it would yield temporal data.

These excavation units were placed accoring to an arbitrary grid established for north-south and east-west baselines parallel to backhoe Trenches 1 and 2, respectively. Since the trees on the site had affected the placement of the backhoe trenches, the grid was oriented 340^{0} W of N rather than true north. The minimum unit of horizontal spatial control within the excavation units was the 50 cm quadrangle. Vertical control was maintained by reference to an arbitrary benchmark (100.0 meters) established on the knot of a tree standing on the east-west baseline of the grid system.

Stratigraphy

The stratigraphic profile (Figs. 8.4-2,3) of site 41WM73 is dominated by a massive accumulation of burned rock. Surprisingly, the delineation of the midden was not overly difficult within a colluvial situation. The upslope boundary of the culturally derived burned limestone was clearly distinguishable from the natural limestone colluvium. The only point where the boundary was unclear was at the western end of the

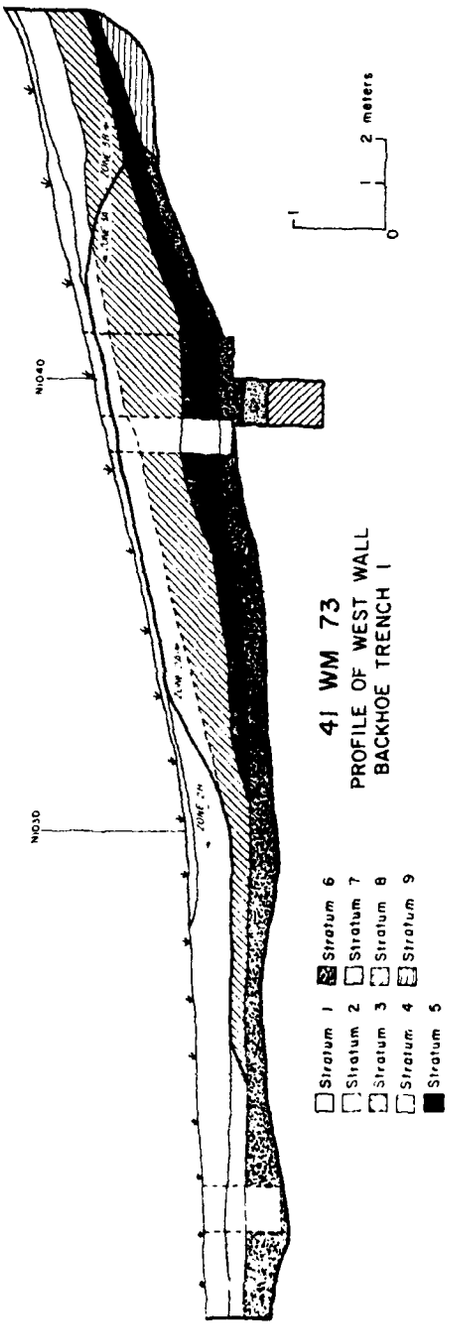

N1040
N1030
0
1
2 meters
41 WM 73
PROFILE OF WEST WALL
BACKHOE TRENCH 1
Stratum 1
Stratum 2
Stratum 3
Stratum 4
Stratum 5
Stratum 6
Stratum 7
Stratum 8
Stratum 9

Figure 8.4-2.

midden. The profile of backhoe Trench 2 demonstrates that the east-west axis of the midden is approximately 30 meters in length. The shorter north-south axis is only 16 meters. The midden, displaying a typical dome-shaped structure characteristic of Central Texas middens, varies from 1 meter in depth at its center to 10 cm in depth at its eastern extremity. Like site 41WM304, this accumulation of burned rock occurs upon a surface with an 8-10 percent slope.

The stratigraphic profile of site 41WM73 reflects the presence of two microenvironmental zones: (1) the upland slope with a dense overstory vegetation and a high density of colluvial material and (2) the flat alluvial terrace with a possibly more open grassland vegetation. The resulting stratigraphic profile is as follows:

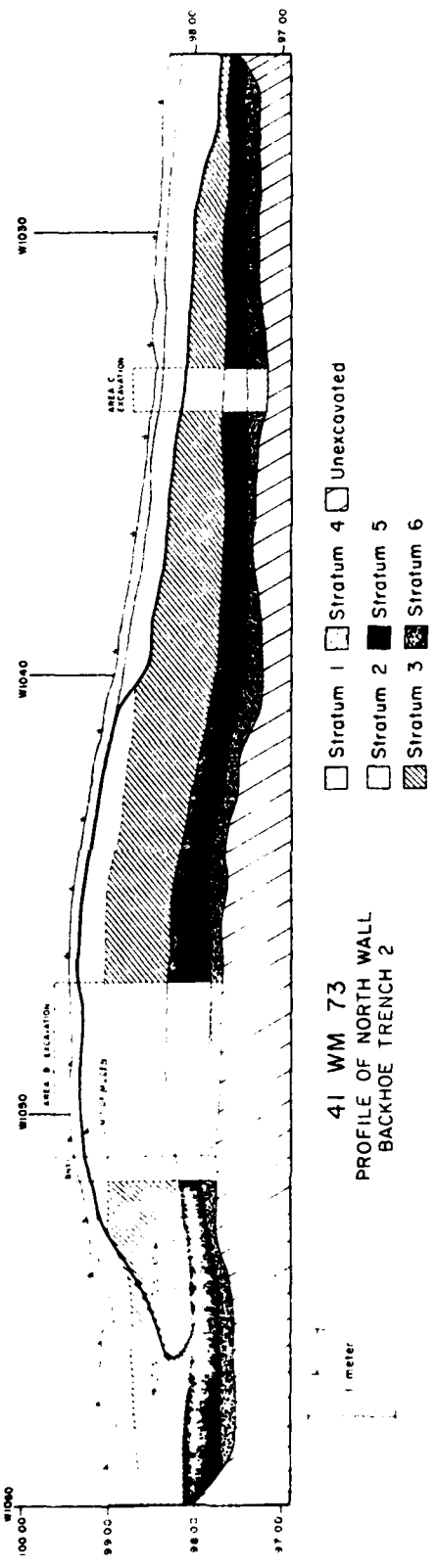
Stratum 1: This stratum is a very dark gray (5YR 3/1) humic enriched loam deposit. The humic content is derived from the decay of forest litter on the steep upland slope. This stratum either disappears or is obscured by the organic zone of the terrace soil profile. This zone contains relatively few pieces of colluvial limestone.

Stratum 2: This stratum is a black (5YR 2/1), humic stained loam with numerous inclusions of colluvial derived limestone spalls. Zone 2a on the upslope side of the midden exhibits a very high density of colluvial limestone fragments which are two to five cm. in breadth. Downslope from the midden, stratum 2B also exhibits colluvial limestone fragments, but they are smaller and less frequent. Stratum 2b is the "A" horizon of the terrace soil pr file. the midden, itself, does not interrupt stratum 2, for the sediment structure and color remains the same throughout this continuous zone. Tree roots are profuse throughout this entire stratum.

Stratum 3: Stratum 3a comprises the major portion of the burned rock midden. This zone is essentially a mass of burned limestone rock (5-20 cm in breadth) interspersed with a very dark gray (10YR 3/1), fine grained loam. Tree roots are still present, but they are much smaller. Artifacts and some bone fragments are also present. On the upslope side of the midden, stratum 3b consists of colluvial limestone fragments rather than burned limestone. The same powdery, loam matrix is present; however, it is darker colored (10YR 3/2 - very dark grayish brown). Artifacts were not noticed in this portion of stratum 3.

Stratum 4: This stratum is a very dark grayish brown (10YR 3/2) clayey loam with some colluvial limestone inclusions. Most of the colluvial gravels are two to three cm in breadth, although a few larger fragments (5-15 cm) are present. The southern extension of the burned rock midden interfaces with this zone. A sparse scatter of burned rock is present in the interface area. Artifacts are most numerous within the stratum of the terrace proper.

Stratum 5: This matrix is a brown (10YR 4/3), powdery, clayey loam with inclusions of burned limestone and colluvial gravels (1-3 cm in breadth).



41 WM 73
PROFILE OF NORTH WALL
BACKHOE TRENCH 2

Figure 8.4-3.

The burned limestone fragments are less dense than in stratum 3a. Snail shells, charcoal flecking, and burned earth are noticeably more abundant within this stratum. Stratum 5 is also the major artifact zone. As one moves downslope onto the terrace and eastward along backhoe Trench 2, this stratum becomes more compact and contains fewer artifacts.

Stratum 6: The yellowish brown (10YR 5/4) clayey loam of this stratum is very compact. Colluvial gravels (3-5 cm in breadth) are present on the slope and significantly diminish in number as one moves southward down the terrace. Artifact density within this stratum is highest in the area immediately beneath the burned rock midden.

Stratum 7: The dark yellowish brown (10YR 4/4) clayey matrix in this stratum is very similar to that of stratum 6. Colluvial limestone gravels (1-3 cm in breadth) are still present. Although charcoal flecking is present, the amount of lithic artifacts and faunal material diminishes significantly.

Stratum 8: This stratum is a highly compacted, yellowish brown (10YR 5/6), clayey loam. The sub-angular limestone fragments (1-3 cm in breadth) comprise a larger percentage of the matrix than that of the two strata immediately above it.

Stratum 9: This stratum is a mixture of colluvial limestone gravels 3-15 cm in breadth) and deteriorated limestone. This brownish yellow (10YR 6/6) matrix lies above the limestone bedrock which forms the upland slope.

The stratigraphic profile (Fig.8.4-2, 3) described above is a generalized depiction of the strata as they were viewed in backhoe Trenches 1 and 2 and in excavation unit 1040N/1051/W. The subsequent excavation of Area B demonstrated that the strata interfaces were not always as consistent or distinct as the generalized profile depicted them. The profile of the north and east walls of Area B (Fig.8.4-4) demonstrated that the base of the major accumulation of burned rock is quite irregular.

This irregularity is due to both cultural and natural processes. The depression in the east wall is directly associated with the presence of Feature 2, a dug pit, in units 1040N/1048W and 1041N/1048W. The irregularity in the north wall is not so easily explained, however. Whether the depression is a cultural or erosional feature is an enigmatic matter. The first impression was that the eastern limit of the depression, an abrupt contract between the matrices of strata 3a and 5, might represent cultural rather than erosional processes. A more careful examination of the matrix in this area, however, indicated that a rodent disturbance had contributed to this impression. Although the matrices were intermixed in this area, it appeared that the eastern extremity of the depression was a more gradual slope and less well defined than originally thought.

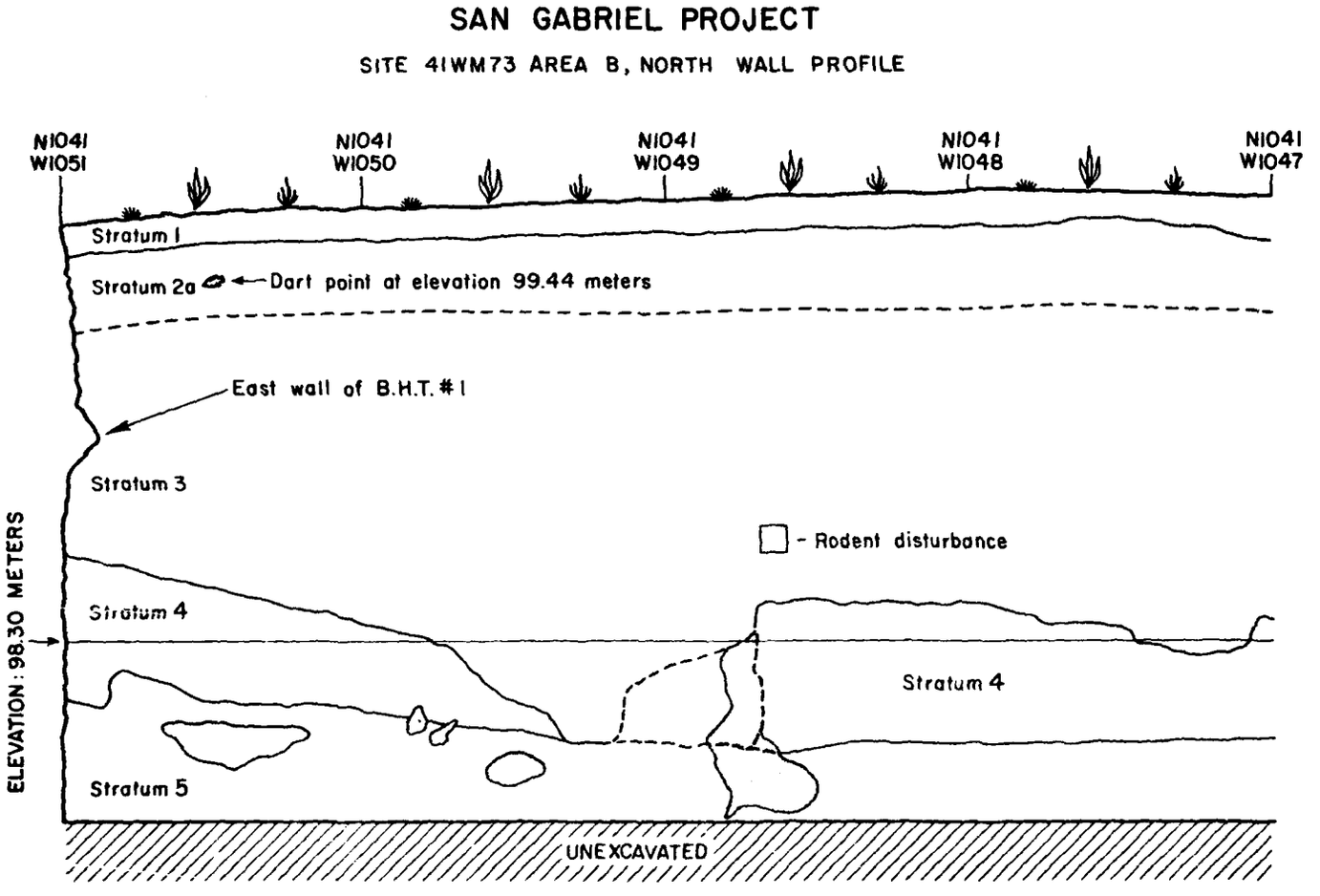


Figure 8.4-4. Profile of North and East Walls of Area B, Site 41WM73

The western slope of the depression was more readily recognized as a possible erosional feature. The boundary between strata 3a and 5 was less distinct in this area. The darker color of the matrix and the apparent higher density of burned rock were the only evidence of a disconformity. The gradual slope of the base of stratum 3a toward the deepest portion of the depression suggests the presence of a natural feature. The presence of mottled fill in a linear-shaped depression extending southward 1.5 meters and downslope through excavation units 1041N/1050W and 1040N/1050W also denotes an erosional feature. Unfortunately, only a portion of this stratigraphic disconformity was exposed. Although the evidence more strongly supports erosional forces as the cause of this depression, the processual sequence may ahve been more complex. Perhaps this depression was originally like that of Feature 2 and was subsequently partially obscured by cultural and/or natural forces. Whatever the cause, the possibility that cultural debris of several occupational episodes is intermixed within the immediate area of this depression had to be considered during the analytical stage of the project.

Culture/Time stratigraphic Units

As with the other sites, the large number of arbitrary excavation levels was reduced to a more manageable number of culture/time stratigraphic units. The vertical distribution of the projectile points and the stratigraphy within each excavation unit contributed to the designation of these units. Unfortunatley, sufficient radiocarbon samples were not obtained so that an absolute chronological framework could be developed.

The projectile points from site 41WM73 indicate that the site was utilized from the early Clear Fork phase to the San Marcos phase (Table 8.4-1). From the excavation of the central midden area, however, it is apparent that the major accumulation of burned rock was produced during the Round Rock phase. Diagnostic artifacts of the San Marcos phase are found only in the peripheral units.

Due to the cultural and natural site formation processes discussed earlier, the stratigraphic break between the Round Rock and Clear Fork occupation is not very clear. In levels 14-17 the density of burned rock decreases, the sediments are more clayey, and diagnostics of the Round Rock and Clear Fork phases are intermixed. The intermixing of the projectile points is only partially explained by the postualted erosional feature within these levels. When the units directly associated with this feature are discounted, the intermixing of the diagnostic artifacts remains. Therefore, it is not unreasonable to assume that these four levels likely represent a transitional Round Rock/Clear Fork phase prior to the major accumulation of the midden during the Round Rock phase.

Within stratum 6 beneath this transition zone, a Clear Fork phase occupation is indicated by the presence of Bulverde, Nolan, and Group 2 (Chapter 14.1) points. A small charcoal sample collected from this

Table 8.4-1. Projectile Point Distribution, 41WM73.

	AREA A								AREA B																					AREA C										AREA E								
	San Marcos					Round Rock			Round Rock													Round Rock/ Clear Fork*				Clear Fork			Round Rock									Clear Fork	San Marcos		Round Rock						
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	BHT
Ensor					1																																									
Montell																																						1								
Castroville				1																								1																		2
Marshall														1																																
Pedernales								1						1	1			4	1	1			1		4						1		1								1				1	3
Bulverde																							1	1	2	1																				1
Bulverde-like																											1										1								
Travis																							1														1								1
Nolan																						1				1	1																		
Group 2																											1																		
Group 4																				1	1	1																							
Group 7																									1																				
Unidentified							1		1									1		1	1		3		1				1																12

*See text for discussion of stratigraphic relationships.

stratum provided a date of 5285 ± 725 B.P. (UGa-2482). The large sigma value of this sample significantly lessens the value of this date. Nevertheless, this initial occupation of the site likely took place during the early fifth millenium B.P.

The initial occupations of the site during the Clear Fork phase are limited to a smaller area than the subsequent Round Rock phase occupations. The Round Rock phase is represented within the midden accumulation in all excavation units. The intensity and perhaps the function of the occupation of site 41WM73 changed dramatically between these occupational phases. Interestingly, the intensity of this occupation again changed abruptly at the end of the Round Rock phase occupations. The San Marcos phase is only minimally represented. Unfortunately, sufficient charcoal was not recovered to date these occupational changes at site 41WM73.

Features

Although the research objective of isolating activity areas peripheral to the mound of burned rock was not realized at site 41WM73, two features were uncovered within the central portion of the midden (Area B). The lack of features in the area peripheral to the mound may be due to sampling error; however, this is unlikely given the relative lack of occupational debris within this area. The mound, itself, was the focal point of activity at site 41WM73. Like the other burned rock middens examined in the 1978 excavations, features were not recognized within the massive accumulation of burned rock itself, but rather at the base of the midden zone. Nevertheless, the two features provide some insight into the cultural processes involved in midden accumulation.

Feature 1 is located at the very base of Stratum 3a in units N1041/W1051 and N1040/W1051. The feature (Fig.8.4-5) consists of two concentrations of ash associated with the scattered burned rock and mottled matrix of the possible erosional feature discussed earlier. The larger concentration of ash (1400 cm^2) is 10 centimeters deep and exhibits an irregular basin shape with a lens of burned earth beneath it. The burned lens is only one to two cm in depth. One large core and several flakes were found within the larger ash concentration. Several small burned rocks were beneath the ash lens, but they were scattered and exhibited no apparent pattern of special relationship to the ash lens. The smaller concentration of ash (288 cm^2) is separate from the larger and is amorphous. This pocket of ash does not have an associated lens of burned earth; therefore, it is likely derived from the larger concentration.

Although several pieces of lithic debitage (Table 8.4-2) were directly associated with the ash concentrations, diagnostic projectile points were only indirectly associated within the midden fill surrounding Feature 1. Three complete projectile points (Bulverde, Travis, and Pedernales) and the stem from another (Bulverde) were recovered from Stratum 3a matrix (Level 15) within a meter of Feature 1. According to the presently accepted

Figure 8.4-5

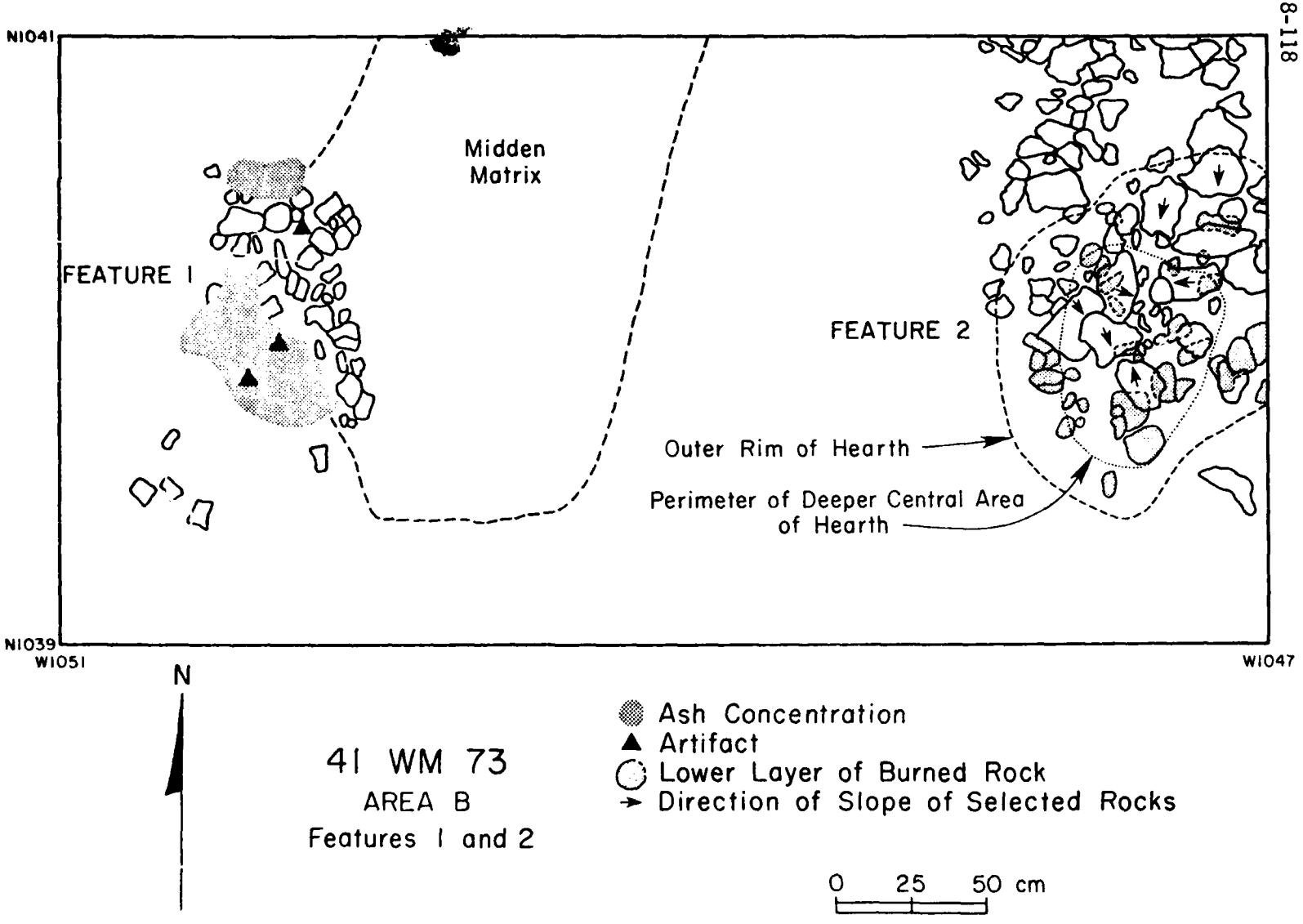

N1041
N1039
W1051
W1047
Midden
Matrix
FEATURE 1
FEATURE 2
Outer Rim of Hearth
Perimeter of Deeper Central Area
of Hearth
N
41 WM 73
AREA B
Features 1 and 2
Ash Concentration
Artifact
Lower Layer of Burned Rock
Direction of Slope of Selected Rocks
0 25 50 cm

Table 8.4-2. Lithic Material Associated with Features 1 and 2, Site 41WM73

LITHIC REMAINS	FEATURE 1	FEATURE 2		
		15	16	17
Secondary Flakes (>50% cortex)	1	1	1	2
Secondary Flakes (<50% cortex)	3	3	4	7
Tertiary Flakes	24(3)	15	14	31(2)
Micro-flakes	6(1)	3	9(1)	8
Biface Thinning Flakes	2	-	1	1
Chunks	1	-	-	-
Chips	20(1)	29(3)	22(2)	18(1)
Core	1	-	-	-
Blade Fragments	-	2	-	-
Projectile Points	-	2	-	-

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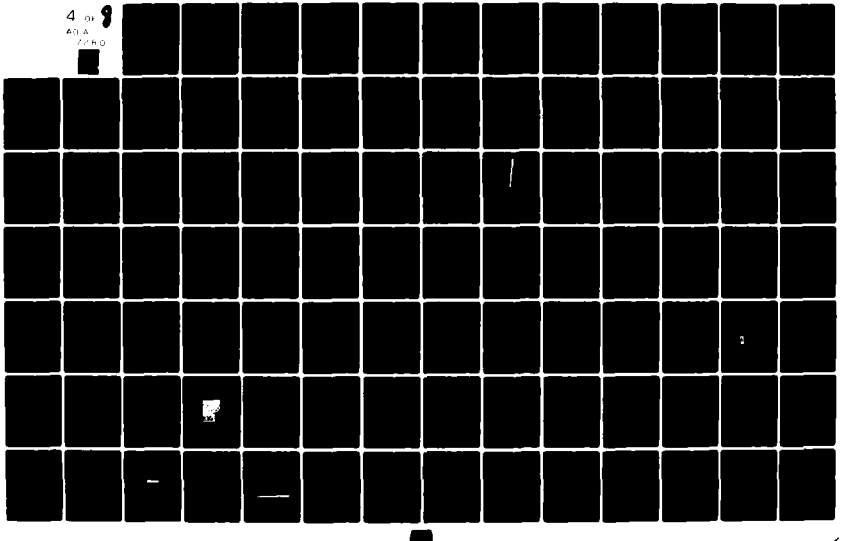
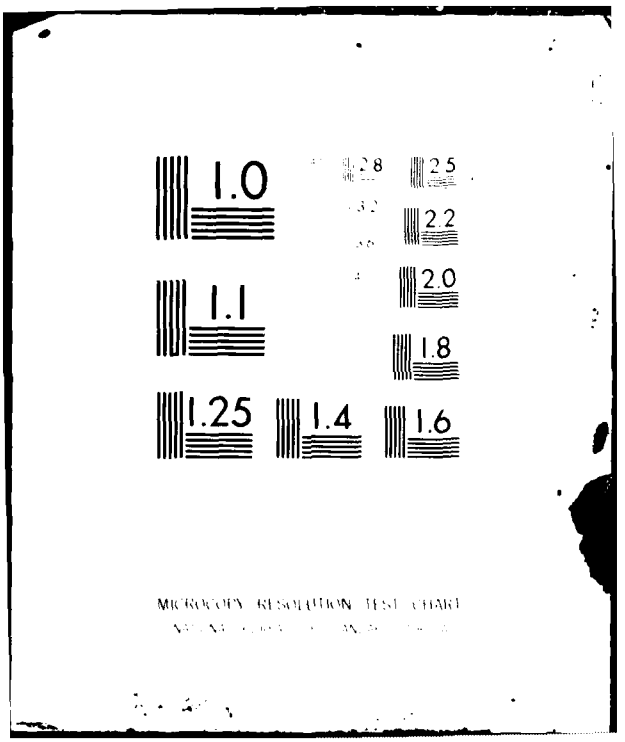



1.0
1.1
1.25
1.4
1.6
2.0
2.2
2.5
MICROCOPY RESOLUTION TEST CHART

chronological scheme for Central Texas, these projectile points suggest that the major accumulation of burned rock was initiated during the Clear Fork-Round Rock transition (4000 B.P.). As expected for Central Texas, the formation of the midden at 41WM73 occurred primarily within the Round Rock phase.

The stratigraphic contect of Feature 1 suggests that it is the result of one of the earliest occupational episodes contributing to the midden accumulation. Both concentrations are bounded on the west by the matrix of Stratum 5. However, the darker matrix and burned rock of Stratum 3a is directly associated with the concentrations and the depression noted in excavation units N1040/W1050 and N1041/W1050. Whatever the cause of this depression, it appears that Feature 1 is the product of a small intense fire built along the edge of the depression. This fire may have served to heat rocks for utilization within a larger cooking pit.

Feature 2, located in units N1040/W1048 and N1041/W1048, is situated in the same stratigraphic position (at the interface of strata 3a and 5) as Feature 1. Feature 2, hoever, is a pit which had been dug into the lighter colored matrix of Stratum 5. Irregular in form, the pit (Fig. 8.4-6) is 90 cm in breadth along its N-S axis and approximately 120 cm across its E-W axis. At its deepest point the pit is 47 cm in depth. Except for the northeastern portion of the pit, the pit walls slope sharply to the deepest point within the feature.

The upper level of the feature was recognizable due to the concentration of a number of unusually large (12-20 cm) burned rocks. The varied vertical inclinations of these rocks also suggested the presence of a depression or pit. Removal of the matrix around these large burned rocks demonstrated that the dark colored loam of Stratum 3a continued downward only within the immediate area of this concentration. A cross-section (Fig.8.4-6) of the pit showed that burned rocks were present throughout the pit fill; however, they were generally much smaller (5-8 cm) than those found in the uppermost level. Although no lens of burned earth lined this feature, the fire that might have been built within the pit was not necessarily hot enough to produce such a phenomenon. Utilization of the pit as an earth oven is not unlikely. Unfortunately, whether it was used to cook a vegetable or animal resource is unknown. The small numbers of specimens of heat spalled flint within the feature fill (Table 8.4-2) indicates that the pit was probably utilized secondarily as a refuse pit.

Although the structure of these two features suggests differing functions, the associated lithic debitage and tools with each is remarkably similar. It appears that such materials were introduced into the features following their primary utilization. The limited number of heat-altered pieces within these featuers supports such a conclusion. It is, therefore, unlikely that any of the associated lithic materials are directly related to the function of the features.

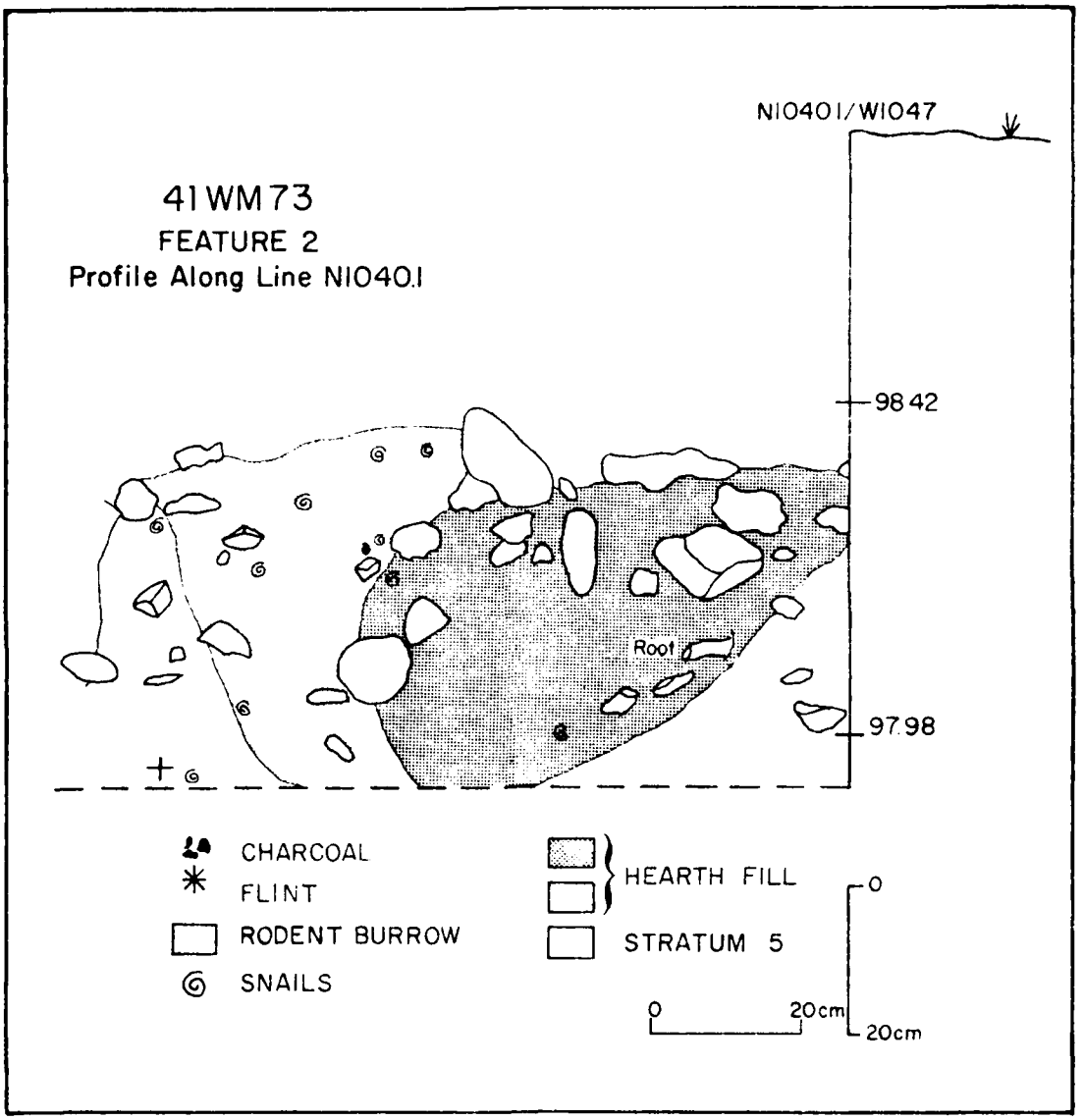

N1040I/W1047
41WM73
FEATURE 2
Profile Along Line N1040.I
98.42
97.98
Root
CHARCOAL
FLINT
RODENT BURROW
SNAILS
HEARTH FILL
STRATUM 5
0
20cm
0
20cm

Figure 8.4-6.

Unfortunately, the relationship of these features to the massive accumulation of burned rock is not clear. The mound of burned rock is actually the major feature of the site. It seems likely that the accumulation of burned rock is the by-product of features similar to these isolated at the base of the midden. Similar features were also revealed at the base of Midden 3 at site 41WM57. Of particular interest at both of these sites is the presence of charred acorn remains. Both of the features at site 41WM73 contain the remains of acorns. Feature 2, the larger pit structure, exhibits the greatest quantity of charred acorn remains of any feature encountered in either reservoir. Although these two features are associated with the base of the midden zone, the distribution of acorn remains (Chapter 15.2) at site 41WM73 is almost entirely limited to the strata below the main midden accumulation. However, this distribution of floral remains is likely related to preservation factors rather than the presence or absence of the floral resources within the systemic context. The midden zone lacks the clay content of the lower strata; consequently, preservation of floral remains would be expected to vary significantly. Therefore, it seems reasonable to suggest that the midden accumulation may be the result of numerous episodes of acorn parching. Earth ovens, similar to Feature 2, were constructed and lined with hot rocks so that the acorns might be parched. The large quantities of fire-cracked rock eventually formed the structureless jumble encountered during excavation.

Lithic Tools

A total of 392 lithic tools was analysed from site 41WM73 (Table 8.4-3): San Marcos component with a total of 30 tools; Round rock component with 189 tools; the Round Rock/Clear Fork transition assemblage with 112 tools; the Clear Fork component with 39 tools. Eighteen tools were collected from undatable and mixed context, four tools came from the surface.

The San Marcos component is weakly represented, with few tools identified (Table 8.4-4). The scraper and notched pieces were both unidentifiable fragments, and do not show in the cumulative diagrams. Of interest is the presence of a gouge in this assemblage. Also, there are more bilaterally retouched pieces than unilaterally retouched pieces, also rather unusual.

The Round Rock phase is best represented at [illegible]te, and also shows the largest variety in tool types. Scrapers, [illegible]ulated pieces and notches are relatively well represented, burins, [illegible]cations and backed pieces are not. Interesting to note also is that this cultural component yielded only one complete biface, a deeply patinated unique subtype.

The levels containing the Round Rock/Clear Fork transition component are fairly dense, with a relatively large amount of notched pieces and

Table 8.4-3. Tool Classes, 41WM73

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT	COMPONENT TOTAL	COMPONENT
San Marcos	A	1	1		2						2									5				
		2				1					1		3							5				
		3									2		3							5				
		4					1		1		1		1	1						5				
		5									3		1	1	1					6	26	65.00		
	E	1									1		1	2						4				
		2																		-	4	23.53	30	7.65
Round Rock	A	6			1						1		2							4				
		7									2		1	1						4				
		8											1	2						3				
		9		1																1				
		10											2							2	14	35.00		
	B	1	1		4						7		5	4						21				
		2									1		1	1				1		4				
		3											1							1				
		4				1					1		1							3				
		5									1	1	1							3				
		6									2		1	2						5				
		7									1		1	1						3				
		8									1									1				
		9			1								1							2				
		10		1	1						4		1	5						12				
		11		1	2						2		6	1						12				
		12		1							10		1	2	1	1				16				
		13			1						9		6	2						18				
		14	1						1		4		1							7	108	40.30		
	C	1											4							4				
		2			1						2		2	1						6				
		3			1						4		4	1						10				
		4	1										8	1						10				
		5									1		3	1						5				
		6	1	2							1			1						5				
		7											1							1				
		8																		-				
		9	1								3		2							6	47	87.04		

Table 8.4-3. Tool Classes, 41WM73 (continued)

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
Round	D	1											1							1				
Rock		2	1								1									2				
(Cont.)		3									2		1							3	7	12.96		
		4			1															1				
	E	3											1							1				
		4												1						1				
		5																		-				
		6				1														1				
		7	1					1												2				
		8									1		2	1						4				
		9											3							3				
		10																		-				
		11					1													1				
		12																		-	13	76.47	189	48.21
RR/CF	B	13			1						4			1						6				
Transi-		14	2		1						6	1	3	2		1				16				
tion		15			3				1		2		3	5						14				
		16		2	2						11		16	2						33				
		17	1		1	1		1			12	2	16	9						43	112	41.79	112	28.57
Clear	B	18		1	1						4		9	2						17				
Fork		19	2	1	1						2		4	3						13				
		20									1									1				
		21																		-				
		22																		-				
		23																		-				
		24	1																	1	32	11.94		
	C	10									1		4	1						6				
		11																		-				
		12																		-				
		13									1									1	7	12.96	39	9.95
Unknown	D	5											1							1				
		6									1									1				
		7																		-				
		8																		-	2	22.22	2	.51
Mixed	B	13									1			1					1	3				
		14											5							5				
		15									5	1	2							8	16	5.97	16	4.08

Table 8.4-3. Tool Classes, 41WM73 (continued)

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT	COMPONENT TOTAL	COMPONENT
S αBHT											2		2							4	-	-	4	1.02
TOTAL			14	10	25	4	2	2	3	-	124	5	139	58	2	2	-	1	1	392	392	-	392	99.99
%			3.57	2.55	6.38	1.02	.51	.51	.77	-	31.63	1.28	35.46	14.80	.51	.51	-	.26	.26	100.00				
Restr. Total																				129				
%			10.85	7.75	19.38	3.10	1.55	1.55	2.33	-		3.88		44.96	1.55	1.55	-	.78	.78	100.00				

NOTE: Levels 13 through 17 for area B have been "noted" 3 times, according to the 3 different cultural components within those levels in this area of the site.

Table 8.4-4: 41WM73 Tool & Debitage Ratios by Area.

Area	Component	Excavated Volume m^3	Tool/ Density N/m^3	Debitage Density N/m^3	Tool/ Debitage Ratio
A	San Marcos	1.0	26	2807	1:108
	Round Rock	.9	15	1858	1:119
	Total area	*1.9*	*21*	*2357*	*1:112*
B	Round Rock	5.0	22	931	1:43
	RR/CF trans.	2.5	45	2646	1:59
	Clear Fork	2.6	12	972	1:79
	Mixed	.7	23	2288	1:100
	Total area	*10.8*	*25*	*1426*	*1:57*
C	Round Rock	1.4	34	2097	1:62
	Clear Fork	.4	18	1153	1:66
	Total area	*1.8*	*30*	*1888*	*1:63*
D	Round Rock	.4	18	988	1:56
	Unknown	.4	5	240	1:48
	Total area	*.8*	*11*	*614*	*1:55*
E	San Marcos	.2	20	650	1:33
	Round Rock	1.0	13	993	1:76
	Total area	*1.2*	*14*	*936*	*1:66*
	Total site	16.5	24	1508	1:64

Table 8.4-5: 41WM73 Tool & Debitage Ratios by Cultural Component.

	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tools/ Debitage Ratio
San Marcos	1.2	25	2447.50	1:98
Round Rock	8.7	22	1224.25	1:56
RR/CF Trans.	2.5	45	2646.00	1:59
Clear Fork	3.0	13	996.00	1:77
Unknown/mixed	1.1	16	1543.64	1:94
Total	16.5			

more complete bifaces than anywhere else on the site. The Clear Fork component is fairly dense in its upper levels of area B, but thins out rapidly. This component is poorly represented. This is also reflected in the very low tool and debitage densities at the site. Overall the site has a relatively low to medium lithic density (Table 8.4-5). with the densest area in the northern part of the site (i.e. Area B and A during transition and later periods).

The cumulative diagram (Fig. 8.4-7) reinforces the above conclusions. There is little diversity in tool types, and many of the tools are biface fragments (not included on the diagrams), retouched pieces, and other unidentified tool types. For some curves (San Marcos and Clear Fork) it is clear that their differences are due to the smallness of the sample.

Statistical analyses of the measurements of the tools can be found in the Appendix H-3. The other measurements analyses were incorporated with the results of the North Fork Reservoir (Appendix H-4).

Site Summary

Although the original research objective of examining the occupational areas peripheral to the burned rock midden was not realized, it was determined that site 41WM73 was the focal point of intensive and, perhaps, functionally specific utilization for most of the Archaic period. A radiometric date from charcoal collected from Level 19 within Area B, indicates that the site was initially occupied during the Clear Fork Phase. The large sigma value for this date of 5285 + 725 B.P. (UGa-2482) is disturbing; nevertheless, the associated projectile points (Table 8.4-1) indicate that the site was also occupied during the Round Rock and San Marcos Phases. Unfortunately, charcoal samples sufficient for dating were not recovered within the upper levels.

The deposition of burned rock is clearly evident during the initial Clear Fork occupation of the site; however, the initial levels of the eventual mound of burned rock were not deposited until later during the Clear Fork/Round Rock transition. The distribution of projectile points within the site clearly demonstrates that the output of burned rock was a major by-product of the occupants' activities during the Round Rock and San Marcos Phases. It is unlikely that the mound of burned rock at site 41WM73 represents a dump or secondary refuse area as has been proposed by Sorrow (1969). The lack of features and associated occupational debris in the area surrounding the mound proper suggests that the mound was the primary activity area. Fullington's interpretation of the molluscan

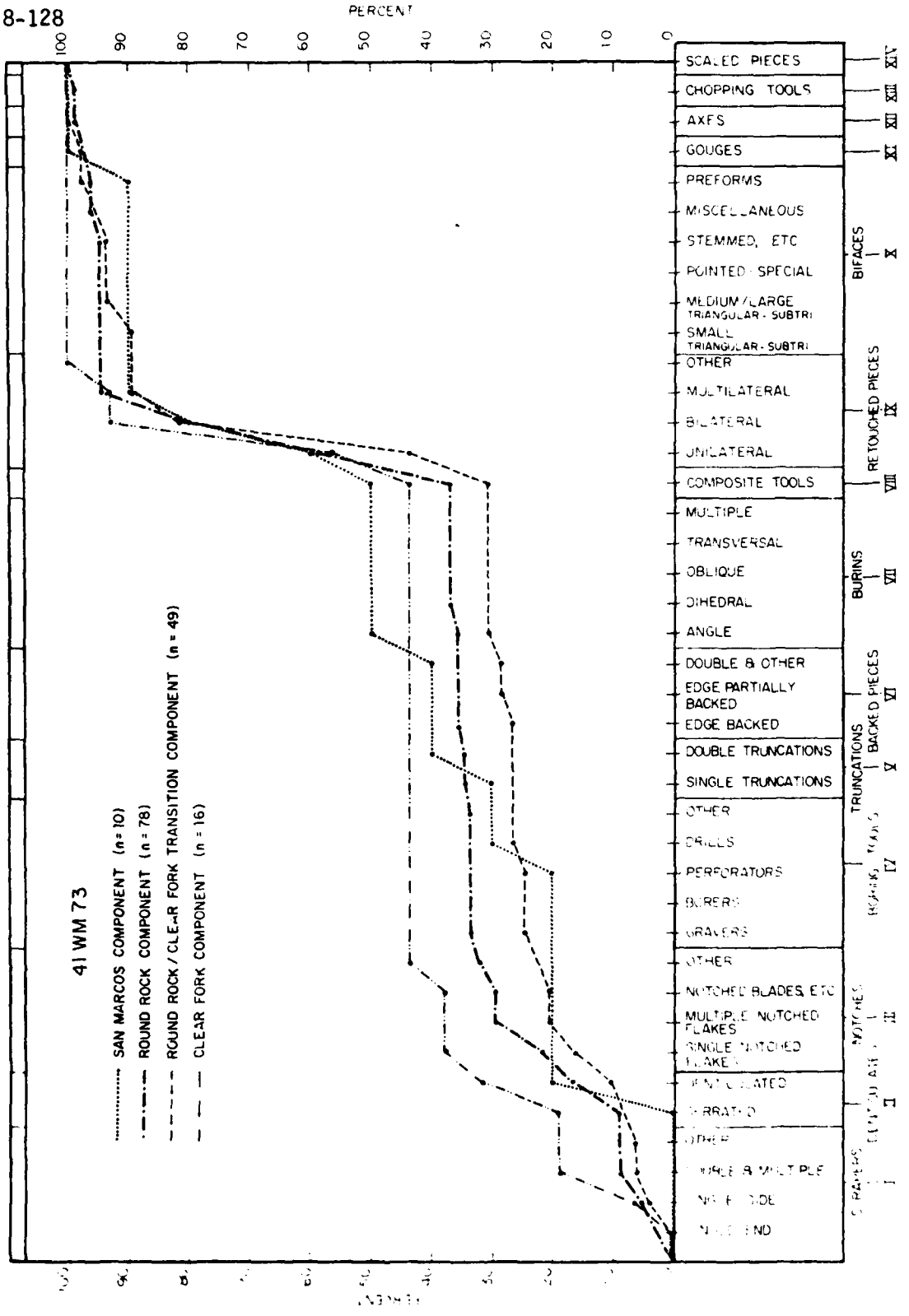


Figure 8.4-7. Cumulative Graph of Lithic Tools, Site 41WM73

fauna (Chap. 15.) indicates that the site was probably flooded frequently. This flooding may have caused the primary deposits within the site to have been destroyed; nevertheless, the floodwater action needed to remove the occupational features likely associated with such a secondary refuse deposit should have truncated the colluvial derived strata exposed within the site, also. Since this is not the case, it is evident that the mass of rock deposited at site 41WM73 is the result of primary deposition.

It is suggested that the accumulation of burned rock may be related to the processing of acorns. Numerous pit structures, similar to Feature 2, were probably constructed so that the acorns might be parched. Features, similar to Feature 1, were needed for the initial heating of the limestone cobbles. The repetition of this process over hundreds of years would produce the structureless jumble that is evident today at site 41WM73. The hypothesized specialized nature of this activity is not reflected by the differential distribution of artifact densities within the site area. Tool density values in the central midden zone of excavation Area B are very consistent with those in the more peripheral areas. Only the amount of debitage is significantly less in the center of the mound. Whatever activity took place at the center of the mound was apparently an integral part of the everyday subsistence activities of the site.

8.5 Site 41WM304

Site Situation

41WM304 is a buried burned rock midden located approximately 800 meters NNW of the point at which the channel of the North Fork of the San Gabriel River meets the centerline of the dam. It is 125 meters north of the North Fork channel and 140 meters northeast of the confluence of the North Fork and the second north side drainage upstream from the dam (Fig. 8.0-1). This side drainage is a spring fed stream which curves north and west around the site.

41WM304 is similar to many other burned rock middens in that it is situated at the base of the upland ridge on the border of two microenvironments--the river floodplain and the uplands (Fig. 8.5-1). The immediate site area at the bottom of the ridge was covered with various types of oak and hackberry trees prior to their removal by construction machinery, while on the slopes and uplands post cedar trees predominated. A large portion of the ground surface of the upland ridge above 41WM304 is exposed limestone bedrock. Because of weathering processes, numerous limestone spalls have broken off these limestone ledges at ridgetop and fallen down the steep slope to the rear of the burned rock midden. While these limestone spalls range in size from large boulders to very minute pieces, many are in the size range of those burned limestone rocks that constitute the majority of the nonperishable remains of the burned rock midden. Indeed, it is probable that one reason the occupants chose the base of upland slopes for the location of burned rock middens was the close availability of large quantities of limestone spalls.

41WM304 was discovered by NTSU archaeologists in January, 1978, after borrow activities for construction of the North Fork dam had cut through the dome-shaped burned rock midden, in effect cross-sectioning it. Possibly one-third to one-half of the mounded accumulation of burned rocks and a majority of an associated area between the burned rock midden and the two drainages was removed. The site was presumably buried and thus missed by several previous archaeological contractors. The burned rock midden was in the east wall of the borrow pit and appeared to be over ten meters in length. The depth of the midden could not be ascertained because much of the material had fallen down the slope of the borrow pit wall. A thin horizontal lens of burned rock , flint debris, snails, and mussel shells trailed off the northern end of the dome-shaped mound. To the south side there appeared to be possibly two separate lenses of cultural material extending off the edge of the mound. Beneath the mass of burned rocks the matrix changed from a dark gray silty clay to a reddish-brown silty clay loam which contained pieces of highly patinated flint which were white incolor compared to the dark blue, gray, and brown

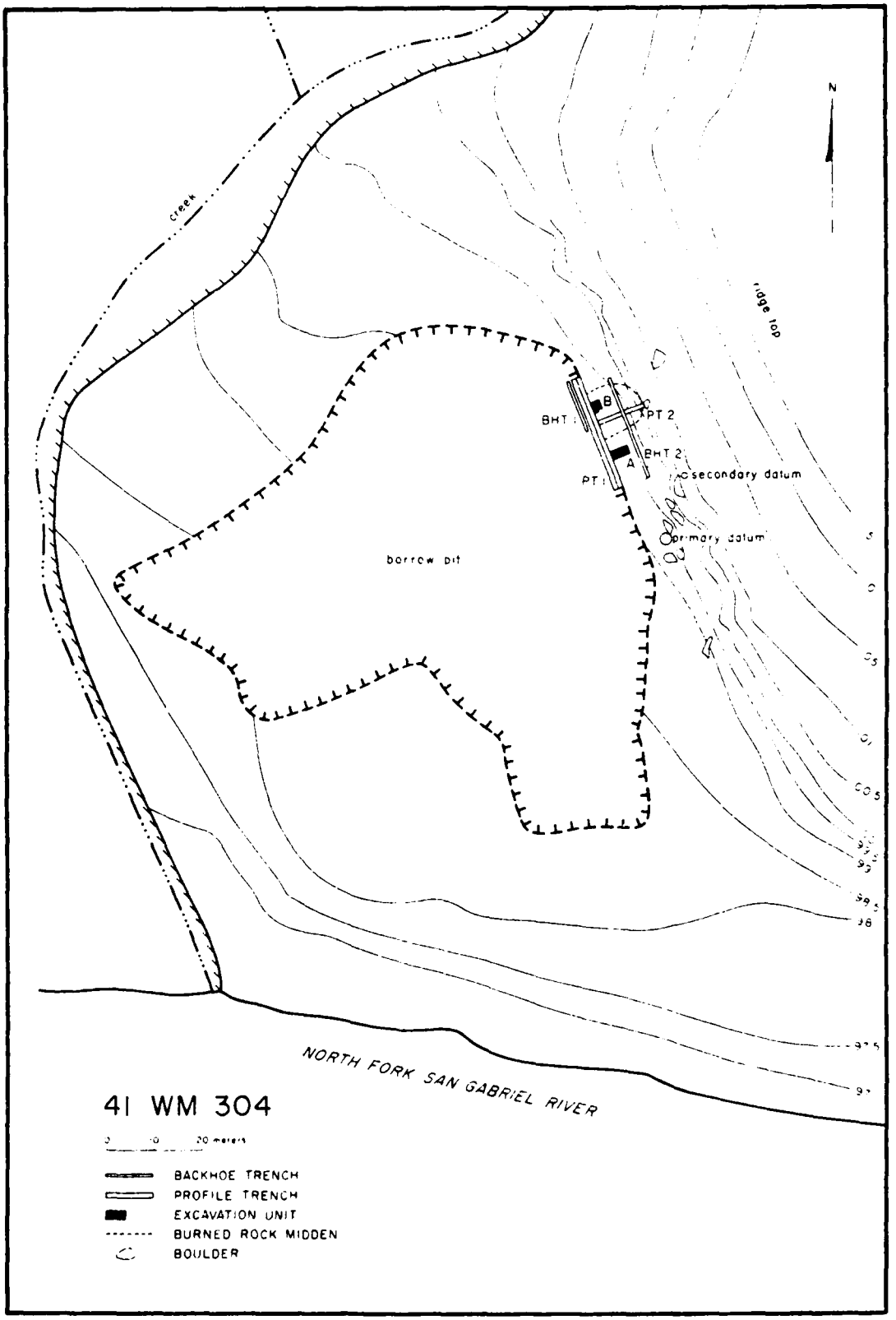

N
creek
ridge top
BHT 1
B
PT 2
BHT 2
A
PT 1
secondary datum
primary datum
borrow pit
NORTH FORK SAN GABRIEL RIVER
41 WM 304
BACKHOE TRENCH
PROFILE TRENCH
EXCAVATION UNIT
BURNED ROCK MIDDEN
BOULDER

Figure 8.5-1.

colored flint within the midden. In the central part of the borrow pit about 60 meters away from the midden, the badly disturbed remnants of three possible hearths were seen.

Since the construction machinery had cut completely through the midden, a unique opportunity to study the internal structure of the midden with minimal clean-up effort was presented. The possibility of two separate lenses of cultural debris on the south side of the mound was interesting and deserving of attention as two different occupations might be present. Since three possible hearths had been seen in the borrow pit, it seemed that other intact hearths might be present. Also, the presence of flint debris below the core of the burned rock midden might indicate an occupation that was very early in time and could help explain the origin of the burned rock midden phenomenon. With all of these considerations in mind, it was decided that the site was worthy of further investigation. Since the destruction of sites 41WM330 and 41WM331 by local collectors precluded any extensive scientific investigation of those sites under the terms of the contract, it was suggested that site 41WM304 be investigated in their stead. As a result of a meeting with archaeologists of the Army Corps of Engineers, approval for this modification was granted by the Fort Worth District of the Army Corps of Engineers.

Evacavation Methodology

The first phase of investigation was the excavation of a stepped profile of the mounded area of the burned rock midden in the sloped wall of the borrow pit (Fig.8.5-2). Labeled Profile #1, the 25 meter long profile was hand-excavated on a line 20^{o} west of north from the N100 line to the N125 line. The face of Step #1 was the W100 line while that of Step #2 was the W101 line. A nail was set in the top of one of the few remaining tree stumps in the vicinity of the site to serve as a vertical datum. The top of this nail was arbitrarily assigned the value of 100.00 meters above sea level. The Step #1 profile wall began at ground surface (generally 99.45 meters) and ended at 98.80 meters. The Step #2 profile wall extended from 98.80 to 98.20 meters. Since, by chance, the bottom of the mass of burned rocks occurred at approximately 98.80 meters on the dividing line of the two steps, it was later decided to remove the second step from N100 to N121 so that the view of the profile would be clearer.

The matrix removed during the excavation of Profile #1 was not screened. However, all flint tools which were seen by the excavators were bagged. In the fill from the first step, 4 Pedernales points, 3 Bulverde-like points, 1 stemmed biface with an asymmetrical blade, 1 unidentifiable projectile point fragment, and 5 bifaces were found in the debris. In the excavation of the second step, 1 Bulverde point 5 Bulverde-like points, 2 Travis points, 2 Travis-like points, 2 Tortugas

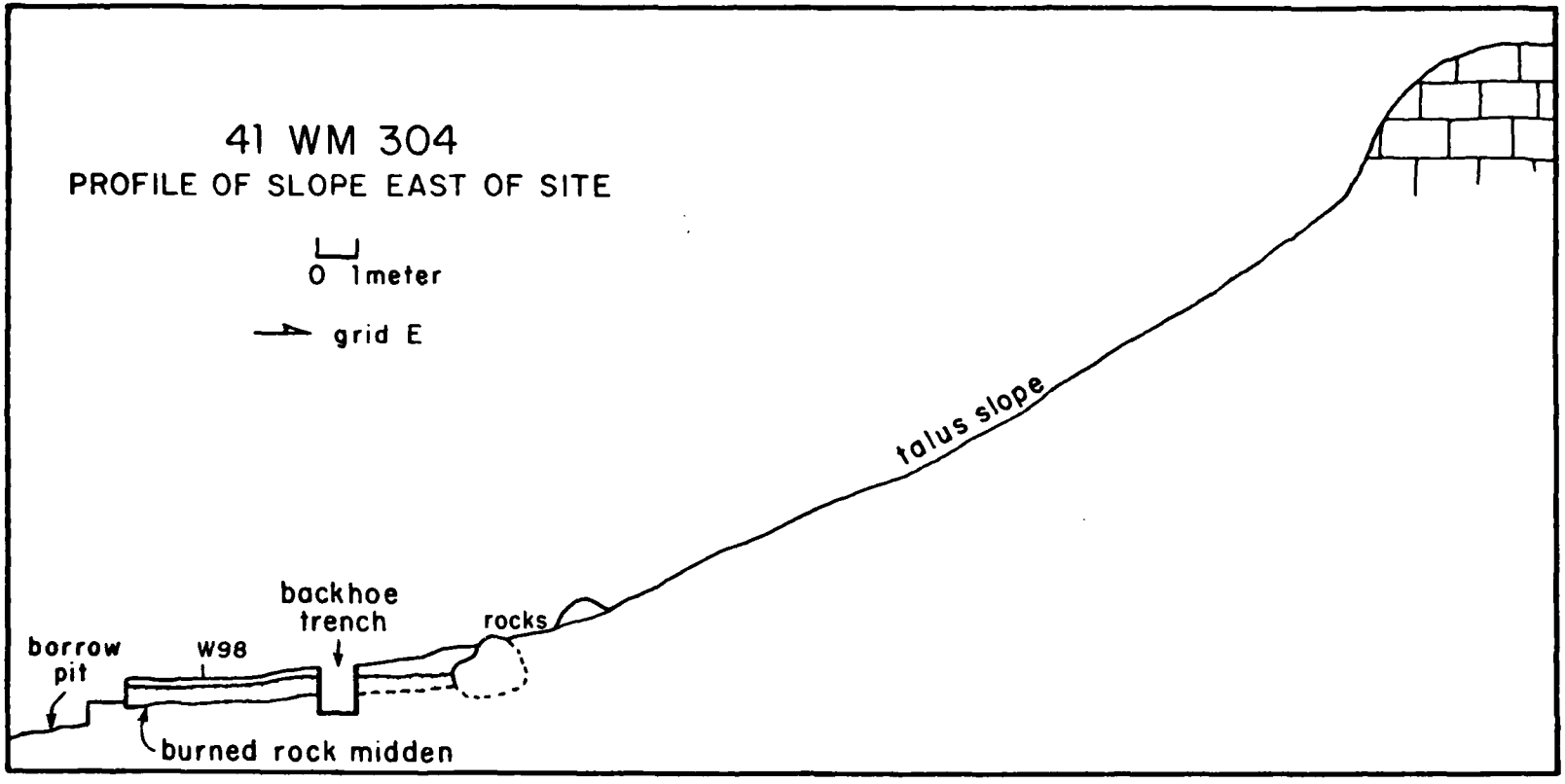

41 WM 304
PROFILE OF SLOPE EAST OF SITE
0 1meter
grid E
talus slope
backhoe trench
rocks
borrow pit
W98
burned rock midden

Figure 8-5-2.

points, 1 Martindale point, 1 probable Martindale preform, and 3 unidentifiable projectile point fragments were recovered along with 5 scrapers and 38 biface and biface fragments.

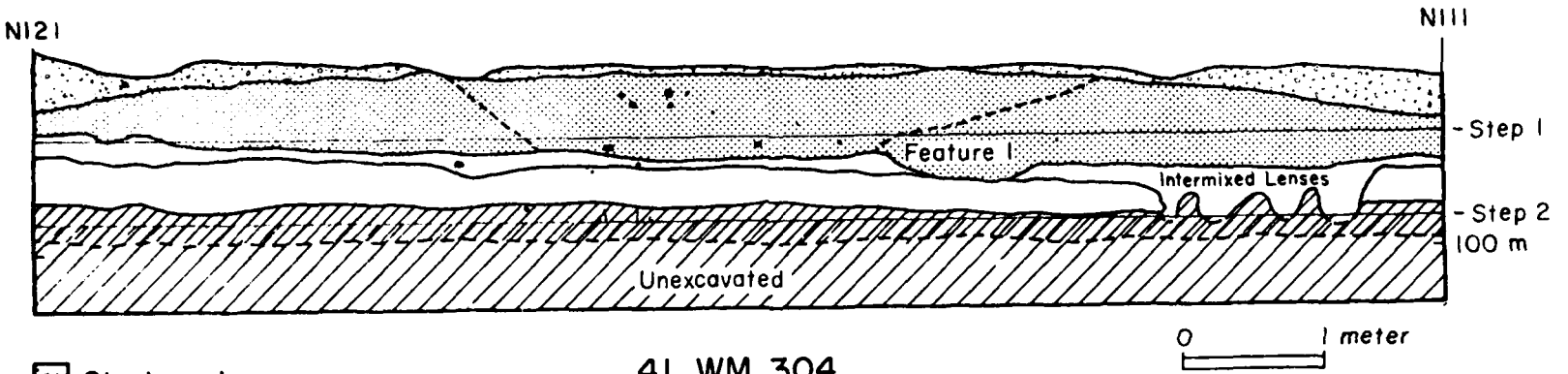
Profile #1 showed the dome-shaped mound to be 10.80 meters in length and 70 cm deep at its thickest point. While there was generally only about 10 cm of sediment covering the crest of the mound, more alluvium was banked up on the sides of the mound so that in places it was buried under 40 cm of sediment. To the south there was clearly only one unbroken lens of debris trailing off the edge of the mound. Evidently, the movement of construction machinery over the slope of the borrow pit wall in this portion of the site had caused the illusion of two distinct lenses on the day that the site was discovered.

When viewing the profile from a distance of over 50 meters, it appeared that the central part of the mounded area of the burned rock midden possibly had a less dense accumulation of burned rocks than the surrounding sides. This less dense area, which resembled a refilled pit, measured 4.25 meters in length and extended from the top of the mound to its bottom of 60 cm in maximum depth. At a closer inspection, one could see, however, that an unusually large number of burned rocks had been knocked out of the center of the mound by crew members cleaning the profile. Also, a large tree had spread its root system through the northern part of the less dense area probably causing some movement of burned rocks and occupying space where burned rocks might have been. No roots were seen in the adjacent denser area of burned rocks immediately to the north. Nevertheless, the possibility that a refilled pit feature was present within the central part of the mound was examined later by controlled excavation and a backhoe trench.

In the next procedure, all sediment covering the top of the burned rock midden was removed between the N114 and N115 lines progressively eastward beginning at the W100 line. The purpose was to find the eastern edge of the burned rock midden. This trench, which was labeled Profile #2, ended at the W90 line (Fig.8.5-3). At approximately the W90.5 line, several large limestone boulders were struck both above and below ground surface. It appears that the burned rock midden ended abruptly against these boulders.

One week after excavations had begun, a backhoe was obtained to test the site further. Backhoe trench #1 was dug from N114/W103 to N125/W103, from 98.20 to 96.00 meters elevation approximately, to determine if any cultural debris lay deeper than the bottom of Profile #1. No cultural material was observed in the removed fill from the backhoe trench or in the walls of the backhoe trench.

Backhoe trench #2 was dug from N100/W95 to N122/W95 to a depth of 1.5 meters below ground surface to gain more information about the dimensions of the eastern edge of the burned rock midden, and to see if there was any additional evidence of a pit feature in that portion of the site. The backhoe trench indicated the burned rock midden to have almost



Stratum 1
Stratum 2
Stratum 3
Burned Rock Midden
-- Approximate Boundary of Apparently Less Dense Central Area of Midden
Roots

41 WM 304
Profile 1
Along Line W100, Above Step 1;
Along Line W101, Above Step 2

Figure 8.5-3.

the exact same length as shown on Profile #1 and no evidence of a refilled pit feature was noted in the backhoe trench profile. Fig. 8.5-4 shows that all the sediment zones slope from east to west between Backhoe trench #2 and Profile #1. The burned rock midden likewise slopes downward from east to west.

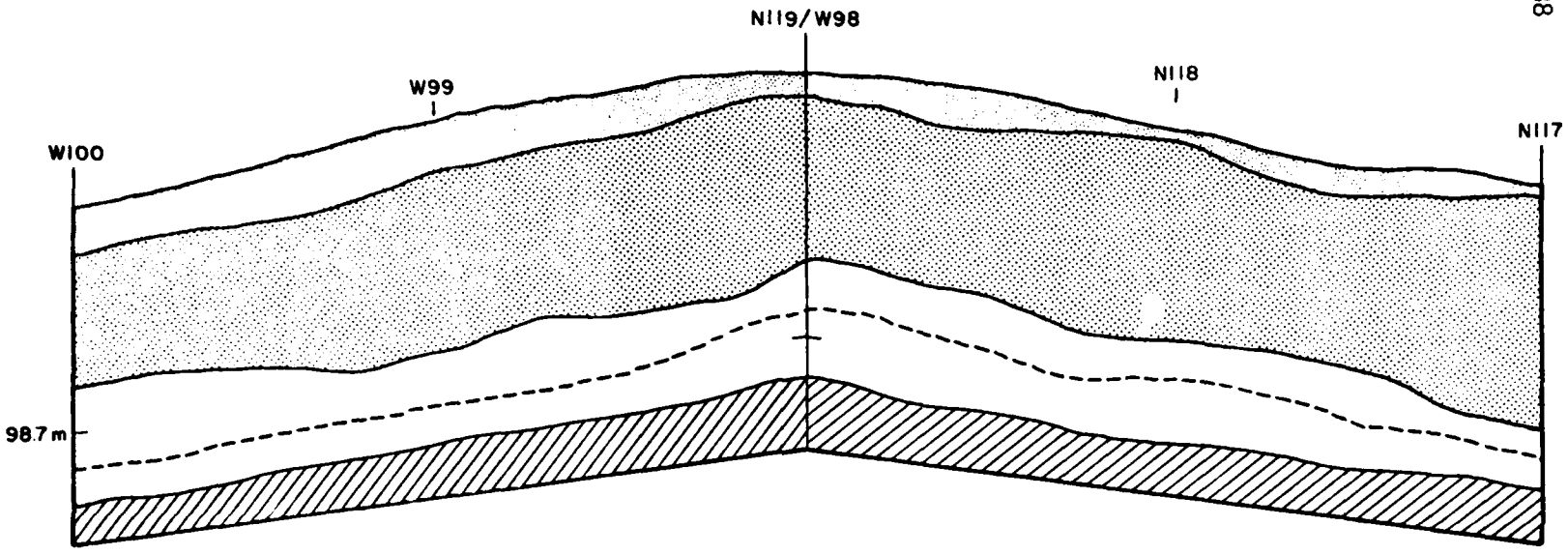
Near the north end of the mound in Backhoe trench #2 between N118.05 and N120.10 meters, the burned rock and other debris dipped 45 to 50 cm deeper than on the adjacent sides. This area did not have a hearth-like resemblance, but rather it appeared to be a natural depression or gully that was filled with cultural debris. Alternatively, it might be an older midden accumulation.

The backhoe trenches and profiles indicated that two excavation units were needed to properly sample the mound itself, and the less of debris extending southward from the mound. The purpose was to compare the two areas in terms of types and densities of lithic debitage and tools. It was also thought that features and/or activity areas might be uncovered in the units adjacent to the mound (cf. Sorrow 1969:51). In Area A (Fig.8.5-5), two contiguous 2 x 2 meter square units, N108/W100 and N108/W98, were begun to the south of the mound to expose a section of the horizontal lens of debris. Unfortunately, the N108/W98 unit had to be discontinued after the completion of level 2 because of time limitations. Two adjacent 2 x 2 meter square units were excavated to sterile matrix within the mound area proper.

The W100 line, on which profile 1 was cut, served as the base line for excavations. Each of the 1 x 1 meter square excavation units within the 2 x 2 meter squares was designated according to the coordinates of its northwest corner. All site matrix was removed in 50 cm. square quadrants in arbitrary 10 cm. levels except for Level 1 in Area B where all matrix from the ground surface to the top of the midden was removed as a single unit. All matrix was passed through 5 mm. wire mesh with the aid of water. Northwest quadrants were additionally sieved through 1 mm. mesh window screen.

Excavations in the N119/W100 2 x 2 meter square in Area B focused on the possible pit feature mentioned earlier. The west walls of both the N119/W100 and the N118/W100 2 x 2 meter squares were also the line on which Profile #1 had been cut. In Profile #1, the northern edge of the "pit" occurred just south of the N118/W100 line. Excavation of the N119/W100 2 x 2 meter square would then allow examination of a section of the pit feature and of the denser accumulation of burned rock surrounding it. In addition to standard excavation procedures, all rocks regardless of size from each quad in the N119/W100 and the N118/W100 1 x 1 meter squares were weighed in order to determine if there actually was a lesser density or volume of burned rock in the center of the mound since the presence of the feature was uncertain. Because of the border of the possible pit cut through the center of the northern quads of the N118/W100 units making them invalid for testing, the NW and NE quads of the N117/W100 were excavated and all burned rocks were weighed so that the sample size of the supposed less dense

Figure 8.5-4



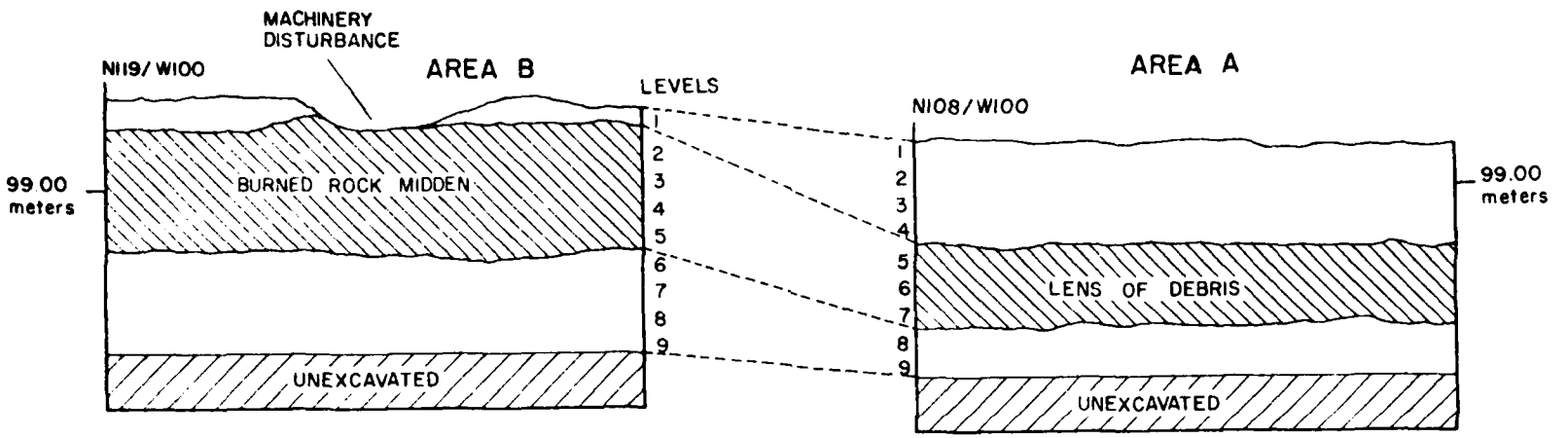
41 WM 304
AREA B
Profiles of North and East Walls

Stratum 1
a
b
Stratum 2
Stratum 3
Burned Rock Midden

N

0 25 50 cm

STRATIGRAPHIC RELATIONSHIP OF AREAS A & B, SITE 41 WM 304.



41 WM 304
COMPARABLE LEVELS

AREA B AREA A
level 1 = levels 1-4
levels 2-6 = levels 5-7
levels 7-9 = levels 8&9

0 20 40 cm

Figure 8.5-5.

area would be equal to the dense area. The other 1 x 1 meter squares, N119/W99 and N118/W99, were not weighed.

Stratigraphy

Information concerning the stratigraphy of the site was gained from several profiles which exhibited three basic sediment divisions (Fig. 8.5-3). The sediments are mostly alluvial in nature, but some colluvium is probably present (Stephen Hall, 1979, personal communication). The strata are listed in reverse depositional order.

Stratum 1. This very dark gray (10YR3/1) silty clay covers the burned rock midden and extends slightly into the top of the midden in some areas. It ranges from 5 to 42 cm in vertical thickness and contains flint debris, snail and mussel shells, and small colluvial limestone fragments. Burned rock fragments, however, are scarce above the actual burned rock midden. Numerous grass roots were seen in the upper part of this stratum, particularly in the top 5 cm. This sediment contains a high organic content which causes its very dark color.

Stratum 2. A transition zone, stratum 2, is divided into two parts with stratum 2A being a silty clay (like stratum 1) while 2B, which lay beneath 2A, is a more compacted silty clay loam similar to stratum 3.

Stratum 2A has a dark brown color (7.5YR3/2), and varies from 15 to 50 cm in vertical thickness. The top of this zone occurs in the upper part of the burned rock midden, but the boundary between it and the bottom of stratum 1 is hard to distinguish within the burned rock midden because there is actually more rock than sediment present. Profile #1 shows that the bulk of the cultural debris is contained in stratum 2A. In Profile #1, stratum 2A continues downward beneath the burned rock midden slightly. Just 5 meters to the east of Profile #1, stratum 2A does not appear to extend all the way to the bottom of the burned rock midden in backhoe Trench #2, except between the N111 and N115 lines.

Stratum 2B is a dark brown (10YR3/3 to 4/3) sediment that represents the transition from a silty clay to a silty clay loam. It is found well beneath the major accumulation of burned rock in Profile #1. In the two excavation units, the amount of cultural debris recovered from stratum 2B was less than that in stratum 2A, particularly in the Area A unit. In the Backhoe Trench #2 profile, the top of stratum 2B is found to vary from the bottom of the burned rock midden in the central part of the midden between the N111 and N115 lines to the approximate middle of the midden elsewhere. Zone 2B ranged from 6 to 50 cm in depth.

Stratum 3. This brown to reddish brown (7.5YR4/4 to 5YR4/4) compacted, silty clay loam can be seen in the bottom of all profiles, backhoe trenches, and all across the bottom of the borrow pit. A small bit of cultural material was seen in the top of this zone in Profile #1 while in Backhoe Trench #2 a very thick accumulation of burned rock actually dipped down into stratum 3 between the N118 and N120 lines.

Excavation Results

Except for the N108/W98 2 x 2 meter square, all excavation units were dug to depths that were almost totally sterile of any cultural debris. The Area A unit was terminated at 98.30 meters and the Area B unit at 98.40 meters. Nonperishable cultural materials consisted of burned limestone rocks, flint debitage, flint tools, manos, a mortar fragment, mussel and snail shells, and burned and unburned bones. Limestone rocks made up the bulk of this material. These burned rocks may be the residue of individual fire hearths, a single over structure, or a combination of both.

Thy only feature recorded at 41WM304 was a possible fire hearth seen in Profile #1 at the bottom of the central part of the burned rock midden. It did not become visible until several months after excavations were finished when several rainstorms had washed sediment off the fact of Profile #1 to expose it. Below is a discussion of this feature.

Feature #1

A dip in the bottom of the burned rock accumulation in the wall of Profile #1 between N114.05 and N115.10 meters might be the lower portion of a basin-shaped hearth (Fig. 8.5-3). The top of the feature could not be distinguished from the mass of burned rocks within the burned rock midden, but the depression dipped 15 cm beneath the adjacent burned rocks on either side. The length of the feature at its widest recognizable point was 1.05 meters. The fill within the depression consisted of burned rocks, snails, and a mussel shell fragment. The bottom of the depression occurred at 98.50 meters elevation or 80 cm below ground surface. Unfortunately, no charcoal was seen within the depression.

The Refilled Pit?

As noted above the possibility that a major refilled pit was present within the central portion of the mound was further examined through the measurement of the weight of the burned rock both inside and outside of the hypothesized pit area. An equal number of quads from both areas were sampled. In order to objectively evaluate the weight differences between the two areas, a comparison utilizing the "Student's t" statistic was implemented. The null hypothesis in this case is that the mean weights of burned rock for the two areas are equal. Since a type I error (rejecting H_0 when it is true) was viewed as less critical than a type II error (accepting H_0 when it is false), a significance level of .10 was chosen (Nie et.al 1975: 267-268).

It also was assumed that the two populations may not share a common variance (Snedecor and Cochran 1967: 114-117). A test of equality of two variances ($F=s_1^2/s_2^2$) indicated that this assumption was correct;

an approximation to "t" was computed (Nie et.al 1975:269-270):

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (m_1 - m_2)}{S_1^2/n_1 + S_2^2/n_2}$$

Although this statistic is not distributed as student's t, the probability for t can be approximated by treating it as t, but with degrees of freedom as indicated in the following equation:

$$df = \frac{[(s_1^2/n_2) + (s_2^2/n_2)]^2}{[(s_1^2/n_1)^2/(n_2-1)] + [(s_2^2/n_2)/(n-1)]}$$

The two populations consist of the four quads of unit N119/W100 and two quads from both units N118/W100 and N117/W100. The northern half of unit N118/W100 was not included, for the boundary of the hypothesized pit area was within these quads. Unit N119/W100 represents the area outside the hypothesized pit while the southern quads of N118/W100 and the northern quads of N117/W100 represent the hypothesized pit area (Table 8.5-1).

The burned rocks from each area were weighed by quad. The statistical comparison of the two areas was conducted for each arbitrary 10 cm. level (Table 8.5-1). Since the null hypothesis could not be rejected, this comparison demonstrated that there was not a significant difference between the weights of the burned rocks of the two areas in any of the levels. The overall weight of the burned rocks outside the hypothesized pit area is greater than that within the pit area; nevertheless, the statistical comparison indicates that there is no true difference between the two populations.

This statistical comparison of the burned rock weights provided an objective assessment of the presence or absence of the hypothesized refilled pit. The lack of a significant difference in the mass of burned rock removed from the two areas suggests that the perceived pit outline in the profile wall was a construct of the profiling efforts rather than an actual feature within the mound itself. As noted earlier, it appeared that the excavators had removed differential amounts of rock from the various areas of the profile, thereby creating an appearance of lesser and greater densities of burned rock. The distribution of three roots within the mound and the resulting disturbance of the midden may also have contributed to the impression of a pattern within the distribution of the burned rocks.

Observations made both during and after the excavation of Area B were also designed to provide information concerning the presence or absence of a

Table 8.5-1.

Comparison of the samples of burned rocks removed from two areas of the mound at site 41WM304. Sample 1 represents the area outside the hypothesized pit; sample 2 represents the hypothesized refilled pit.

		Weight of Burned Rock by Quad				$\bar{x}$ Weight	Calculated t and degrees of freedom valves	Critical Region for Significance Level of .10
Level 2	Sample 1	58	93.5	65	88.5	$\bar{x}$ = 76.3	t = .21	$\pm$2.353
	Sample 2	52	61.5	62	60	$\bar{x}$ = 58.9	d.f. = 3	
Level 3	Sample 1	58	66.5	71	66	$\bar{x}$ = 65.4	t = -.07	$\pm$2.353
	Sample 2	39	106	86.5	87	$\bar{x}$ = 79.6	d.f. = 3	
Level 4	Sample 1	69.5	69.5	51.5	79.5	$\bar{x}$ = 67.5	t = .28	$\pm$2.015
	Sample 2	65	48.5	51.5	52.5	$\bar{x}$ = 54.4	d.f. = 5	
Level 5	Sample 1	65.5	71	81	64	$\bar{x}$ = 70.4	t = .28	$\pm$1.943
	Sample 2	63.5	55	43.5	43	$\bar{x}$ = 51.3	d.f. = 6	

refilled pit. A pit outline did not show up in the east or south wall profiles of the completed 2 x 2 meter square unit. One would have expected to see a similar pit outline most probably in the southern half of the east wall profile or else in the south wall profile if the pit feature did not extend very far eastward into the burned rock midden (Figs.8.5-4). Also during the excavation of Area B, the floor of each level was carefully examined for perceptible differences between the hypothesized pit and the surrounding matrix. None were observed. Therefore, these in-field observations and the statistical comparisons of the burned rock weights all point to the conclusion that the refilled pit outline was merely a result of the profiling efforts and not an actual structural feature within the mound. Like the other burned rock middens examined within the North Fork Reservoir, features were detected only at the bases of the mound structures.

Culture/Time Stratigraphic Units

Diagnostic artifacts from the Round Rock, Clear Fork, and San Geronimo components were recovered from Areas A and B (Table 8.5-2). In Area A, there may be some mixing as two Hoxie-like projectile points which should have come from the deepest levels were found in levels 2 and 5, instead. Otherwise, Pedernales points were found in levels 1 and 3 above Bulverde points in levels 5 and 6 and Bulverde-like points in levels 5-7. A single Tortugas point was recoverd from the lens of burned rock in level 6; however, elsewhere in Area B Tortugas points were found only in levels (7-8) beneath the main concentration of burned rock. Above the Tortugas points in Area B, a mixture of Bulverde, Bulverde-like, Travis and Travis-like points were recovered from levels 1-6. The temporally diagnostic projectile points from both areas, therefore, indicates that the midden accumulated primarily as a result of Clear Fork phase occupations.

Although no Round Rock phase diagnostics were recovered from controlled excavations within the mound, Pedernales points were seen in the upper levels of the mound when Profile #1 was excavated. The only Round Rock phase diagnostics found in controlled excavations came from Area A in the levels above the midden. Since much of this material above the midden may have been introduced by slope wash from site 41WM329, its context is suspect; nevertheless, this material may be associated with the final accumulation of the burned rock midden. The lack of clear micro-stratigraphy, however, precludes any definite conclusions concerning such a relationship.

Levels 8 and 9 in Area A and levels 7, 8, 9, in Area B are similar in that they lay beneath the dense accumulation of burned rock. In Area B there is some evidence of a pre-burned rock midden occupation. Tortugas points were the only diagnostic artifacts found in these levels in Area B. In Area A, the stem of a projectile point was recovered from level 9. Otherwise, the amount of debris in level 9 from both areas was so minimal that excavations ceased. Therefore, as with the John Ischy

site (41WM49), the Tortugas points are diagnostic of the earliest occupation of the site. A late San Geronimo or early Clear Fork component is indicated.

Lithic Tools

A total of 230 tools was analysed for site 41WM304 (Table 8.5-2). Most of the tools came from Area A, which also had the majority of the debitage elements. Both Areas A and B have medium to low densities for both tools and debitage, with the exception of the Clear Fork component in Area A, where both debitage and tool density are high (Table 8.5-3).

The variety within the tool classes is relatively low (Table 8.5-2). The Round Rock component is very poor with only one burin and five notched pieces next to the three other major classes. There are more tool classes present in the Clear Fork component, especially scrapers and complete bifaces. Scrapers are important in the Clear Fork pre-midden assemblage, but most other tool classes are either absent or poorly represented. Interestingly, this component yielded the only backed pieces recovered during excavation. Also, the percentage of retouched pieces is lower in this component than is usually the case.

Comparing the cumulative graph (Fig. 8.5-6) and the density data organized by cultural component, both the Round Rock and Clear Fork pre-midden have relatively low density, while the Clear Fork is rather high (Table 8.5-4). Some of the differences in the cumulative graph are to be explained by the very low Round Rock component densities.

There were not enough complete tools per tool class per unit to make the statistical analysis of complete tool measurements by site. The units were incorporated with the analysis of the reservoir as a whole (Appendix H-4).

Intrasite Comparisons

Intrasite comparisons on the basis of the recovery of nonperishable materials may be made overall between Areas A and B. Area B represents a section of the site within the dome-shaped burned rock accumulation while Area A is a portion of the site on the periphery of this accumulation. Both areas are very near the base of the upland slope, and a more ideal sample of the peripheral area probably would have been further to the south and west of the mounded area away from the upland slope and nearer to the confluence of the North Fork and the tributary. However, this entire area had been removed earlier for borrow material for construction of the North Fork dam. It should be mentioned that the three

Table 8.5-2. Tool Classes, 41WM304

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT	COMPONENT TOTAL	COMPONENT
Round Rock	A	1			3				1		7		6	2						19				
		2			2						7		11	1						21				
		3									1	2	1	1						5				
		4									4		5	1						10	55	42.64	55	23.91
Clear Fork	A	5	1	1							5		8	2						17				
		6	2	1	1				2		8	1	13	2						30				
		7	1								2	1	4	1						9				
	B	1			1		1				2		7	1						12				
		2			1		1				5	1	9	2						19				
		3	1		2	1					2		6	1						13				
		4										2	3	1						6				
		5		1							2		5	2						10				
		6		1							6	1	5	3						16	76	82.61	132	57.40
Clear Fork	A	8									4		6							10				
Premidden		9	1		1			1			1		3	1						8	18	13.95		
	B	7	2					1			4	1	2	1						11				
		8	1										2	2						5				
		9																			16	17.39	34	14.78
Surface BHT				3				2	3						1					9			9	3.91
TOTAL			9	7	11	1	2	4	6	-	60	9	96	24	1	-	-	-	-	230				100.00
%			3.91	3.04	4.78	.43	.87	1.74	2.61	-	26.10	3.91	41.75	10.43	.43	-	-	-	-	100.00				
RESTRICTED																				74				
RESTRICTED %			12.16	9.46	14.86	1.35	2.70	5.41	8.11			12.16		32.44	1.35					100.00				

Table 8.5-3. 41WM304 Tools and Debitage Ratios by area.

Area	Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool Debitage Ratio
A	Round Rock	2.4	23	1828	80
	Clear Fork	1.2	47	5493	118
	CF. premidd.	.8	23	1838	82
	Total area	*4.4*	*29*	*2829*	*97*
B	Clear Fork	2.7	28	2356	84
	CF. premidd.	1.25	13	1289	101
	Total area	*3.95*	*23*	*2018*	*87*
	Total site	8.35	26	2446	92

Table 8.5-4. 41WM304 Tool and Debitage Ratios by Cultural Component

Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/ Debitage Ratio
Round Rock	2.4	23	1828	80
Clear Fork	3.9	34	3322	98
CF. premidd.	2.05	17	1503	91
Total site	8.35			

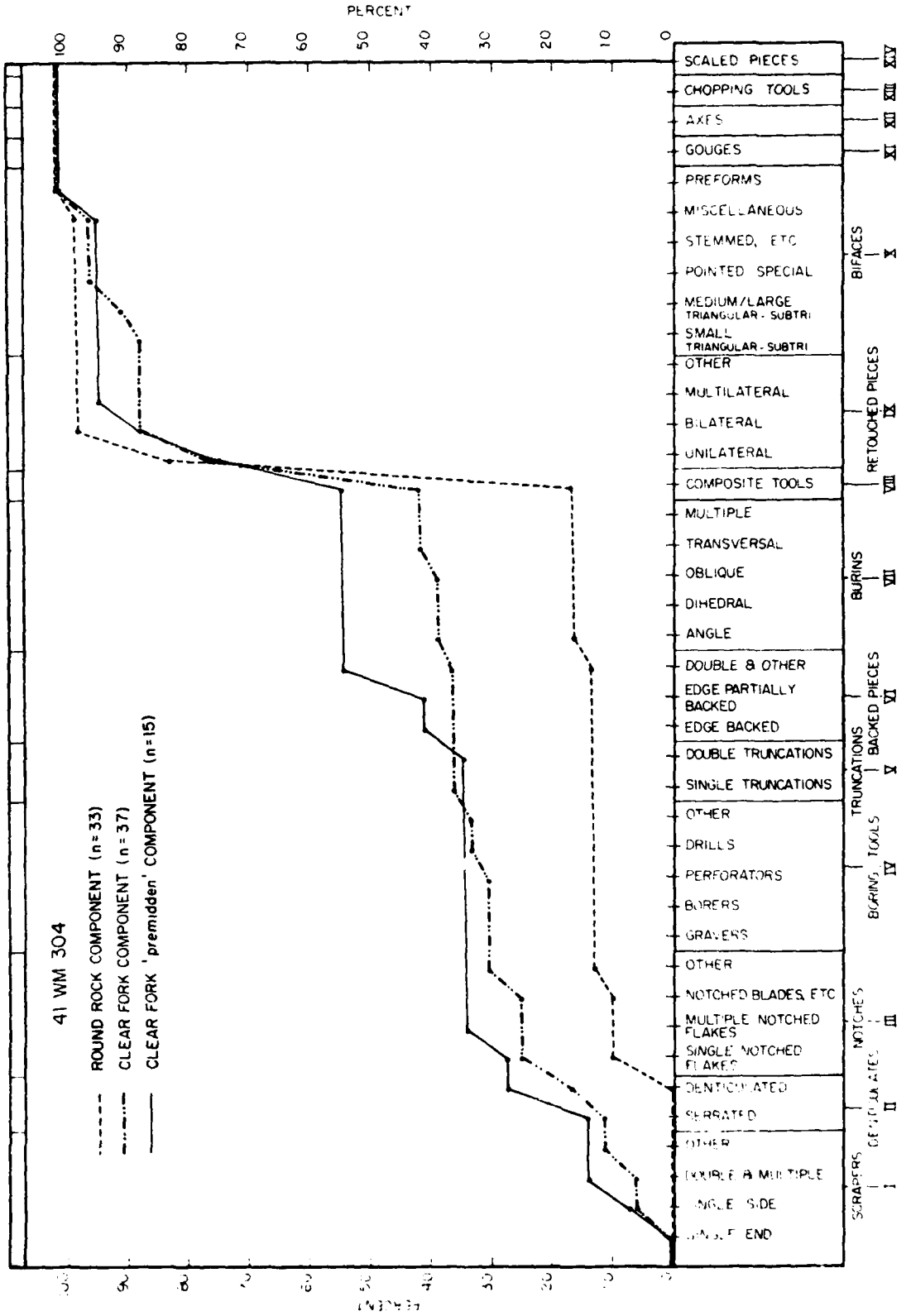


Figure 8.5-6. Cumulative Graph of Lithic Tools: Site 41WM304

possible hearths seen in the central part of the borrow pit area on the day the site was discovered had further deteriorated when excavations began three months later, and could not be identified as hearths if indeed they were.

Regarding a comparison between Areas A and B, it is important to realize that level 1 in Area B and levels 1-4 in Area A are probably sediments that postdate the deposition of the mound and the lens of debris on the periphery. These sediments lay above the mass of burned rocks and are almost entirely void of burned rock. Cultural material in these levels is restricted to flint debris, mussel, and snail shells. Some, and perhaps a majority, of this debris has washed down from a lithic scatter, 41WM329, which lay on the ridgetop above 41WM304.

The bulk of cultural remains other than burned rocks was flint debitage. Tertiary flakes were far more numerous than primary or secondary flakes. Microflakes were also more numerous than primary and secondary flakes, but were still significantly small in percentage compared to tertiary flakes. Interestingly, between 10 and 20 percent of all debitage at 41WM304 was thermally altered. More research needs to be done to tell if this is significantly more than would be found at a terrace site. Area A had very high flint debitage counts in levels 5, 6, and 7 which were those levels that contained the lens of burned rock that trailed off the mound. These levels also had an unusually large number of biface thinning flakes suggesting that biface production took place on the mound periphery, but not in Area B within the mound proper. A mano found in level 7 in Area A and a mortar fragment on the border between levels 7 and 8 of Area A suggest that the periphery of the mound may have been a locus for plant food processing. In Area B, two manos were found resting on the top of the accumulation of burned rock in the trench dug for Profile #2.

Site Summary

41WM304, a buried burned rock midden, was investigated after construction machinery within a borrow pit area removed a portion of the mounded accumulation of burned limestone rocks. The investigation included: 1) excavation of a stepped profile in the wall of the borrow pit to show a cross-section view of the internal structure of the burned rock midden, and 2) controlled excavation of two units--one (Area B) in the center of the mounded accumulation of burned rocks and another (Area A) on the periphery of this accumulation--to study intrasite variability.

Upon the completion of the stepped profile, the presence of a possible refilled pit was noted within the center of the burned rock midden. Negative evidence in further investigations led to the conclusion that a refilled pit was not present. One probable hearth was observed in the stepped profile wall. It appeared at the bottom of the mounded area of the midden as a small rock-filled, basin-shaped

depression which dipped deeper than the burned rocks on either side of it.

In the controlled excavation unit diagnostic projectile points from the Round Rock, Clear Fork, and San Geronimo Phases of the Central Texas Archaic were recovered. These diagnostics were somewhat vertically mixed, particularly in Area A. Tortugas points, a late San Geronimo and/or early Clear Fork Phase diagnostic, were clearly the only type found in the deepest levels in Area B unit. Proportionally, there were greater numbers of tools showing more diversity of type of tools in Area A unit. Flint debitage was denser in Area A, particularly in those levels which composed a portion of the horizontal lens of debris which extended beyond the mounded accumulation of burned rock. The presence of a mano fragment and a mortar fragment in the Area A unit suggest that plant foods were a part of the diet. Hunting is implied by the presence of numerous projectile points. Faunal remains were scanty in both excavation units and were mostly limited to the deeper levels beneath the major concentration of burned rock. No charcoal sample large enough to date was found anywhere at the site nor were any plant remains recovered by flotation. Finally, while there is some evidence of intrasite variability at 41WM304, any statement to this effect is fraught with uncertainty since construction operations obviated defining the overall size and complexity of the site.

8.6 Site 41WM328

Site Situation

41WM328 is a buried alluvail terrace site located on the left bank of the North Fork of the San Gabriel River about 550 meters southwest of Russell's Crossing. The site is on the floodplain about 80 meters north of the river channel and 150 meters south of Jim Hogg Road (Fig. 8.0-1). A gully 50 to 60 meters north and east of the site marks the downstream end of the borad 1.75 kilometer long terrace on which the site is situated. While most of this terrace is clear of trees giving the appearance of previous cultivation, the extreme downstream edge where the site is located was covered by scattered pecan, hackberry, and oak trees prior to their removal for construction clearing. It is probable that the site was never disturbed by farming activities. The surface of the site was slightly altered in several spots when the trees were removed. There had also been borrow activities in the immediate area, but fortunately all borrow pits were outside the site boundaries.

From the site survey description, it appeared that 41WM328 was one of the few buried terrace sites in the North Fork reservoir area that had not been destroyed (Patterson and Moore 1976). It was anticipated that comparisons could be made with other excavated terrace sites in the North Fork in terms of environmental setting, chronology, features, lithic reduction patterns, and activity areas. 41WM328, a terrace site in the Edwards Plateau or Balcones Escarpment, could likewise be compared in these respects to the terrace sites in the Granger Lake area all of which are in a different physiographic zone, the Coastal Plain. Finally, it could serve as a contrast to burned rock middens, the predominant site type in the North Fork Reservoir.

Four series of backhoe trenches were dug in order to locate the vertical and horizontal limits of the site (Fig. 8.6-1). Cultural material was struck initially in backhoe trench series #2 and #3 which showed the good intact cultural deposits were present. Two possibly distinct concnetrations of material were noted. In Area A at the top of the terrace, cultural material, including four possible hearths, was found from ground surface to a depth of 60 cm. Area B was located about 15 meters downslope at the south end of BHT #2B where cultural material was found deeper beneath flood deposits. A hearth filled with charcoal was seen about 80 cm below ground surface. Other cultural debris appeared to continue downward perhaps another 100 cm. After the N982/W1002 unit was excavated in Area B, showing it to be multicomponent, an additional backhoe trench series (#4) was dug to find the limits of Area B. Additional materials were struck that led to the conclusion that the entire site measured about 40 meters from north to south and at least 40 meters from east to west.

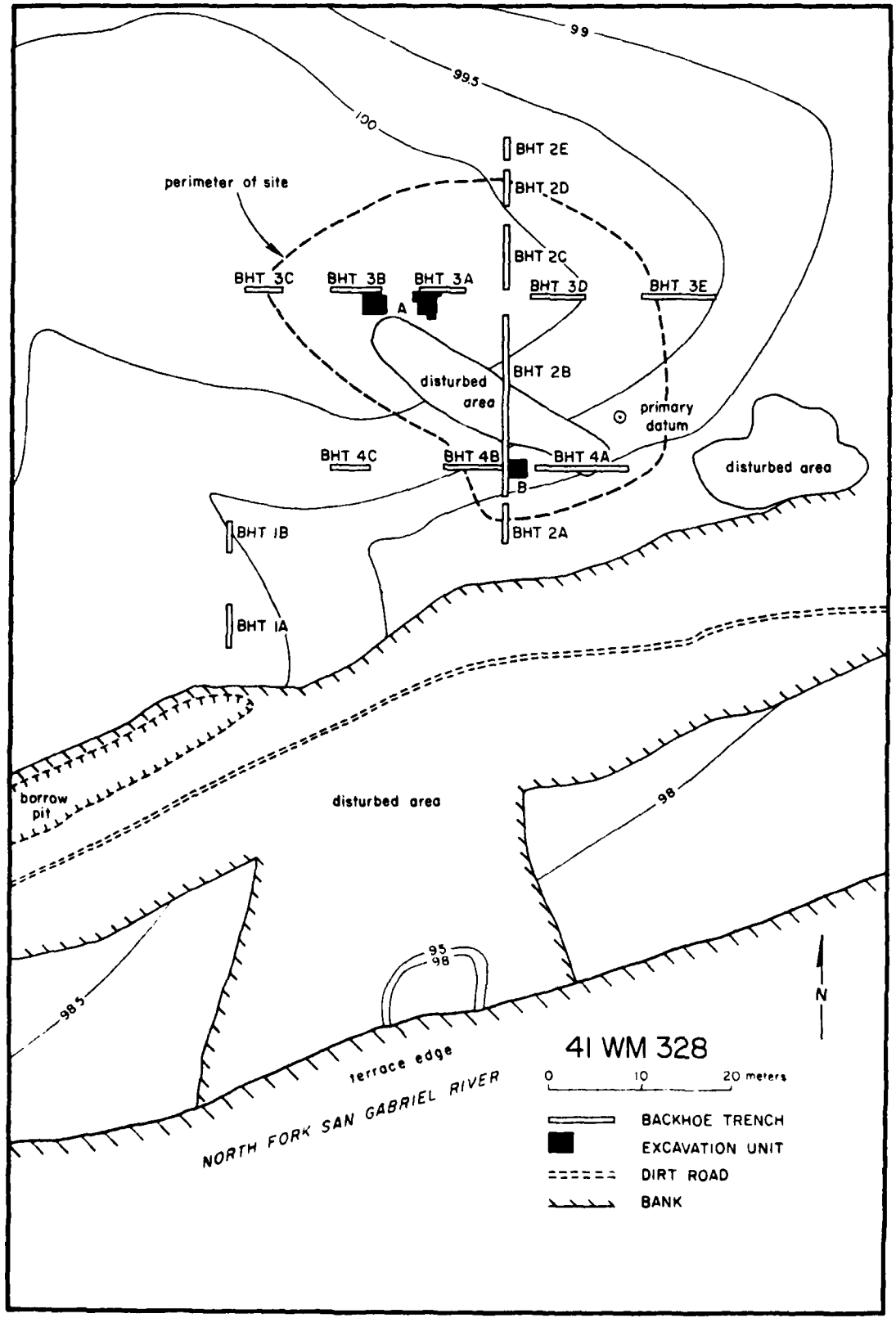

99
99.5
100
BHT 2E
BHT 2D
perimeter of site
BHT 2C
BHT 3C
BHT 3B
BHT 3A
BHT 3D
BHT 3E
A
BHT 2B
disturbed area
primary datum
BHT 4C
BHT 4B
BHT 4A
disturbed area
B
BHT 2A
BHT 1B
BHT 1A
borrow pit
disturbed area
98
95
98
98.5
terrace edge
NORTH FORK SAN GABRIEL RIVER
N
41 WM 328
0
10
20 meters
BACKHOE TRENCH
EXCAVATION UNIT
DIRT ROAD
BANK

Figure 8.6-1.

In Area A where two 2 x 2 meter square units were excavated, standard excavation procedure included the division of 1 x 1 meter units into quadrants which were dug in 10 cm levels. All matrix was passed through ¼" wire mesh with the NW quads being fine screened. In several instances in Area A when features extended into the walls of excavation units, additional adjacent quads were excavated to expose the remainder of the features. Both 2 x 2 meter squares were excavated to sterile matrix.

In Area B, since there was about 80 cm of sterile overburden overburden covering the upper portion of cultural deposits, only the N982/W1001 1 x 1 meter square was excavated in 10 cm levels and ¼" screened as a precautionary measure until cultural material was encountered. The remaining area of the 2 x 2 meter square was shoveled out. When a thin cultural horizon appeared in levels 9 and 10, all four 1 x 1 meter squares were excavated in 50 cm quads and 10 cm levels. All quads were ¼" screened and the NW quad was fine screened. Afterwards, the N982/W1002 1 x 1 meter square was excavated in 10 cm levels in 50 cm quads with standard screening procedures to test for a deeper cultural horizon. When cultural material was located at the bottom of level 14, the matrix from levels 11-13 in the other three 1 x 1 meter squares was shoveled out, and the lower 2 x 2 meter unit was excavated in 50 cm quads and 10 cm levels again. Sterile matrix was reached again over the entire 2 x 2 meter unit at level 20.

Stratigraphy

A Total of 12 different alluvial strata were recognized at 41WM328. Not all of these were present over the entire site. The profile of a one meter wide section of the south wall of backhoe trench #3A serves to demonstrate the stratigraphy in Area A, while another nine meter long profile from a section of backhoe trench #2B exhibits Area B (Figures 8.6-2 and 3). Below is a list and description of each sediment in reverse depositional order. Aid in the definition of each and interpretation of the depositional sequence was provided by Dr. Stephen Hall and U.S. Soil Conservation Service Soil scientists Leroy Werchan and John Coker.

Stratum 1. A large grained pale brown (10YR 6/3) sandy loam was found on the surface of the very southeast edge of the site at the east end of backhoe trench #4A. It extended south and east for an undetermined distance and its thickness in the wall of backhoe trench #4A varied from 30 to 40 cm. This sediment, the most recently deposited alluvium in the site area, was devoid of cultural material.

Stratum 2. This alluvial deposit covered the surface of the entire site area except for the very southeast downslope edge where stratum 1 was seen. It was an extremely hard, compacted loam (10YR 4/2). The dark grayish brown color was the result of decayed organic matter within the

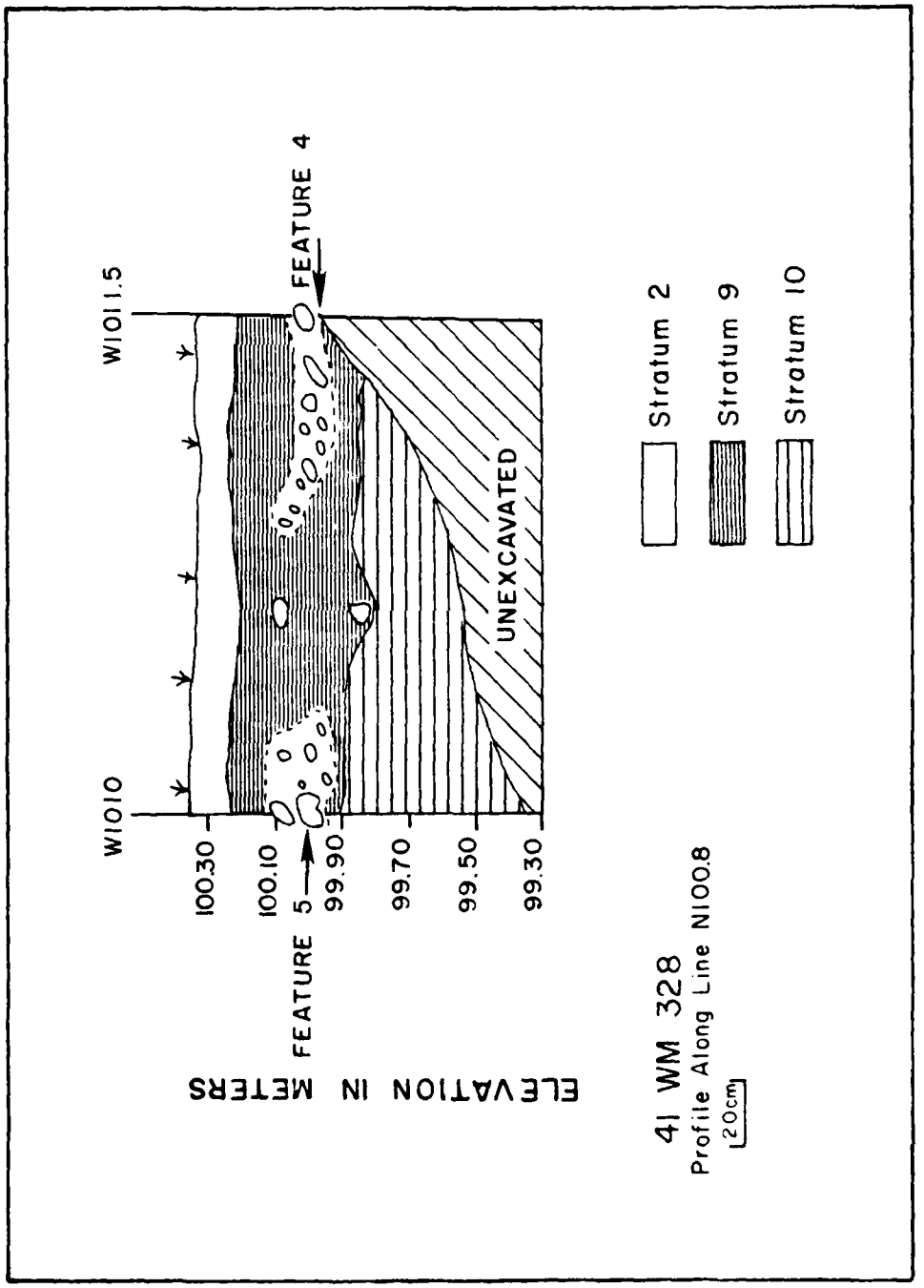

41 WM 328
Profile Along Line N100.8
20cm
ELEVATION IN METERS
100.30
100.10
99.90
99.70
99.50
99.30
W1010
W1011.5
FEATURE 5
FEATURE 4
UNEXCAVATED
Stratum 2
Stratum 9
Stratum 10

Figure 8.6-2

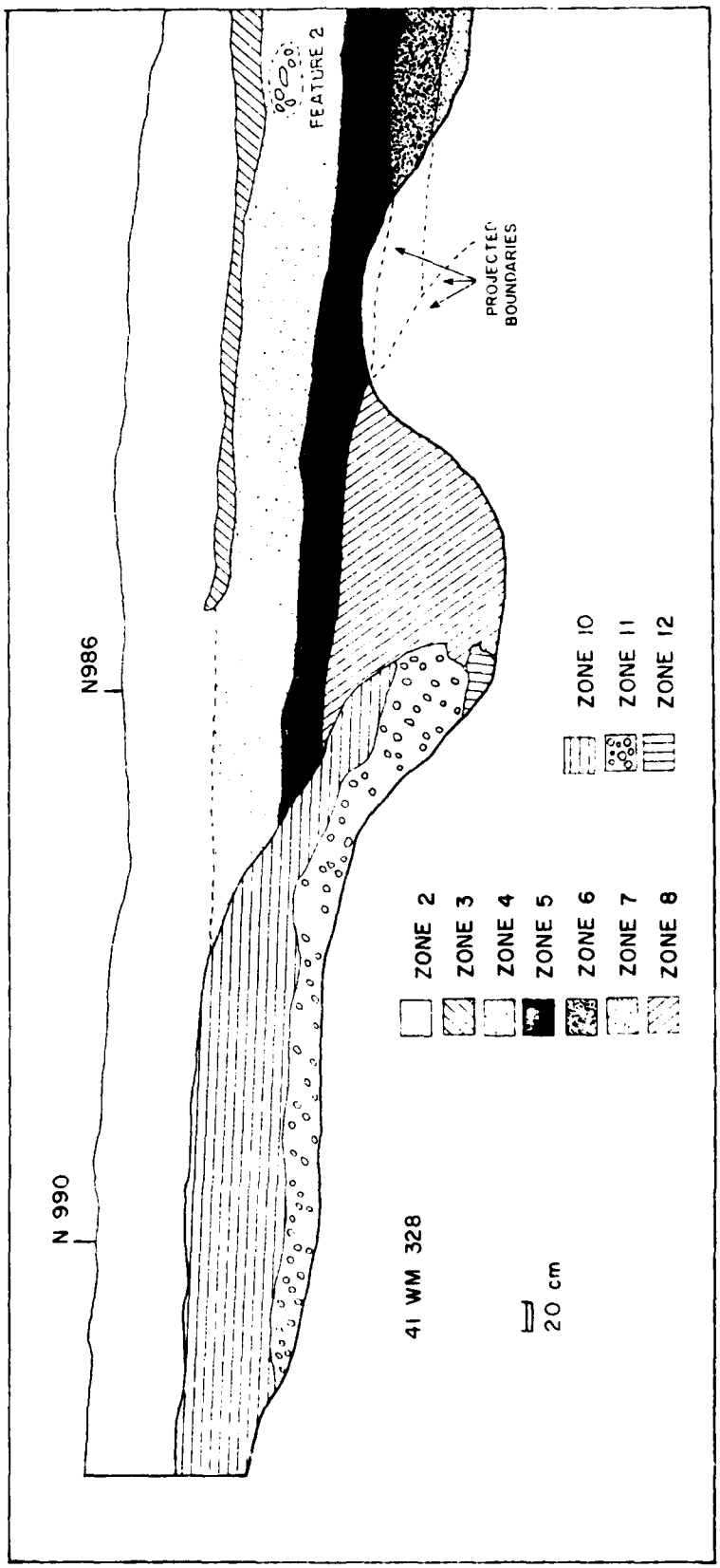

N 990
N986
41 WM 328
20 cm
FEATURE 2
PROJECTED BOUNDARIES
ZONE 2
ZONE 3
ZONE 4
ZONE 5
ZONE 6
ZONE 7
ZONE 8
ZONE 10
ZONE 11
ZONE 12

Figure 8.6-3.

sediment. It was only 10 cm thick in Area A of the site, but further east and south it ranged from 50 to 120 cm in thickness. It contained only very sparse cultural debris except in the vicinity of the two Area A units where cultural material was more dense.

Stratum 3. A thin 10 to 20 cm thick heavy silt loam with fine sand articles showed very clearly in the profiles in Area B because its brown (10YR 5/3) color was much lighter than strata 2 and 4. This alluvial sediment banked up against the lower slope of the terrace apparently in a single flood episode creating a weak buried "A" horizon beneath it. Stratum 3 was almost completely devoid of cultural debris.

Stratum 4. This dark brown (10YR 4/3) silty clay loam was a buried "A" horizon. In excavations in Area B of the site, an Austin Phase component was found in the upper part of this stratum. Stratum 4 was seen only in Area B where it overlay stratum 5 and banked up against stratum 10 which was part of an earlier terrace edge. The average thickness of stratum 4 was 30 cm.

Stratum 5. This compacted silty clay loam was like stratum 4, but lighter in color due to the presence of more calcium carbonate and less organic material. It was grayish brown (10YR 5/2) in color, and was generally about 35 cm in thickness. It overlay strata 6 and 7, and extended up slope against stratum 10 which formed an earlier terrace edge. Materials from Twin Sisters Phase occupations were found in this sediment.

Stratum 6. On the lower south slope of the terrace in Area B, this stratum was found above stratum 7 and banked up against stratum 9 which in turned had banked up against strata 10 and 11 (an ancient terrace edge). Stratum 6 was a silty loam, yellowish brown (10YR 5/4) in color, about 35 cm thick that was very disturbed by rodent burrows. The very sparse cultural material within this stratum was the earliest seen at the site.

Stratum 7. This stratum was seen at the bottom of those backhoe trenches at the very south end of the site beneath stratum 6. It had banked up against stratum 8, but did not reach entirely over stratum 8 to the earlier terrace edge formed by strata 9, 10, 11, and 12. It was a pale brown (10YR 6/3) color and was similar in character to stratum 6 but contained more clay. No cultural material was observed within this deposit in the profile wall.

Stratum 8. The earliest sediment against the aforementioned ancient terrace edge was stratum 8. Like strata 7, 11, and 12, the bottom of this stratum was not located, so the thickness is unknown. It was a brown (10YR 5/3) silty loam that was very disturbed by rodent activities. No evidence of prehistoric occuaptional debris was seen within this stratum.

Stratum 9. In backhoe trenches #3A, 3B, 3C, and 2C at the top of the terrace, this dark brown (10YR 4/3 to 10YR 3/3) loam was found beneath stratum 2 and above stratum 10. It probably once formed the cap of the

terrace that would have included stratum 10, 11, and 12 in that order. Stratum 9 did not appear south and east of Area A on the downslope of this ancient terrace edge. Either it never extended in those directions or it eroded away prior to the deposition of stratum 2 in those areas. Practically all of the Twin Sisters Phase occupation in Area A was within this sediment. Other than being darker in color than strata 2 and 10, it was also different in that it had a higher clay content than those two zones. In vertical thickness this zone ranged from 28 to 92 cm.

Stratum 10. This stratum was seen at the top of the terrace under stratum 9. It was a reddish brown silty clay loam (5TR 5/4) that contained no cultural material. On the south and east slopes of the terrace where stratum 9 was not present, it must have formed the top of an early terrace. It sloped drastically between the N988 and N986 lines in backhoe trench #2B (Fig.8.6-3) and disappeared at approximately the N985.7 line in that trench along with strata 11 and 12. To the south, more recently deposited sediments then appeared.

Stratum 11. Many small pieces of limestone gravels ranging from 2 to 5 cm in diameter were found in this light silty clay loam. It was seen at the top of the terrace in the northern half of backhoe trench #2B. Stratum 11 occurred underneath stratum 10 and possibly formed the core of the early terrace. It had the same reddish brown (5YR 5/4) color as stratum 10 and sloped dramatically between the N988 and N986 lines ending at N985.7 like stratum 10. No cultural material was present in this stratum.

Stratum 12. A very small portion of this sediment was located in the deepest part of the upslope end of backhoe trench #2B beneath stratum 11. Like strata 10 and 11, it was not seen south of the N985.7 line. It lacked the gravels that were present in strata 11 and was different in color, being a yellowish brown (10YR 5/4). This unit was a large grained silty loam devoid of cultural debris.

Culture/Time Stratigraphic Units

Two culture/time stratigarphic units were evident at 41WM328: a Twin Sisters component represented in both Areas A and B and an Austin component represented only in Area B. Diagnostic projectile points, radiocarbon dates, soil stratigraphy, and vertical and horizontal positioning of artifacts and features were considered in defining each component.

Evidence of an Austin component was found in stratum 4 sediments in levels 8, 9, and 10 in the Area B unit. Two hearths, Features 2 and 9, were exposed in these levels. Feature 2 has a radiocarbon age of 1290 $\pm$ 100 B.P. (UGa - 2470). This date and the presence of a Scallorn point between the two features strongly suggested an Austin phase affiliation. The amount of lithic debris associated with these hearths was low in numbers, and only several tools and tool fragments were observed.

The boundaries of this component could be reasonably estimated by examining adjacent backhoe trenches. It may have covered an area of only 120 square meters horizontally. BHT #2B showed that the northern extent of the 1st Horizon may have been just 3 or 4 meters north of the Area B unit. Its southern boundary must have been approximately 2 meters south of the Area B unit as there was no evidence of it in BHT #2A several meters to the south. A sparse scattering of burned rocks in BHT #4B at approximately 98.70 meters appeared to be a western continuation of the 1st Horizon. It definitely was not present further west in BHT #4C. The 1st Horizon was most evident in BHT #4A where two fire hearths and a probable pit feature containing charcoal but no burned rocks were observed in the north wall of the trench. The horizon appeared to slope downward at the east end of the trench and may have extended eastward beyond the end of the trench at the W989 line. As in the Area B unit, however, the amount of lithic debris associated with these features appeared to be very small.

The Twin Sisters component began in the Area B unit at approximately 97.95 meters elevation at the top of stratum 5 (Fig. 8.6-3). The top of this component was separated from the bottom of the Austin component by about 35 cm of almost sterile sediment in which only occasional isolated flint flakes were seen. The total vertical thickness of this component varied in each of the four 1 x 1 meter squares in the Area B unit. At a minimum, it was 47 cm thick and 59 cm at a maximum. The top and bottom of the Twin Sisters component corresponded for the most part to the top and bottom of sediments of stratum 5 at Area B.

Three features, 15, 16, and 17 appeared in the upper part of this stratigraphic unit in the Area B unit excavation. Radiocarbon dates of 1610 $\pm$ 165 B.P. (UGa - 2483) and 1460 $\pm$ 80 B.P. (UGa - 2481) from Features 15 and 17, respectively, and the presence of a Darl point beneath these hearths indicate a Twin Sisters Phase occupation. Feature 18, another hearth, lay deeper than the other three features in the 2nd Horizon. It should date earlier than the other three, unless it is a rock pavement and the bottom of a deeply basin-shaped pit. No evidence of a pit outline could be seen, however. No charcoal was present within the hearth that could have been used for carbon dating.

A strange cluster of eight tools and one core in the N982/W1001 unit to the east of the hearth in level 20 just below the base of the hearth further confused the date of this occupation. Fiv projectile points including a Pedernales, a Castroville, a Fairland-Ensor, and two unidentifiable types were present in this cluster which may have been a cache. Other tools were a biface and two denticulates. Although the identifiable points may represent a time span of 2,000 years (Round Rock to Twin Sisters Phase), the continued use and curation of such specimens should not be unexpected. The association of these specimens could be expected of a late San Marcos Phase occupation. Extremely little debitage was found associated with the tools in unit N982/W1001 or in any of the other three excavation units leading to the suspicion that they were made at earlier dates elsewhere and then somehow collected and transported to 41WM328.

The tools were not, however, stacked together but were instead found in three of the four quads of the N982/W1001 unit. There was no physical evidence of a cache pit, although the tools did lay at a greater depth than the majority of the cultural debris within this stratigraphic unit. Although this earliest evidence of occupation within the stratigraphic unit is not firmly dated, it appears that early to middle Twin Sisters Phase occupations are best represented. However, an earlier occupation, possibly of the San Marcos Phase, at the base of the horizon cannot be ruled out.

The overall horizontal dimensions of this component closely match that of the Austin component in the north, south, and west directions. To the east, it was very evident at the west end of BHT #4A. A hearth that appeared to belong to the Twin Sisters component was seen in the north wall of that trench between the W993.5 and W994 lines approximately. Further east of this hearth, however, the amount of cultural debris tapered off and very little was evident at the east end of the trench at approximately W989. Another hearth at the east end of BHT #4B at approximately the W1007 line was at the depth of the Twin Sisters component in stratum 5 matrix.

The remaining component of cultural debris was located in both the N1000/W1018 and N1000/W1012 2 x 2 meter squares in Area A excavation. This component lay in levels 2-5 in these units in stratum 9 matrix. This component was located at the very top of the terrace north and northwest of the other two components. Stratum 9 matrix containing early Twin Sisters component material was seen in BHT #3A, 3B, 3D, 2D, and 2C. Its overall horizontal area appeared to be confined to a 400 square meter area at the terrace top. It definitely did not extend east of the N1000/W1012 unit all the way to BHT #2B or southward all the way to BHT #4B. No evidence of cultural material was seen in the stratum 9 matrix in BHT #3C west of the N1000/W1018 unit, and it did not extend northward beyond BHT #2D.

Above the stratum 9 sediment in the vicinity of the two Area A units there is approximately 10 cm of stratum 2 matrix that contains cultural debris. Since stratum 2 matrix is thought to be much more recent than stratum 9 matrix at the site, all cultural material on the ground surface and in the 1st level may date from a later time period than the Twin Sisters component. Unfortunately, no diagnostic artifacts were found in level 1.

Time diagnostic markers for the Twin Sisters component are Fairland/Ensor projectile points. Three of these were found in level 2, one in level 4, and another in level 5. Cultural debris thins in level 6 drastically and even more so in level 7. Fairland/Ensor points are thought to be representative of the early part of the Twin Sisters Phase. Therefore, an approximate date of 1700 B.P. may be postualted. This component should date slightly earlier, then, than the upper part of the Twin Sisters component within Area B and possibly be contemporaneous with the earliest occupations of that component. Unfortunately, the large number of hearths within the horizon did not provide sufficient radiocarbon samples for dating.

Features

Eighteen features were recorded during excavations at site 41WM328. Area B yielded six features while Area A yielded twelve. Most of the features were clusters of burned rock which were definite or possible hearth remains. Feature 16 was unique in that it was a mass of oxidized soil and ash that contained no burned rocks. The features will be presented according to their association with the previously described cultural components. Lithic remains directly associated with these features are presented in Table 8.6-1.

Austin Component

Two hearths, both from excavation unit B, comprise the total sample of features excavated from this Austin phase component. Other hearths noted in the backhoe trench walls are likely the products of Austin phase occupations, also. The stratigraphic relationship of the two excavated hearths suggests that they may have been utilized contemporaneously.

Feature 2. This hearth was first encountered when the backhoe removed the western portion of it near the south end of backhoe trench #28. The remainder measured 56 x 35 cm and was uncovered in the NW and SW quads of the N982/W1002 unit. Some of the 13 bunred rocks found appeared to be fire cracked in situ. The hearth ranged from 90 to 110 cm below ground surface and was multiple layered (Figure 8.6-4).

Some lithic debris was present in the vicinity of the hearth including a thin biface fragment and a core. Eighty centimeters to the northeast, a hearth labeled Feature 9 was uncovered at the same elevation. A Scallorn point was found not far from the feature in the same level. A large amount of charcoal was recovered from Feature 2 which provided a date of 1290 ± 100 B.P. (UGa - 2470). It represented the latest occupation at 41WM328 that was carbon dated. Flotation analysis showed that charred acorns (Quercus sp.), walnuts (Juglans sp.) and pecans (Carya sp.) were within the feature fill.

Feature 9. A small cluster of burned limestone rocks in the NW quad of the N982/W1001 unit that extended into the north wall of the unit was found between 81 and 89 cm below ground surface. The exposed portion of the hearth measured 30 cm from north to south and 39 cm from east to west. Several of the rocks appeared to have cracked in situ from repeated burning. The hearth was 88 cm northeast of Feature #2 and at the same approximate elevation. A Scallorn point was recovered just sourth of the hearth stones and two distal ends of possible arrowpoints were found in the level beneath the hearth. The date of 1290 ± 100 B.P. (UGa - 2470) obtained from Feature 2 should apply for this feature also.

Table 8.6-1.
Lithic Material Associated with Features 1-18, Site 41WM328.

LITHIC REMAINS	FEATURES																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Secondary flakes >50%	1															1(1)		
Secondary flakes <50%	3	1		1	2	2(1)	2	2	1				2		1	2	3(2)	
Tertiary flakes	11(2)		4	9(1)	3	13(3)		6	2	2	4	2(1)	18(3)	12(3)	7(4)	4	9(5)*	
Micro-flakes	15(2)		7(2)	3	4(1)	12		3			2	6(1)	13	3(1)	4(1)	3	5(2)	
Micro-blades																	1	
Biface thinning flakes				2														
Core removal flakes																1		1
Core fragments								1						1				
Chunks		2(1)		1(1)								2		1		8(1)	2	
Burin spalls								1										
Chips	27(8)		13	27(4)				1	2	1	5(2)		18(7)	12(1)	5(3)	5(2)	20(13)	
Biface fragments			1					1										
Retouched pieces												14					1	

*( ) Heat Altered Specimens

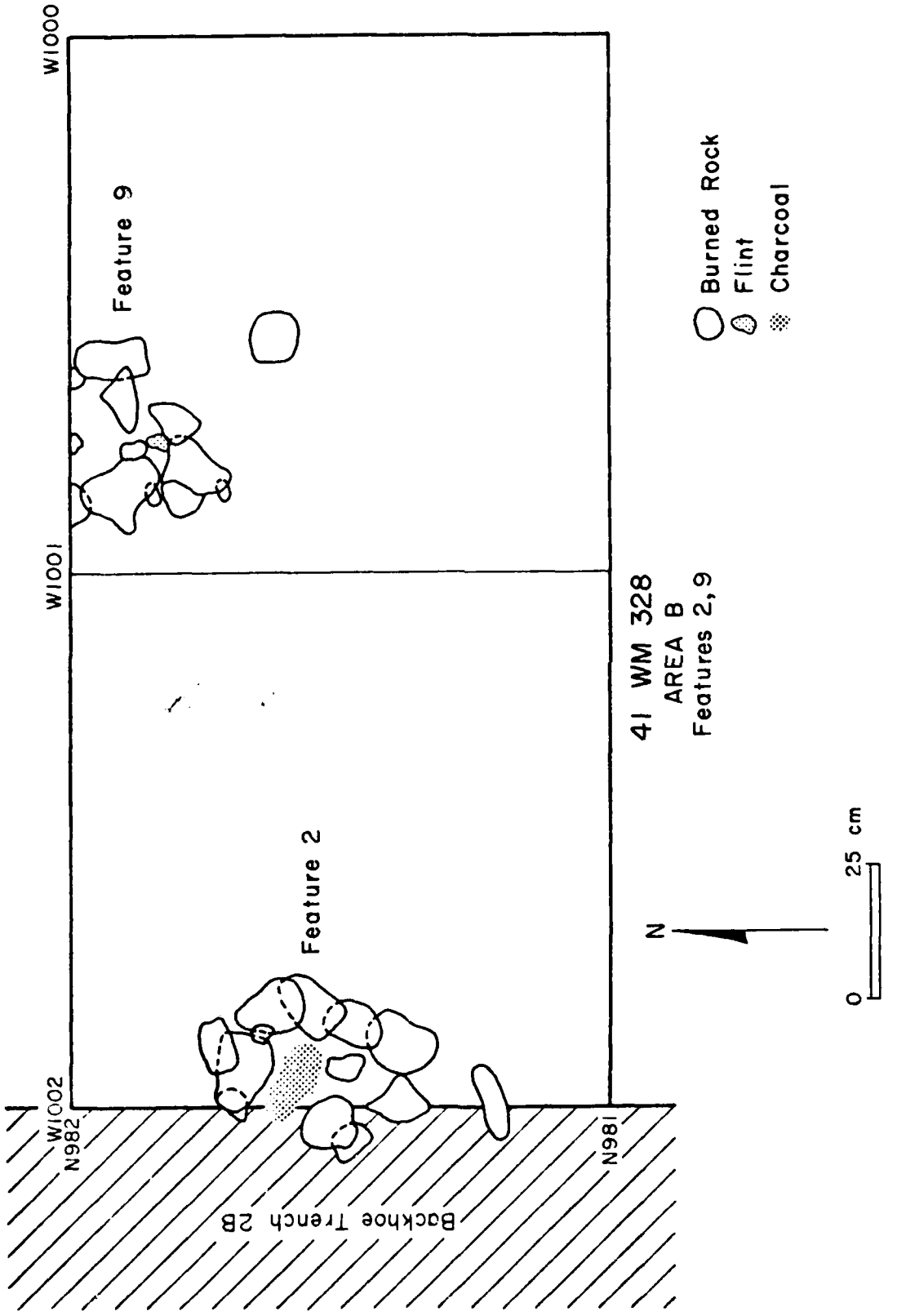

W1000
W1001
W1002
N982
N981
Feature 9
Feature 2
Backhoe Trench 2B
41 WM 328
AREA B
Features 2, 9
Burned Rock
Flint
Charcoal
N
0
25 cm

Figure 8.6-4.

Twin Sisters Component (Area B)

As with the Austin component, all four features of this component were recovered from excavation unit B. The deepest hearth, Feature 18 likely represents an early Twin Sisters phase occupation. The remaining hearths, Features 15, 16, and 17 are more firmly dated as middle Twin Sisters Phase occupations. The order of presentation will be from oldest to more recent (Figure 8.6-5).

Feature 18. The vertically deepest of all features found in the Area B unit at 41WM328 was Feature 18 which occurred from 1.79 to 1.93 meters below ground surface. It was located in the NE and NW quads of levels 18, 19, and 20 in the N982/W1002 1 x 1 meter square unit. The hearth extended into the north wall of the excavation unit, but it appeared that a majority of the hearth was uncovered. Horizontally, the exposed part was oval-shaped and measured 43 x 32 cm. No basin was evident nor was any charcoal recovered from the hearth area. Flint debris in levels 17 through 20 above and around the hearth in the N982/W1002 1 x 1 meter square was very minimal. Horizontally more debris lay to the west in levels 18-20 of N982/W1001. Oddly enough, in the unit adjacent to the east, five projectile points were found in Level 20. Included were a Fairland/Ensor, a Castroville, a Pedernales, and two unidentifiable specimens. The presence of diagnostic artifacts from three different phases of the Central Texas Archaic in one level was unusual for this site. Other tools and debitage elements were also present in that level. The projectile points and retouched flakes may have been a cache of tools that through time were slightly dispersed over the 1 x 1 meter square area. Alternately, these tools may have washed in during floods or been moved about by rodents. It would be incorrect to say that any of these tools are definitely associated with Feature 18. Since Feature 18 does appear above this collection of material, an early Twin Sisters Phase designation for the occupation represented by Feature 18 seems reasonable.

Feature 17. This tight cluster of burned limestone rocks measured 95 x 50 cm horizontally in the N981/W1001 1 x 1 meter square unit. Two layers of rocks comprised its depth in most places, but surprisingly there was no evidence of a basin shape. The top of this hearth also overlapped the bottom of Feature 15 vertically, but it was on the average 20 cm horizontally south of Feature 17. The matrix in and around the hearth was very dark with charcoal flecks. Charcoal collected from within the hearth stones dated 1460 $\pm$ 80 B.P. (UGa - 2481). This date, along with that of Feature 15, places this component in Area B in the Twin Sisters Phase of the Central Texas Archaic. Surprisingly, Feature 17 dated later in time than Feature 15, although it was slightly deeper vertically. The dates do overlap when the standard deviation values are considered. Several isolated patches of burned orange soil were observed in and around the burned rocks. A concentration of snail shells was found about 25 cm south of the hearth. The pocket was about 4 cm in vertical thickness and extended into the south wall of the excavation unit. Feature 17

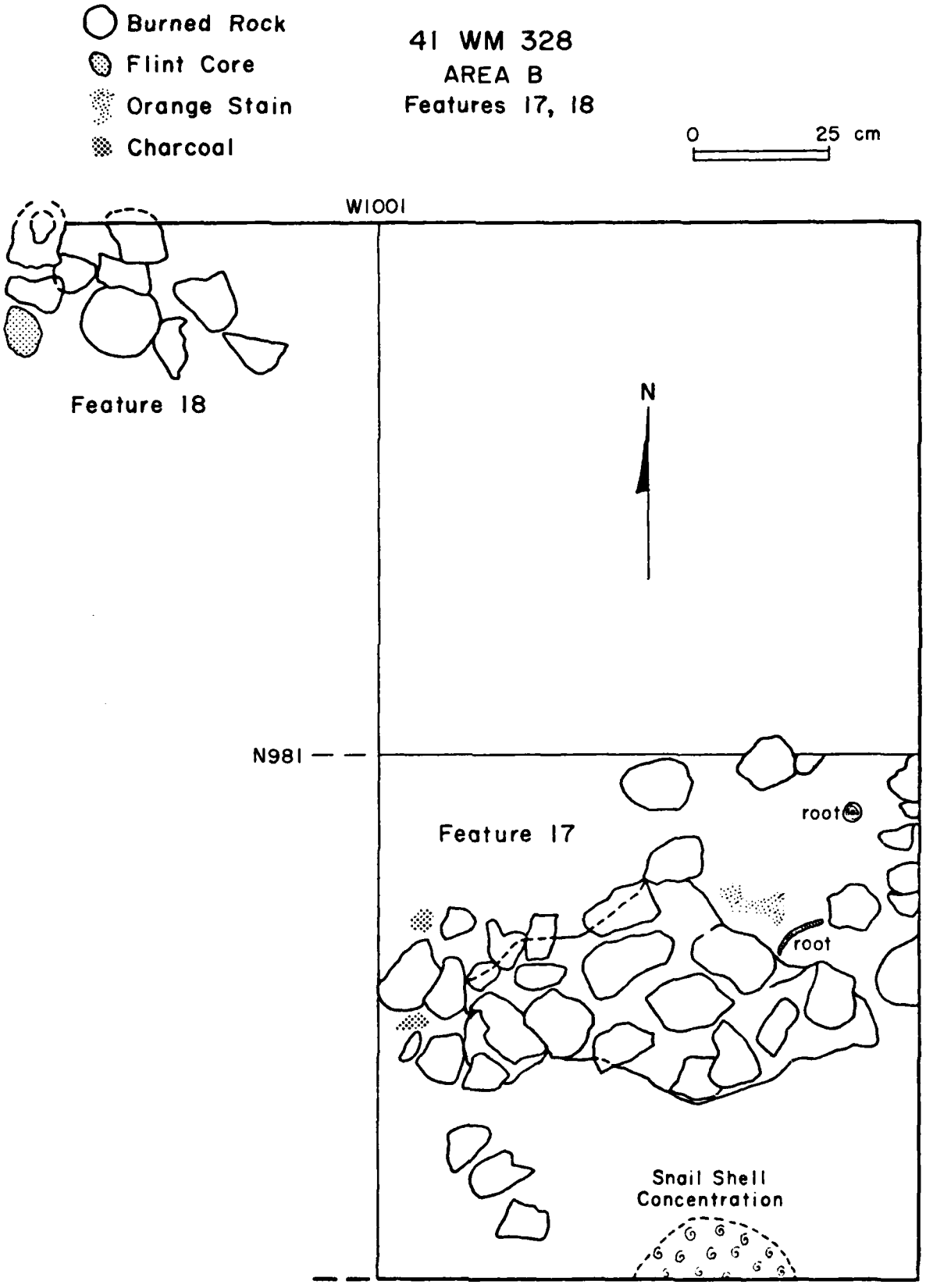

Burned Rock
Flint Core
Orange Stain
Charcoal
41 WM 328
AREA B
Features 17, 18
0
25 cm
W1001
Feature 18
N
N981
Feature 17
root
root
Snail Shell
Concentration

Figure 8.6-5.

also held a large quantity of acorn and pecan fragments. Relatively speaking, much cultural material was recovered from the levels associated with Feature 17. The only diagnostic projectile point nearby was the previously mentioned Darl point fragment which fits well with the dates from Features 15 and 17.

Feature 16. Feature 16 was a pocket of mottled, burned orange soil that covered the entire NW and most of the NE quads of the N982/W1001 unit. Stratigraphically, Feature 16 is situated between Features 15 and 17. Charcoal fragments and pieces of a light yellow to white colored deteriorated limestone and/or ash appeared within the orange soil. While commonly referred to as an "orange" color, in this case it was 7.5YR 5/6 ("strong brown"). The feature extended an undetermined distance into the unexcavated areas north and east of the Area B unit. A few of the burned limestone rocks from Feature 15 extended into the southern portion of the orange stain, but because the orange stain was for the most part horizontally separate from the rock cluster, it was given its own feature designation. Feature 16 may represent a fire pit, but a true pit profile was not distinguishable in the walls of the excavation unit. The explanation may lie in the unexcavated part of the feature to the north and east. Orange stains were frequently seen surrounding hearths during the field season, but mostly in the Granger Reservoir. Since, in this case, many burned rocks were found to the south side of the orange stain in a rather formless mass, it may be that the occupants raked the hearthstones out of the Feature 16 area when removing food. The dates from Features 15 and 17 should apply to this feature (Figure 8.6-6).

Feature 15. The remains of one or more hearths were thought to be represented by a large scatter of burned rocks that covered most of the N981/W1001 unit. Horizontally, the feature measured 126 cm from north to south and 56 cm from east to west. It was from 138 to 153 cm below ground surface. In some cases 2 or 3 layers of rock comprised its vertical depth. The upper part of the hearth was in level 14, and it continued into the top of level 16. A charocal sample from this feature dated 1610 $\pm$ 165 B.P. (UGa - 2483), placing it within the Twin Sisters Phase of the Central Texas Archaic.

The only diagnostic artifact recovered in the levels surrounding these middle Twin Sisters Phase hearths (Features 15, 16, 17) was the proximal half of a Darl point which came from the matrix of level 16 of unit N982/W1002. A large anvil was also recovered from this same level. An unusually high number of large flakes were found in the same vicinity; thereby, suggesting a possible association with the anvil.

Twin Sisters Component (Area A)

A total of eleven hearths was recovered from this horizon within the Area A excavation units (Fig.8.6-8). A minimum of two occupational features (Features 8, 12) occurred in the earlier depositional

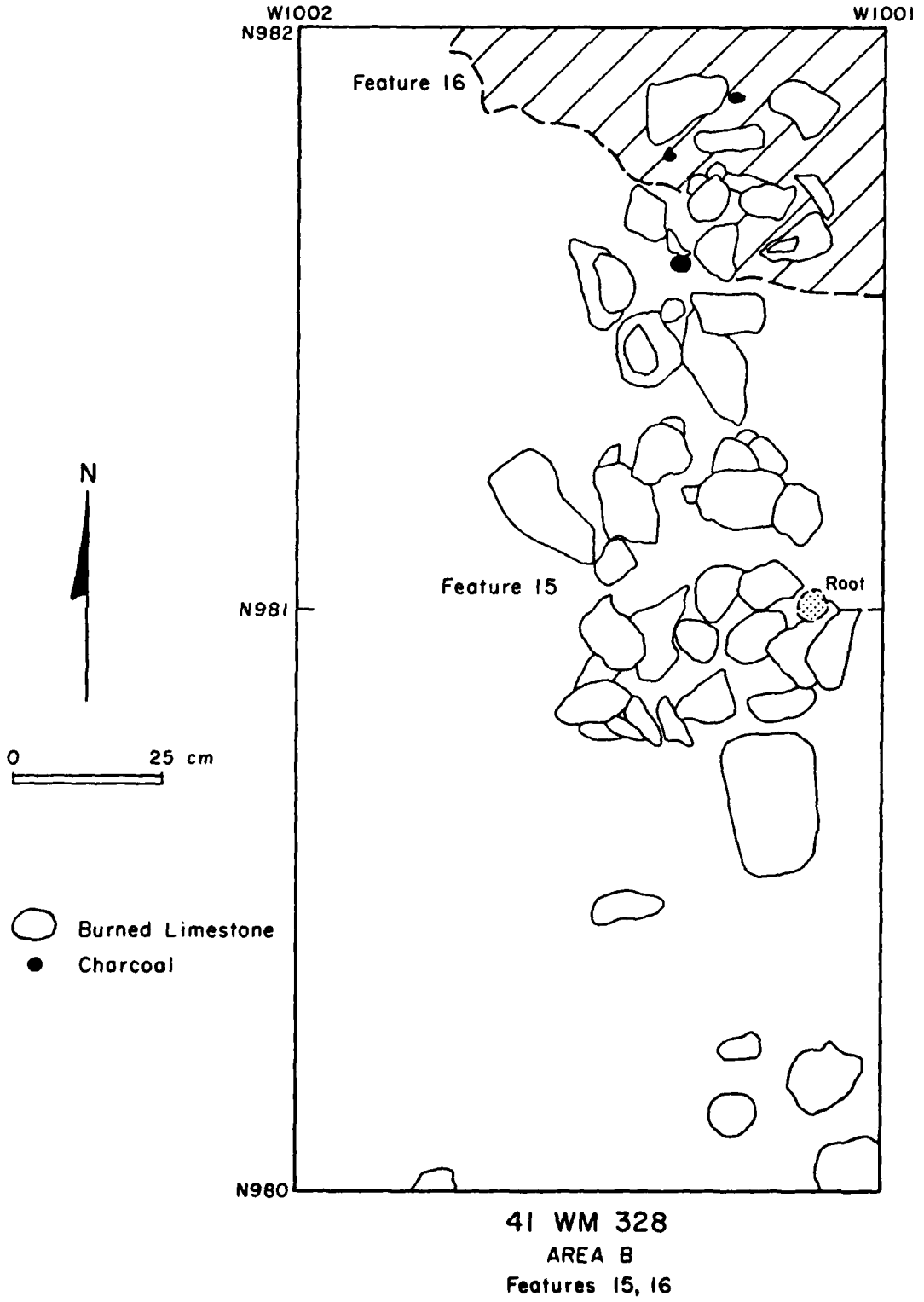

W1002
W1001
N982
Feature 16
N
Feature 15
Root
N981
0
25 cm
Burned Limestone
Charcoal
N980
41 WM 328
AREA B
Features 15, 16

Figure 8.6-6

episode; the remaining eight hearths comprise the later. Both occupational episodes are contained within stratum 9 sediments. The earlier episode will be presented first.

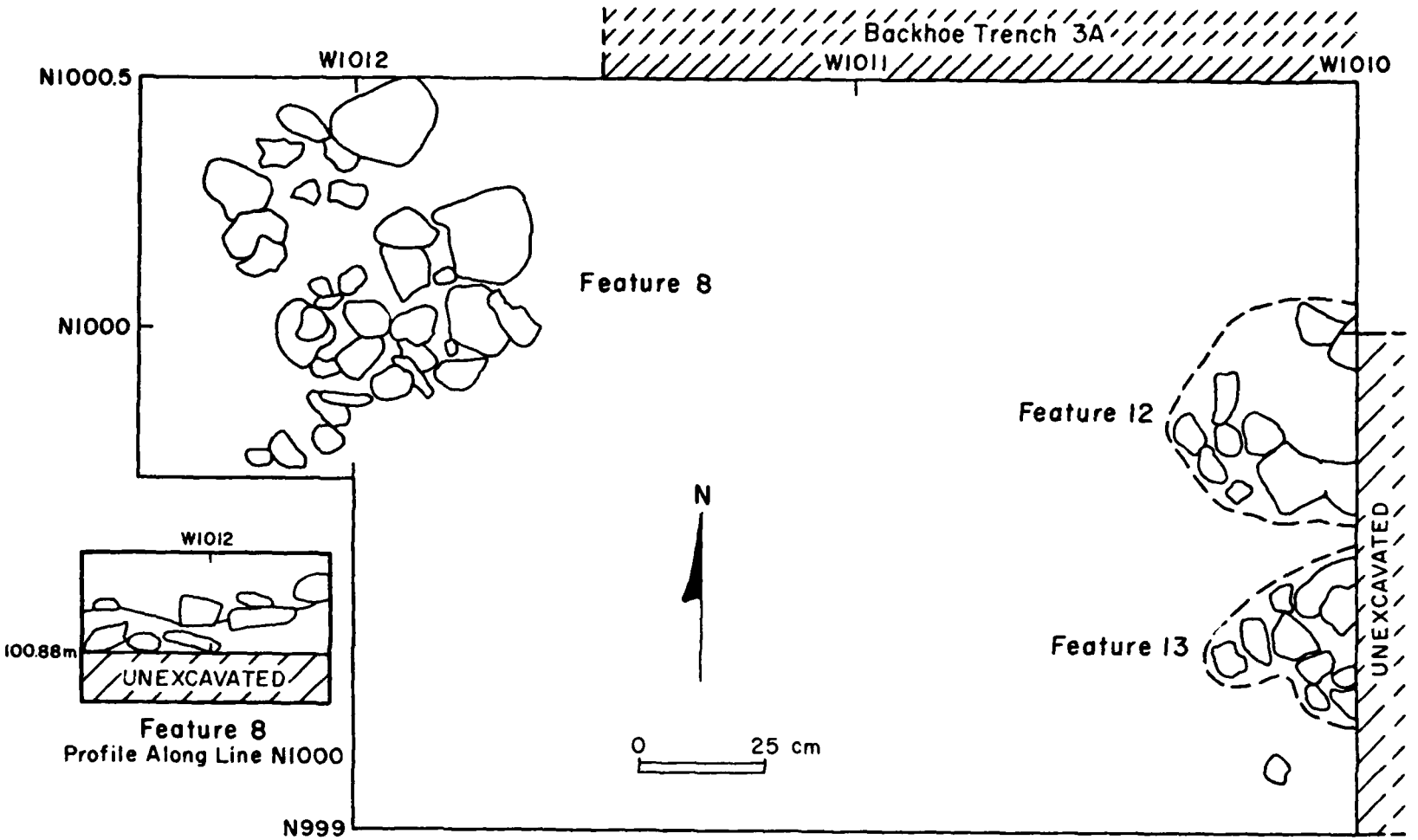
Feature 8. Several hearth stones that appeared to be larger than any of those in the other hearths in Area B were found in the western edge of the NW quad of the N1000/W1012 unit and the SW quad of the N1001/W1012 unit. The SE quad of the N1001/W1013 unit and the NE quad of the N1000/W1013 unit were then removed to the level above these burned rocks to see if a hearth similar to Features 4 and 6 of site 41WM53 were present.

The hearth that was uncovered was a somewhat circular arrangement of burned rocks about 65 cm in diameter (Fig.8.6-7). The three large limestone rocks first seen in the original excavation unit were the only exceedingly large ones. The hearth was similar in size and structure to all others in Area A. It ranged from 34 to 44 cm below ground surface. It was slightly basin-shaped like many of the other hearths at this site. It was 5 cm southwest and 5 cm deeper than Feature 4. A small amount of charcoal collected from the center of the hearth was not sufficient for a radiocarbon date. A Fairland/Ensor projectile point remade into a drill was found less than 50 cm to the southeast of the feature.

Feature 12. Approximately 6 to 12 cm below the northern portion of Feature 7, a probable hearth was uncovered (Fig.8.6-7). The entire hearth was not seen because it extended into the east wall of the excavation unit. It was either a crescent-shaped hearth or a very disturbed circular hearth whose center was void of burned rocks. Since the hearth was not completely exposed, a definite conclusion could not be drawn. A cluster of 9 burned rocks in the NE quad of the N1000/W1011 unit formed either the western portion of a crescent-shaped hearth or the southwestern part of circular hearth. Two other burned rocks aobut 20 cm to the northeast in the east wall of the excavation unit would form the northern edge of the circular hearth, but would not be part of a crescent hearth.

The hearth occurred 27 to 31 cm below ground surface. It was a single flat layer of burned limestone rocks which measured 38 cm from north to south if the two isolated rocks to the northeast were included or 28 cm if they were excluded. The exposed portion of the east-west axis measured 36 cm. No charcoal was found within the cluster of stones nor were any diagnostic artifacts seen.

Feature 13. This hearth was similar to Feature 12 in that it was 8 to 12 cm beneath Feature 7. It was located in the NE and SE quads of the N1000/W1011 unit about 10 cm south of Feature 12 from 30 to 37 cm below ground surface. The maximum dimensions of the exposed portions were 34 cm from north to south and 28 cm from east to west. A mano found to the west between Features 12 and 13 might be associated with either or both hearths (Fig. 8.6-7).



41 WM 328
Features 8, 12, 13

Figure 8.6-7

The later episode is represented by eight distinct clusters of burned rock. The elevations of these clusters indicate that all were likely constructed on the same surface. The term, episode, is used rather loosely here, for strict contemporaneity of these hearths cannot be demonstrated.

Feature 3. This small, compact cluster of 6 limestone rocks was found about 12 to 16 cm beneath ground surface in the NW and NE quads of the N1000/W1011 unit (Fig. 8.6-8). If it was a hearth, it was rather small as it measured only 38 x 30 cm. Three of the rocks were obviously burned while the others may not have been burned. Its position is slightly higher in elevation than three immediately adjacent hearths.

Feature 4. The extreme northern edge of this hearth was struck by the backhoe in the south wall of trench #3A (Fig. 8.6-8). Excavations showed it to be a slightly basin-shaped, single layer of burned rocks about 26 to 38 cm beneath ground surface. Maximum horizontal dimensions were 82 x 50 cm. In addition to the burned limestone rocks, there were two pieces of burned sandstone on the east end of the feature.

Feature 5. Like Feature 4, this hearth had its northern edge removed by backhoe trench #3A (Fig. 8.6-8). The top was struck at 35 cm below ground surface; the bottom was 15 cm deeper. The hearth was a slightly basin-shaped pavement of burned rocks which measured only 40 x 35 cm. Other nearby hearths at similar elevations were Feature 5 which was 40 cm to the east and Feature 12 which was 20 cm to the south. At very slightly higher elevations were Feature 3 about 35 cm to the southwest and Feature 7 which was 24 cm due south. No charcoal was recovered from the hearth stones.

Feature 6. In the SW quad of the N999/W1011 unit, a hearth was found at approximately 13 to 28 cm below ground surface. It was a small cluster of burned limestone rocks most of which sloped toward the center giving it a definite basin shape, even though it was only 15 cm in vertical thickness. It covered a horizontal area of 40 x 28 cm. The hearth was 40 cm west of the western edge of Feature 11, and 60 cm south of the southern edges of Features 3, 7, and 13 (Fig. 8.6-8). On the immediate west side of the hearth was a concentration of snail shells about 20 cm long, 8 cm wide, and approximately 5 cm thick. A combination mano and anvil was found 4 cm south of the hearth.

Feature 7. This hearth consisted of burned limestone rocks found in the NE and SE quads of the N1000/W1011 unit (Fig. 8.6-8). The east edge of this feature extended into the unexcavated N1000/W1010 unit. The exposed portion measured 66 cm from north to south and 38 cm from east to west. The feature was 16 to 24 cm below ground surface. It was surrounded on three sides by other features. About 10 cm deeper, two additional hearths were found directly underneath portions of Feature 7. Both of these likewise ran into the east wall of the excavation unit.

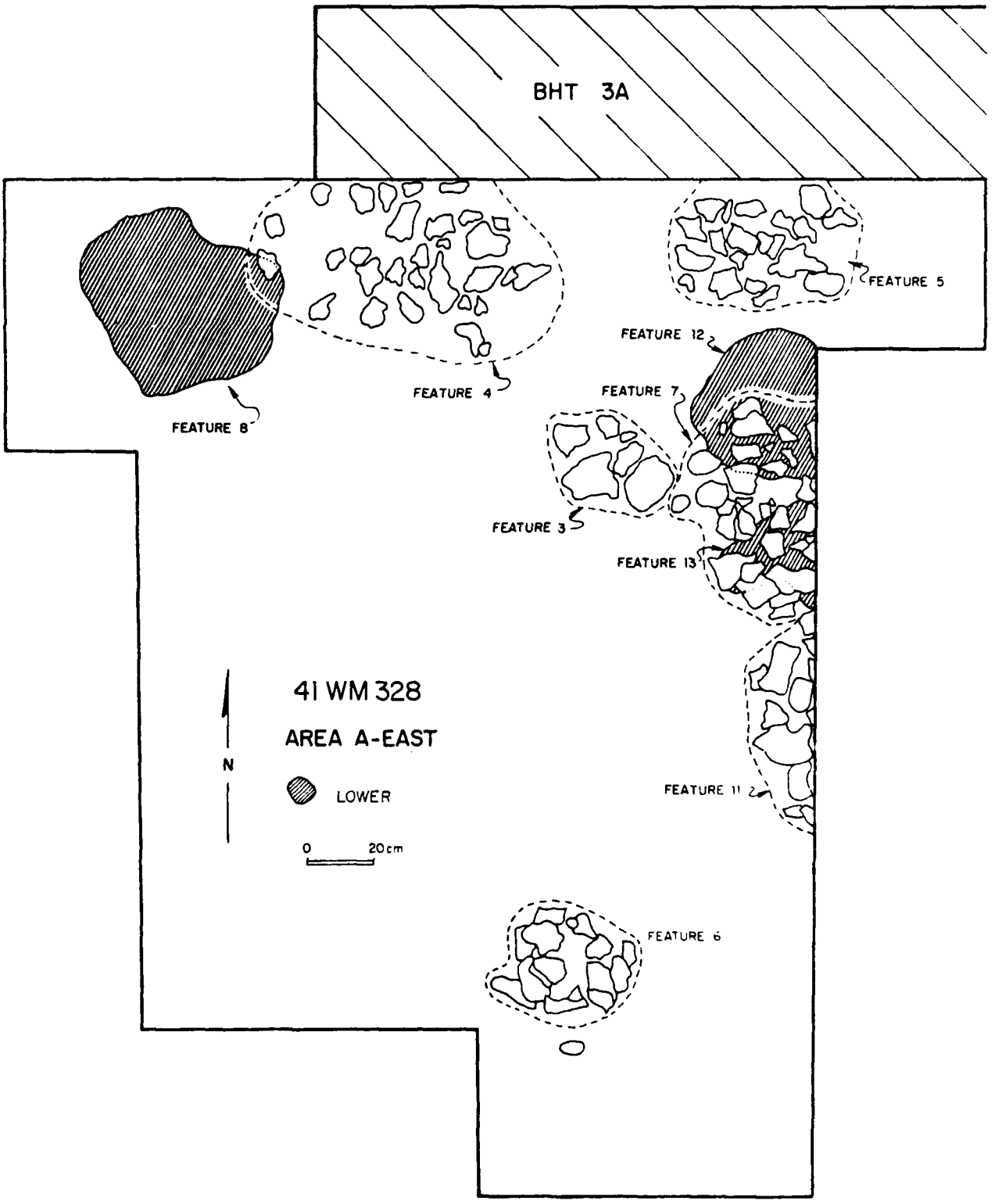

BHT 3A
FEATURE 5
FEATURE 12
FEATURE 4
FEATURE 7
FEATURE 8
FEATURE 3
FEATURE 13
41 WM 328
AREA A-EAST
N
LOWER
FEATURE 11
0 20cm
FEATURE 6

Figure 8.6-8.

Some of the burned rocks slanted toward the center in a way that basin-shaping would have been anticipated if the entire hearth had been uncovered. A Fairland/Ensor projectile point was found in the matrix just above the northwest edge of the hearth.

Feature 11. The western edge of this apparent hearth was found in the SW quad of the N1000/W1011 unit and in the NE quad of the N999/W1011 unit. Less than 50% of the hearth was exposed, the majority being in the unexcavated area to the east. Many of the hearthstones appeared to be sloping toward the center of the hearth hinting at a basin shape. The northern edge of the hearth was only 3 cm south of the southern edge of Feature 7 and at the same approximate elevation. The portion of the exposed hearth measured 64 cm from north to south and 20 cm from east to west. It was from 17 to 29 cm below ground surface. No diagnostic artifacts were found in the immediate vicinity.

Feature 10. This cluster of burned limestone rocks was uncovered in the SE quad of the N1000/W1018 unit and the SW quad of the N1000/W1017 unit. It occurred from 20 to 28 cm below ground surface. Burned rocks were scattered over an area measuring 35 cm by 56 cm. If it represented the remains of a hearth, it was badly disturbed, as it was by no means a tight cluster of rocks. A Fairland/Ensor projectile point was found in the level beneath the hearth (Figure 8.6-9).

Feature 14. The northwestern section of this circular arrangement of burned rocks was removed during backhoe excavations at the east end of backhoe trench #3B. The remaining undistrubed part was a tight configuration of burned rocks 19 to 32 cm below ground surface (Figure 8.6-9).

Although the burned rocks sloped in many directions, the majority were inclined toward the center of the hearth giving it somewhat of a basin shape. This was perhaps the only hearth in Area A that had very many rocks stacked on top of each other.

In the fill scooped out by the backhoe, two retouched flakes and a mano were recovered. In addition, a deer tooth and lithic debris were recovered in excavations. The excavated portion of the hearth was in all quadrants of the N1001/W1017 unit except the NW quad which was extracted by the backhoe.

The large number of hearths within the Twin Sisters component, especially in the N1000/W1012 2 x 2 meter square and adjacent quads, points to the probability of several episodes of occuaption on the upper terrace surface. This utilization of a small portion of available terrace space might be termed intensive, but some caution should be taken in overemphasizing this since each family group may have used several hearths at the same time for different functions. Prewitt believes that he has found multiple hearth usage at Loeve-Fox in Late Archaic components (personal communication). Still, the large

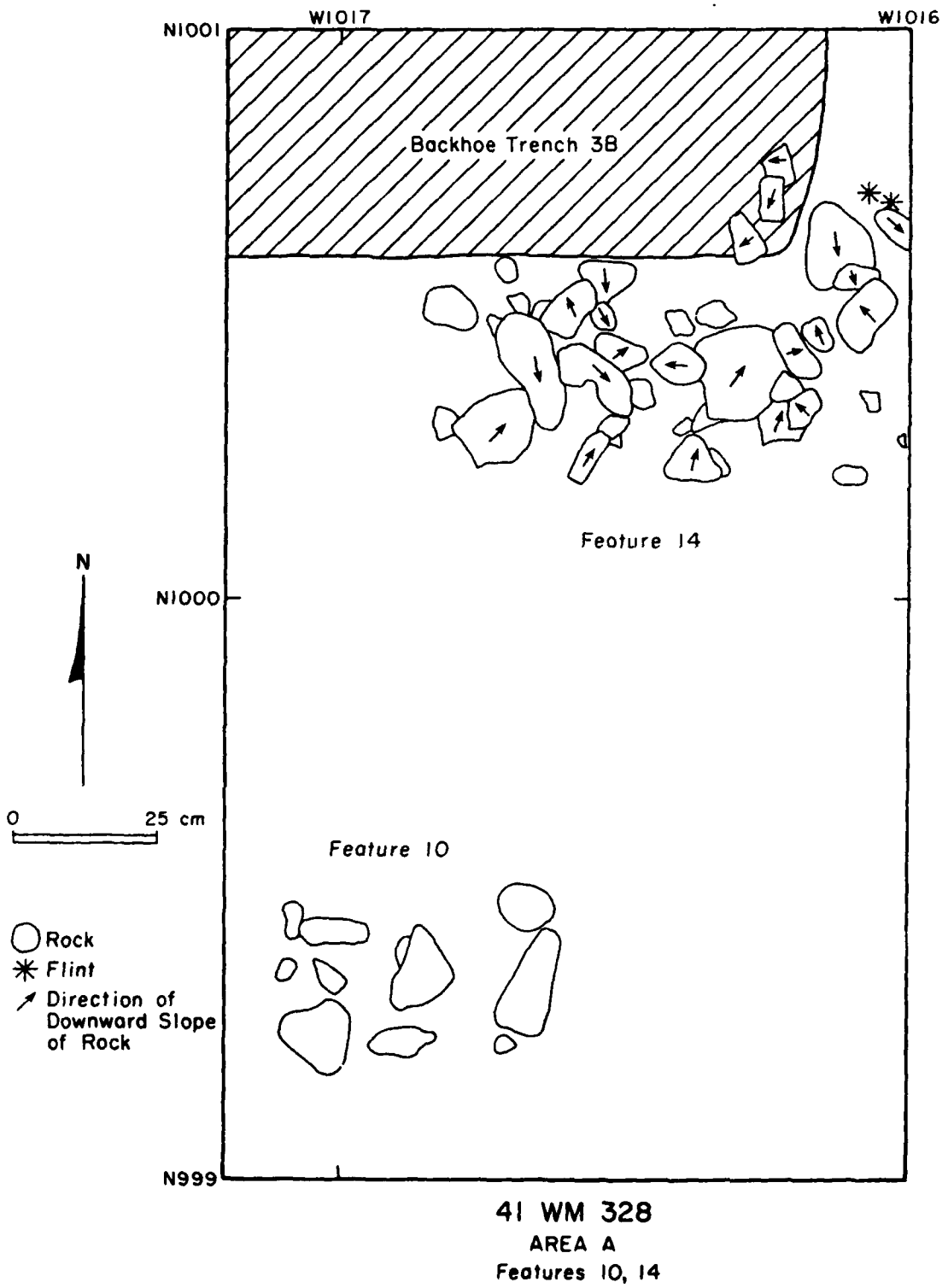

N1001
W1017
W1016
Backhoe Trench 38
Feature 14
N
N1000
0
25 cm
Feature 10
Rock
Flint
Direction of Downward Slope of Rock
N999
41 WM 328
AREA A
Features 10, 14

Figure 8.6-9

number of hearths in the N1000/W1012 unit could be compared to that in Areas A and B at site 41WM53. At Area A at site 41WM53, the repeated use of a small select area of the site by Twin Sisters and Austin component groups led to the formation of a burned rock lens or pavement after numerous hearths were constructed. The repeated use of the terrace in the vicinity of the N1000/W1012 unit at 41WM328 for hearth construction was apparently not as intensive as at Area A of 41WM53 because of solid rock lens of intersecting hearths and burned rock fragments was not evident. Individual hearths were more easily identifiable as in Area B of site 41WM53.

Bond (1978) has noted a similarly intensive occupation of a small part of the available space at site 41WM130 in Granger Reservoir. There, over 30 separate hearths were uncovered within a horizontal area of 100 square meters. The vertical spacing of these hearths was greater than at 41WM328, but still comparable. Like the features at sites 41WM328 and 41WM53, these features dates from the late prehistoric period. At site 41WM130, Bond thought that the degree of slope on the levee side facing the river channel caused the prehistoric population to favor one spot for repeated hearth construction.

Unknown Temporal Association

One remaining hearth (Feature 1) was recovered from the stratum 2 sediments which are directly above the Twin Sisters component within Area A. Unfortunately, no temporally diagnostic artifacts nor radiocarbon samples were recovered from stratum 2; consequently, no temporal determination could be made. A Twin Sisters or Austin Phase occupation is equally probable.

Feature 1. This feature was a cluster of 25 burned limestone rocks that were probably the remains of a hearth. The main rock concentration was in the western half of the feature where two especially large limestone rocks, each approximately 20 cm long, were cracked in situ. The eastern part of the feature may have suffered damage from rodents. Only lithic debris, a few scattered burned rocks, and snails were recovered. There was no evidence of any basin shape to the hearth (Fig. 8.6-10).

The hearth extended from 7 to 22 cm below ground surface. The maximum length of the feature was 70 cm; maximum width was 60 cm. The feature was found in the NE quad of the N999/W1017 unit, the SE quad of the N1000/W1017 unit, and the NW quad of the N999/W1016 unit.

Lithic Tools

One hundred and fifteen tools were excavated at site 41WM328. More than half of these artifacts were projectile points, projectile point fragments, biface fragments and retouched pieces. Only a few of the other tool classes are represented in any number (Table 8.6-2).

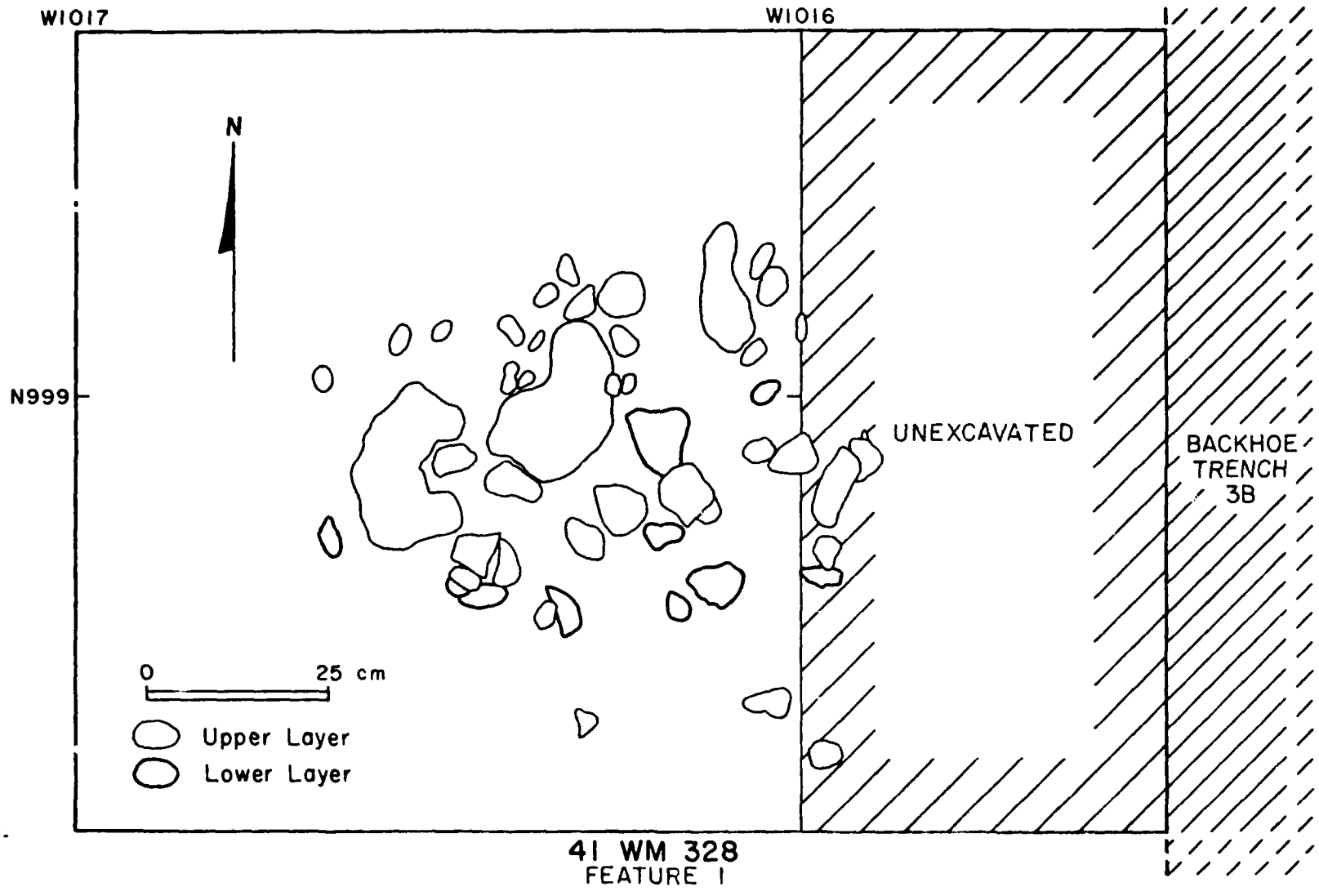

W1017
W1016
N
N999
UNEXCAVATED
BACKHOE
TRENCH
3B
0
25 cm
Upper Layer
Lower Layer
41 WM 328
FEATURE 1

Figure 8.6-10

Table 8.6-2. Tool Classes, 41WM328

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT	COMPONENT TOTAL	COMPONENT
Austin	B	8									1									1				
		9		1								1		1						3				
		10									2		4							6	10	20.83	10	8.55
Twin	A	2						1	1		4		8	3		1				18				
Sisters		3		2		1			1		1		5					1		11				
		4							3		3	1	5	4						16				
		5	1								1		1	1						4				
		6											1							1				
		7									1									1	51	76.12		
	B	14									1									1				
		15									1		1							2				
		16	2	1	2			1	2		1		2	1						12				
		17						1	2											3				
		18																		-				
		19		1							1							1		3				
		20		2								1		6						9				
		21	1								1									2	32	66.67	83	70.94
Unknown	A	1	1		1		1	2			7		4							16	16	23.88		
No	B	1											1							1				
Diag-		2											1							1				
nostics		3																		-				
		4																		-				
		5											1							1				
		6												1						1				
		7																		-				
	(B)	11							1											1				
		12																		-				
		13											1							1	6	12.50	22	18.80
S α BHT									2											2			2	1.71
TOTAL			5	7	3	1	1	5	12		25	3	35	17		1		2		117			117	100.00
%			4.27	5.98	2.56	.85	.85	4.27	10.26	-	21.37	2.56	29.91	14.53	-	.85	-	1.71	-	99.97				
Restric.T.																				57				
" %			8.77	12.28	5.26	1.75	1.75	8.77	21.05	-		5.26		29.82	-	1.75	-	3.51	-	99.97				

NOTE: Levels 11-13 in area B are considered sterile.

The majority of the tools were found during excavation in Area A, although this area is smaller in excavated volume than area B. Area B was very poor for all but the Twin Sisters component; few tools were found in the upper sevel levels.

The Twin Sisters component is most prominent at the site. Most artifacts were found in the upper levels (2-4) of Area A, and levels 16 and 20 in Area B. Biface fragments are most abundant; retouched pieces, projectile points and projectile point fragments are also numerous. There is also a rather important number of burins and denticulated pieces.

The Austin component was present only in Area B and yielded very few tools. Almost half of the sample consists of biface fragments. Debitage and debris were also very low in this area.

The density tables for the site (Table 8.6-3) show an overall less intensive lithic distribution in Area A and low intensity in Area B. This is also reflected by low intensity during the Austin component, and slightly higher during the Twin Sisters component (Table 8.6-4).

The same trends are reflected in the cumulative diagrams (Fig. 8.6-11). Tools for the Austin component are few. In the Twin Sisters component the proportion of tool classes I through XII is unusually high. In contrast, the retouched pieces are a relatively smaller class than usual. There is a large burin class, while backed pieces are also important. Truncations are few, and gravers are the only identified boring tools. There are also very few complete bifaces in the Twin Sisters assemblage.

Very few of the identified tools were complete artifacts, therefore no separate statistical analysis on those tools' measurements were made for this site, but were incorporated with the appropriate cultural components (Appendix H-4) by reservoir.

Site Summary

The materials recovered at 41WM328 show that repeated short term occupations, probably on a seasonal basis, occurred at the downstream end of a 1.75 kilometer long terrace edge adjacent to the river's edge. The utilization of this area over possibly a 400 to 500 year period by various hunting and gathering groups of Twin Sisters and Austin Phase affiliations are in some cases horizontally and vertically isolable. At 41WM328, two components--one ofthe Austin Phase and one of the Twin Sisters Phase--could be distinguished. It is highly likely that other prehistoric sites lay buried beneath alluvial sediments further upstream on this same terrace edge.

Table 8.6-3: 41WM328 Artifact Density by Area

Area	Component	Excavated Volume m^3	Tool/ Density N/m^3	Debitage Density N/m^3	Tool/ Debitage Ratio
A	Twin Sisters	2.1	24	2113	1:87
	Unknown	.4	40	2755	1:69
	Total area	2.5	27	2216	1:83
B	Austin	.6	17	455	1:27
	Twin Sisters	1.4	23	821	1:36
	Unknown	3.6	2	20	1:12
	Total area	5.6	9	267	1:31
	TOTAL SITE	8.1	14	883	1:62

Table 8.6-4: 41WM328 Artifact Density by Component

Component	Excavated Volume m^3	Tool/ Density N/m^3	Debitage Density N/m^3	Tool/ Debitage Ratio
Austin	.6	17	455	1:27
Twin Sisters	3.5	24	1597	1:67
Unknown	4.0	6	294	1:50
TOTAL SITE	8.1	14	883	1:62

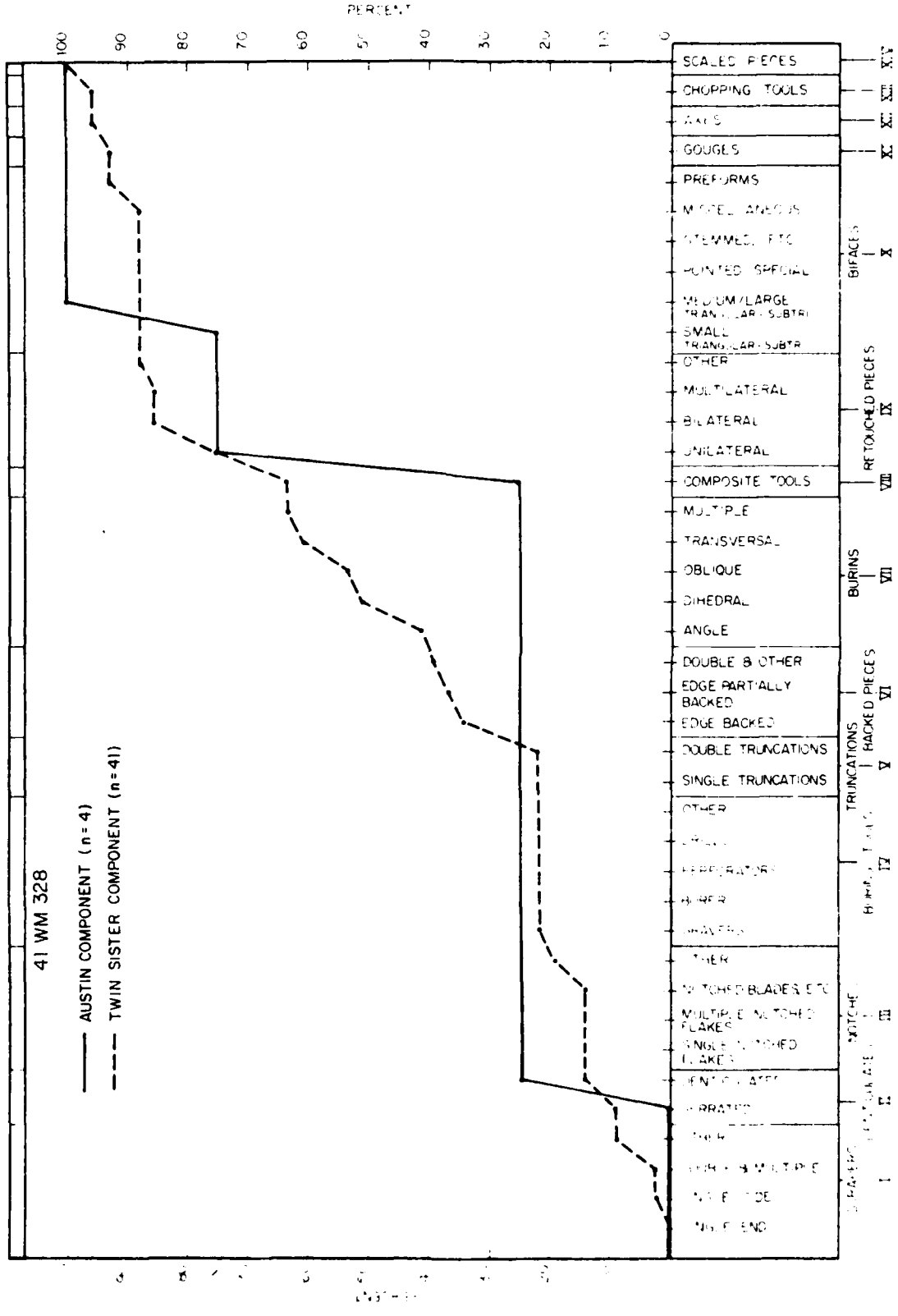


Figure 8.6-11. Cumulative Graph of Lithic Tools: Site 41WM328

A large sample of the Twin Sisters component was collected in excavations at Areas A and B of the site while the Austin component was sampled to a smaller extent in the Area B unit. Excavations in Area B were terminated because of the low volume of lithic debris present. The fact that Area B was subject to frequent flooding may account for the low density of cultural debris there.

41WM328 seems most comparable to 41WM53 since both are terrace sites utilized by Twin Sisters and Austin Phase inhabitants. They clearly contrast with burned rock middens in environmental location and in time. These later prehistoric terrace sites may reflect a change in some as yet undocumented site function. The shift may be due to a change in climate or a transformation in resource exploitation.

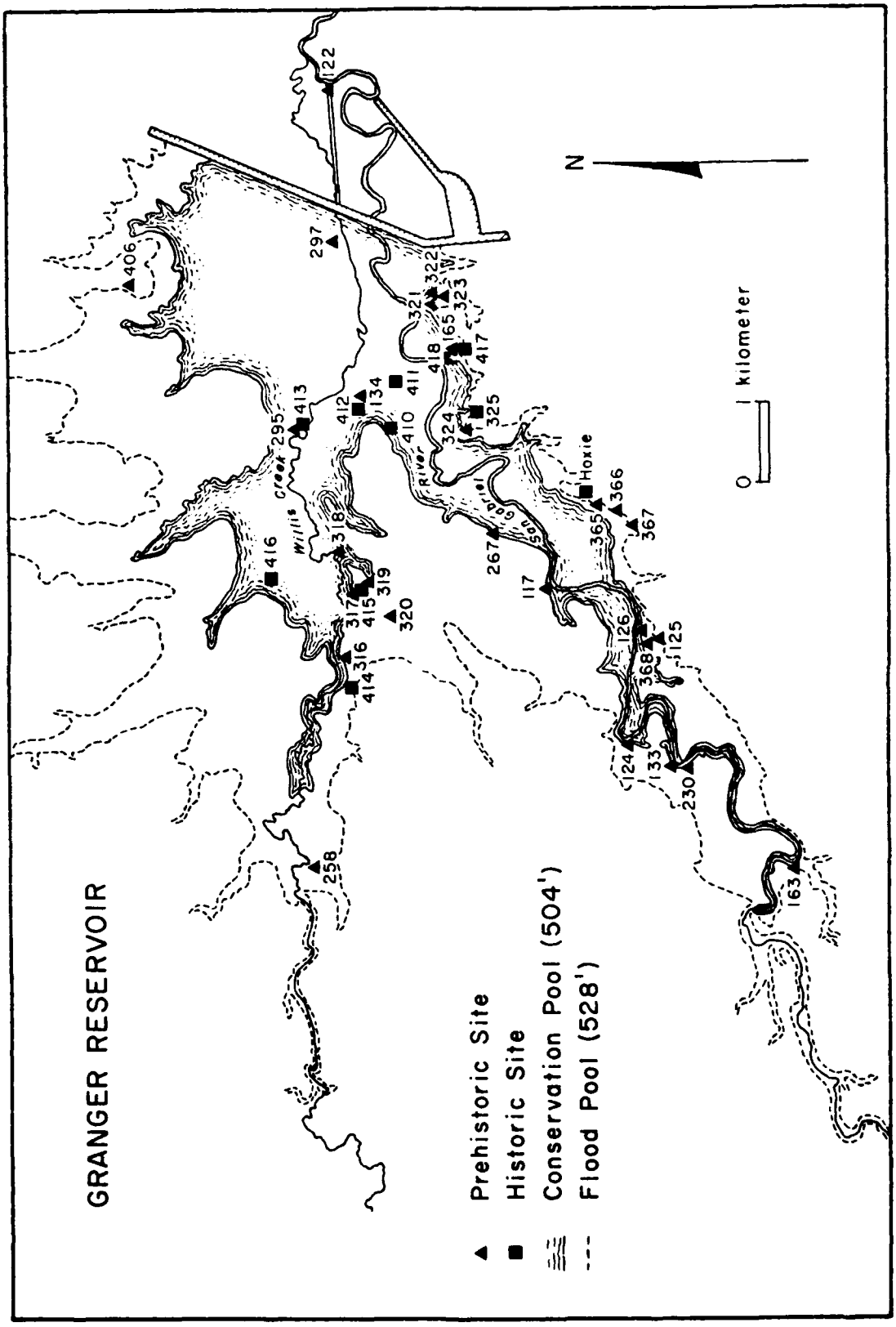


Figure 8.7-1. Location Map of Investigated Archaeology Sites in Granger Reservoir.

Granger Reservoir

41WM124

8.7 (Bryan Fox Site)

Site Situation

The Bryan Fox Site is located on the left bank of the San Gabriel River approximately 4 km northeast of the intersection of Highways 95 and 29 (Fig. 8.7-1). Situated on an alluvial terrace, the site is bounded on the east by the San Gabriel River and on the north and west by the rising Blackland Prairie surface. Erosional forces have cut a gully through the southern end of the site. An overstory vegetation consisting of pecan, oak, elm, and chinaberry trees dominates the less disturbed portions of the site. The former Bryan Fox home site and a previously cultivated field occupy the remainder of the site.

The most visible feature of this site is the badly disturbed accumulation of burned rock within the cultivated field (Fig. 8.7-2). Following the abandonment of the Fox home site, numerous artifact collectors disturbed the cultural depsosits while in search of projectile points. Mr. Clarence Loeve, a local collector who has willingly shared his knowledge of the archaeology along the San Gabriel River for many years, reported that numerous artifacts from the Late Archaic to the Neo-American period had been removed from the site. Intact hearths and human skeletons were also supposedly associated with the accumulation of burned rock. Mr. Loeve had also discovered Early Archaic projectile points and hearths exposed at the bottom of the erosional gully.

Prior Investigations

The Bryan Fox Site was first evaluated professionally in 1963 during the initial survey of Granger Reservoir (Shafer and Corbin 1965:51). Not finding any evidence of deeper components, the investigators did not recommend any further work on the site. Subsequent investigations by Prewitt (1973:139-140), however, noted the possibility of cultural deposits at 5-6 meters below ground surface. Viewing the site as a "twin" to the Loeve-Fox Site, Prewitt recommended that extensive excavations be conducted.

Due to the need for comparative data to assess the cultural resource potential of 41WM21 (endangered by dam construction) in 1976, the Bryan Fox Site was tested along with other sites with potentially deep deposits. Two 1 meter square test units were excavated in the area of the burned rock accumulation. A stepped profile was also cut on the bank of the erosional gully at the east end of the site.

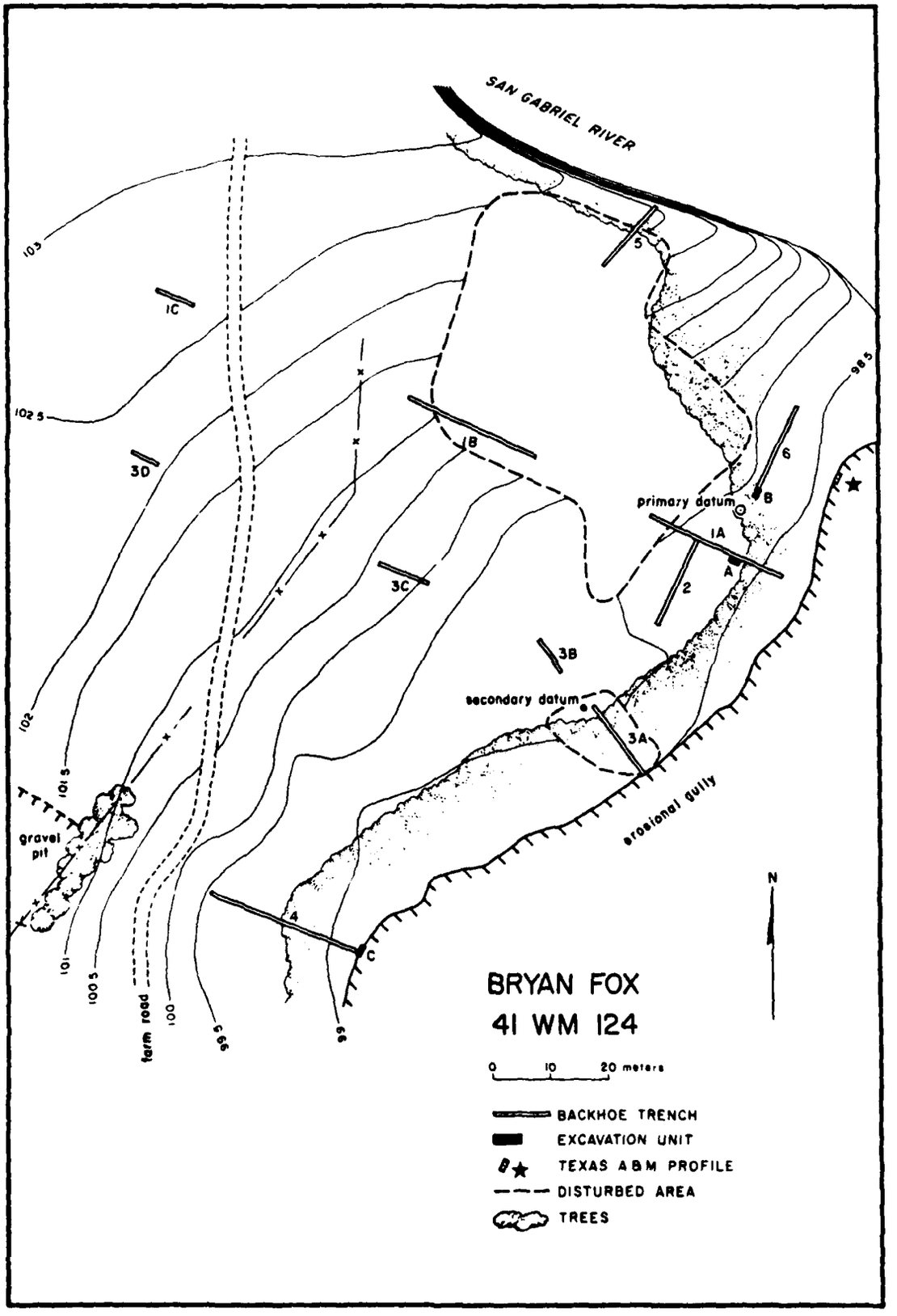

SAN GABRIEL RIVER
103
102.5
102
101.5
101
100.5
100
99.5
99
98.5
1C
1B
1A
2
3D
3C
3B
3A
4
5
6
A
B
C
primary datum
secondary datum
gravel pit
farm road
erosional gully
N
BRYAN FOX
41 WM 124
0 10 20 meters
BACKHOE TRENCH
EXCAVATION UNIT
TEXAS A&M PROFILE
DISTURBED AREA
TREES

Figure 8.7-2.

The units within the burned rock accumulation demonstrated that "some of the areas bordering existing potholes contained intact cultural materials" (Moore 1977:25). However, the cultural deposits were not more than 50 cm in depth. The stepped profile, on the other hand, revealed a series of buried cultural lenses to a depth of 7 meters. The investigators emphasized that the horizontal expanse of these occupational lenses should be examined by full-scale excavation (Moore 1977:25).

Excavation Methodology

Further investigation of the Bryan Fox Site was not conducted until the summer of 1978. Unfortunately, the local collectors had done more damage to the accumulation of burned rock within the cultivated field. At least seventy percent of this area no longer contained *in situ* cultural remains. Consequently, the major emphasis of the exploratory backhoe trenches was to locate undisturbed portions of the site.

Six series of backhoe trenches were used to determine the site limits and document the presence or absence of buried components (Fig. 8.7-2). Backhoe trench 1A revealed that cultural material was present to 4 meters below the surface in the forested area of the site. However, within the cultivated field a buried terrace surface and underlying gravels were encountered; consequently, cultural deposits appeared no deeper than 1 meter. In trench 1B the buried cultural deposits became even more shallow and disappeared entirely at the west end of the trench. Although lithic debris is present on the ground surface to the west of the ranch road, no buried cultural materials were discovered in trench 1C.

To test an apparently undisturbed portion of the cultivated field, backhoe trench 2 was dug perpendicular to trench 1A (Fig. 8.7-2). The cultural deposits became more shallow and eventually nonexistent toward the south end of the trench. This evidence together with the presence of cultural material in the forested area farther south suggested that the terrace surface had been differentially occupied through time. Even though this southern area had been disturbed to a depth of 1 meter by Mr. Clarence Loeve's excavations, backhoe trench 3A was placed there due to Mr. Loeve's advice that deeper deposits might be present. Cultural material was present below 1 meter, but it was exceedingly sparse. One hearth was uncovered at 3.3 meters below surface; unfortunately, very little other cultural debris was present. This area of the site was apparently not intensively occupied prior to the accumulation of burned rock. Of the remaining segments of backhoe trench 3, only trench 3D revealed a sparse scatter of cultural debris.

Mr. Clarence Loeve also advised us that possibly Early Archaic hearths had been exposed nearer the upper end of the erosional gully. Backhoe trench 4, placed to locate this component, revealed a single lens of faunal material, lithic debris, and scattered burned rock approximately

3.75 meters below surface. This cultural lens extends for approximately 10 meters laterally before ancient gravel deposits rise abruptly to the west.

Backhoe trench 5 was placed along the high bank of the San Gabriel River to verify the reports that human burials had been removed from this area. The trench revealed a very sparse scatter of cultural material within the thin topsoil zone. No human or animal bone was recovered. In fact, the proximity of dense clays and gravels to the surface would have made the digging of a burial pit a very arduous task. Human burials may, indeed, have been here in the past, but no evidence was found to verify such reports.

To determine the horizontal extent of the lenses revealed in the Texas A & M profile (Moore 1977:20-28) of the erosional gully, trench 7 was placed in the heavily wooded area to the northeast. Although cultural material was present to the bottom of the 4.5 meter deep trench, the distinct lenses reported by Moore (1977:20-28) were not present in this locality. Instead, trench 6 revealed a buried terrace edge which slopes sharply to the northeast. Below this buried surface cultural material was present, but it was less abundant and did not occur in distinct stratigraphic lenses (Fig. 8.7-3).

The series of trenches demonstrated that the only truly undisturbed cultural deposits were within the forested area of the site along the erosional gully. These undisturbed deposits are likely present in the right bank of the gully also, but time strictures prevented any examination of this area. Three areas within the undisturbed deposits were chosen for controlled excavation (Fig. 8.7-2). One area, Area C was designed to sample the Early Archaic component at the south end of the site. The left bank of the erosional gully was cut back so that a 1 x 2 meter excavation unit could be placed at the bottom of the gully. The remaining two excavation units, Areas A and B, were placed to test the variability of the assemblage along the old terrace edge. A controlled examination of the locality around trench 3A would have been desirable, but the disturbed nature of the major cultural zone precluded such an endeavor.

These excavation units were designated according to their position on an arbitrary horizontal grid system (Fig. 8.7-2). Due to the trees and the resulting alignment of the backhoe trenches, the grid system at the Bryan Fox Site is oriented to 65° west of north rather than to true north. The minimal unit of horizontal spatial control was the 1 meter square excavation unit. Vertical spatial control was maintained by reference to datum points (Fig. 8.7-2) established in trees along the edge of the field.

Stratigraphy

The homogeneous nature of the alluvial and/or colluvial derived deposits

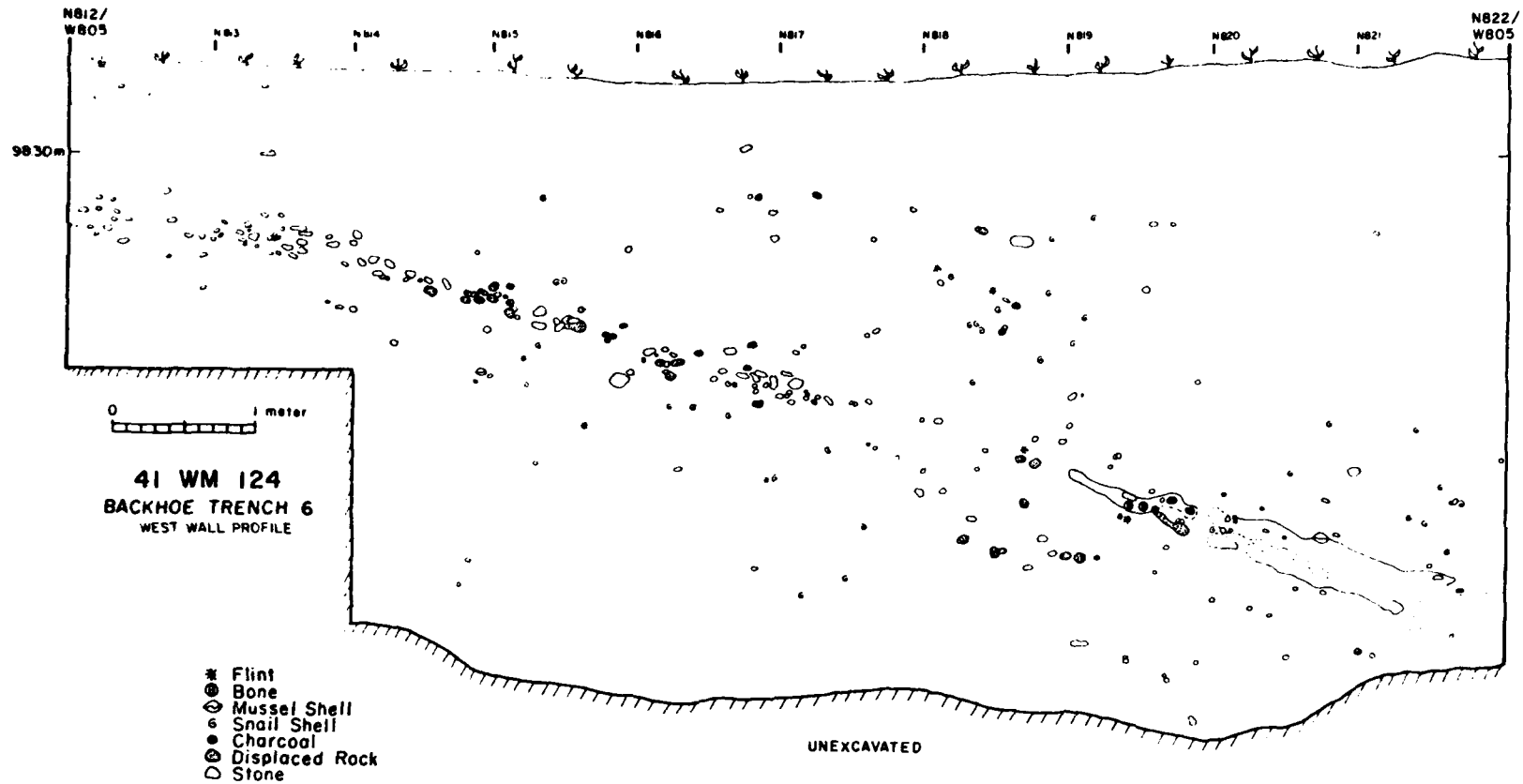

N812/
W805
N813
N814
N815
N816
N817
N818
N819
N820
N821
N822/
W805
9830m
0
1 meter
41 WM 124
BACKHOE TRENCH 6
WEST WALL PROFILE
Flint
Bone
Mussel Shell
Snail Shell
Charcoal
Displaced Rock
Stone
UNEXCAVATED

Figure 8.7-3.

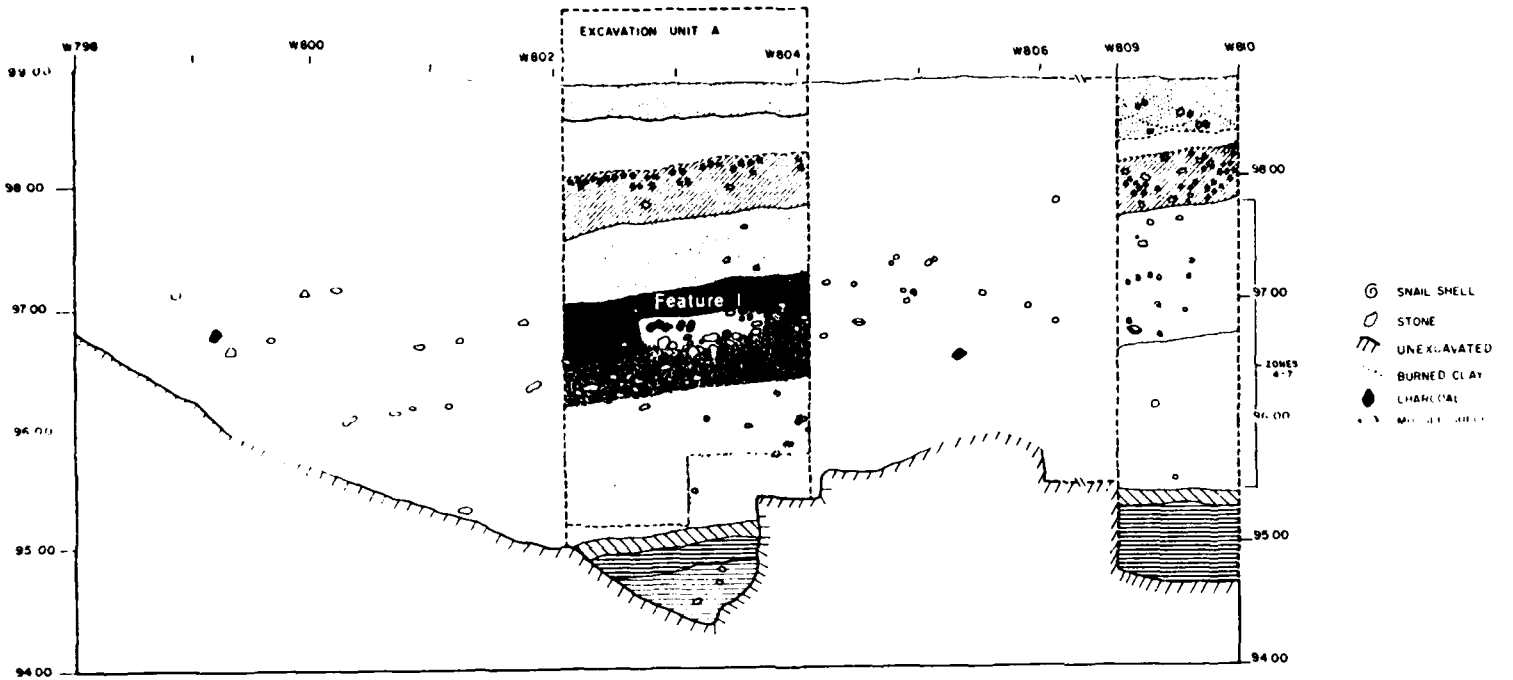
at the Bryan Fox Site made the interpretation of the depositional history and the stratigraphic relationships of the various areas of the site a more difficult task. The tree cover along the San Gabriel River and the erosional gully also precluded the placement of trenches in the most appropriate places. Nevertheless, sectional profiles of the various backhoe trenches and test excavation units permit a general overview of the depositional sequence. Unfortunately, the presently available data do not allow a definite determination of strata correspondence among the isolated profile sections.

Figures 8.7-3 and 4 demonstrate that an old terrace edge lies buried beneath alluvial and/or colluvial deposits. Evidence of this buried terrace edge is most visible within trench 6 and test excavation unit A (Fig. 8.7-4). The terrace edge slopes sharply downward to the northeast (33% slope) and slightly less so to the southeast (30% slope). Occupational debris sharply demarcates this buried surface. Unfortunately, this is not the situation elsewhere in the site. Between test excavation unit A and the intersection of trenches 1A and 2, the abrupt disappearance of cultural material beneath 1 meter in depth denotes the presence of a rising terrace edge; however, the buried surface, itself, is not evident. The general orientation of the strata (all slope downward to the southeast) and the disposition of the artifacts indicate that alluvial deposits were deposited against a rising terrace edge. Slopewash from the terrace surface likely contributed to the depositional accumulation, also.

The distribution of diagnostic projectile points in Areas A and B (Table 8.7-1) is what one would expect from such a depositional environment. Both the terrace itself and the adjacent floodplain were occupied during the San Marcos, Twin Sisters, and Austin Phases. The entire culturally related depositional sequence on the terrace itself is no deeper than 1 meter; the alluvial deposition, on the other hand, has telescoped the same relative temporal span into 4 meters of artifact bearing deposits. Nearer the upland origin of the erosional gully (Unit C), an artifact bearing stratum of apparently Early Archaic age was located at only 3.75 meters below the surface (Fig. 8.7-2). Due to its higher elevation, deposition within this area of the site was not as likely affected by the same cut and fill processes that are represented in Areas A and B.

The homogeneous nature of the deposits, together with the time strictures associated with the field investigations, made any correlation of the isolated profiles extremely difficult. Although sections of each backhoe trench were trowelled and drawn, only the profile section within test excavation unit A was adequately analyzed with regard to consistency, structure, texture, and color. The following described strata were recognized within that profile (Fig. 8.7-4).

Stratum 1: This uppermost stratum is a humic, dark brown (10YR 3/3), silty clay loam. Intensive grass and tree root activity permeate this stratum. The dryness of the season caused this zone to crack and form large, irregular peds. Consistency of this stratum is hard and friable;



Stratum 1
Stratum 2
Stratum 3
Stratum 4
Stratum 5
Stratum 6
Stratum 7
Stratum 8
Stratum 9
Stratum 10

41 WM 124
Backhoe Trench I-A
South Wall

Figure 8.7-4.

the structure is blocky. Relatively few artifacts are found in this stratum outside the burned rock accumulation farther upslope. Agricultural activities and collectors' holes have disturbed this zone throughout much of the site.

Stratum 2: Like stratum 1, this stratum exhibits a blocky structure with an increased occurrence of vertical cracking. The very dark gray (10YR 3/1), silty clay loam is hard and friable. Artifact density increases within this stratum. The presence of historic artifacts deep within this unit, however, indicates that the vertical cracking has negatively affected the archaeological context. This stratum likely correlates with the second depositional unit observed within excavation unit B and profile section 1B.

Stratum 3: This dark grayish brown (10YR 4/2) silty clay loam contains a greater abundance of snail shells. This characteristic and the slight color change are the only traits separating this stratum from those above it.

Stratum 4: This stratum is distinguished from stratum 3 solely on basis of a lesser density of snail shells and a more granular soil structure.

Stratum 5: This dark brown (10YR 3/3), silty clay loam exhibits a granular structure, also. Consistency is hard and friable. (Feature 1, a deep pit hearth which slopes to the southeast as the strata do, is very prominent within this zone.) It is within stratum 5 that San Marcos Phase diagnostics first appear in excavation unit B. The radiometric date of 1745 ± 85 B.P. (UGa-2476) from within Feature 1 demonstrates that much of stratum 5 was deposited prior to 205 A.D.

Stratum 6: Two traits differentiate this zone from those above and below it: (1) a slight color change to a medium brown (10YR 4/3) and (2) a significantly lesser amount of burned rock and associated cultural debris.

Stratum 7: This stratum is structurally homogeneous with strata 5 and 6. A color change to a yellowish brown (10YR 5/4) is the only apparent distinguishing trait. Excavation, however, demonstrated that occupational debris is quite dense within this zone. The examination of the trench walls had not indicated this.

Stratum 8: This stratum is a thin (<10 cm) gravel lens. Consisting mainly of pea gravel, the lens contains larger gravels only in the section revealed in the central portion of Trench 1A. Apparently, for a short time a stream flowed through this portion of the site. Perhaps a spring had once carried gravels from the massive deposits to the southeast. This lens is not likely derived from the gravel bed exposed in Trench 1B, for the size distribution of the gravels observed in Trench 1A would be much different if it had. Furthermore, the gravel bed exposed within Trench 1B is an ancient, more consolidated gravel deposit embedded in a dense clay. This deposit was not likely exposed

when the stratum 8 gravels were deposited.

Stratum 9: This brown (10YR 4/3) silty clay which underlies the gravel lens also contains a small amount of gravel. This matrix is hard and friable and has a granular structure. Lithic debitage, although sparse, was also noted at this level.

Stratum 10: This stratum exhibits a mottled appearance due to the inclusions of coarse sand and fine gravel within the very dark grayish brown (10YR 3/2) silty clay. Structure and consistency is the same as in stratum 9. No cultural material was observed within this zone; however, this negative evidence does not necessarily signify that this stratum is culturally sterile. Stratum 6 contained an abundance of cultural remains even though the trench wall indicated otherwise.

Although our investigations of the Bryan Fox Site did not reach the 7 meter depth as the previous profile cut supposedly had (Moore 1977: 20, 27, Figure 9B - photo of test unit B profile does not indicate a 7 meter deep profile), they do demonstrate that the stratigraphic sequence is much more complicated than previously documented. Separate distinct cultural lenses were not found in excavation units A and B; rather, cultural material was continuously distributed to at least a depth of 4 meters in Area A. In Area B, 11 meters northwest of the Texas A & M profile cut, the buried terrace surface slopes sharply downward toward the profile area. The thin occupational lenses observed by Texas A & M apparently are the result of ephermeral occupations of the alluvial bottoms adjacent to the terrace edge. Like other sites within the Granger Reservoir (41WM230, 41WM267), what lies deeper remains unknown.

Culture/Time Stratigraphic Units

The establishment of culture/time stratigraphic units for the Bryan Fox site was made more difficult by the lack of distinct sedimentary units, sufficient radiocarbon dates, and a dearth of diagnostic artifacts in many levels of the excavation units. The identifiable projectile points, however, indicate that the site was occupied during the Clear Fork, San Marcos, Twin Sisters, and Austin Phases (Table 8.7-1).

The upper levels of Areas A & B could be designated Neo-American; however, the lack of projectile points plus the presence of historic artifacts in many of the upper levels of Areas A and B preclude any definite designations. The vertical cracking of the clayey sediments which was observed during excavation had apparently affected the context of the upper half meter of cultural deposits.

Within Area A the Twin Sisters and San Marcos Phase occupations are well represented within the alluvial sediments deposited against the original terrace edge. Feature 1, whose orifice is within level 19, appears at the arbitrary boundaries of these two phases. A radiocarbon sample from the feature has provided a date of 1745 $\pm$ 85 B. P. (UGa-2476).

Table 8.7-1. Provenience of Projectile Points from the Bryan-Fox Site (41WM124).

Culture/Time Stratigraphic Unit	Mixed	?	Twin Sisters						San Marcos													Mixed	Twin Sisters?	?	San Marcos				Clear Fork?
	AREA A																					AREA B							AREA C
Levels	6	↔	13	↔	17	18	19	20	21	22	23	24	25	↔	27	28	29	30	31	↔	36	3	4	5	6	7	↔14	↔	18	↔ 22	4
Scallorn																						1?				1					
Darl					1																				1						
Ensor						1																									
Fairland/Ensor			1		1			1†,1																							
Montell									1†				1				1		*	1				1			1				
Castroville																					1										
Pedernales																												1		
Travis																														1	
Unidentified	1					2	1						1										1						1		

*1 preform.

†Specimens recovered from Feature 1 (orifice is in level 19)

This date is in accordance with the presently recognized time period for the San Marcos/Twin Sisters transition (Weir 1977; Prewitt 1974; Patterson 1977). Both a Fairland/Ensor and a Montell point were recovered from the feature fill.

Within Area B the cultural sequence is not nearly as clear. The lack of both diagnostic artifacts from levels 8 - 13 and sufficient radiocarbon samples makes the designation of a Twin Sisters Phase highly speculative. Below level 13, the midden accumulation on the terrace edge appears to be the result of a San Marcos Phase occupation. The single Pedernales point was recovered from beneath the midden accumulation. Although not apparent elsewhere in the site, a Round Rock Phase occupation may be present within the buried terrace.

Although an Early Archaic component may lay at greater depths within Areas A and B of the Bryan Fox site, a probable Clear Fork component is clearly present within Area C. This isolated component is protected by almost 4 meters of alluvial sediments. Like the Loeve-Fox site, this site location was apparently favored throughout much of the occupational history of the San Gabriel River valley.

Features

Due to the limited area excavated at the Bryan Fox Site (41WM124) only two features were uncovered. One was a formal fire pit located 1.8 meters below the surface in Area A. The other was a dense scatter of burned rocks revealed 1.3 meters below the surface in Area B. This scatter comprised a portion of a living surface situated on a former terrace edge. This lens of burned rock is likely representative of what much of the upslope portion of the site looked like before it was disturbed by local collectors. Although the massive accumulation of burned rock at this site has been severely disturbed, our excavations demonstrated that many intact features likely exist in the portion of the site nearest the erosional gully.

Feature 1, the only formal feature fully investigated at the Bryan Fox Site, was partially removed by backhoe Trench 1A and subsequently exposed by excavations in Area A. Feature 1 was a well defined circular fire pit lined with burned rocks. A ring of fired soil outlined the upper portions of the pit. Since the pit had been partially disturbed by Trench 1A, the nearly circular pit is estimated to be 106 x 112 cm in diameter. The maximum depth of the pit is 36 centimeters. The walls of the pit were vertical; the bottom was gently rounded (Fig. 8.7-5).

The matrix within the pit was a dark brown clayey loam with inclusions of ash, charcoal, muddaubers nest, snail shells, lithic debitage (Table 8.7-2), bone fragments (burned and unburned), and burned limestone cobble fragments. Although charred acorns were recovered from the site (Chapter 15.2), the feature matrix contained only 3 hackberry seeds. Seeds of grasses and Canadian wild rye were recovered in the matrix surrounding

Figure 8.7-5. Photograph of Feature 1, 41WM124

Table 8.7-2. Lithic remains within Feature 1, site 41WM124.

Lithic Remains	Levels 19	20	21	22
Secondary flakes (>50% CORTEX)	6		4(3)*	1(1)
Secondary flakes (<50% cortex)	16		12(8)	1
Tertiary flakes	23	1	24(11)	10(2)
Biface thinning flakes	2			
Micro-flakes			3(1)	2
Chips	39	2	36(22)	9(3)
Quartzite chunks			17	2
Biface fragments		2	2(2)**	
Retouched pieces	1	1	1(1)	
Projectile points		1	1(1)	

* Number of heat altered specimens
** 1 fragment is quartzite

the orifice of the pit. One hundred and thirty burned limestone cobbles lined the bottom and sides of the pit. The ring of fired soil around the pit was discontinuous and extended no more than 20 cm down the pit walls. The thickness of the fired soil varied from 1 to 2 centimeters. The presence of ash and an abundance of charcoal in the uppermost portion of the pit indicates that the pit possibly served a different function than for which it was originally designed. It is likely that the pit was partially refilled when a fire was built in the remaining depression. The significantly greater amount of cultural refuse within the lower portion of the pit (Table 8.7-2) further substantiates the inference that the pit served more than one function. What these functions were is not so clear. The pit may have originally been lined with hot rocks to cook either animal or vegetable matter within a crude but effective earth oven. A dense accumulation of cultural refuse within the pit would not be expected during such utilization. Once the pit no longer efficiently served as an oven, it may have been used as a trash pit (See Table 8.7-2) and a place to build an open fire. A high density of ash and charcoal, as exhibited by the upper portion of Feature 1, would be the expected product of such a function.

The distribution of projectile points in relation to the orifice of Feature 1 within level 19 (97.0-96.9 m) denotes a terminal San Marcos Phase or Twin Sisters Phase occupation. Both a Fairland/Ensor and a Montell point fragment are present within the feature matrix. The badly burned Montell fragment was approximately 10 centimeters deeper than the Fairland/Ensor specimen. A radiocarbon sample from within the feature (96.9-96.8 m) has provided a date of 1745 $\pm$ 85 B.P. (UGa-2476). This date fits well within the presently recognized chronological framework for Central Texas (Weir 1977; Prewitt 1974; Patterson 1977). The San Marcos/ Twin Sisters Phase transition is indicated.

Feature 2 was initially discovered in the wall of backhoe Trench 6. The profile of the trench wall exhibited cultural debris lying on the slope of a terrace edge (Fig. 8.7-3). Near the top of the slope a basin-shaped hearth could be seen in the west wall of the trench. This living surface continued upward and levelled off somewhat at the south end of the trench. To expose a portion of the living surface that would not have been as greatly affected by slopewash,a 1 x 2 meter excavation unit was placed at the south end of Trench 6.

The scatter of burned rocks (Fig.8.7-6) consisted of limestone cobbles, pieces of conglomerate, and two fossil Exogyra. All of these materials are readily available in the site vicinity today. The pieces of conglomerate are found in hearths at other sites (41WM267, 230) within the Granger Reservoir, but they are usually of an earlier Archaic occupation. The scatter of rocks, which averaged 20 cm in depth, exhibited no particular pattern except that the living surface sloped downward to the north and east. All of the rocks were either reddened or exhibited cracks as a result of exposure to a fire.

Perhaps these rocks once lined the hearth basin downslope in trench 6. Unfortunately, such an inference is largely conjectural; nevertheless,

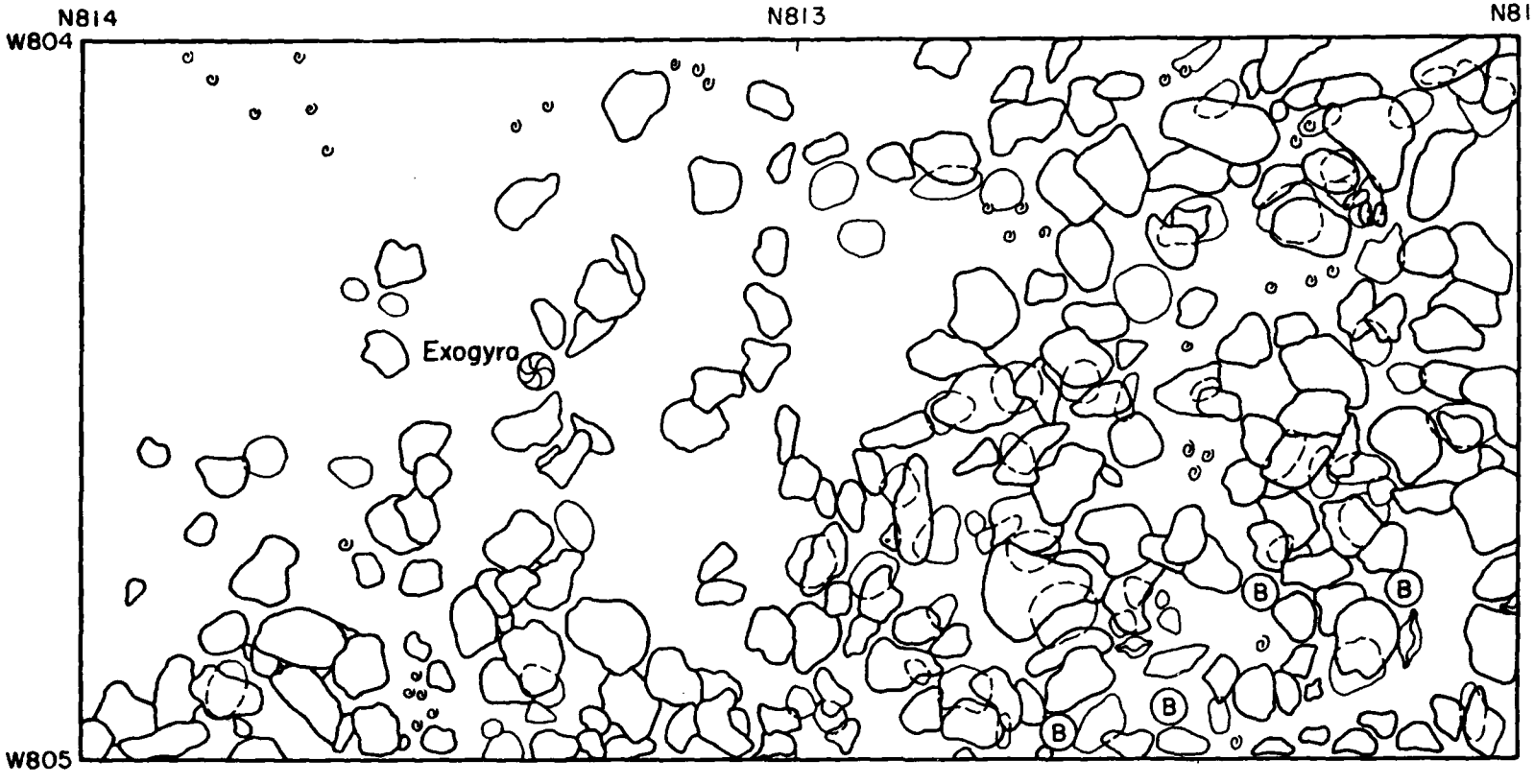

N814
N813
N812
W804
W805
Exogyra
B
B
B
B
41 WM 124
FEATURE 2 (AREA B)
Upper Level Rock
Lower Level Rock
Bone
Mussel Shell
Snail Shell
0 10 20 cm
N

Figure 8.7-6.

the position of the burned rocks did not indicate that they were primarily deposited for use as a griddle. The observed scatter was more likely the result of secondary deposition following a primary function within a hearth or fire pit.

The cultural refuse interspersed between the rocks also substantiates this inference. Mollusc shells, lithic debitage and tools, bone fragments, and some pieces of charcoal were noted among the rocks. In other words, refuse from a wide range of cultural activities, rather than a specialized activity, is associated with the burned rock scatter.

Placement of this living surface within a chronological framework is made more difficult due to the absence of substantial radiocarbon samples. The presence of one diagnostic artifact, a Montell point, within the burned rock lens suggests a San Marcos Phase occupation, however.

Lithic Tools

A total of 293 tools and tool fragments were recovered during excavations at Site 41WM124. The vertical distribution of the tools is presented in Table 8.7-3.

Area A is the excavation unit with the highest excavated volume and yielded the majority of tools and debitage, followed by Areas B and C. Area A also has the highest tool and debitage density, and also the tool to debitage ratio is higher than in area B and much higher than in Area C (Table 8.7-4).

An equal number of tools was found in the San Marcos and Twin Sisters levels of the site, although a slightly larger volume of San Marcos material was excavated. Densities in the Twin Sisters component are higher, but the tool to debitage ratio is higher in the San Marcos component (Table 8.7-5). The Twin Sisters component also has the largest variety in tool types. There is also a large variety in the San Marcos tool types, especially for boring tools and backed pieces. It is also noteworthy that there is a very low debitage density in the San Marcos assemblage, especially in Area B. The contrast in tool and debitage density between Areas A and B for both the Twin Sisters and San Marcos components is striking (Table 8.7-2, 8.7-3).

The differences between these two areas indicate that Area A was much more intensively occupied than Area B. Table 8.7-6 shows the percentage of whole tools for both areas in both components, and only the San Marcos component in Area B is significantly different. Such a large portion of fragments could suggest a refuse area rather than a living or working area.

Comparing the various site components in a cumulative graph (Fig. 8.7-7) the Austin/Toyah and the Clear Fork curves are distinctly different from the others. The Twin Sisters and San Marcos components

Table 8.3-7. Tool Classes, 41WM124

COMPONENT	AREA	LEVEL	TOOL CLASSES																					
			SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
Toyah & Austin	A	1									3		1							4				
		2			4		1				4	1	1							11				
		3			1	1			2		6	1	1							12				
		4			1						3		5							9				
		5	1		1	1					2		1							6	42	21.00	42	14.33
Twin Sisters	A	6					1	1			3		3	1						9				
		7			1						1		1							3				
		8											1							1				
		9	1								1		1							3				
		10									1	1								2				
		11					1		1		2		2							6				
		12										1	2							3				
		13						1			2		1	1						5				
		14									2									2				
		15		1	1	1					2									5				
		16	1		1		1				2	2	1							8				
		17	1		1				1		1		3	2			1			10				
		18				2							5	2						9				
		19									4		3							7				
		20			1						1		5	2						9	82	41.00		
	B	8	1																	1				
		9	1	1							2									4				
		10				1			1				1				1			4				
		11																		-				
		12		1							1		3							5	14	17.72	96	32.76
San Marcos	A	21						1			1		3	1						6				
		22		1							1		2							4				
		23	1		1								2							4				
		24						1			2		1							4				
		25	1								3			1						5				
		26	1			1					2	1	1							6				
		27	1								5									6				
		28						1	1		3		3	1						9				
		29			1	1		1			1		1							5				
		30			2						2			1						5				
		31				1					2			1			1			5				

Table 8.7-3. Tool Classes, 41WM124 (continued)

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
San		32									1									1				
Marcos		33																		-				
(Cont.)		34																		-				
		35			2						2		2							6				
		36	1	1							1			1						4				
		37	1								3		2							6	76	38.00		
	B	13									5		3							8				
		14												1						1				
		15																		-				
		16																		-				
		17											1							1				
		18			1	1								2						4				
		19									1									1				
		20			1						1									2				
		21									2									2				
		22												1						1	20	25.32	96	32.76
Clear	C	1																		-				
Fork		2										1	1							2				
		3			1						1		1							3				
		4	1		1	1					1	1	3							8				
		5									1									1				
		6																		-	14	100.00	14	4.78
Mixed	B	1																		-				
		2		1	1								2							4				
		3	1				1		1		3		6	2						14				
		4	1		2	1		1			3		3	2						13				
		5			1									1						2				
		6									4		3	2						9				
		7									1		1	1						3	45	56.96	45	15.36
S α BHT																				-				
TOTAL			15	6	26	12	5	7	7	-	95	9	82	26	-	-	3	-	-	293			293	99.99
%			5.12	2.05	8.87	4.10	1.71	2.39	2.39	-	32.42	3.07	27.99	8.87	-	-	1.02	-	-	100.00				
RESTRICTED																				116				
%			12.93	5.17	22.41	10.34	4.31	6.03	6.03	-		7.76		22.41	-	-	2.59	-	-	99.98				

Table 8.7-4: 41WM124 Artifact Density by Area

Area	Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/ Debitage Ratio
A	Toyah & Austin	1.4	30	1104	1:37
	Twin Sisters	2.6	32	2716	1:86
	San Marcos	2.9	26	1066	1:41
	Total area	6.9	29	1695	1:58
B	Twin Sisters	1.4	10	757	1:76
	San Marcos	2.0	10	649	1:65
	Mixed	1.0	45	2683	1:60
	Total area	4.4	18	1146	1:64
C	Clear Fork	1.1	13	1361	1:107
	Total area	1.1	13	1361	1:107
	SITE TOTAL	12.4	24	1471	1:62

Table 8.7-5: 41WM124 Artifact Density by Component

Component	*Excavation* Volume m^3	*Tool* Density N/m^3	Debitage Density N/m^3	Tool/ Debitage
Toyah & Austin	1.4	30	1104	1:37
Twin Sisters	4.0	24	2030	1:85
San Marcos	4.9	20	896	1:46
Clear Fork	1.1	13	1361	1:107
Mixed	1.0	45	2683	1:160
	12.4			

Table 8.7-6: 41WM124: Whole and Fragmentary Tools.

	Area A			Area B		
Component	Total Tools	Whole	%	Total Tools	Whole	%
Twin Sisters	75	24	32	13	4	31
San Marcos	71	24	34	15	1	7
Total	146	48		28	5	

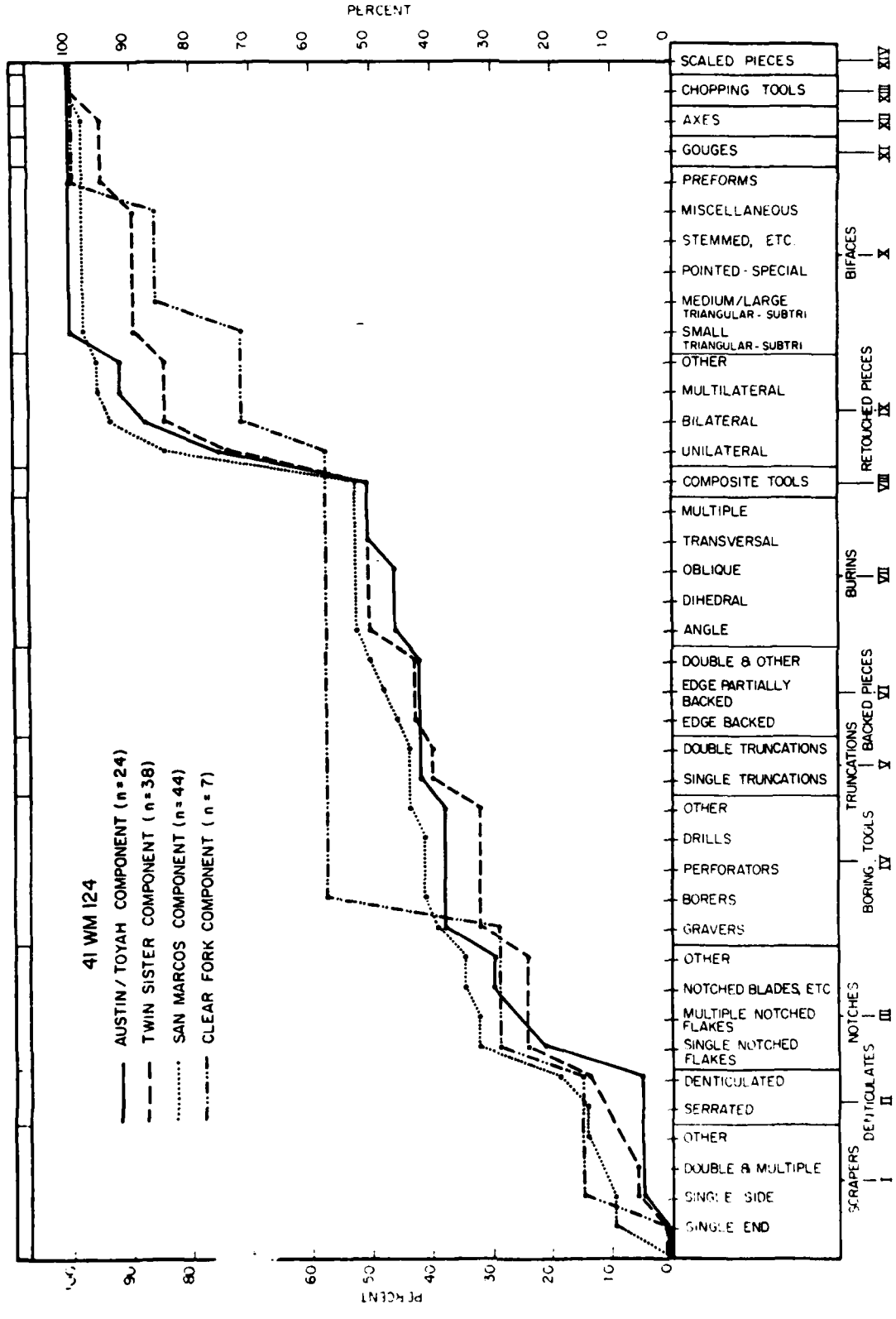


Figure 8.7-7. Cumulative Graph of Lithic Tools: Site 41WM124

may seem similar, but upon closer examination it becomes clear that there are major differences in the tool types if not so many in the tool classes. For example, this is the case in the scraper class: the Twin Sisters component has single sidescrapers (and no single endscrapers) while the San Marcos component has single endscrapers and no single sidescrapers. Another important difference is in the boring tools; in Twin Sisters context only gravers were found, but in the San Marcos levels gravers as well as borers and other boring tools occur. Backed pieces are much more important during the San Marcos period than during Twin Sisters times.

Only one tool class (notches) had enough complete tools for measurements. Statistical analysis of the measurements of these tools can be found in Appendix H-5. The other measurement analyses were incorporated with the results of the Granger Reservoir (Appendix H-8).

Site Summary

Further investigation of the Bryan Fox Site (41WM124) has exposed a much more complex depositional sequence than was previously documented. The central area of occupation involved two topographic features - the terrace surface and the adjacent alluvial bottoms. Within this portion of the site, occupational debris of the San Marcos, Twin Sisters, and Austin Phases is documented. The presence of a single Pedernales point beneath the buried terrace slope within excavation unit B (Table 8.7-1) suggests that an earlier Middle Archaic component may be present. Whether a similar component lies deeper within the alluvial deposits tested in excavation unit A remains unknown. Unfortuantely, the stratigraphic relationships between Areas A and B remain unclear. The terrace slope within Trench 1A is very poorly defined; however, the dramatic change in the vertical disposition of artifacts within Trench 1A indicates that the terrace slope lies to the northwest of excavation unit A. Excavation unit A, therefore, served as a test of the occupational sequence of the alluvial bottoms.

Excavation unit C, on the other hand, documented the presence of an Early Archaic component near the upper end of the erosional gully. Although no radiocarbon samples were collected and only one probable Early Archaic projectile point was recovered, the Early Archaic designation is supported by Clarence Loeve's report that he had previously recovered Early Archaic projectile points from the same stratigraphic unit. The occupational lens uncovered within trench 4 apparently represents an occupational episode of rather limited duration. Protected by almost 4 meters of overburden and situated above the projected conservation pool, this Early Archaic component should be available for future problem oriented research. Small and isolated assemblages such as this may prove to be more amenable to behaviorable interpretations than the massive assemblages on which we presently focus our research efforts.

Perhaps the most interesting facet of this site is the huge accumulation of burned rock upon the terrace surface. Due to the extensive disruption

of this area by collectors, however, an intensive examination of the burned rock accumulation was judged to be inappropriate. Nevertheless, the similarities with the burned rock accumulations of the Edwards Plateau to the west are striking. This accumulation of burned rock during the San Marcos, Twin Sisters, and Austin Phases is apparently due to the same processes that led to similar accumulations at sites 41WM56, 57, 328, and 53 within the North Fork Reservoir. Due to the uniqueness of this accumulation within a prairie edge environment, it is likely that the burned rock accumulation represents the utilization of very localized resources which are represented more widely to the west of the Balcones Escarpment.

Excavation units A and B demonstrate that large portions of the site outside the cultivated field remain intact. Excavation unit A exhibits a minimum of 2.5 meters of deposits pertaining to the San Marcos and Twin Sisters Phases. The intermittent occupation of the alluvial bottom is not interrupted by sterile alluvial strata. Evidently alluvial accumulation was relatively constant during these time periods. Such a depositional environment has allowed the preservation of features, charcoal, and floral remains (Chapter 15.2). Since these deposits are above the conservation pool level, the Bryan Fox Site contains great potential for future problem oriented research concerning the Late Archaic.

8.8 Site 41WM163

Site Situation

41WM163 is located on a terrace bench north and west of the point at which the first creek on the south side of the San Gabriel River downstream from the State Highway 95 bridge empties into the river (Fig. 8.7-1). A majority of the site is in a formerly cultivated field now grown up in coastal bermuda and mesquite. A small area on the east side of a barbed wire fence near the eastern edge of the terrace, however, may not have ever been cultivated. Surrounding the site on the north, south, and east sides are stands of pecan, hackberry, sycamore, elm, and oak trees along with brush, vines, and briars. To the west are plowed fields, pecan orchards, and pasture land.

The site was first recorded by Frank Eddy (1969) who reported a dense accumulation of artifacts in the plow zone. Prewitt (1974) recommended test excavations, and the Texas A & M survey (Moore, 1977) included it on the list of sites from the Granger Reservoir to be nominated to the National Register of Historic Places.

Testing at 41WM163 was coordinated with testing at 41WM258 since it was important to find undisturbed Post-Archaic assemblages for comparison with Archaic assemblages. Special interest was given to this site because collectors had reported finding Scallorn and Perdiz projectile points along with pottery. A human burial was also reported to have been struck by pothunters.

A series of exploratory backhoe trenches were dug in order to find the vertical and horizontal limits of the site and to discover if discrete components could be discerned in the walls of the trenches. The 11 trenches dug showed the site to be about 80 meters long from north to south (Fig. 8.8-1). The northern and eastern borders of the site are the edge of the terrace bench. To the south the site extends almost all the way to the southern terrace edge adjacent to the creek. The western end of the site is difficult to define because farming activities have pushed cultural debris west of the actual limits of the site. Material was found beneath the plow zone at least 120 meters west of the western edge of the site.

Cultural debris was found to a maximum depth of 160 cm below ground surface in most areas of the site (Fig. 8.8-2). Near a fenceline cut by backhoe trench #2, however, material was only about 100 cm thick. Because of the homogeneous nature of the soil, the plow zone could not be distinguished in any of the walls of the trenches. Likewise, there were no breaks in the cultural debris in the profiles to indicate isolated cultural horizons. Rodent and root disturbances were numerous in all parts of the site. Features in the form of hearths were found in backhoe trenches # 2, 3, 4, 5, 9, and 10, ranging from approximately 75 to 135 cm below ground surface. All hearths appeared

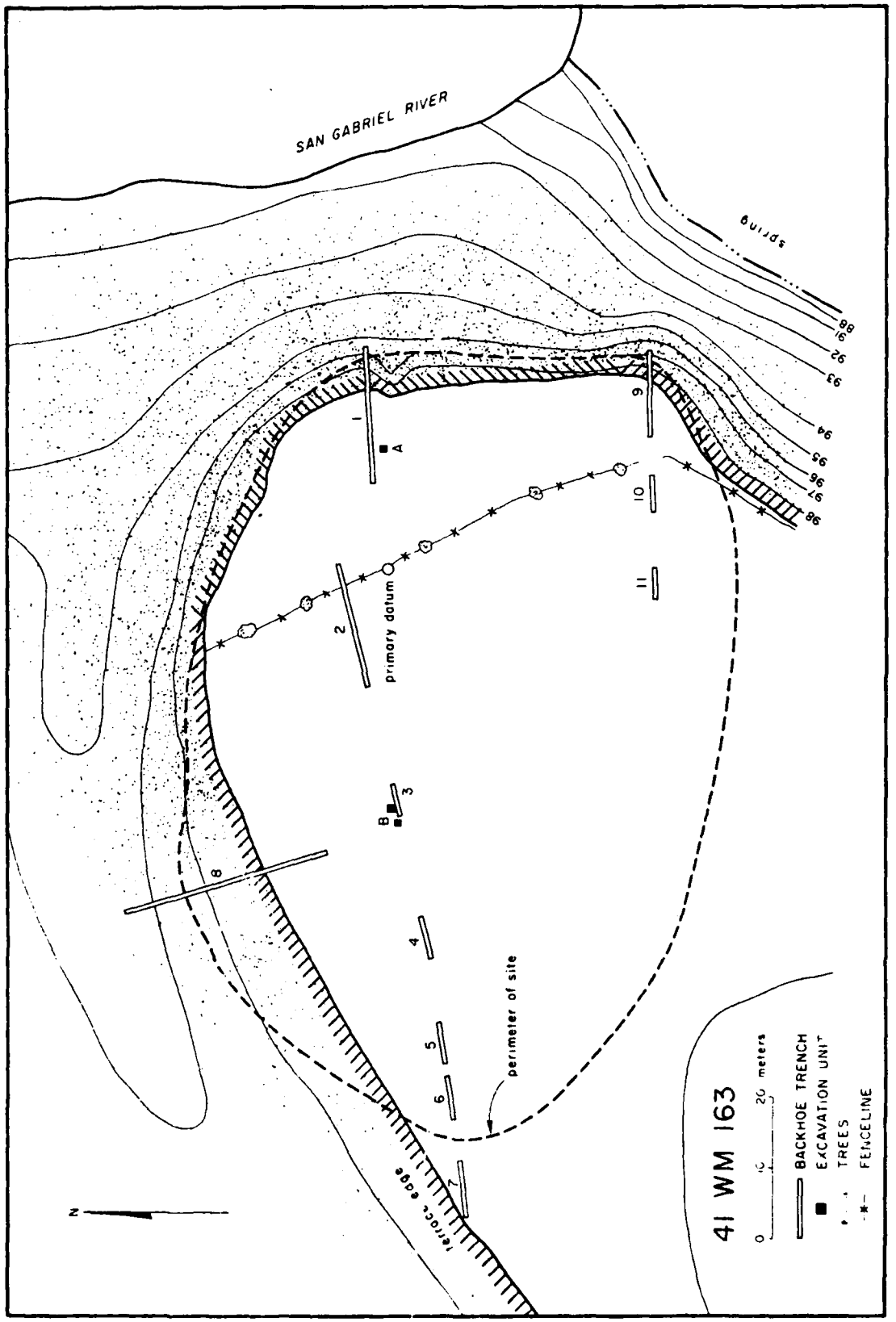
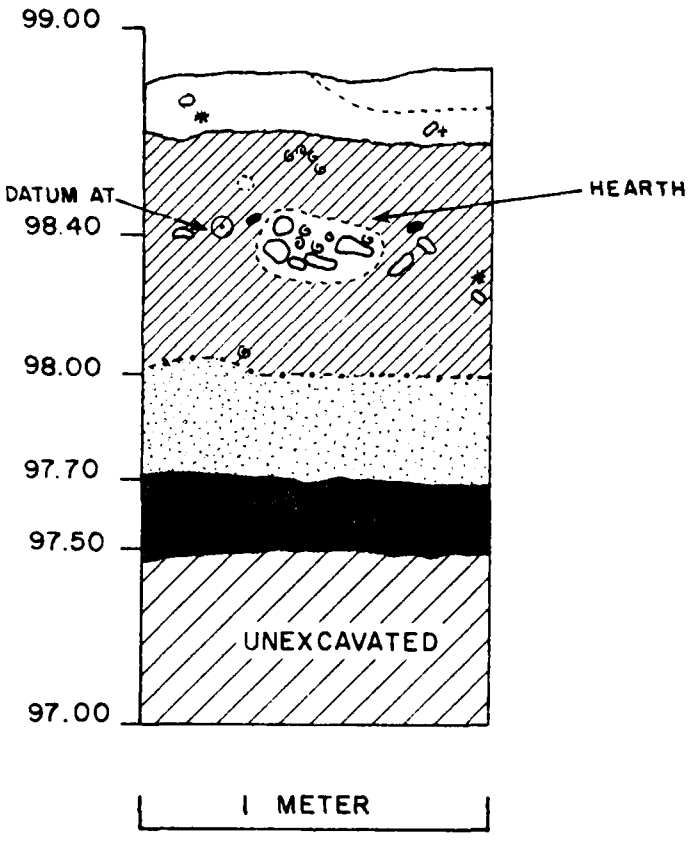


Figure 8.8-1. Site Map, 41WM163



41 WM 163
BACKHOE TRENCH 2
Segment of North Wall

Stratum 1
Stratum 3
Stratum 4
Stratum 5

FLINT
BONE
CHARCOAL
STONE
DISPLACED STONE
SNAIL SHELL

Figure 8.8-2.

to be associated with diagnostic projectile points of the Archaic period.

Test Excavations

The excavation units were dug in 10 cm levels and dry screened through ¼" wire mesh. To speed up the work, each 1 x 1 meter square was not divided into 50 cm quads nor was the matrix water screened or fine screened. One of these units was placed at N1001/W1004 which was one meter south of backhoe trench #1. It was in the possibly uncultivated area of the site and was near the spot where the only Perdiz point and potsherd had been found in backhoe activities.

The other area tested was adjacent to one of the hearths on the north side of backhoe trench #3. The purpose of excavation here was to rest the area around one of these hearths for density of lithic debris and to find diagnostic points that would date the succession of hearths in backhoe trenches # 3, 4, and 5. Two separate 1 x 1 meter square units were excavated simultaneously. One unit at N999/W1056 was dug from ground surface to 98.10 m. The other was started at 98.15 m after the top 70 cm had been removed by the backhoe. This pit was located at N1000/W1054 immediately over the remnants of a hearth which lay at 98.00 to 97.90 m in the north wall of the backhoe trench. From these two units the entire vertical sequence was obtained (Fig. 8.8-3).

Stratigraphy

The sediments at 41WM163 are fairly homogeneous with the borders of individual strata being difficult to define as they blend into each other. The Oakalla silty clay loam commonly seen on the terraces adjacent to the river channel in the Granger Reservoir area was found on the surface of the site. Of the five sedimentary divisions recognized in the backhoe trenches and test pits at 41WM163 the upper four are silty clay loams while the vertically deepest is a silty clay. The strata are listed in reverse depositional order (Figure 8.8-2).

Stratum 1. A very dark grayish brown (10YR3/2) friable silty clay loam was present on the ground surface of the site. Approximately 10 cm thick, it corresponds to a dense root zone. Cultural debris including flint flakes, burned rocks, bones, mussel and snail shells were present.

Stratum 2. Stratum 2 could be seen only in backhoe trench #1 which is located at the east end of the site near the terrace edge closest to the present day river channel. It is a dark brown (10YR3/3) silty clay loam that lacks the high organic content of stratum 1 and the heavy calcium carbonate streaking of stratum 3. A few roots are present within the matrix as is the same inventory of cultural material seen in Stratum 1. It is approximately 20 cm in vertical thickness and its upper half probably has been disturbed by plowing.

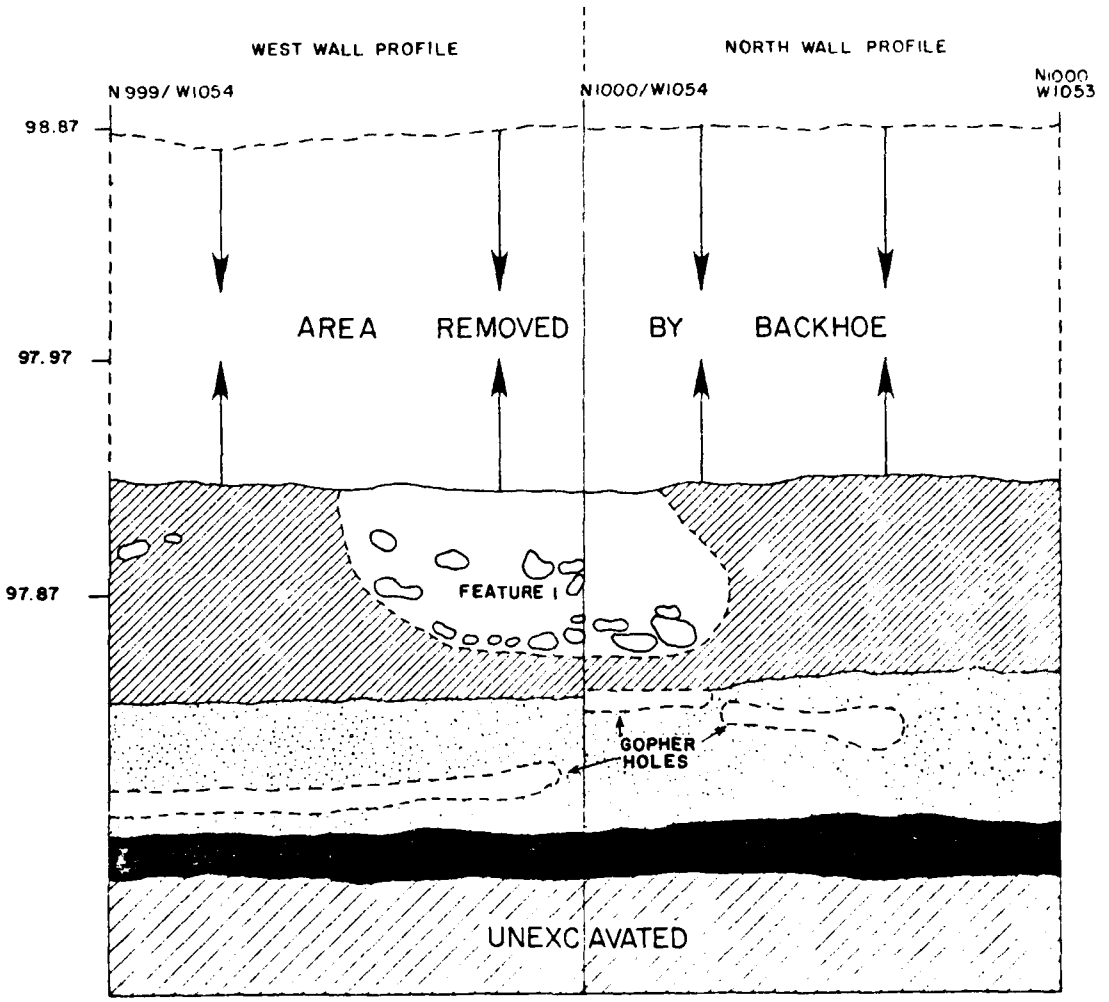

WEST WALL PROFILE
NORTH WALL PROFILE
N999/W1054
N1000/W1054
N1000 W1053
98.87
97.97
97.87
AREA REMOVED BY BACKHOE
FEATURE 1
GOPHER HOLES
UNEXCAVATED
Stratum 3
Stratum 4
Stratum 5
41 WM 163
PROFILES NORTH & WEST WALLS
N1000 / W1054 (Area B)
10 cm

Figure 8.8-3.

Stratum 3. This stratum is characterized by numerous streaks of calcium carbonate. It lies directly beneath stratum 1 in all backhoe trenches except in backhoe trench #1 where stratum 2 is between Strata 1 and 3. Excluding where Stratum 2 is present, the upper portion of stratum 3 has been disturbed by plowing. It ranges from 70 to 130 cm in vertical thickness and is a dark brown to brown (10YR3/3 to 10YR4/3) silty clay loam. A few tree roots penetrated stratum 3 and cultural features, especially hearths, were very noticeable in stratum 3.

Stratum 4. The deepest cultural material was seen in this brown (10YR4/3) silty clay loam. Although some of the debris was brought down in rodent burrows that are very noticeable in stratum 4, most of it appeared to be undisturbed. The sediment is very clayey and strongly calcareous as the calcium carbonate streaking characteristic of stratum 3 continues into stratum 4.

Stratum 5. The sediment seen at the bottom of all backhoe trenches was a silty clay more compacted than any above. It was sterile of cultural material except for isolated flint flakes probably brought down within rodent disturbances. The silty clay was dark yellowish brown to yellowish brown (10YR4/4 to 10YR5/4) color that contained more clay, silt, and carbonate than stratum 4.

Culture/Time Stratigraphic Units

At Area A where the N1001/W1004 1 x 1 meter square unit was placed, identifiable Toyah phase artifacts included a Perdiz point fragment in level 2 and 6 potsherds in level 4. An unidentifiable arrowpoint and a Granbury arrowpoint (Jelks 1962: 35-36)(diagnostic of the Austin Phase) were also found in level 3; however, a Fairland/Ensor point also present. Two other diagnostics were found nearby in backhoe trenches rather than in controlled excavations. They were a Scallorn point which was observed less than 10 cm below ground surface at the east end of backhoe trench #2 (18 meters northwest of the N1001/W1004 unit), and another Ensor point which came out 70 or 80 cm below ground surface in backhoe trench #1 less than 10 meters from the N1001/W1004 unit.

The diagnostics in these upper levels (2, 3, and 4) appeared to be mixed. The potsherds from level 4 were noteworthy because they were similar to these found at Bigon-Kubala (41WM258). One other plainware potsherd that came from backhoe trench #1 was different in that it had a more sandy paste and lacked any apparent bone temper. Levels 6-8 had less flint debris than the upper levels. Beginning in level 9, however, the flint count increased through level 14 where excavations ceased. No diagnostics were found in any of these levels, but in vertical elevation these levels corresponded to the ones containing probable San Marcos or Round Rock Phase hearths in Area B.

In Area B where the N999/W1056 and N1000/W1054 1 x 1 meter square units were dug, a Perdiz point was seen in level 1, a Darl point fragment

from the Twin Sisters Phase in level 4, and a dihedral angle burin made on Pedernales point (Chapter 14.3) from the Round Rock Phase in level 11. In addition, 2 diagnostic projectile points of the San Marcos phase were found in nearby backhoe trenches between 50 and 100 cm below ground surface.

Features

Two hearths were uncovered in Area B. Both were burned limestone rock hearth constructions that were representative of a succession of hearths seen all across the site between 75 and 135 cm below ground surface. Vertically, both of these features were in the middle to lower portions of cultural deposits and were thought to be the probable remains of Round Rock and/or San Marcos Phase occupations. The only diagnostic found in controlled excavations near either feature was a Pedernales point which was recovered within 10 cm of the bottom of Feature #2. In backhoe trenches #4 and 5 further northwest, San Marcos Phase diagnostics appeared to come from hearth areas at the same approximate elevations as the two excavated hearths.

Feature 1 - Hearth. The southwest edge of a basin-shaped hearth was truck in the northwest corner of the N1000/W1054 unit. Many of the burned limestone rocks in the tight cluster were cracked in situ and a little charcoal was present among them. Only a very small portion of the entire hearth was uncovered since the remainder lay in three adjacent unexcavated units to the north and west. Maximum horizontal dimensions of the exposed portion of the upper part of the hearth measured 39 cm from east to west and 37 cm from north to south. Deeper, the hearth area became smaller as the walls of the basin sloped inward. The hearth was first encountered at 75 cm below ground surface and the bottom lay at 115 cm below ground surface. The burned rocks appeared to be vertically continuous for 40 cm making it one of the vertically thickest hearths seen during the field season. No traces of burned orange soil could be seen outlining the perimeter of the hearth, but the hearth area was slightly darker in color from the presence of charcoal. A thin, flint biface fragment, a mussel shell, some bone fragments, and several heat spalled flint flakes were found among the hearth stones. No diagnostics were seen in the immediate vicinity, however.

Feature 2 - Hearth. The south end of this cluster of burned limestone rocks was removed by backhoe trench #3 leaving a line of burned rocks exposed in the north wall of the backhoe trench. When the remainder of the hearth was uncovered, in the SE quad of the N1000/W1054 unit and the NE quad of the N999/W1054 unit, it showed a rectangular shape horizontally that was 65 cm from north to south and 53 cm from east to west. The top and bottom of the hearth were 86 and 98 cm below ground surface. Feature 2 lay 37 cm southeast of the south end of Feature 1 and its top was 12 cm deeper than the top of Feature 1. Feature 2 did not come close to approaching the thickness of Feature 1. While there was no clear evidence of a basin shape, the hearth stones

may have been laid in a shallow depression. Very little charcoal and no indication of burned orange soil was seen in the hearth area. The only diagnostic found near the hearth in controlled excavations was the burin, made on the proximal half of a Pedernales point from the level beneath the hearth. Within the hearth, itself, two biface fragments and three flakes were the only artifacts recovered. As in the case of Feature 1, there was not enough charcoal present in the hearth for a radiocarbon date.

Lithic Tools

A total of 131 tools and tool fragments were recovered at site 41WM163. The largest tool class is the retouched pieces (41%) followed by biface fragments (21%). No composite tools, gouges or unifaces were excavated at the site. All other tool classes are present, mostly with only a few artifacts (Table .8-1). Area 3 was richest both in tools and debitage, with over half of the tools in the Twin Sisters component. Compare the high densities in Area B for the Twin Sisters and San Marcos components with the very low densities for the same components in Area A, while in both areas the Post-Archaic component is highest. The same observations hold for the debitage material (Tables .8-2, .8-3).

Comparing the site components on a cumulative graph (Fig. .8-4) one has to keep in mind that the curves represent few artifacts, which will give a slightly skewed image. Both the San Marcos and Round Rock assemblages are too small. The Austin component has a very small tool variety with only a few notched, truncated and backed pieces; more than half of its tools are retouched pieces. The Twin Sisters component has most tool classes represented, although not in any great numbers, and here also retouched pieces represent more than half of the tools.

There were not enough complete tools per unit to make a statistical analysis of complete tool measurements meaningful. All were incorporated with the analysis of the reservoir as a whole (Appendix H-8).

Site Summary

Limited test excavations at 41WM163 revealed a series of occupations as early as the Round Rock Phase and continuing through the Post-Archaic Toyah Phase. Research at this site focused primarily on the Austin and Toyah components since these were underrepresented in assemblages collected in the earlier part of the field season. Unfortunately, in controlled excavations, Toyah, Austin, and Twin Sisters materials were found to be mixed in the upper levels. Deeper, from 75 to 115 cm below ground surface, two intact hearths were struck in Area B with sizeable quantities of accompanying cultural debris. Diagnostic artifacts in direct association with these hearths indicate they were possibly from San Marcos and/or Round Rock occupations. Work at 41WM163 was terminated in favor of excavation efforts at another site where Post-Archaic components were better separated.

Table 8.8-1. Tool Classes, 41WM163

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
Neo-American	A	1																		-				
		2			1						2			1						4				
		3						1			4		6	4						15				
		4																		-	19	73.08	19	14.39
Austin	B	1									8		1	1						10				
		2			2			2			2		2					1		9	19	24.36	19	14.39
Twin Sisters	A	5											1							1				
		6							1											1				
		7											1							1				
		8																		-	3	11.54		
	B	3		1								1								2				
		4									1		1	1						3				
		5						1			1		1							3				
		6									2		1							4				
		7						1	1		5		2							7				
		8	1		1	1			1		11		6							21	40	51.28	43	32.58
San Marcos	A	9																		-				
		10																		-				
		11									1									1				
		12																		-				
		13						1			1									2				
		14									1									1	4	15.38		
	B	9									1									1				
		10			1						4		4							9	10	12.82	14	10.61
Round Rock	B	11						1		1	1		1							4				
		12				1					2									2				
		13																		1				
		14									2									2				
		15																		-				
		16																		-	9	11.54	9	6.82
S a BHT			3				2				5	10		5		2	1			28			28	21.21
TOTAL			4	1	6	3	6	3	1	-	54	11	27	12	-	2	1	1	-	132			132	100.00
%			3.03	.76	4.55	2.27	4.55	2.27	.76	-	40.91	8.33	20.45	9.09	-	1.51	.76	.76	-	100.00				
Restr. Tot.																				51				
"	%		7.84	1.96	11.76	5.88	11.76	5.88	1.96	-		21.58		23.54	-	3.92	1.96	1.96	-	100.00				

Table 8.8-2 : 41WM163 Artifact Density by Area

Area	Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/ Debitage Ratio
A	Toyal/Austin	.3	63	2533	1:40
	Twin Sisters	.4	7	102	1:14
	San Marcos	.6	7	310	1:47
	Total Area	1.3	20	759	1:38
B	Austin	.2	95	4670	1:49
	Twin Sisters	.6	67	3172	1:48
	San Marcos	.2	50	3905	1:78
	Round Rock	.6	15	1107	1:74
	Total Area	1.6	49	2676	1:55
			$\bar{x}$	$\bar{x}$	$\bar{x}$
	SITE TOTAL	2.9	36	1825	1:51

Table 8.8-3 : 41WM163 Artifact Density by Component

Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/ Debitage Ratio
Toyah/Austin	.3	63	2533	1:40
Austin	.2	95	4670	1:49
Twin Sisters	1.0	43	1944	1:45
San Marcos	.8	17	1208	1:69
Round Rock	.6	15	1107	1:74
TOTAL	2.9			

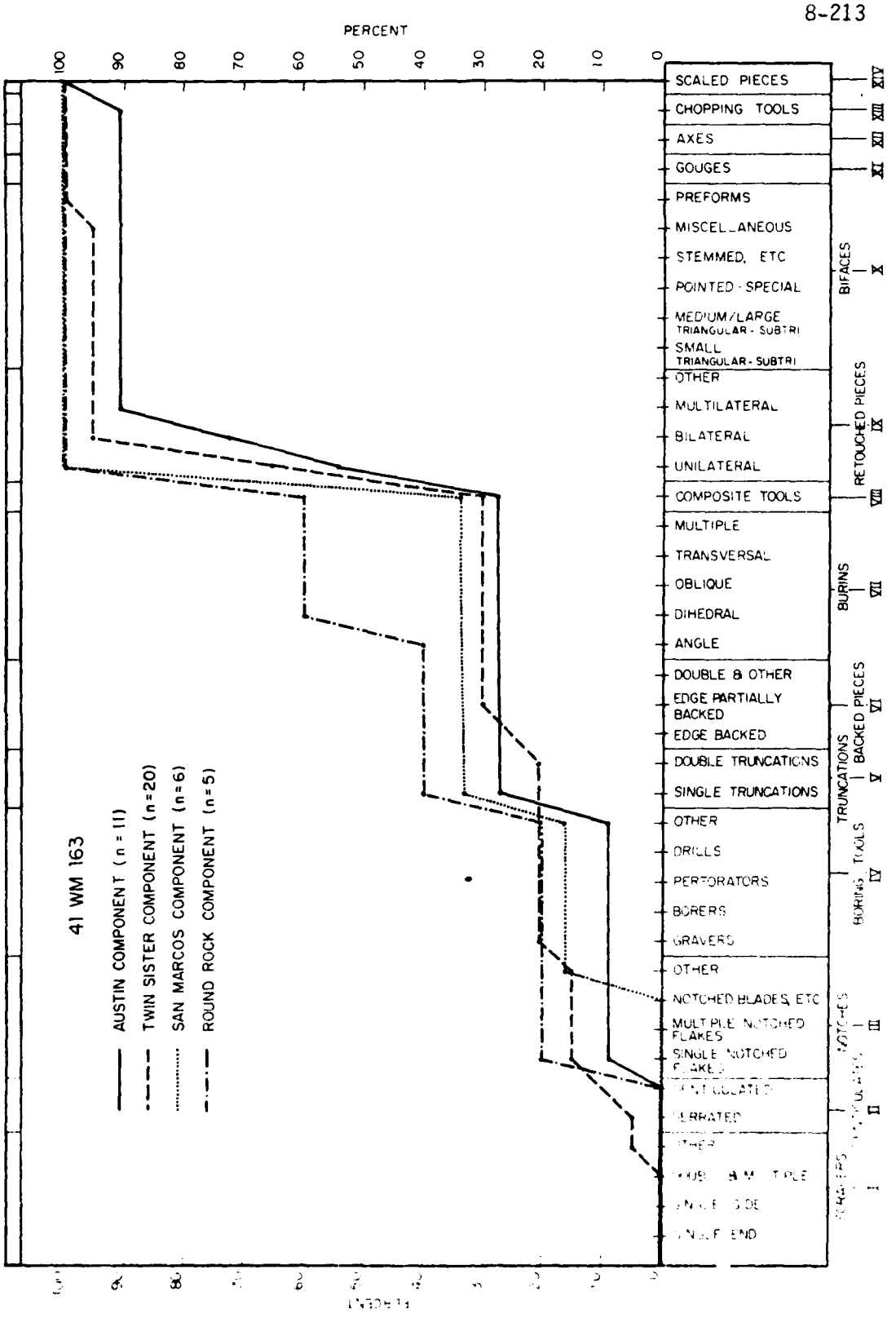


Figure 8.8-4. Cumulative Graph of Lithic Tools: Site 41WM163

41WM258

8.9 (Bigon-Kubala Site)

Site Situation

41WM258, a prehistoric terrace site, is located on the right bank of an S-shaped curve in the Willis Creek channel. The site is about 3 kilometers southeast of Granger, Texas near the upper end of the Granger Lake project area (Fig.8.7-1). Most of the site is in a formerly cultivated field with three large pecan trees on the southeast edge of the site. There is also a narrow band of hackberry and pecan trees, brush, and briars on either side of the Willis Creek channel edge.

Two parallel overflow channels that transect the site from northwest to southeast (Fig. 8.9-1) are approximately 40 meters apart, and each dips about 1 meter below ground surface. According to local residents, these channels are less than fifty years old, and were formed by Willis Creek floods. Both channels empty into a shallow, silted-in lake that is a portion of an old fossil channel of Willis Creek about 300 meters south of the site.

Previous Investigations

41WM258 was first recorded in January, 1974 by Daniel Prikryl who noted that flood waters rushing through the two overflow channels had cut into cultural materials well beneath the plow zone exposing burned limestone rocks, flint debris, mussel shells, animal bones, and snails. Several clusters of burned rocks appeared to be hearths. Four Perdiz points, a reworked Archaic point, a double-edged biface, and a grinding stone fragment were found on the surface during initial investigation and recording.

At that time, the western portion of the site was still under cultivation. As the site was located on the property line dividing farms owned by Mr. John Bigon and Mr. Emil Kubala, it was named the Bigon-Kubala site. From conversations with Mr. Ed Bigon, son of one of the land owners, it was learned that one of his sisters had found a bead and several plain ware potsherds on the site many years ago. The bead was later examined and found to be a conch shell columella bead similar in type to many found in sites on the Texas coast. On subsequent visits to the site by Prikryl and Elton Prewitt several mussel shell tools and additional Toyah Phase and Archaic materials were found. In his recommendations for further work in the Granger Reservoir Prewitt (1974:144) advised extensive testing of the site because of the probable presence of an isolated Post-Archaic component. The importance of the site was reinforced in Texas A&M's recommendations for sites to be nominated for the National Register which stated "This is the only site of this nature reported in the

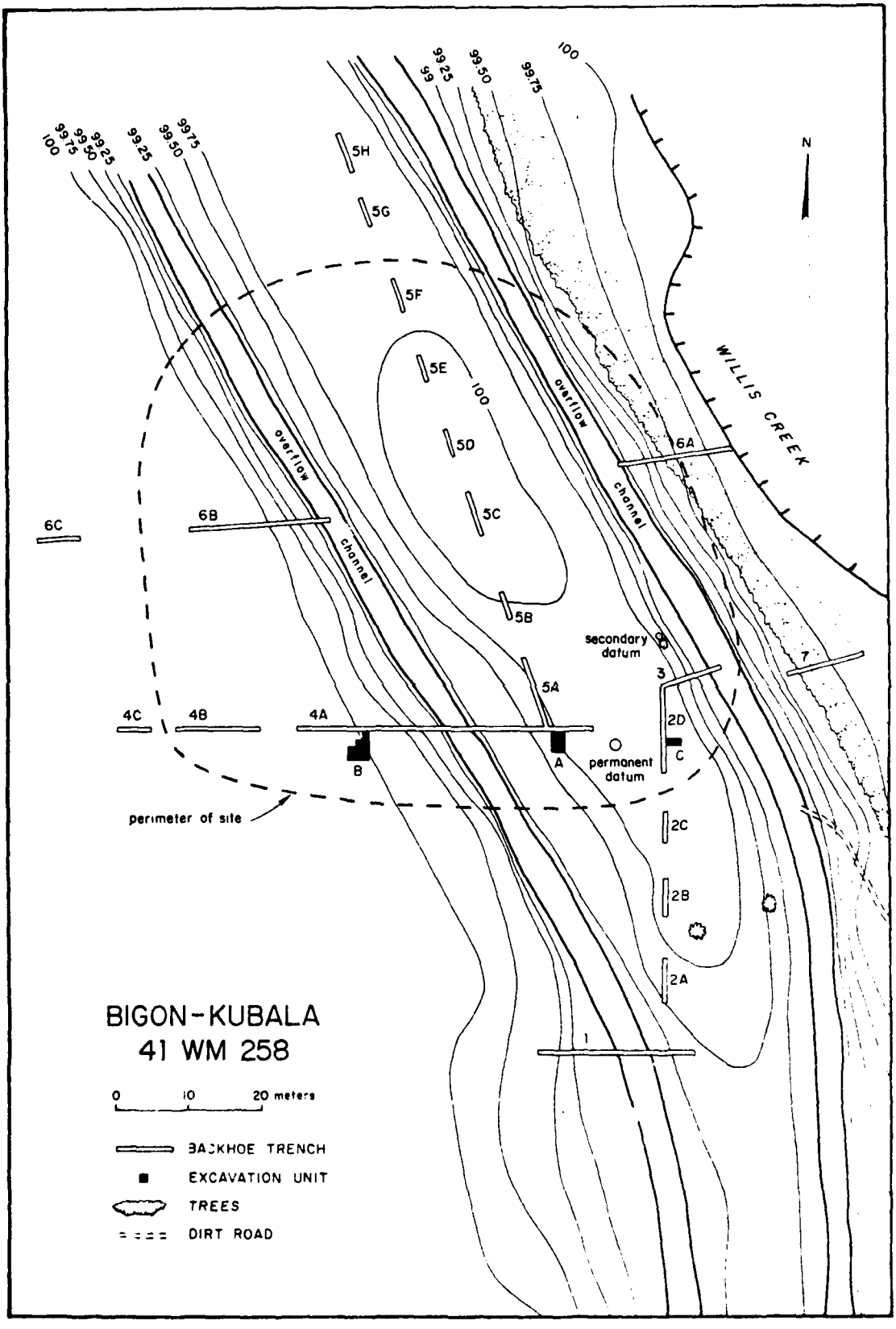


Figure 8.9-1. Site Map, 41WM258

reservoir district." The Scope of Services for NTSU required "stripping the plow zone" and "testing for features." Twenty man-days of effort was allocated for the work.

In July and August, 1978, the site was tested to investigate the presence of a late Neo-American occupation. At that point, no isolated Neo-American lithic assemblage of any volume had been found during the field season. It was hoped that if such a component were present at 41WM258, a sizeable lithic assemblage could be recovered for comparisons with the numerous Archaic assemblages that had been found at other sites in both reservoirs. Neo-American features and activity areas, if present, could likewise be compared to those found at Archaic sites. Lastly, there was a possibility that aboriginal pottery and/or historic European trade goods might be found.

Testing Methodology

Testing strategy included the use of: 1) a magnetometer survey to detect subsurface features, 2) backhoe trenches to determine the vertical and horizontal limits of the site, and 3) test pits to check the contextual integrity of the cultural deposits and establish a temporal sequence.

In late January, 1978, the magnetometer survey was conducted. Three areas each measuring 10 x 20 meters were tested with readings taken at one meter intervals. The test areas centered on the slopes of the western overflow channel and the adjacent terrace surface. The readings obtained showed a very limited gamma range compared to other sites on the San Gabriel River. Two backhoe trenches were cut through magnetometer tested areas, but in neither case were features found where anomalies were present.

Initially, five series of backhoe trenches were dug. Various sized sections of each trench were hand troweled and profiled. Two additional series of trenches (#6 and #7) were dug later to generate more data about the nature and limits of the northern half of the site (Figure 8.9-1).

The backhoe trenches indicated that the site measured about 80 x 80 meters horizontally. Cultural material seen as far as 50 meters further south had been washed down the gullys by flooding. All cultural material seemed to be at least 40 cm beneath ground surface except on the lower slopes and bottoms of the overflow channels where erosion had disturbed the upper half of the cultural deposits. Subsequent plowing further damaged these exposed areas. Cultural debris appeared to be most dense in the southern portion of the site where the culture bearing deposits were 70 to 130 cm thick. Along the BHT #5 series to the north, cultural debris was 50 to 60 cm thick in cuts B, C. and E, but very thin in cut F. The area of the site between the creek channel and the eastern gully looked very disturbed and lacked dense cultural debris. BHT #6B in the west central part of the site showed a dense concentration of cultural

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ARCHAEOLOGICAL INVESTIGATIONS AT THE SAN GABRIEL RESERVOIR DIST--ETC(U)
JUN 82 T R HAYS, R KENMOTSU, S A HALL DACW63-78-C-0012

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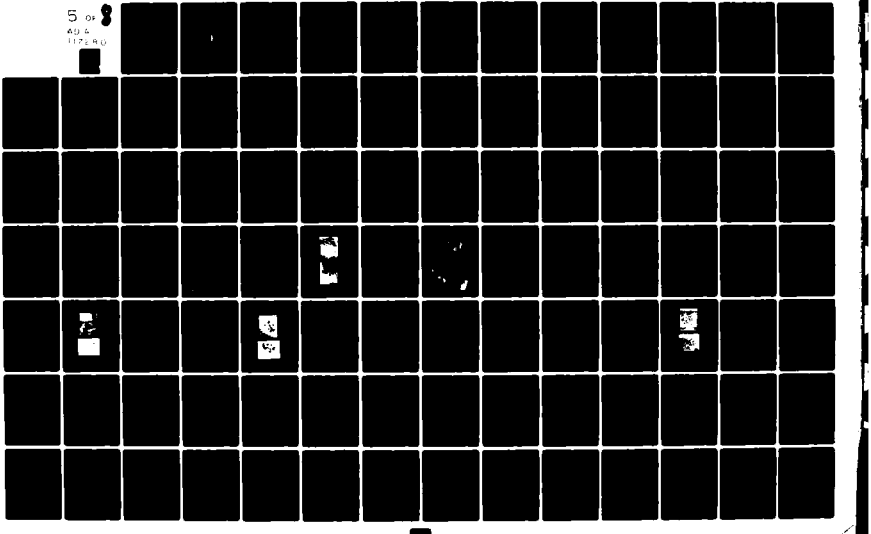
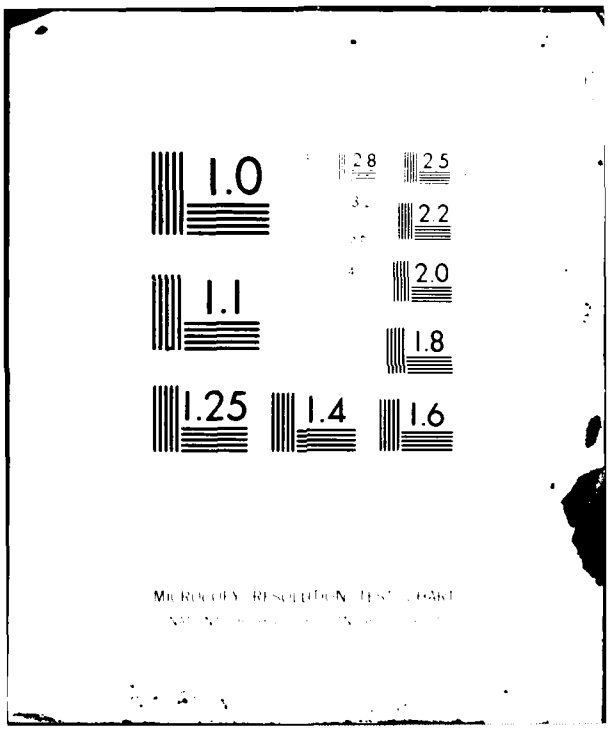



1.0
2.8
2.5
2.2
2.0
1.1
1.8
1.25
1.4
1.6

debris about 70 cm thick with features. It indicated that the entire area west of the western gully between BHT #6B and BHT #4A and B would yield good data in further excavations. Both Neo-American and Archaic diagnostics including a Scallorn point, ceramic sherds, a Marshall point, and a Darl point were found in the trenches. Hearths containing pockets of gray-white ash and orange soil in and about the hearthstones were exposed by the backhoe. Some of these hearths were similar to those reported at 41WM130 (Bond 1978) in that pit outlines were present in the form of burned orange and black soil. These pit outlines showed that the hearths were deep basin-shaped pits which often did not contain many burned rock fragments or had a rock pavement only at the bottom of the pit.

Profiled sections of very closely adjacent backhoe trench walls were used to judge the boundary between the overburden and the top of the midden. In controlled excavation units, the overburden was removed, but not screened. The levels containing cultural materials were then excavated to sterile depths by 10 cm arbitrary levels. All matrix was ¼" screened only because there was not enough water in Willis Creek for water screening.

Of the three initial 1 x 1 meter squares dug through cultural bearing deposits to sterile soil during the first phase of testing, the two which produced the most positive results were expanded. In Area A in the south part of the site between the two overflow channels, evidence of three components found in the correct temporal sequence led to the expansion of this unit into a 2 x 2 meter square. Of these three additional 1 x 1 meter squares, one was excavated to the bottom of cultural deposits, while the other two were completed only through Toyah and Austin Phase deposits. At Area B in the southwest part of the site Leon Plain pottery and large bones were found in the upper levels, and a Scallorn point was found deeper. A third component still deeper, but without diagnostics, was thought to be Twin Sisters Phase or earlier. Seven additional contiguous 1 x 1 meter squares were then added and excavated through the Toyah phase levels. Area C was a 1 x 1 meter square placed near one of the deep hearths on the east side of BHT #2D in the southeast part of the site. Unfortunately, the projectile point sequence obtained from the levels at the top of the adjacent hearth was somewhat mixed. Consequently, this pit was not expanded although the cultural deposits there were the thickest seen at the site.

Stratigraphy

The entire soil profile at 41WM258 was very homogeneous. Five basic strata were seen in the backhoe trenches and excavation units (Fig. 8.9-2). Strata 1 through 4 were found all across the site except in the area of the two overflow channels where strata 1, 2, and the upper portion of 3A have been washed away. Stratum 5 occurred only in the bottom of the deepest sections of two backhoe trenches. Aid in the recognition of sediment types and strata divisions was provided by NTSU

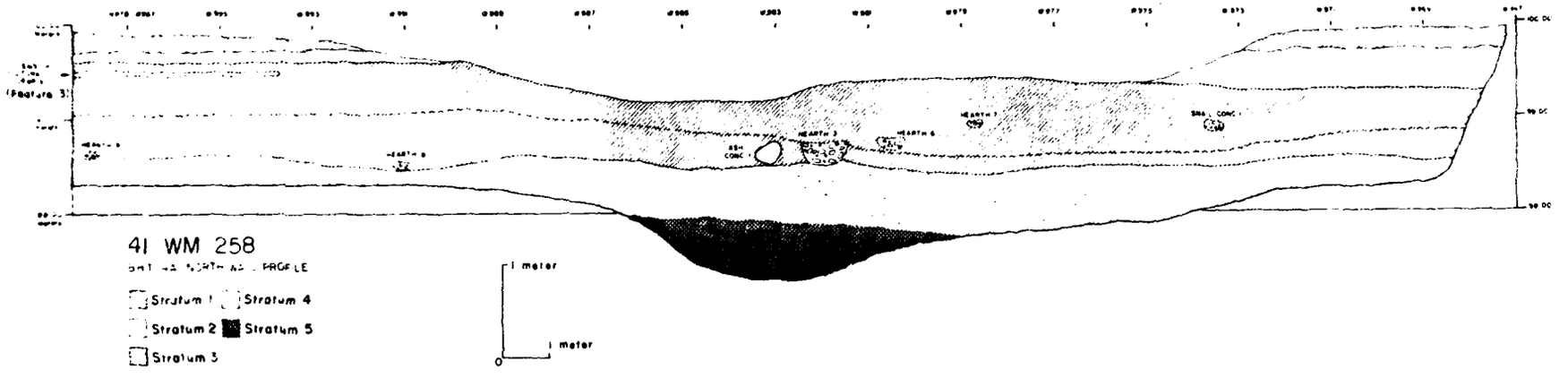

41 WM 258
Stratum 1
Stratum 2
Stratum 3
Stratum 4
Stratum 5
1 meter
1 meter

Figure 8.9-2.

geomorphologist, Dr. Stephen Hall, and by U. S. Soil Conservation soil scientists, Leroy Werchan and John Coker. Below is a description of each stratum in reverse depositional order.

Stratum 1. On ground surface a Blackland Prairie sediment described as Tinn Clay was found. It is subject to swelling and shrinking depending on the moisture content, and in the summer, many deep vertical cracks were observed. It has a dark gray color (10YR4/1) which was the result of decayed organic matter that had filtered down from ground surface. Grass roots were numerous, and a few snails were noted. No cultural material was seen in this stratum. In areas of the site previously cultivated, the upper part of this zone had been thoroughly churned by plowing.

Stratum 2. This stratum is a continuation of the Tinn Clay, but in structure it is not as massive as stratum 1. The other major distinction is a lighter gray color (10YR5/1) which is due to less decayed organic material and an increase in the amount of calcium carbonate. More snails and fewer roots were seen compared to stratum 1. At the southeastern and southwestern edges of the site stratum 3 slopes downward from 40 to 60 cm. Stratum 2 thickens in these areas to fill in the gap where stratum 3 lay lower in elevation. Stratum 2 can be divided into two parts in these areas. Stratum 2A is very much like stratum 2 elsewhere in the site, but is lighter in color than stratum 2B which lay beneath it. Stratum 2B, in addition to being darker in color, contained many snail shell and a few isolated flint flakes.

Stratum 3A. This stratum is the upper part of the cultural bearing deposit and has the characteristic dark color of a midden. This dark gray (10YR4/1) Tinn Clay clearly contrasts with the lighter colored sediments above and beneath it. Burned rock, flint debris, snails, charcoal, and bone are numerous in the matrix. In other respects it is similar to strata 1 and 2.

Stratum 3B. This lower portion of stratum 3 did not have as dense an accumulation of cultural debris and was slightly lighter in color than stratum 3A. It was a dark grayish brown (10YR4/2) color and was at the bottom of the Tinn Clay. The volume of snails was consistent with stratum 3A, but there was less burned rock and flint debris.

Stratum 4. This stratum represented the transition from Tinn [illegible] silty clay. It was devoid of cultural material, but many snails were still evident. The light color, a grayish brown (10YR5/2), was attributed to the decrease in organic material and the increase in calcium carbonate in the sediment.

Stratum 5. A subtle color change and slight increase in clay content distinguished this stratum from stratum 4. The brown (10YR5/3) silty clay had more calcium carbonate than stratum 4, and like stratum 4, it contained no cultural materials.

Culture/Time Stratigraphic Units

Diagnostic projectile points found in controlled test excavations are affiliated with the Toyah, Austin, and Twin Sisters Phases. Darl points, a Twin Sisters Phase diagnostic, were found in the deepest culture-bearing deposits in the Area A unit. It is very probably, though, that earlier occupations occurred at the site. In level 8 in the Area C unit, Austin and Twin Sisters projectile points were recovered, but seven deeper levels that contained cultural material lacked diagnostic artifacts. Likewise, the three deepest levels in Area B did not have any datable artifacts. At least some of these deep levels may predate the Twin Sisters Phase. A Pedernales point seen on the surface in one of the eroded gullies, and a Marshall point found in the backdirt pile at BHT #4A's western end are indications that Round Rock and San Marcos Phase occupations may have occurred in the site area.

The latest occupation of the site was by Toyah Phase bison hunters. Diagnostic projectile points pertaining to this group were found in levels 2-5 (99.65-99.30 m) in Area B, and in levels 3-5 (99.30-99.00 m) in Area A. No indications of a Toyah Phase occupation were present in the Area C unit (Fig.8-9-3).

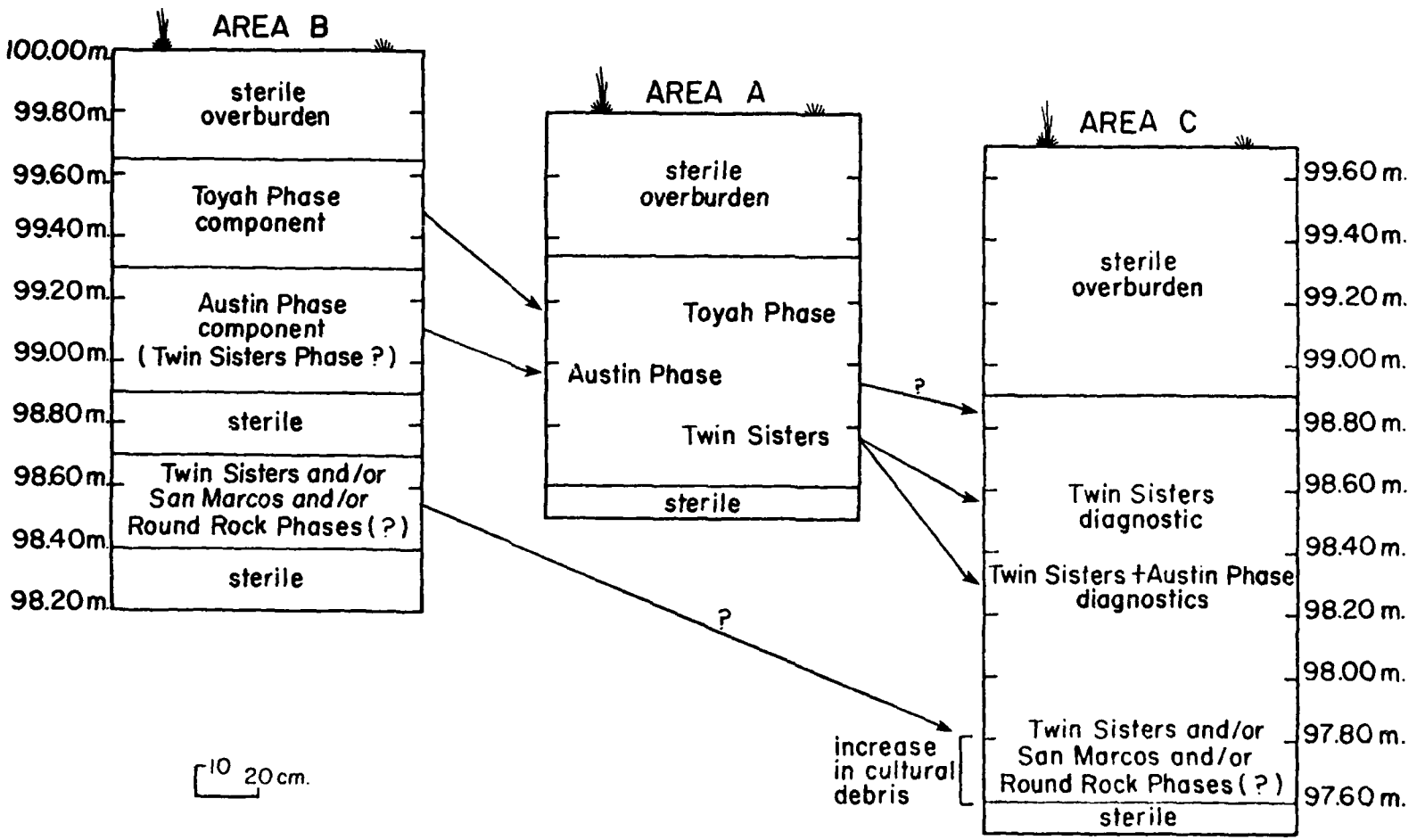
In the Area B unit within the Toyah component levels over 200 potsherds were recovered. These are generally similar in type to what is referred to as Leon Plain. A majority of these sherds lay between 99.65 and 99.50 meters elevation. Scattered sherds were found down to 99.30 m, which was thought to be the bottom of the Toyah Phase component in Area B, and single isolated sherds must have fallen through cracks in the soil another 40 cm deeper. Many unarticulated bison bones (Feature 2) were found in the Area B unit between 99.60 and 99.30 meters elevation. Feature 1, a hearth found between 99.43 and 99.3 meters provided a radiocarbon date of 480 ± 70 BP (UGa-2477) for a portion of this component. Lithic debris in the Toyah Phase levels in Area B was almost nonexistent. Noteworthy flint tools included a Perdiz point and a biface which may have been used as a butchering tool.

Toyah Phase diagnostics in the Area A unit, which is located 26 meters east of Area B, were in an area about 30 cm in vertical thickness. Level 3 had one Perdiz point, while levels 4 and 5 each held two Perdiz points and one Scallorn point. No pottery was seen in the Area A Toyah component levels, but the amount of flint debris was much greater here than in the Area B levels. There appears, then, to be an activity difference between these two Toyah Phase occupation areas.

Beneath the Toyah Phase components in Areas A and B, is an Austin Phase component which includes Scallorn points, large amounts of lithic debris, burned rocks, mussel shells and snails. In the faunal assemblage, deer is present, while bison is absent except for several bison bones in level 6 in Area B. In four 1 x 1 meter squares in Area A, Austin Phase diagnostics were found in levels 4-7. The upper part of this component grades into the Toyah Phase materials there, as previously

Figure 8.9-3

41 WM 258
DISTRIBUTION OF COMPONENTS



mentioned, while in level 7 a Scallorn point and a Darl point (a Twin Sisters Phase diagnostic) were found.

In Area B, two 1 x 1 meter pits penetrated a probable 40 cm thick Austin Phase component in levels 6-9 (99.30 - 98.90 M). A Scallorn point was found at the bottom of these levels between 99.00 and 98.90 m. Deer bone again replaced the larger bison bones and flint debris was much denser than in the Toyah component levels above. No diagnostics from another time period were seen in these 40 cm to indicate mixing or a time overlap except for several Leon Plain potsherds most of which were in the upper part of this presumed component. The sherds probably fell through cracks or rodent burrows to these depths.

The presence of an Austin Phase component in Area C is inferred by two Scallorn points in level 8. However, a Darl Point also appeared in level 8 while an Ensor point was seen even higher in elevation in level 6. Mixing of components is probable in this area.

The vertically deepest identifiable component was the Twin Sisters Phase of the Central Texas Archaic. It was approximately 20 cm thick in Area A where a Darl point was found in level 8 along with lithic debris, faunal material, mussel shells and snails. Cultural debris in level 9 may also be from that time period. In Area C the vertical thickness of the Twin Sisters component is unknown, but could range anywhere from a minimum of 30 cm (levels 608) within which Darl and Ensor points are present, to possibly 100 cm (levels 6-15). San Marcos and/or Round Rock Phase materials may be in the deeper levels, but no diagnostics were found in the 1 x 1 meter test pit. Similarly, the position of the Twin Sisters Phase component in Area B is uncertain since no diagnostics were recovered in two 1 x 1 meter squares which reached the depths where it might be expected to occur.

In addition to the radiocarbon date from Feature #1, another hearth which was located in BHT #4A was also dated. Labeled Hearth 3, this hearth appears at the contact of strata 3A and 3B at 98.76 meters elevation. In the area A test unit, 9 meters to the east, a Darl and Scallorn point were recovered from level 7 (98.90 - 98.7 m). Since both of these levels were above the contact of strata 3A and 3B, it was assumed that the hearth might represent an occupation of the late Twin Sisters or early Austin components. The radiocarbon date of 990 $\pm$ 290 B.P. (RL-1088), although exhibiting a large sigma value, is not inconsistent with this assumption. Unfortunately, the large sigma value provides little support for a definite temporal designation.

Features

Three features including two hearths and a concentration of bone were recorded during excavations. A thin lens of cultural debris in the north wall of BHT #4A just northeast of the Area B unit was recorded as a feature because it is possibly a Toyah Phase living surface. Numerous

other hearths and ash concentrations that were visible in the backhoe trench walls were not given formal feature numbers, but will be discussed in this section.

Feature 1 - Hearth. A hearth composed of 13 fossil Exogyra ponderosa shells and a flint cobble was found within the Toyah Phase component in Area B of the site (Fig. 8.9-4). Both the Exogyra ponderosa shells and the flint cobble showed evidence of having been burned extensively. A large amount of charcoal within the hearth made the matrix darker than that in the surrounding excavation unit. The charcoal dated 480 ± 70 BP (UGa - 2477).

While other hearths uncovered in the Granger Reservoir often had 1 or 2 Exogyra shells among the burned limestone rocks, this is the only known example in which over 90% of the hearth stones are Exogyra shells. Whether these people had discovered some scientific reason (i.e., they retain heat better) for their usage is uncertain. Evidence for another possibility, a magical or ritual one, is lacking. The hearth construction may represent the behavioral pattern of just one individual, but judging from the unusually large number of burned Exogyra shells included in the cultural debris on the surface of the overflow channels, it is probable that other hearths of similar composition are present within the site.

The top of the hearth was struck at 99.43 meters, and the lowest Exogyra shell rested on a surface at 99.33 meters. The southern half of the hearth was about 3 cm higher in elevation than the northern part. The hearth was essentially flat rather than basin-shaped, there being only two instances in which a fossil shell was beneath another one. There was no burned orange soil or any evidence of a pit outline similar to those of numerous other hearths at the site. This may mean that Toyah Phase peoples were not constructing deep pits like earlier inhabitants of the site. A larger sample of hearths from controlled excavations is needed before any definitive statement may be offered, however.

Most of the hearth was in the SW quad of the N975/W999 unit, but it extended into the NW quad of the same unit and also very slightly into the SE and NE quads of the N975/W1000 unit. It measured 30 cm from north to south and 33 cm from east to west at 55 to 65 cm beneath ground surface.

Two bone fragments found within the hearth might be a part of a large bone cluster (Feature 2) that surrounded the hearth. Over 200 Leon Plain potsherds were also recovered, but flint debitage was minimal. Two finished flint tools, a biface and a Perdiz point, were found in the vicinity.

Feature 2 - Bone Concentration. A cluster of unarticulated bones was found all across the Area B excavation unit within the Toyah Phase levels from 99.60 to 99.30 meters elevation or from 40 to 70 cm below ground surface (Fig. 8.9-4). A vast majority of the identifiable bones were bison but also present were a deep tibia, a deer rib and a rodent mandible with an attached incisor. At least two individual bison were

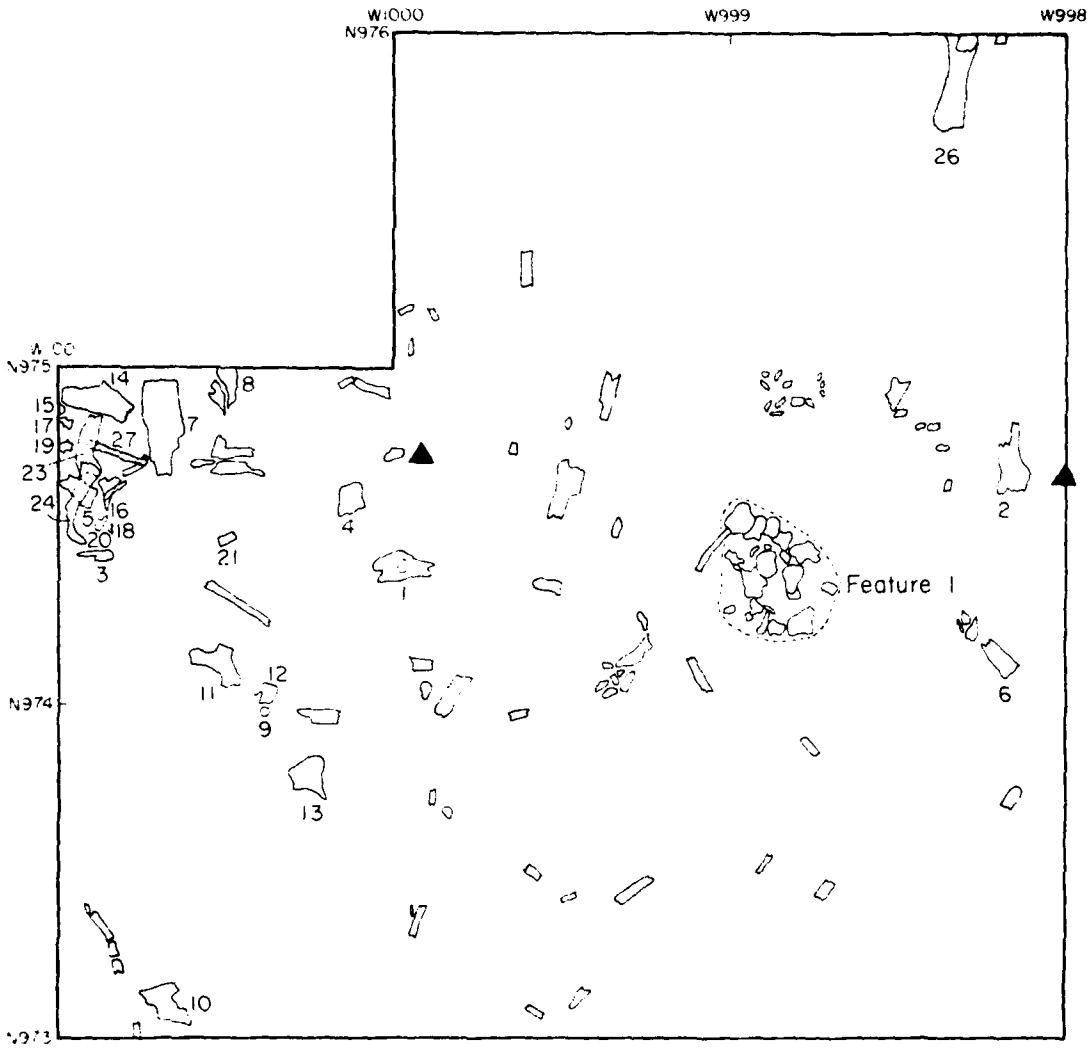

W1000
W999
W998
N976
N975
N974
N973
Feature 1
41 WM 258
AREA B
Feature 2
Bison Bone
Deer Bone
Stone
Lithic Artifact
0 25 50 cm
N

Figure 8.9-4.

represented - one mature and one immature. Those bones that could be identified are listed in Table 8.9-1. Many other bones were too fragmented to be identified. Others were weathered or showed evidences of rodent and carnivore gnawing.

The bones were densest in the N975/W1001 1 x 1 meter square and other bones could be seen in the north and west walls of this unit. Additional bones should also lie in adjacent unexcavated units in all directions except possibly to the south of Area B. In association with the concentration were a hearth (Feature 1) which dated 480 + 70 BP (UGa-2477), approximately 200 Leon Plain potsherds, one Perdiz point and a biface. Noticeably missing was flint debris.

The presence of such a large number of bones may indicate that Area B was used by Toyah Phase peoples for butchering animals. A finished biface found in the N975/W1000 unit at 99.41 meters could have served as a butchering tool. Since a hearth and a large number of potsherds were present with the bones, a food preparation locus was suggested. Alternately, the upper cultural levels in Area B may represent a Toyah Phase refuse dump where bones and broken pottery were deposited after use of the hearth terminated.

Feature 3 - Lens of Cultural Debris. In the north wall of BHT #4A, a thin, horizontal, continuous line of cultural debris was evident which averaged only 2 cm in thickness and consisted of burned rock fragments, flint debris, snails, and a potsherd (Fig.8.9-2). The eastern end of the lens appeared at W993.80 meters while the western edge became indistinct at the W998.20 meter line. In this area of BHT #4A, the north wall of the trench fell between the N977 and 978 grid lines. The bottom of the lens occurred at 99.48 meters, which placed it in the Toyah Phase component in Area B, the northeast corner of which lay within 2 meters of the western edge of the feature. The presence of a sherd within this concentrated lens of debris was further evidence of a Toyah Phase affiliation.

Surprisingly, this concentrated lens of debris could not be distinguished in the adjacent south wall of BHT #4A or in the profiles of the completed Area B excavation unit. Apparently, the 50 cm backhoe trench cut through the very south edge of this feature.

Feature 3 may represent the remains of a Toyah component living surface. Certain features and materials found in the Toyah component in Area B may be related to this living surface. The top of Feature 1, a hearth found in Area B, lay 5 cm below the bottom of Feature 3 while the bison bones which comprised Feature 2 in Area B lay at elevations between 99.60 and 99.35 meters. Perhaps 50% of these bones, however, were recovered between 99.95 and 99.45 meters of elevation. A clear majority of the potsherds found in Area B came from elevations between 99.65 and 99.50 meters.

Horizontally, there was an increase in the amount of flint debris and potsherds across the Toyah component in Area B toward the north

Table 8.9-1. Key to Numbered Bones in Feature 2, 41WM258
(All bones are bison except where noted.)

1. tibia (L) d.*
2. humerus (R) d.
3. ulna f.*
4. scapula (L) p.* f.
5. pelvis f.
6. femur (L) d.
7. scapula (R) p.
8. scapula (R) p.
9. carpal
10. femur (L) p.
11. femur (R) p.
12. carpal
13. femur (R) p.
14. scapula (L) f.
15. astragulus (R)
16. pelvis f.
17. thoracic vertebra f.
18. mandible (Squirrel)
19. vertebra f.
20. thoracic vertebra
21. cervicle vertebra
22. rib f.
23. femur (R) d.
24. pelvis f.
25. femur (R) p.
26. fragmentary radius?
27. tibia (L) (Deer)

*d = distal; p = proximal;
f = fragment

in the direction of Feature 3. However, the amount of flint debris in all Toyah component levels in Area B was minimal. The bison bones in Area B were more equally dispersed although there was a concentration in N975/W1001 unit at the west end of Area B. Nevertheless, Feature 3 may mark the southern edge of a more concentrated area of the Toyah component occupational debris.

Feature 4 - Hearth. This feature first became apparent when an arc-shaped line of burned orange soil became visible in the very northeast corner of the N976/W956 unit. The north and east ends of this orange line each entered their respective walls of the unit about 24 cm from the northeast corner of the unit. Only a small portion of the total pit was excavated so its overall size could not be determined. The feature showed well in the north and east walls of the excavation unit (Fig.8.9-5). This profile showed the top of the feature at 98.70 meters and the bottom at 98.37 meters, elevation. The fire pit had a lining of burned orange soil around its outer perimeter. At the very bottom several burned Exogyra shell fragments were noted along with a little charcoal. Flecks of charcoal and occasional snails could be seen in the midsection of the pit. A denser accumulation of charcoal and several burned rock fragments were evident near the top of the pit and probably represented a later and final episode of use after the lower portion of the pit had become filled. A large number of snails were either attracted to decaying organic matter after the pits last use or washed in during a flood episode.

Since the orifice of the pit was higher in elevation than diagnostic artifacts, such as an Ensor (98.55 m.), a Darl (98.4 - 98.3 m), and two Scallorn points (98.4-98.3 m.), an Austin or Toyah component occupation is most likely. The lack of any ceramics within this unit, however, may indicate that a Toyah component is not present in this area of the site.

Many deep basin-shaped fire pits that were used as hearths were struck by the backhoe when trenches were being dug. The outlines of some of these showed clearly in the walls of backhoe trenches as linings of burned orange and black soil within which there was slightly darker than average matrix containing varying amounts of hearth stones, ash, charcoal, and snails. The pits ranged in depth from 15 to 40 cm and the largest were up to one meter in diameter. Often there were hearth stones only near the bottom of these pits where they formed a pavement or grill.

At 41WM130, Bond (1978) discovered similar features which dated from 1740 ± 60 to 700 ± 60 BP and were associated with Darl, Scallorn and what he termed Alba points. At 41WM258, the elevations of a majority of these fire pits related to both Austin and Twin Sisters Phase occupations of the site. Only the very edge of one of these hearths (Feature 4) was struck in controlled excavations. These hearths, plus the ash concentrations and snail shell concentrations encountered in the backhoe trenches are described below. Hearths 1 and 2, encountered in the controlled excavation units, have been previously discussed as Features 1 and 4.

41 WM 258

N976/W956 UNIT

NORTH, EAST WALL PROFILES

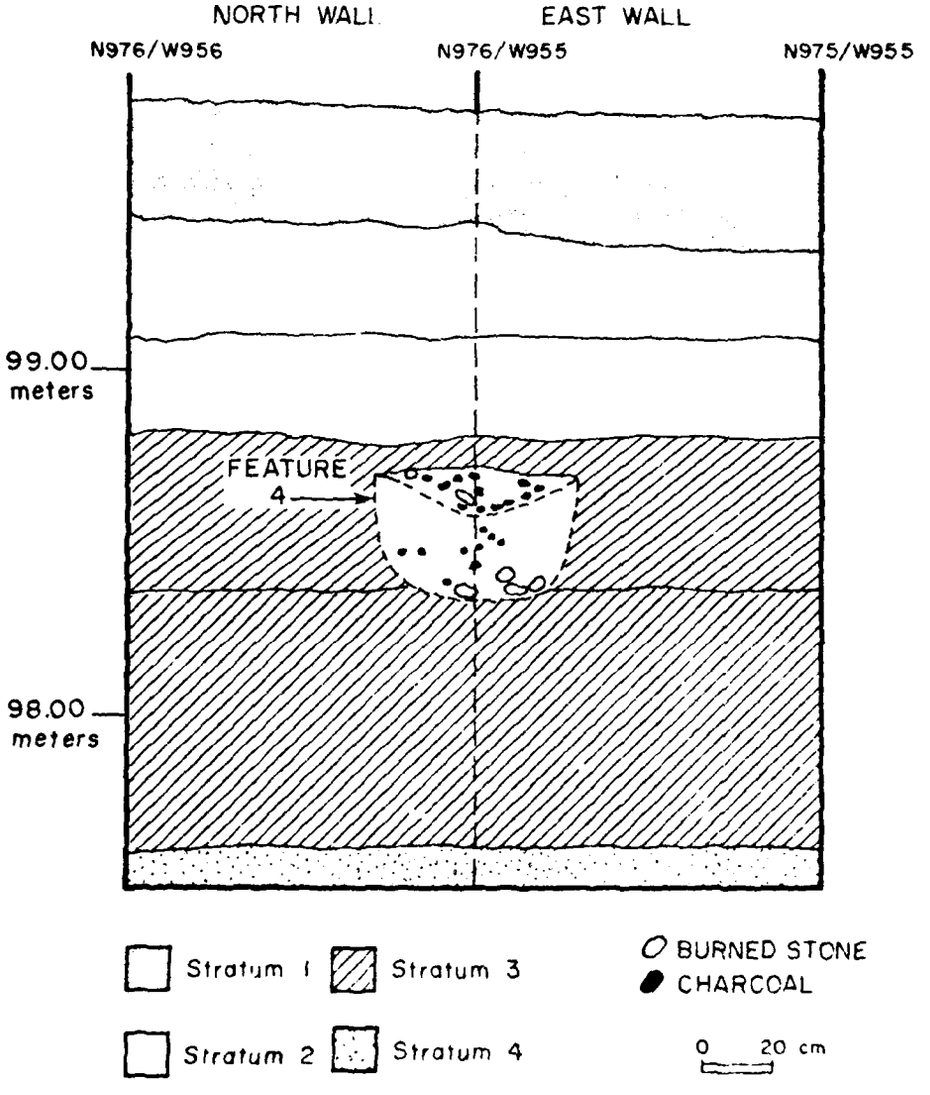


Figure 8.9-5.

Hearth 3. This large basin-shaped hearth was cut in half by BHT #4A so that remnants of the hearth could be seen in both the north and south walls of the trench (Fig. 8.9-2). On the grid this hearth was located in the N977 and 978/W981 and 982 units. It may possibly extend northward into the walls of the trench (Fig. 8.9-2). On the grid this hearth was located in the N977 and 978/W981 and 982 units. It may possibly extend northward into the N979 unit also. The basin-shaped pit had a lining of burned orange soil marking its boundaries. The top of the hearth was about 1 meter in diameter and the bottom approximately 50 cm. It was filled with burned limestone rocks and several fossil Exogyra ponderosa shells. All other similar basin-shaped fire pits at 41WM258 contained smaller quantities of hearth stones.

In profile, the pit walls appeared similar to many of those at 41WM130 where the upper part of the walls were often almost vertical while the lower half sloped inward gently leaving a large bottom on which hearth stones could be placed. The top of the hearth lay at 98.76 meters or at the break between strata 3A and 3B while the bottom was at 98.50 meters elevation. In the Area A test unit, 9 meters to the east, a Darl and a Scallorn point were found in level 7 (98.90 - 98.80 meters) while two Darl points were recovered from level 8 (98.80 - 98.70 meters). It appears to be associated, then, with an early Austin Phase or late Twin Sisters Phase living surface. A radiocarbon date of 990 ± 290 B.P. (RL-1088) was obtained from a charcoal sample collected from this hearth.

Hearth 4. A large basin-shaped hearth was struck in backhoe trench #4B and perhaps a majority of the hearth was saved by leaving a pedestaled area within the backhoe trench (Fig. 8.9-6). On the grid, it would be within the N977 and 978/W917 and 1918 units. In elevation, the top and bottom were at 99.00 and 98.60 meters respectively. The pit may have been used in more than one episode. Within it there was ash, snails, charcoal, lumps of burned soil, burned limestone rocks, and fossil Exogyra shells. The hearth was outlined on the bottom and sides by a lining of burned orange soil. Hearth 4 was the westernmost of a succession of three pits whose orifices were at the same elevation (Fig. 8.9-6). A line of snail shells occurred at the orifices of each of these hearths. The western top edge of the burned orange soil lining of the central fire pit in this succession, Hearth 10, touched the eastern top edge of Hearth 4. Hearth 4 is probably associated with both of these adjacent hearths. They should be the product of a Austin or Twin Sisters Phase occupation. A line of burned rocks 10 to 20 cm beneath Hearth 4 may represent an earlier hearth.

Hearth 5. The remnants of a hearth were observed in the north wall of BHT #6A between 98.90 and 98.75 meters elevation. It appeared about 7.40 to 8.60 meters east of the west end of the backhoe trench. The hearth had no definite basin shape, and its eastern end apparently was missing due to the erosion of an earlier Willis Creek channel. Charcoal, ash, pockets of orange soil, and several burned rocks were seen in the profile wall.

41 WM 258
BHT 4B SOUTH WALL PROFILE

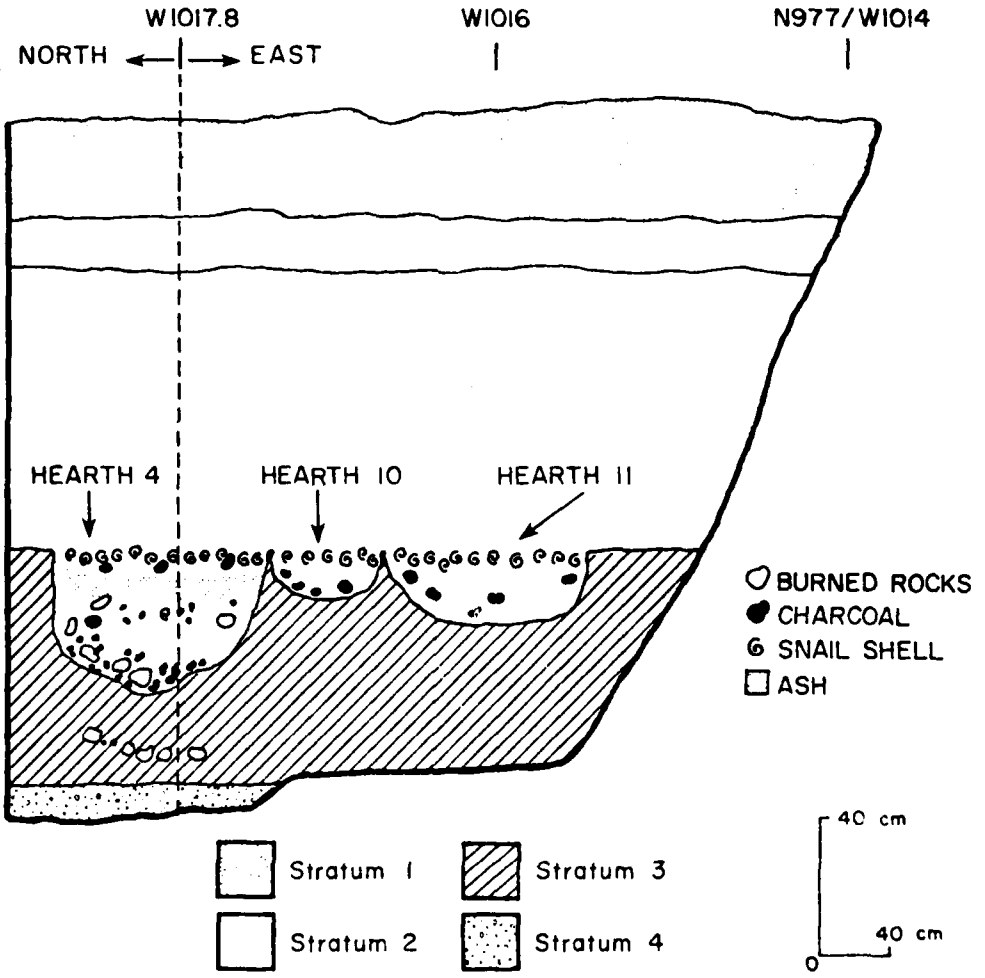


Figure 8.9-6.

Hearth 6. The outline of a basin-shaped hearth occurred in the north wall of BHT #4A between 98.78 and 98.68 meters elevation in the N977 and 978/W980 units (Fig. 8.9-2). It appeared to lie completely within stratum 3A, and it measured 56 cm in length. It had a lining of burned orange soil on its bottom and sides while the top was covered with charcoal. Within the hearth there was charcoal and several lumps of ash, but no burned rocks were observed. Hearth 6 was 62 cm from the eastern edge of Hearth 3, but at a slightly higher elevation. Thus, it may date later in time than Hearth 3.

Hearth 7. The very edge of what was possibly a hearth was seen in the north wall of BHT #4A (Fig. 8.9-2). On the grid it would lie in the N977 and 978/W978 unit. Pieces of charcoal and burned rock fragments denoted its presence. No evidence of a basin shape or a pit outline were found. In elevation it occurred in stratum 3A between 98.98 and 98.90 meters elevation and was 32 cm in length. It may represent the remains of a Neo-American hearth.

Hearth 8. The very edge of a possible hearth was struck in the north wall of BHT #4A between 98.54 and 98.46 meters elevation (Fig. 8.9-2). It was found at the very bottom of stratum 3B and lay within the N977 and 978/W990 and 991 units. Much charcoal and several burned rocks were observed within the 22 cm length of the hearth. No evidence of a basin shape or pit wall was visible. The elevation of this hearth places it with the deepest cultural debris found in Area B which is located 7 to 10 meters to the southwest of Hearth 8.

Hearth 9. Another hearth with characteristics similar to Hearth #8 was seen in the north wall of BHT #4B at the bottom of stratum 3B between 98.66 and 98.50 meters elevation (Fig. 8.9-2). The entire hearth probably lay in the N977 and 978/W997 units. Burned limestone rocks and pieces of charcoal were observed over a length of 28 cm. There was some evidence of a possible basin shape. However, it appeared that only the very south edge of the hearth was exposed in the backhoe trench wall. Its elevation, like that of Hearth 8, placed it within the deep horizon of cultural debris found in the nearby Area B excavation unit. No diagnostics were recovered from this deep horizon, but it probably will date from Twin Sisters and/or San Marcos and/or Round Rock Phase times.

Hearth 10. This basin-shaped fire pit, along with Hearth 11, became noticeable after a rainstorm cleaned the walls of the backhoe trenches. Both of these hearths could be seen in the south wall of BHT #4B (Fig.8.9-6). Hearth 10 was lined on its sides and bottom with burned orange soil while the top was defined by a horizontal line of snail shells. Within the pit area, a few flecks of charcoal could be seen. A definite basin shape was evident. At the top, it measured 60 cm in diameter while the bottom was approximately 40 cm in diameter. The walls of the pit sloped gently inward. The top and bottom of the pit lay at 99.00 and 98.86 meters respectively. No cultural material, except for a thin lens of snails from approximately 99.35 to 99.28 meters was apparent in the profile wall at elevations above the top of the hearth. On the grid it

lay in the N977/W1016 and 1017 units.

Hearth 10 lay sandwiched between Hearths 4 and 11 (Fig. 8.9-6). The top western edge of the orange soil lining of Hearth 10 touched the top eastern edge of the orange soil lining of Hearth 4. The top eastern edge of Hearth 10 touched the upper western edge of Hearth 11 in a similar manner. The tops of all three hearths were covered by the same continuous, horizontal line of snail shells. None of these three hearths could be seen in the adjacent north wall of the backhoe trench. All three may be associated with Twin Sisters or Austin phase occupations. The small size of Hearth 10 in proportion to Hearths 4 and 11 may indicate a different functional use. However, only the very northern edge of this basin-shaped feature may have been showing in the profile wall and at its center further to the south, it may become as wide and deep as Hearths 4 and 11.

Hearth 11. This is the easternmost of the three fire pits which showed in the south wall in the eastern half of BHT #4B (Fig. 8.9-6). In the profile wall it is 116 cm in length at the top and approximately 80 cm in length at the bottom. The sides and bottom of this feature were marked by a lining of burned orange soil while the top was lined with the same horizontal snail lens that covered Hearths 4 and 10. The east wall of the pit was almost vertical while the west wall sloped inward.

Hearth 11 ranged from 99.00 to 98.80 meters elevation. Some charcoal and a few snails were visible within the pit, but as with Hearth 10, no burned rocks were present. All three of these hearths (4, 10, and 11) were probably related to either Twin Sisters or Austin Phase occupations of the site.

Hearth 12. A mass of burned orange soil, ash, and charcoal in the west wall of BHT #2D was thought to represent the remnants of a fire pit. No definite pit outline was seen nor were any burned rock fragments present within this area. On the grid system, this hearth lay in the N976 and 975/W958 units. In elevation the top was at 98.66 meters and the bottom at 98.28 meters. Its maximum length was at least 64 cm. In the profile wall, cultural material first appeared only about 10 cm above the top of this hearth suggesting that this feature may be related to the very latest occupation in time in that vicinity (Area C) of the site. Feature 4 in the northeast corner of the Area C test pit lay at almost the same elevation as Hearth 11. Both of these hearths probably date from the same time period--Austin or Twin Sisters Phase--since no evidence of a Toyah Phase occupation was observed in the upper cultural deposits at Area C.

Hearth 13. The very top was struck by the backhoe within BHT #6B about 8 meters west of the east end of the trench. The area around the hearth was left on a pedestal within the trench and hopefully almost all of the hearth was left intact. The top of the pedestal, which was also the approximate top of the hearth, was at 98.76 meters elevation which placed it at the interface of strata 3A and 3B in that area of the site.

On the pedestal top, burned rocks, lumps of burned orange soil, ash, and charcoal covered an area about 90 cm in length. The depth of the hearth was unknown. The cultural affiliation of the hearth may be Austin or Twin Sisters phase.

Ash Concentration 1. An oval-shaped mass of gray and white colored ash was noted in the north wall of BHT #4A (Fig.8.9-2). On the grid its location was in the N978/W982 and 983 units. Its maximum width was 52 cm and vertically it ranged from 98.74 to 98.50 meters. The eastern edge of it in the backhoe trench wall was 44 cm west of the western edge of Hearth 3. Its closeness to and same approximate elevation as Hearth 3 may suggest an association.

No charcoal or hearth stones were seen within the ash nor was there a lining of burned orange soil to indicate the presence of a pit. At the Loeve-Fox Site, Prewitt (1974) reported four ash pits. Three of these contained burned rocks and were definitely cultural while a fourth may have been a burned tree stump. Bond (1978:103) reported one ash concentration, Feature 27, at 41WM130 that contained 1 bone fragment and two burned rock fragments. He thought that it may have been a burned root or the result of a small fire burning in a gully.

The ash concentration at 41WM258 is thought to be cultural rather than a burned tree stump. Some of the hearths at 41WM258 contained smaller-sized lumps of a similar substance.

Ash Concentration 2. An ash concentration was discovered in the south wall of BHT #6B from 1.5 to 2.8 meters west of the east end of the trench. It was just 20 cm below the bottom of the westernmost of the two overflow channels which cut through the site. In elevation it was situated between 99.10 and 98.92 meters. No burned rocks or charcoal appeared within the ash nor was there any burned orange soil surrounding it. The ash was, however, within the 3A midden. Its preservation, like that of Ash Concentration 1, may be due to rapid alluvial deposition. No conclusion as to what these ash concentrations represent can be drawn until one of them is fully excavated.

Snail Shell Concentration 1. In the north wall of BHT #4A, a concentration of snail shells about 30 cm in length and 10 cm in depth was found in stratum 3A (Fig. 8.9-2). On the grid it was located in the N978/W973 unit between 98.94 and 98.86 meters. While many long horizontal lenses of snails were seen in various parts of the site, this snail shell concentration was not a horizontal line, but rather a very dense oval mass. The snails may have been placed together intentionally by man or, alternatively, the snails may have fallen into a crevice or rodent burrow. No other materials such as burned rock or charcoal were interspersed among the snail shells.

Snail Shell Concentration 2. A snail shell concentration similar to the first one was visible in the north wall of BHT #6B within the 1 meter wide profile completed there. It measured 14 cm in length, 4 cm in depth, and contained a bone fragment in addition to snails. It was found in zone

3B between 98.62 and 98.54 meters elevation about 65 meters west of the east end of the trench.

Lithic Tools

Eighty four stone tools were analysed from site 41WM258 (Table .9-2). There were 54 (64.29%) tools recovered during excavation, the remainder were found on the surface or from backhoe trenches. In the excavated areas of the site five different cultural components could be identified, each with only a few associated lithic tools.

Table .9-3 summarizes debitage and tool densities and ratio by area by cultural component. It is clear that in all cases the densities are low to very low, possibly due to rapid accumulation of alluvium. The tool to debitage ratio is low in the Twin Sisters component pointing to a greater tool use and discard. During the Austin component, on the contrary, the tool to debitage ratio is high. The same relationship is seen in Table .9-4, where densities were calculated by component throughout the site. The "unknowns" represent the plow zones of Areas B and C, and are almost sterile.

Very few tool classes except for retouched pieces, biface fragments and points were represented at this site, leaving very few data to use in cumulative graphs (Figure .9-7). In this case the graph was included only to be consistent in the tool analysis report, but the complete absence during the Twin Sisters component of all tool classes I through VIII is rather astonishing.

Few of the identified tools were complete artifacts, therefore, no separate statistical analyses on those tools' measurements were made for this site. Tools were incorporated with the appropriate cultural components when analysed by reservoir (Appendix H-8).

Ceramics

A total of 205 sherds were recovered at 41WM258. The remains of from three to five vessels may be present in the collection, but no complete or even partially complete vessels were found. All sherds appeared to be associated with the Toyah Phase occupation at Area B of the site. The ceramics at the Bigon-Kubala Site are generally similar to what has been termed Leon Plain in past literature. All ceramics at 41WM258 are a bone tempered, sandy paste plainware except for one untempered sandy paste sherd. An unusual characteristic of this collection is the presence of a red to tan interior slip on some of the sherds. Many sherds are blackened from burning which may indicate that they were utility vessels for cooking.

Table 8.9-2 . Tool Classes, 41WM258

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
Toyah	A	1											2			1				4				
		2				1								1						2				
		3									1									8				
		4									1		4	3						5	19	61.29		
		5											1	4						1				
	B	3												1						2				
		4		1								1								1				
		5											1							2	6	75.00	25	29.76
		6									1		1							3				
Austin	A	6										1	1	1						2	5	16.13		
		7												2						-				
	B	7												1						1				
		8																		-				
		9																		-	1	12.50	6	7.14
		10																		-				
Toyah/ Austin	C	3																		-				
		4									2		1							3	3	20.00	3	3.57
		5									1	1	2	2						6				
Twin Sisters	A	8																		-				
		9											1							1	7	22.58		
		10															1			1				
	B	11																		-				
		12																		-				
		13																		-				
		14																		-				
		15																		-	1	12.50		
		16																		3				
	C	6									1		1	1						2				
		7											1	1						4	9	60.00	17	20.24
		8											1	3						-				

Table 8.9-2. Tool Classes, 41WM258 (continued)

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT	COMPONENT TOTAL	COMPONENT
Late Archaic	C	9											1							1				
		10											2							2				
		11																		-				
		12																		-				
		13																		-				
		14																		-				
		15																		-	3	20.00	3	3.57
Plough Zone	B	1																		-	-	-		
		2																		-				
	C	1																		-	-	-	-	-
		2																		-				
Surface BHT			1	1	1	1			2		3	8	10	2			1			30			30	35.71
TOTAL			1	2	1	2	-	-	2	-	10	11	30	22	-	1	2	-	-	84			84	99.99
%			1.19	2.38	1.19	2.38	-	-	2.38	-	11.90	13.10	35.71	26.19	-	1.19	2.38	-	-	99.99				
RESTRICTED																				44				
%			2.27	4.55	2.27	4.55	-	-	4.55	-		25.00		50.00	-	2.27	4.55	-	-	100.01				

Table 8.9-3: 41WM258 Artifact Density by Area

Area	Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/ Debitage Ratio
A	Toyah	1.6	12	557	1:47
	Austin	.6	8	830	1:100
	Twin Sisters	.6	12	447	1:38
	Total Area	2.8	11	592	1:53
B	Toyah	3.5	2	46	1:27
	Austin	.8	1	156	1:125
	Twin Sisters	.5	2	78	1:39
	Total area	4.9	2	68	1:42
C	Toyah/Austin	3	10	803	1:80
	Twin Sisters	.3	30	733	1:24
	Late Archaic	.8	4	272	1:73
	Unknown	.2		5	
	Total area	1.6	9	425	1:45
			$\bar{x}$	$\bar{x}$	$\bar{x}$
	TOTAL SITE	9.3	6	287	1:49

Table 8.9-4: 41WM258 Artifact Density by Component

Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/ Debitage Ratio
Toyah	5.1	5	207	1:42
Austin	1.4	4	445	1:104
Neo-American	.3	10	803	1:80
Twin Sisters	1.4	12	376	1:31
Late Archaic	.8	4	272	1:31
Unknown	.3		23	
TOTAL SITE	9.3			

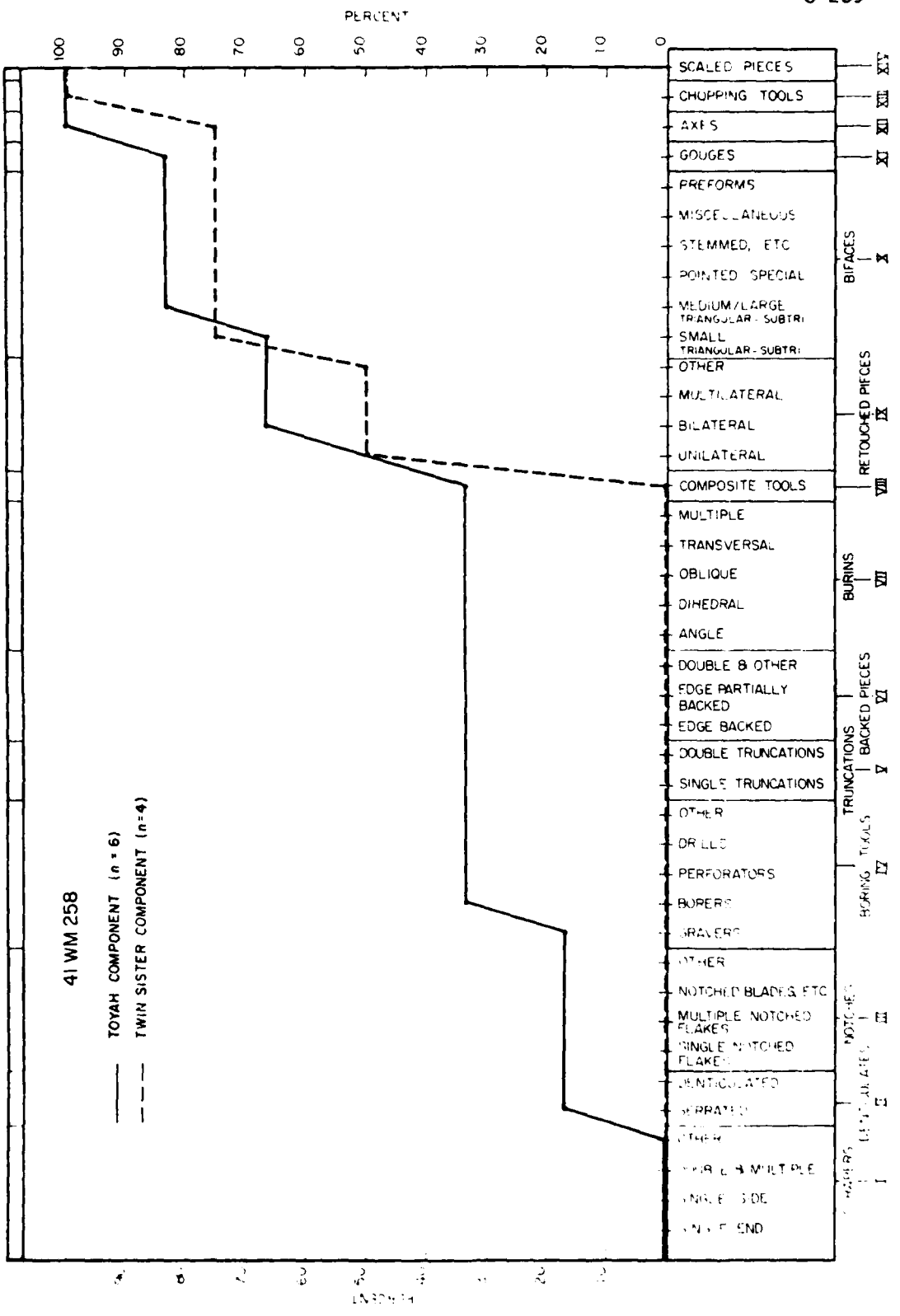


Figure 8.9-7. Cumulative Graph of Lithic Tools: Site 41WM258.

An effort was made to compare the Bigon-Kubala ceramics to the other collections from the two reservoirs and from other Central Texas sites. Pottery from the Barker Site (41WM71), the Loeve Site (41WM133), the Bryan Fox Site (41WM124), 41WM163, the Collins Site (41TV40), and Smith Rock Shelter (41TV42) were examined. In almost all cases, the sherds from various sites were similar by virtue of their bone tempering and Toyah Phase affiliation. The small collection from 41WM163, a site in the Granger Reservoir, came the closest to resembling that at Bigon-Kubala. Most sherds there were bone-tempered sandy paste, the one exception being an untempered very sandy paste sherd similar to the one unusual sherd at 41WM258. Several individual sherds from small collections at two other sites in the Granger Reservoir, the Loeve Site, and the Bryan Fox Site matched those at 41WM258. Other sherds from these sites were not like those at 41WM258 in terms of temper or paste type. In the North Fork Reservoir, the Barker site (41WM71) showed ties to East Texas as one of the more complete vessels was decorated. Other plainware sherds at the Barker Site had a cream colored slip not seen at other sites. The ceramics from the Collins Site and Smith Rock Shelter, both in southern Travis County, were again bone tempered with a majority of that at the Collins Site being brushed whereas none from the Bigon-Kubala Site was brushed.

Site Summary

Preliminary work at 41WM258 (Bigon-Kubala Site), a multicomponent terrace site on Willis Creek, involved a magnetometer survey, backhoe trenching, and the excavation of test pits to establish time frames and contextual integrity. These procedures showed the site to contain significant information about the Toyah, Austin and Twin Sisters Phases. A Toyah Phase component at Areas A and B of the site yielded a large sample of Leon Plain pottery, many bison bones, Perdiz points, lithic debris, and a hearth that dated 480 + 70 BP (UGa - 2477). It is the most promising Toyah Phase component found to this date in the Granger or North Fork Reservoirs. Vertically deeper, Austin and Twin Sisters Phase diagnostics were found in all tested areas except in Area B where no Twin Sisters diagnostics were seen. These were generally in the correct temporal order except in Area C. Numerous deeply buried basin-shaped hearths with pit outlines were observed in the walls of backhoe trenches at the same elevations as these earlier materials. They were very similar in form to many features reported at 41WM130 (Bond 1978). Vertical separation of components and features at 41WM258 appears to be better, however, than at 41WM130. Further excavations are advised in the future at 41WM258 and should include additional test excavations to be followed by the opening of several large contiguous areas.

41WM267

8.10 (Cervenka Site)

Site Situation

The Cervenka Site, which lies just within the confines of the projected conservation pool of Granger Lake, is located 600 meters northeast of Hoxie Bridge (Fig. 8.7-1). The site is named for the Cervenka family who once owned the property and lived within 500 meters of it. The site was originally recorded by Elton Prewitt (1974: 145-146) following its discovery by Mr. Clarence Loeve.

The site, as it was originally described, extends 800 meters along the upland slope from the Cervenka farm house to the upland ridge northeast of the county gravel pits. Lithic material is present on the three major landforms within this area--upland, upland slope, and terrace alluvium. Reconnaissance of the site prior to the 1978 investigations, however, indicated that more than one site was represented within this large area. Admittedly, the definition of a "site" is quite arbitrary, but Willey and Phillips (1958: 18) have provided some general guidelines:

> About the only requirement ordinarily demanded of the site is that it be fairly continuously covered by remains of former occupations, and the general idea is that these pertain to a single unit of settlement, which may be anything from a small camp to a large city.... It is in effect the minimum operational unit of geographical space.

The continuity of the lithic scatter suggests the presence of one very expansive site; however, this continuity has been partially produced by recent agricultural activities involving the construction of artificial terraces on the upland surface between the Cervenka farm house and the gravel pits. The massive movement of dirt for this construction has destroyed the primary context of much of the cultural debris in this area.

The remainder of the site is divided by two distinct landforms--the upland and the terrace alluvium. Diagnostics of the Paleo-Indian period were reported from the upland surface. Early, Middle and Late Archaic materials had been removed from the buried cultural zones in the terrace alluvium. The distinctive landforms and their respective assemblages, therefore, represent different occupational episodes and may be recognized as individual sites. Of these two sites, only the terrace alluvium deposits will be directly affected by the conservation pool of Granger Lake. The contextual integrity of the buried deposits was also not as questionable as that of the upland assemblage. Consequently, the 1978 investigations were limited to the terrace alluvium deposits.

Three major physical features dominate the site area (Figure 8.10-1). The primary feature, which led to the discovery of the site, is an erosional gully (1 - 2.5 meters deep) which originates at the upland edge and dissects the terrace alluvium. Cultural material exposed in this gully has attracted many local collectors who have dug into the banks in search of diagnostic artifacts. This erosional gully drains into another feature, an overflow channel of the San Gabriel River, which lies to the east of the site. A small lake and an associated slough occupy this overflow channel scar.

The most visible feature of the site is a large gravel pit which borders the northwestern or upslope margin of the site. The extensive gravel deposits have been excavated for the construction of Williamson County roads. Prehistoric peoples may have utilized these gravel deposits as a source of limestone, flint cobbles, quartzite, and fossil Exogyra shells. Also within these gravels are numerous seeps which may have contributed to the formation of the erosional gully.

The Cervenka Site was once under cultivation except for the immediate fully area and the area surrounding the gravel pit. Hackberry trees and green briar bushes outlined the erosional gully and many giant pecan trees grow along the county road. Elm and willow trees occupied the wetter portions of the meander scar. To the south of the plowed fields, a large grove of oak, hackberry, and elm trees dominated the upland slope and terrace sufaces.

Prior to 1978 no professional investigation, other than the recording of the site, had been conducted at the Cervenka Site. Several local collectors, however, had dug along the erosional gully. Their investigations indicated that the site had considerable depth and might contain isolated components. One of these collectors, Mr. Clarence Loeve, reported finding numerous artifacts both in the erosional gully and on the upland surface. Mr. Loeve's collection consisted of diagnostic artifacts from the Paleo-Indian through Neo-American periods. Most numerous in his collection, however, were untyped projectile points of probable Early Archaic age. The potential for information concerning this relatively unknown period in Central Texas prehistory was the basis for recommending extensive excavations at the Cervenka site (Prewitt 1974: 145-146).

Excavation Methodology

Since the Cervenka site had not been previously tested, the first phase of the 1978 investigations focused on the determination of the horizontal and vertical extent of the cultural deposits. Five series of backhoe trenches (Fig. 8.10-1) were utilized to accomplish this task. These trenches radiated from the known deposits in the erosional gully. Mr. Clarence Loeve's prior knowledge of the site greatly aided the placement of these trenches.

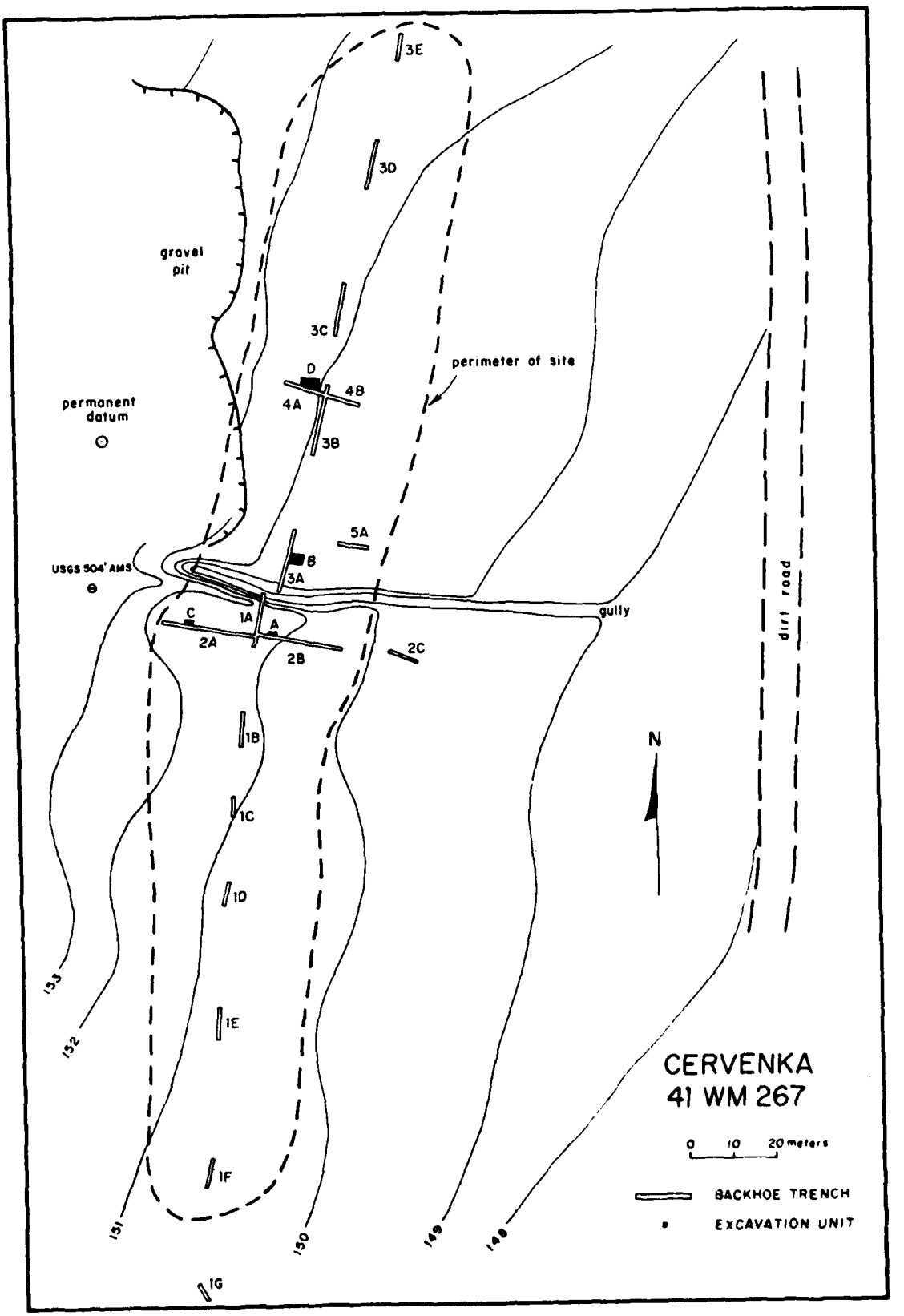

3E
3D
gravel pit
3C
perimeter of site
D
4B
4A
3B
permanent datum
5A
B
USGS 504' AMS
3A
gully
dirt road
C
1A
A
2A
2B
2C
1B
N
1C
1D
153
152
1E
CERVENKA
41 WM 267
0 10 20 meters
1F
BACKHOE TRENCH
EXCAVATION UNIT
151
150
149
148
1G

Figure 8.10-1.

Backhoe trench 1 was placed to determine the southern limits of the cultural deposits noted in the right bank of the gully. These trenches demonstrated that cultural material was present, although sparse, even in the southernmost trench (BHT1G) next to the wooded area. Two cultural zones were noted in trench 1A. The upper zone contained diagnostics of the Late Archaic period. The lower zone yielded Middle and Early Archaic dart points. Below a depth of 3 meters scattered pieces of debitage were present in the alluvial deposits, but no occupational lenses were observed. The upper cultural zone is not present in trenches 1B-1G. However, the lower zone is 40 - 50 cm thick for approximately 150 meters.

Backhoe trench 2 was placed perpendicular to trench 1A to determine the east-west dimensions of the significant accumulation of cultural material in this area. Backhoe trench 2A exhibited the relationship of the alluvial deposits to the ancient gravel deposits on the western upslope side of the site. The upper cultural zone also disappeared within 20 meters of trench 1A. To the east in trench 2B the cultural zones were not nearly so distinct. The cultural zones disappeared entirely in trench 2C.

Backhoe trench 3 extended northward from the erosional gully where Mr. Clarence Loeve had previously investigated the greatest accumulation of cultural material. The northern half of the site is more impressive than the southern half. In trench 3A there was cultural material from the surface to approximately 3 meters deep. No distinctive cultural zones were visible in this trench. In trench 3B, however, three zones (50 - 90 cm. thick) concentrated cultural debris were present. The deepest zone appeared 5 meters below the ground surface. Truly sterile zones were not interspersed between these zones. Rather, the observable zones were the result of greater occupational activity during certain time periods. Segments C and D of trench 3 revealed only one zone of cultural material between 3 and 4 meters below surface. Trench 3E yielded a sparse amount of cultural material, but no occupational zone was recognized.

Trench 4 was excavated to determine the east-west extent of the deepest cultural zone discovered in trench 3B. Unfortunately, little evidence of an extensive lower zone was observed in the trench walls. However, an upper zone which appeared 2 meters higher contained an abudance of faunal material associated with Early Archaic artifacts. The upper cultural zone was well represented in both the western and eastern segments of this trench.

The remaining trench (BHT5) was placed so that the eastern limits of the site on the north side of the gully might be defined. Very little material was recovered from this trench until a depth of 1.5 to 2.5 meters was reached. Cultural material from a possible Early Archaic period was present, but it was quite sparse.

The backhoe trenches indicated that the Cervenka site is an extensive (9600 m^2) and rich site whose excavation would require much more time and resources than had been allotted. Consequently, test excavation units were utilized to determine the optimal areas for data recovery. Four areas of the site (Figure 8.10-1) were initially judged as potential excavation areas. Area D exhibited the greatest potential with an abundance of faunal remains and associated cultural debris. The presence of a possible Paleo-Indian component made this area even more attractive. Areas A and C did not exhibit the deeper cultural zone as Area D had, but the accumulation of Late and Early Archaic material was very dense to a depth of 3 meters. Since cultural zones were visible in area A, but not area B, both areas were tested so that the relationship between the areas would be understood more fully. The remaining area (Area C) to be tested was the occupation of the buried gravel bench exposed in the western end of trench 2A. The objective of this test excavation unit was to establish a temporal relationship between the occupation of the bench surface and the deeper deposits in area A. Although these four areas were regarded as the most significant areas of the site, it was fully realized that the total range of intrasite variability was not being adequately tested. Time strictures, however, did not allow for the examination of any other areas.

The test excavation units in areas A and B were 1 x 2 meter units adjacent to the backhoe trenches. Because the deposits were not so deep in Area C, the test unit there was only one meter square. In Area D, however, a different approach was required. In order to properly test the deeper deposits in the time remaining, it was necessary to sacrifice the upper Late Archaic deposits. A backhoe was used to remove the upper 3 meters of alluvium in a 2 meter square unit. The whole unit was then excavated in arbitrary 10 cm levels to a depth of 80 cm. Once beneath the profuse scatter of faunal material, only the south half of the 2 meter square was tested. The resulting 1 x 2 meter unit was dug another 60 cm. deeper. Since a hearth had been discovered in the wall between units 1057N/989.5W and 1058W/989.5W, the northwest 1 m^2 of the unit was also excavated to this depth. Below this depth (95.4 m) only unit 1057N/988.5W was used to test for the presence of deeper cultural deposits. This unit was excavated another 1.4 meters deeper to a point where the cultural material had declined significantly (only ten flakes). Time did not permit any deeper explorations.

All excavation units were set up from reference points on an east-west base line established parallel to backhoe trench 2. The resulting arbitrary grid system was oriented to 355°W of N rather than to true north. The minimal unit of horizontal spatial control for these initial excavation units was a 1 meter square. Vertical control was maintained be reference to an arbitrary datum (100.0 meters) established in a hackberry tree along the erosional gully. Since subsequent clearing of the site area would destroy all horizontal and vertical data points, a permanent datum was established upslope above the eventual conservation pool. The permanent datum is situated at grid coordinate 103N/1031W and an elevation of 103.50 meters.

Expansion of these areas depended upon the information gained from the test excavation units. The initial test excavation unit in Area C provided the necessary information for correlating the occupation of the bench with the remainder of the site. Since the accumulation of cultural debris was also significantly less dense in this area of the site, Area C was not expanded. Area D, on the other hand, contained a living surface with a profuse scatter of lithic and faunal refuse. In order to reveal a broader horizontal view of this living surface, the unit was expanded to the east. The adjacent 2 x 2 meter unit was opened up by removing the upper 3 meters of alluvial deposits with the backhoe.

The decision to expand Areas A and B was a more difficult one. Area A exhibited the presence of more distinct cultural zones and a wider variety of tools (lithic and bone) than Area B. However, Area B represented an area of more intensive occupation through time. The probability of revealing hearths, hearth activity related artifacts, and radiocarbon samples was judged higher than in Area A. Given the respective merits of these areas, it was decided to excavate an additional 2 x 2 meter unit in Area B and an additional 1 x 2 meter unit in Area A. In this manner a sufficient sample was collected from Area A to aid the interpretation of the mass of data collected in Area B. As in all the expansion units the minimum unit of horizontal spatial control was the 50 cm square unit.

During the late summer and early fall of 1979 an excavation crew returned to Cervenka to continue investigations in area D. Corps personnel aided by providing a backhoe for the re-excavation of area D which was filled-in following the previous seasons work. Briefly stated the purpose of this work was to relocate Feature 2 in BHT 3B and obtain another radiocarbon sample. The first was destroyed accidentally by the processing laboratory. Next, to obtain a statistically valid sample of the upper levels in this section of the site since these units had been mechanically stripped away during the previous work to expose Feature 9; and last, to document and sample the lower extent of the cultural deposits in this area of the site. Previous sampling, consisting of a 1 m. square unit to a depth of 6 m. below datum indicated that cultural materials continued past that depth and that the possibility that Early Archaic and Paleo-Indian materials would be recovered was good.

Figure 8.10-2 shows the excavation plan following the clearing and cleaning operations. In addition to the hand excavation units, a short backhoe trench was placed in the far western protion of area D at the base of the ramp beginning 4.20 m. below datum (b.d.) and continuing to a depth of 92.20 m. at which point the water table was encountered.

Backhoe trench 3B was reopened in an attempt to expose Feature 2, a hearth containing charcoal. Unfortunately the backhoe provided by the Corps had a boom which was some two meters shorter than the commercial

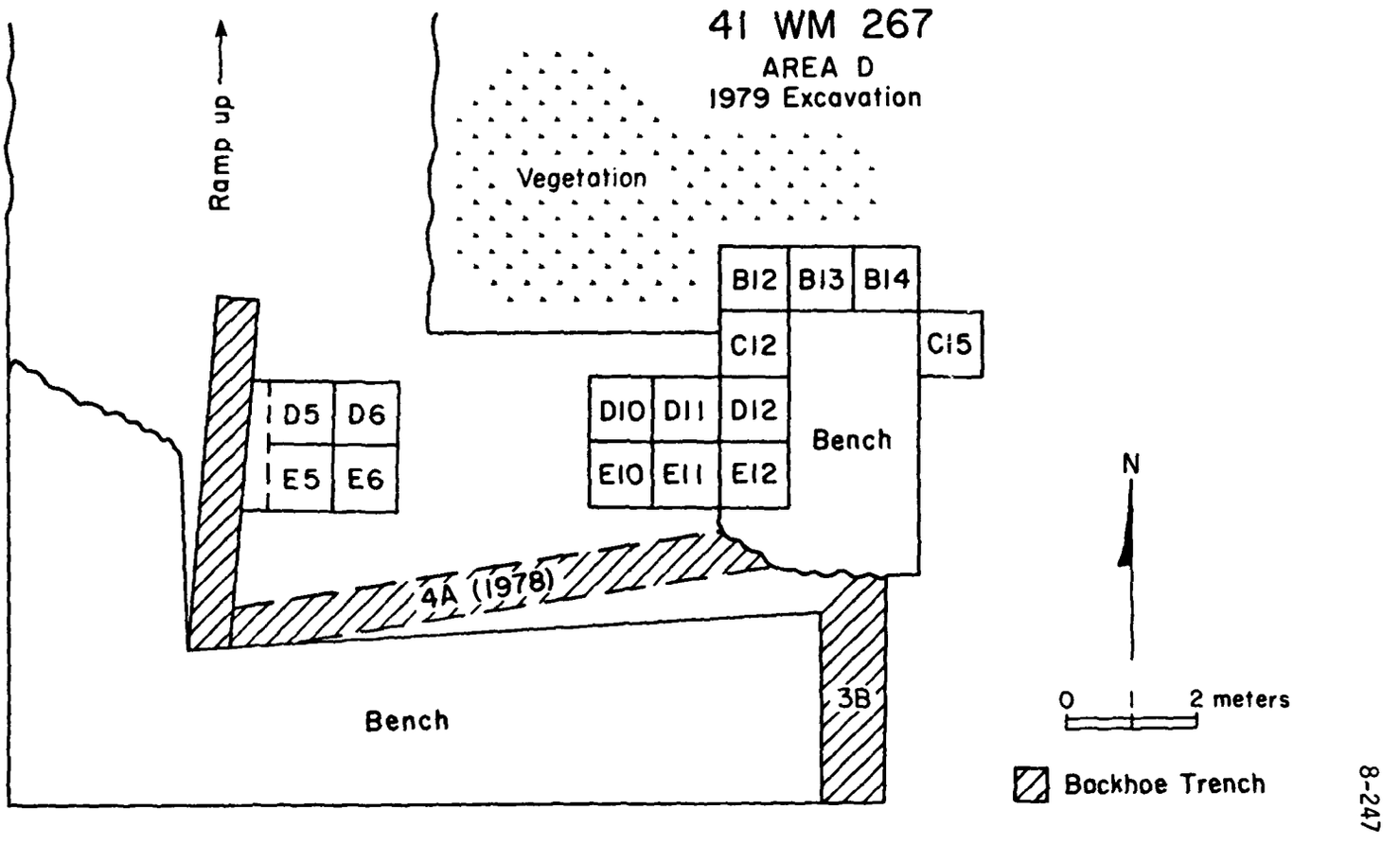

41 WM 267
AREA D
1979 Excavation
Ramp up
Vegetation
B12
B13
B14
C12
C15
D5
D6
E5
E6
D10
D11
D12
E10
E11
E12
Bench
4A (1978)
3B
Bench
N
0
2 meters
Backhoe Trench
8-247

Figure 8.10-2

one used in trenching the previous excavation season. The last two meters were planned to be dug by hand but the friability of the trench walls made such a venture unsafe without extensive shoring, an unexpected expense which was not allowed by the fixed-price contract. Accordingly, the trench was refilled without Feature 2 ever being reached.

At a depth of 6.40 meters below datum (m.b.d.) a large fragment of bison rib was found protruding from the western wall of the trench. In the opposite wall and slightly south of the bone a thin lens of burnt clay was noted at an elevation of 93.41 meters. This was later designated as Feature 19 and is discussed later in this section.

Four 1 m x 1 m excavation units were taken down to a depth of or through what seemed to be the Twin Sisters component. These were units B-12, B-13, B-14, and C-15 (Fig.8.10-2).

Unit B-12 was taken down an additional .65 m while units C-12, D-12 and E-12 were excavated through what was hoped would be the Middle Archaic occupation at the site. As it turned out all four units went through a San Marcos component from elevation 98.30 to 97.50 meters. Unit C-12 went to a elevation of 97.40 meters, unit D-12 and E-12 were taken down to a elevation of 95.35 meters or .45 meters into the previously unexcavated lower section of Area D.

Because of the logistics and safety of excavating any further in an enclosed unit, it was decided to open deeper units off the western backhoe trench (Units D-5, D-6, E-5, E-6). A ladder was placed in the northern end of the trench for access to the excavation units once they became too deep to easily reach from above.

Units D-11 and E-11 were excavated to an elevation of 95.40 meters while units D-10 and E-10 went to 92.65 meters. Unit E-5 was taken down to an elevation of 92.60 meters and unit D-5 to 92.40 meters (7.60 m.b.d.) at which point the water table which was only 12 cm below this last level made further excavations all but impossible without pumps.

A three inch bucket auger was used in unit E-5 to try and determine if the bottom of the cultural deposits at the site had been reached. No artifacts were recovered in this manner, but charcoal and calcium carbonate were encountered to a depth of 9.90 m.b.d. or some 2.30 meters below the last excavation level (field notes for 11/12/79). It is considered probable that cultural manisfestations could be found to this depth but their nature or extent must remain speculative at the present time.

A column of soil, pollen and phytolith samples was taken at 5 cm increments beginning the north wall of the Area D excavation and continuing down the north wall of D-6 to an elevation of 92.75 m (7.25 m.b.d.). These samples, as specified in the Scope-of-Work, have not

been analyzed, but rather are in storage for future disposition at the convenience of the government.

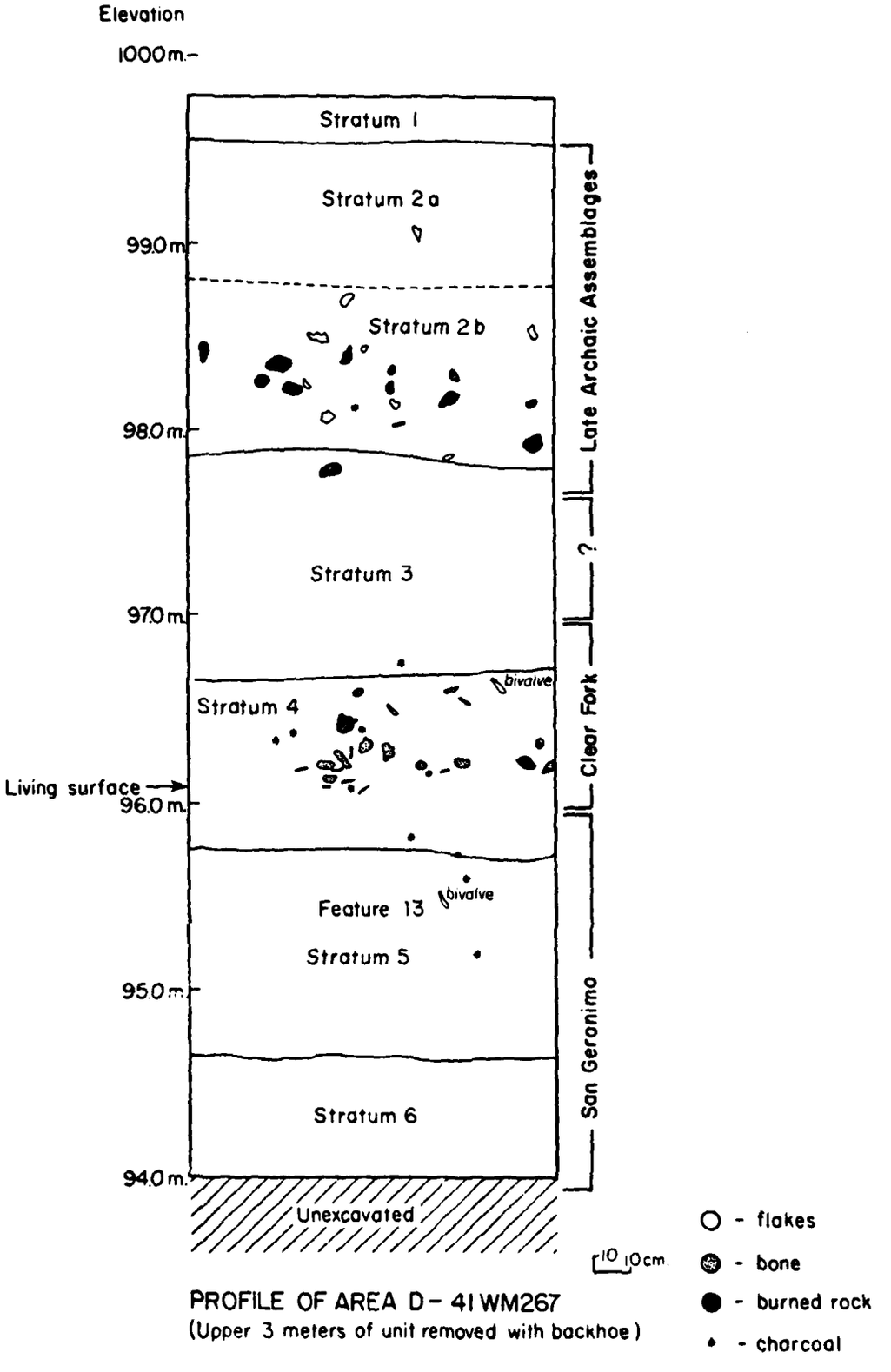
Features, the artifacts and faunal remains, encountered during this work are discussed along with those from the previous season.

Stratigraphy

The backhoe trenches at the Cervenka site revealed that relatively homogeneous alluvial sediments have been laid against an ancient gravel bench which forms a portion of the north valley wall. Seven major stratigraphic units are recognized within the site area. Although time restrictions did not allow continuous trenches across the site area, the determination of strata correspondence among the isolated profile sections was possible. As might be expected within an alluvial depositional environment, the depth of the stratigraphic zones varied significantly across such a large area. For purposes of presentation the profile of excavation unit D will be used to represent the stratigraphic sequence. One meter sections of the several backhoe trenches were trowelled and straightened for profiling. Localized variability is present, but the depositional sequence of the Cervenka site is well represented by the excavation unit D profile. Additional soil samples and descriptions were taken by Dr. David Pheasant. His analysis is in progress and will be completed when the results of laboratory soil tests have been completed. Soil scientists, Leroy Werchan and John Coker, of the USDA Soil Conservation Service graciously provided a preliminary description of the soil profile within unit D. The soil profile is that of a Lewisville-like silty clay loam. The observed strata within excavation unit D area are described below (Fig. 8.10-3).

Stratum 1: a dark yellowish brown (10YR4/4) silty clay loam; strong, fine granular structure; hard and friable; pH content equals 7.8; $CaCo_3$ content is 44 percent. Organic humus material is present from decayed vegetation and grass roots. Very little cultural material is present. This stratum is 10 to 25 cm thick and may correspond to the plowzone.

Stratum 2: a silty clay loam; weak fine granular structure; hard, friable; pH content equals 8.0; CO_3 content is 24 percent. Two substratum are present within this zone. The upper stratum, Zone 2a, is yellowish brown (10YR5/4) in color and contains few artifacts or faunal remains. The lower stratum, Zone 2b, is very dark grayish brown (10YR3/2) in color and contains a dense concentration of snails and cultural material. Both strata contain high concentrations of limestone detritus which are 1 to 3 cm. in diameter. The depth of this zone varies greatly across the site. The greatest depth is exhibited in the area of excavation unit D where it contains San Marcos Phase remains.



PROFILE OF AREA D - 41WM267
(Upper 3 meters of unit removed with backhoe)

Figure 8.10-3.

Stratum 3: a dark yellowish brown (10YR4/4) silty clay loam; weak, fine granular structure; hard, friable; pH content equals 8.0; $CaCo_3$ content is 52 percent. Dendritic deposits of $CaCo_3$ precipitate are present throughout this zone. Cultural remains are also present. The number of snails are less dense than in the overlying Zone 2b.

Stratum 4: a dark brown (10YR4/3) silty clay loam; hard, friable; granular structure; pH content equals 8.0; $CaCo_3$ content is 53 percent. Dendritic deposits of $CaCo_3$ precipitate are more prevalent than in Zone 3. Limestone detritus is also very abundant. The cultural material within this zone is the most dense of any zone within the stratigraphic profile.

Stratum 5: a yellowish brown (10YR5/6) clayey loam; pH content equals 8.0; $CaCo_3$ content is 63 percent. Limestone detritus and $CaCo_3$ content is 63 percent. Limestone detritus and $CaCo_3$ precipitates are still present, but in lesser amounts. The density of cultural material also decreases significantly within this stratum.

Stratum 6: a dark yellowish brown (10YR4.4) clayey loam; pH content equals 8.0; $CaCo_3$ content is 43 precent. This stratum was encountered only in unit D and at the bottom of trench #1A. Isolated features and an associated sparse scatter of artifacts were encountered in excavation *unit D only*.

Stratum 7: This zone represents the ancient gravel bench which was encountered only in trench 1A. This bench of river deposited gravels rises approximately two meters in the western half of this trench. The same gravel deposits are apparent in the walls of the gravel pit to the west of the site.

Culture/Time Stratigraphic Units

As with the other sites the number of arbitrary excavation levels was reduced to a lesser number of culture/time stratigraphic units or components. Assignment of the levels to the culture/time stratigraphic units recognized for Central Texas was based on the vertical distribution of projectile points within each excavation unit. Because of the large numbers of previously unrecognized projectile point forms recovered from this site, the resulting stratigraphic units cover rather large periods of time. Future refinement and division of the Early Archaic stratigraphic units are therefore anticipated.

Three radiocarbon dates from excavation unit D provide a chronological framework for the Early Archaic deposits within the site. The radiocarbon dates of 4280 ± 240 B.P. (RL-1087) and 4330 ± 420 B.P. (RL-1086) from Feature 9 (level 63-64, 96.2 - 96.1 m) and level 69-70 (95.9 - 95.8 m), respectively, reflect the projected boundary between the Clear Fork and San Geronimo Phases (Weir 1976; Patterson 1976: 11). Interestingly, the

distribution of projectile points above and below these radiocarbon samples is also significantly different (Table 8.10-1). Uvalde, Wells and Tortugas points are found below level 69 - 70. Hoxie points are found within the same context as the earlier date. Most of the previously unrecognized points (Groups 1-11) are found no deeper than the earlier date which when calibrated is 4970 ± 436 B.P. Consequently, there are some very apparent changes in the diagnostic projectile points at approximately 5000 B.P. Intensity of occupation of the site also increases dramatically (Fig. 8.10-4).

The third charcoal sample was recovered from a hearth (Feature 19; elevation is 93.45 m) which was exposed in the subsequent excavations of the Cervenka site (October, 1979). This sample yielded a date of 5970 ± 90 B.P. (Tx-3684). Although no diagnostic artifacts were association with this feature, the date indicates that the initial excavations did not recover any cultural remains earlier than the San Geronimo stratigraphic unit.

The San Geronimo component within excavation unit D, therefore, is defined at its upper limits by the presence of Hoxie points. The more traditionally recognized diagnostics such as the Uvalde, Wells, and Tortugas points are also within this component. A previously unrecognized projectile point form (Group 12) is found within the lower levels of this unit. Elsewhere in the site, the upper limits of the San Geronimo component are also placed in those levels where the Hoxie points were recovered. Within area A an Andice point is found just below the Hoxie points. Area C did not yield any artifacts diagnostic of the San Geronimo component (Table 8.10-2).

The Clear Fork component is represented in all of the excavation areas. However, it is not represented by the usual diagnostic points associated with this time period. Bulverde, Nolan, and Travis points are found only in area D. Even there, their representation can only be regarded as a minor segment of the sample of projectile points. Dawson and Morrill points and several other forms of projectiles not previously described from Central Texas assemblages (see Chapter 14.1) dominate the assemblage. The Group 4 projectile points are consistently present in the three major excavation units. The other forms are not similarly represented. The absence of various forms within certain areas of the site may be due to sampling error or functional differentiation within the site. It would be premature at this point to conclude that such projectile forms are not equally diagnostic of the Clear Fork component within the prairie environment of Cnetral Texas. In fact, the projectile forms represented within the Clear Fork component, exhibit greater morphological affinities with the projectile points of the prairie region of Central Texas than those of the Edwards Plateau region. Interestingly, Angostura points, seemingly out of their proper context, are also associated with the Clear Fork component (Table 8.10-1,2,3).

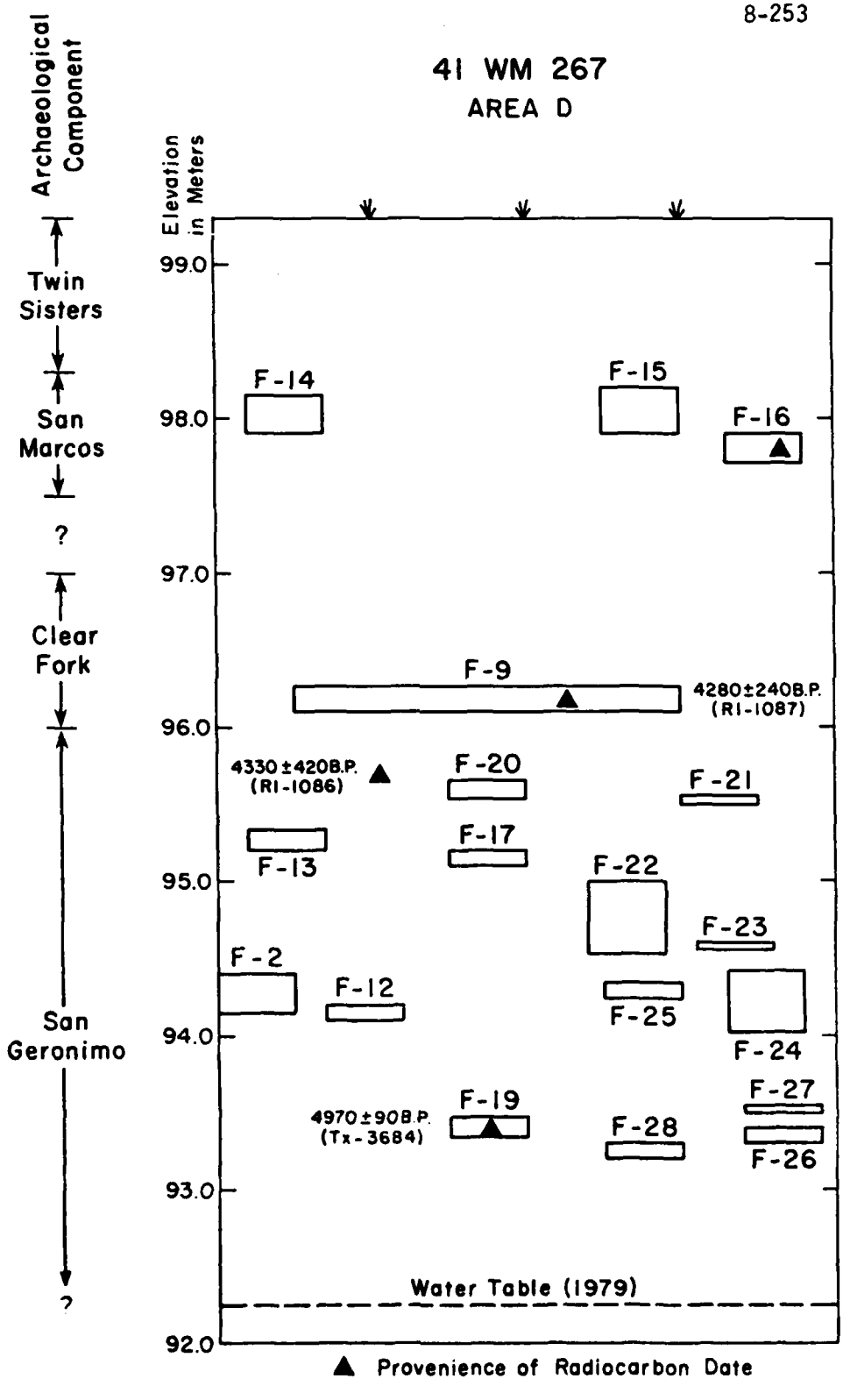

41 WM 267
AREA D
Archaeological Component
Elevation in Meters
Twin Sisters
San Marcos
?
Clear Fork
San Geronimo
?
99.0
98.0
97.0
96.0
95.0
94.0
93.0
92.0
F-14
F-15
F-16
F-9
4280±240B.P. (RI-1087)
4330±420B.P. (RI-1086)
F-20
F-21
F-17
F-13
F-22
F-23
F-2
F-12
F-25
F-24
F-27
4970±90B.P. (Tx-3684)
F-19
F-28
F-26
Water Table (1979)
▲ Provenience of Radiocarbon Date

Figure 8.10-4.

Table 8.10-1. Distribution of Projectile Points in Excavation Unit D.

Distribution of Projectile Points within Excavation Unit D of the Cervenka Site (41WM267).

	Late Archaic			Clear Fork															San Geronimo			
	LEVELS																					
	98.3m.			96.5m.						96.0m.							95.5m.		93.2m	92.8m.		
	21	22	36	53/54	55/56	57/58	59/60	61/62	63/64	65/66	67/68	69/70	71/72	73/74	75/76	77/78	85/86	103/104	131	BHT
Darl	1																			3
Fairland		1																		
Montell																				
Marcos			1																	2
Castroville																				1
Marshall																				
Pedernales																				2
Bulverde									1		1									1
Nolan										1										2
Travis				1					1						1					2
Uvalde												1	1							
Morrill							1													
Wells																	2			
Tortugas																	1	1		
Dawson					2		1		1	2										4
Andice																				
Hoxie											1	1								1
Angostura																				2
Group 1						3	1					1								2
Group 2					1	2			1											
Group 3																				2
Group 4					1			3	1	1	1			1						6
Group 5					1	1														
Group 6																				
Group 7					1				1											2
Group 8																				1
Group 9											1	1								
Group 10												1								1
Group 11											1									2
Group 12																			1	
Specimen A																				1
Specimen B										1										
Unidentified	1	1			2	1	4	3	6	2	1	1		1	1	1				22

Table 8.10-2. *Distribution* of Projectile Points within Excavation Units A and C of the Cervenka Site (41WM267).

Distribution of Projectile Points within Excavation Units A and C of the Cervenka Site (41WM267).

AREA A

Culture/Time Stratigraphic Units	SAN MARCOS													CLEAR FORK					SAN GERONIMO			
	LEVELS																					
	99.0m								98.0m												97.0m	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Fairland/Ensor								1														
Montell										1												
Marcos													1									
Castroville								1														
Tortugas														1								
Dawson									1							1						1
Andice																				1	1	
Hoxie																						
Angostura														1								
Group 1																						
Group 2																						
Group 3																						
Group 4							7						1			1		1				
Group 5																						
Group 6														1								
Group 7												1							1	1		
Group 8																						
Group 9																			1			
Group 10																						
Group 12																						
Unidentified			1						1			2	4	3		1			2	1	1	

AREA C

Culture/Time Stratigraphic Units	?				CLEAR FORK					
	100m				99.5m					
	Levels									
	1	2	3	4	5	6	7	8	9	10
Dawson						2				
Unidentified							1			

Table 8.10-3. Distribution of Projectile Points, Unit B.

	TWIN SISTERS						SAN MARCOS							CLEAR FORK													SAN GERONIMO						
Culture/Time Stratigraphic Unit	99.0m										98.0m									97.0m												96.0m	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Scallorn						1																										
Fairland/Ensor						*		1																								
Montell						1							1																			
Marcos													1																			
Castroville												1																				
Marshall												1																				
Pedernales									1			1?						1														
Bulverde																																
Nolan																																
Travis																																
Uvalde																																
Morrill																							1									
Wells																																
Tortugas																																
Dawson									1							1	1		1				1									
Andice																																
Hoxie																											1					
Angostura																					1											
Group 1																						1										
Group 2																								1								1
Group 3																																
Group 4						1							1	1	1	1	1															
Group 5													1					1		2	1											
Group 6															1																	
Group 7								1					1					1														
Group 8																							1									
Group 9																																
Group 10											1																					
Group 11																					2											
Unidentified			1			1	1	1		1	4	1	3	3		3	5	1	3	1	2		2									

* One Ensor Specimen

Unfortunately, the lack of radiocarbon dates precludes any determination of the upper temporal limits to the Clear Fork component. This is of particular importance since diagnostic artifacts of the Round Rock component are scarcely present. Instead, diagnostic projectile points of the San Marcos component overlay the Early Archaic assemblages in areas A, B, and D. Although the number of diagnostic projectiles is comparatively low, occupational intensity as indicated through other cultural remains is apparently quite high. The recovery of Fairland/Ensor, Ensor, and Darl points from the three major excavation areas also indicates that the site continued to be utilized during the Twin Sisters Phase.

From the distribution of the projectile points alone, it is evident that the Cervenka site was utilized most intensively during the Clear Fork culture/time stratigraphic unit. This stratigraphic unit differs, however, from the traditional definition of the Clear Fork Phase for the Edwards Plateau region. The temporal frame remains the same, but the diagnostic projectile point forms vary greatly. Furthermore, the Round Rock Phase which is so well represented at sites within the North Fork Reservoir is practically nonexistent at the Cervenka site. Whether these differences represent social differences or adaptations to differing environments is difficult ot determine. Perhaps, the temporal period for the Round Rock Phase is represented within the assemblages at the Cervenka site. Unfortunately, the lack of charcoal samples from certain critical levels precludes such a determination. Nevertheless, it is apparent from the available evidence that the site was intensively utilized throughout much of the Archaic period. The extremely sparse representation of diagnostics of the Neo-American period indicates that the site became increasingly less desirable as an occupation area after 600 A.D. In fact, the small number of Twin Sisters Phase diagnostics suggests that the site was utilized less intensively much earlier.

Features

Twenty-seven features were identified within the four excavation units at the Cervenka Site. Excavation area D yielded eighteen features while area B yielded four. Areas A and C yielded three and two features, respectively. The culture/time stratigraphic units represented by these features are entirely of the Archaic period. The features will be presented according to their association with a culture/time stratigraphic unit. The order of presentation will be from oldest to most recent.

San Geronimo Component

Informal clusters of burned rock, basin-shaped hearths, and concentrations of ash and heat altered soil comprise the total sample of

features associated with this component. Fourteen were encountered within and adjacent to area D; the remaining hearth was associated with the deepest living surface identified within area A. Many of the hearths were only partially exposed along the walls of the excavation units. Consequently, the living areas around the hearths were not fully exposed.

Within Area D the stratigraphic positions of the hearths (Fig. 8.10-4) form three occupational horizons within the four meters of matrix designated as the San Geronimo component. Features 19, 26, 27 and 28 comprise the lower occupational zone. The features of the deepest occupational horizon will be discussed first.

Feature 19 (Area D)

Feature 19 is a large informal hearth which appears to have been utilized several times. It is located in unit E5 and a small section of E4 between elevations 93.47 and 93.35 meters. The latter unit is truncated by the exploratory backhoe trench placed along the western side of Area D. The feature consists of alternating and intermixed lenses of fire discolored clay, soil, charcoal and burned rocks in a roughly circular scatter of approximately 1 meter in diameter and 10 cm deep (Fig. 8.10-5).

The feature was first noted in the eastern wall of the exploratory backhoe trench (Fig. 8.10-5) and was one of the deciding factors in the placement of several units in this location. Unfortunately, a section of the feature (10%) was cut out by the trenching. The overall depth of the feature placed it fairly near the water table and at a much lower level than any noted at that time. Given its location it was thought that it would be associated with the Early Archaic or possibly the Paleo-Indian occupation of the site. A C^{14} sample was taken and immediately processed by the Radiocarbon Laboratory at the University of Texas at Austin. It came out at 4970 $\pm$ 90 B.P. (Tx-3684) which when corrected to 5738 B.P. placed it within the Early Archaic time period.

Two artifacts, a borer and a graver were associated with the feature fill. In addition, mixed elements from two pocket mice were found, but are considered to be intrusive following the abandonment of the hearth.

Here as in other features a dessication crack was noted crossing the unit. It could not be accurately traced through the charcoal concentration area of the hearth, but since it does cross the burned clay scatter it is suspected that it is an antecedent to the creation and use of the hearth.

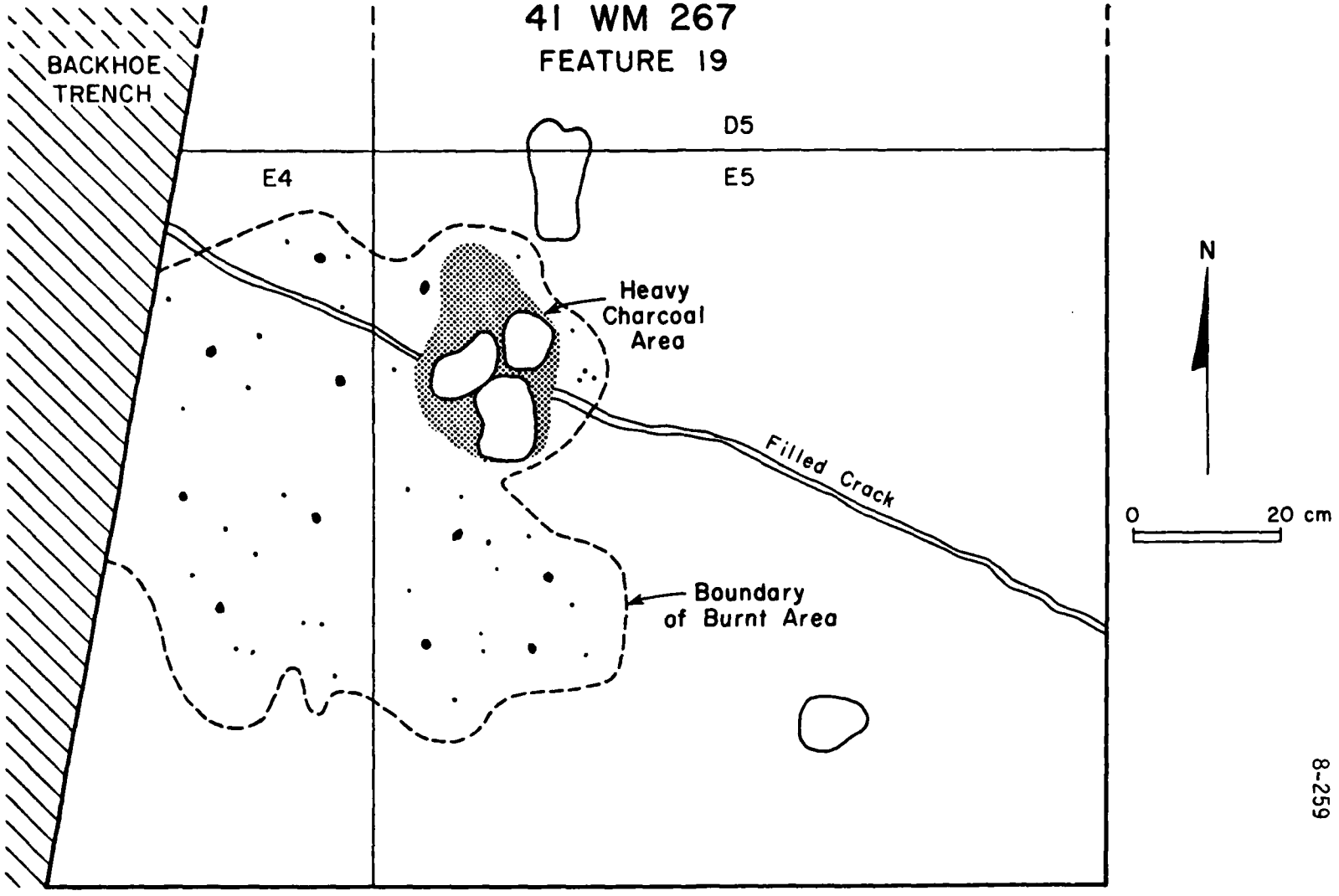

41 WM 267
FEATURE 19
BACKHOE TRENCH
D5
E4
E5
Heavy Charcoal Area
Filled Crack
Boundary of Burnt Area
N
0
20 cm
8-259

Figure 8.10-5.

Feature 26 (Area D)

Feature 26 is an accumulation of burned clay ash and charcoal in a shallow basin (Fig. 8.10-6). Scattered around the basin were several bison bones in varying stages of deterioration. The feature is located in unit E6, levels 199/120 (93.40 - 93.30 m.). The uppermost contact with this feature is only 5 cm below the lowest extension of feature 19. The connection, if such exists, shall be explored later.

The basin is roughly circular in shape and some 60 cm in diameter. In cross-section it contained several layers of deposit, at the bottom, an orangish brown fire discolored clay, then a dark grey/brown burned soil and finally a thin discontinuous layer of whitish ash. The orange discoloration is probably the result of the natural soils below the fire being discolored by heat rather than any addition to the basin. Unfortunately the charcoal present was insufficient for a C^{14} sample. However, soil samples and archeomagnetic sample were recovered for later disposition by the governmrnt.

A total of five bison bones: three ribs, a radial epiphysis and a vertebral process (Fig. 8.10-6). The bone was scattered around all but the eastern side of the hearth area; and several other pieces were noted but were too deteriorated for recovery or identification. All intact bone was removed in a wet state, packed in gauze and wrapped in plastic for transportation to the lab where identification was accomplished before drying and further deterioration occurred. This technique was deemed more worthwhile than the various methods of field stabilization of saturated bone since it did allow species identification without delaying critical excavation time.

It appears that Feature 26 is an informal hearth utilized for the preparation of bison. The presence of ribs, vertebrae and a radius fragment is interpreted as an indication that the forequarter of the bison was being utilized in this case. Following the abandonment of the hearth the area dried out resulting in the crack which transects the hearth and goes through one of the ribs. During a subsequent wetter period the hearth was covered over and Feature 19 constructed. At a much later date the area experienced an increase in moisture to the extent that calcium carbonate formed in the old cracks and around the bone concentrations. It should be noted that this phenomenon may take place rather quickly and may have happened some time after abandonment of the feature.

Feature 27 (Area D)

Feature 28 is a roughly circular diffuse scatter of heat altered clay and burned bone fragments. It is located in unit E 10 in level 116 (93.55 - 93.50 m) and is 45 cm in diameter. A dessication crack ran through the unit from the southwest to the northwest. This was filled with fine grained sediments and calcium carbonate nodules.

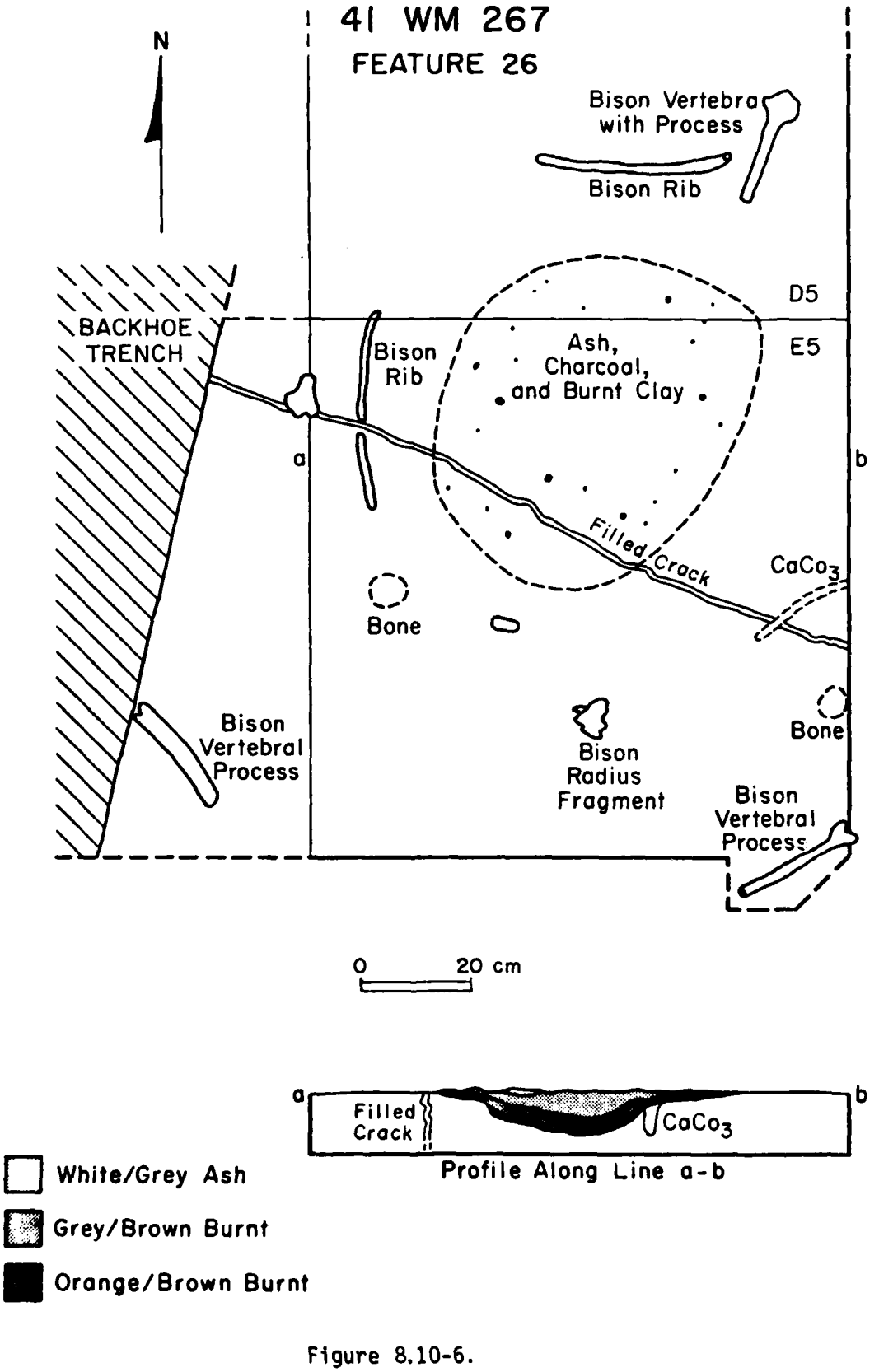

41 WM 267
FEATURE 26
N
Bison Vertebra with Process
Bison Rib
D5
E5
BACKHOE TRENCH
Bison Rib
Ash, Charcoal, and Burnt Clay
a
b
Filled Crack
CaCo3
Bone
Bison Vertebral Process
Bison Radius Fragment
Bone
Bison Vertebral Process
0
20 cm
a
b
Filled Crack
CaCo3
Profile Along Line a-b
White/Grey Ash
Grey/Brown Burnt
Orange/Brown Burnt

Figure 8.10-6.

This feature appears to be the residuals of a nearby hearth which was cleared out rather than a hearth itself. All the deposits were very shallow as the discoloration was lost in level 117 (93.50 - 93.40 m). Since no fire cracked rock or basin were found it may be that feature came from an informal,rather than a formal hearth setting.

Feature 28 (Area D)

Feature 28 is an irregular accumulation of burned clay, ash, and charcoal measuring approximately 30 cm E/W x 60 cm NE/SW. Surrounding it were a few pieces of lithic debris and animal bone. The elements of the feature went from a depth of between 93.29 to 93.20 m. in unit E 6. Surrounding soils were extremely wet and it is probable that a wet/dry situation over the years hastened the deterioration of this feature. The bone fragments around the ash/clay concentration were in a poor state of preservation but identifiable as two deer long bone fragments, one bison vertebra fragment, a partial pocket mouse skeleton and one unidentifiable bone fragment from a large mammal.

The only other item of note was a dessication crack 20 cm north of the clay/ash accumulation running to the northeast into unit D 6. This crack was filled with calcium carbonate nodlues.

Feature 28 is interpreted as an informal hearth, most probably utilized only a few times and then abandoned. There was insufficient charcoal to obtain a C^{14} sample although both soil and finescreen samples were collected.

The middle occupational zone consists of features 2, 12, 22, 23, 24, and 25. Stratigraphically, Feature 12 is the deepest of these features. The vertical positions of Features 2 and 24 are sufficiently close to that of Feature 12, however, that contemporaneous utilization of these features is not unlikely.

Feature 2 (BHT 3B)

A basin-shaped hearth, Feature 2, was exposed at an elevation of 94.4 meters approximately 8 meters southeast of area D in BHT 3B. Although only a small portion of the feature could be dug within the narrow confines of the backhoe trench, the general profile and nature of the feature were easily determined (Fig.8-10-7). The overall length of the feature visible in the west wall of BHT#3B is 141 centimeters. The backhoe trench exposed only 31 cm. of the east-west axis of the hearth. The extensively burned rocks within the hearth were either a sandstone conglomerate or a fist-sized limestone river cobble. Burned clay and charcoal flecking were present throughout the feature matrix.

Figure 8.10-7. Photographs of Features 2 and 12, 41WM267.

Feature 12 (Area D)

This feature (Fig. 8.10-7) consists of concentrations of ash, isolated lumps of burned clay, flecks of charcoal, and a lens of burned soil. Several charred hackberry seeds were also associated.

Only a small portion of this possible hearth (36 cm. in breadth) was exposed in the southwest corner of a 1 x 1 meter square test excavation unit. Although the lens of ash and underlying burned soil exhibited a vertical depth of 10 centimeters, there was no indication that a basin shaped depression had been prepared for the fire. The association of this feature with a dramatic increase in lithic debitage indicates that a very small portion of an undisturbed Early Archaic living surface has been exposed.

Feature 22 (Area D)

Feature 22 appears to be the remnants of an area experiencing intense heat. It is located in unit E6 at an elevation of from 95.00-94.53 m. (5-5.47 m. below datum). It was first noted in the western profile of the 1978 one by one meter test unit, but was not explored at that time. The feature consists of two areas of clay fired to different degrees in depressions, one irregularly shaped and one inverted conical, connected by a scatter of dispersed burned clay and charcoal flecks.

Figure 8.10-8 shows the feature at approximately 95.00 m. during excavations it was discovered that the feature changed constantly with the removal of but a few centimeters of fill; almost as if clays of different colorations and consistency were purposefully packed together like a jigsaw puzzle.

The few charcoal flecks and pieces were collected as was an archeomagnetic sample from the burned clay section of "Area A." Soil and fine screen samples were obtained throughout the feature.

Area B of the feature may represent a separate occurrence, but most certainly one that happened concurrently with that in Area A. The clays in both areas appear to have undergone the same amounts of burning, and both are very mottled. One small burned section in Area A seems to have been a post or small tree which was burned around leaving a hole of softer sediment surrounded by charred clay. Several areas of compacted ash were also found in Area A. This material appears to have been combined with water, perhaps filling cracks around the fired area and precipitating out of suspension. When first encountered these lenses of ash, some of them vertical, were thought to be a type of kaolin clay.

It is difficult to speculate on the exact function of this feature; however, several observations may be offered. Obviously the area experienced a great deal of heat as evident by the highly burned nature of

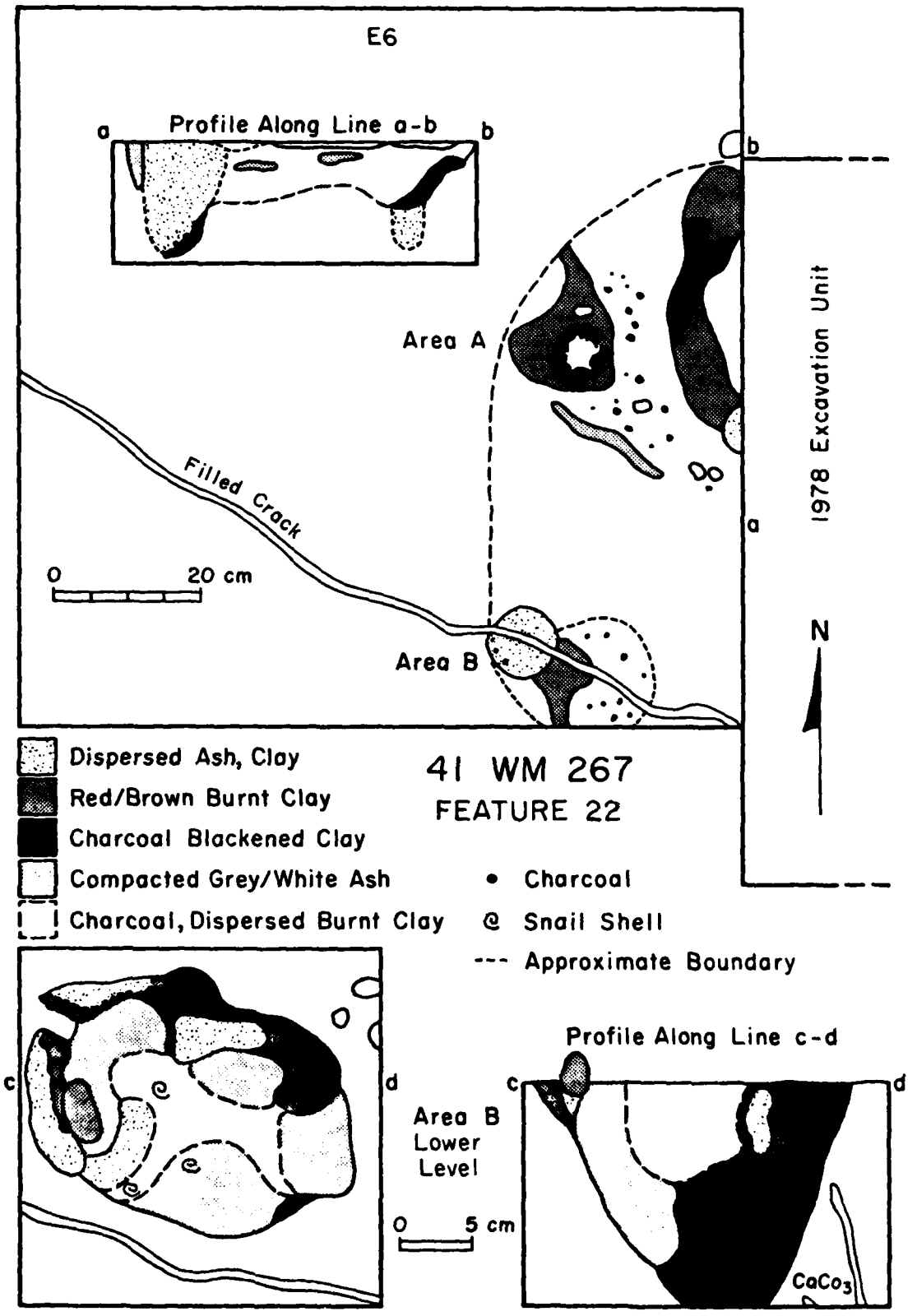

E6
Profile Along Line a-b
a
b
Area A
Filled Crack
0
20 cm
Area B
1978 Excavation Unit
N
41 WM 267
FEATURE 22
Dispersed Ash, Clay
Red/Brown Burnt Clay
Charcoal Blackened Clay
Compacted Grey/White Ash
Charcoal, Dispersed Burnt Clay
• Charcoal
@ Snail Shell
--- Approximate Boundary
c
d
Area B
Lower
Level
0
5 cm
Profile Along Line c-d
CaCo3

Figure 8.10-8.

most of the deposits. The high firing along with the absence of large amounts of charcoal might indicate that something like grass was used as a fuel rather than wood. Most of the deposits within the feature are very fine sediments with a reasonably high clay content. It is difficult to imagine exactly how the various deposits within the feature got there, especially in Area B, except through the agency of man, but an explanation of the associated activity is at present elusive.

Feature 23 (Area D)

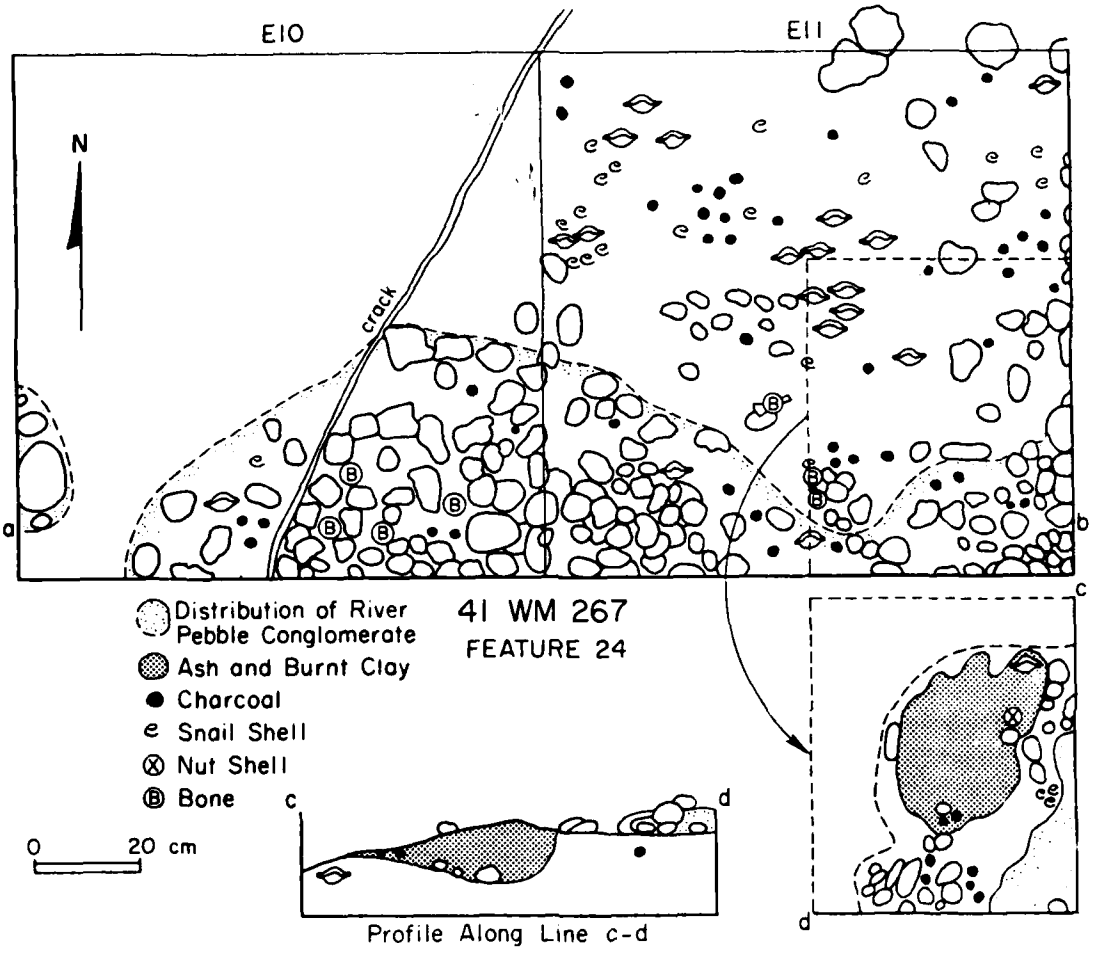
Feature 23 represents the remains of a small formal hearth extending from the eastern wall of excavation unit E 11 at an elevation of approximately 94.60 meters. The exposed section is roughly circular in form, measuring 34 cm E/W by 28 cm N/S and consists of a series of nine (9) medium sized river cobbles, a deteriorated mussel shell, several charcoal flecks and, most interestingly, an intact mud daubber nest. The latter shows signs of having been in a fire which is most probably what allowed its preservation. With no other supportive evidence it is purely speculative whether the nest may have been derived from a nearby structure or intentionally placed in the fire after having been procured from some other location.

Feature 24 (Area D)

Feature 24 is a large food preparation area consisting of the remnants of several hearths, quantities of mussel shell, some burned bone, fire-cracked rock, burnt clay and charcoal. It is located in units D 10 and D 11 between the elevations of 94.42 and 94.04 m. Many snail shells were encountered around and under and in the hearth. It is noteworthy that none of the snails show signs of burning and so their deposition occurred before construction of the deposit and following its abandonment. Undoubtedly the presence of fresh vegetation growing on a rich midden area as well as the midden contents would have attracted the snails.

Figure 8.10-9 shows the horizontal plan of the feature, a small hearth component and the south wall profile of the feature. While none of the rocks appear to be in-situ it is clear that they represent reuse of the area for the same purpose over a short period of time. The ash basin configuration in Inset 1 (Fig. 8.10-9) was the only distinct "hearth" noted during excavations.

All fill was fine screened, and numerous soil as well as flotation samples were collected for later analysis. While many burned and fragmentary animal bones were recovered, the only identifiable ones belonged to a cotton rat, cotton tail rabbit, frog and snake. That river mussels were exploited is unquestioned; however, it is of interest that very few shells were burned.


E10
E11
N
crack
a
b
c
d
41 WM 267
FEATURE 24
Distribution of River Pebble Conglomerate
Ash and Burnt Clay
Charcoal
Snail Shell
Nut Shell
Bone
0 20 cm
Profile Along Line c-d

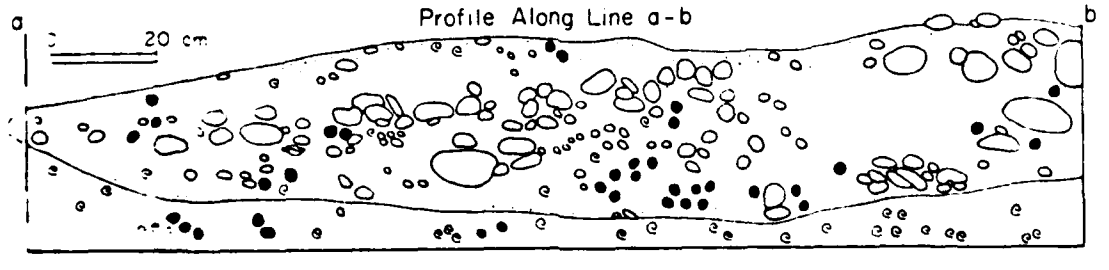

a
b
20 cm
Profile Along Line a-b

Figure 8.10-9.

The discovery of the feature late in the field season did not allow time for the completion of surrounding units and thus it is estimated that only about one half of the total feature area was explored at best. For this reason, it is not clear whether the feature represents the actual activity area or the debris from cleaning operations for some undocumented central cooking locus. It is felt that whichever case is correct, the remains investigated represent a series of utilizations rather than a single activity occurrence. Ash, charcoal, soil and flotation samples were taken in some quantities as required in the Scope-of-Work, and have been placed in storage pending deposition at some future date by the government.

Feature 25 (Area D)

Feature 25 is a formal hearth located in unit D6 in levels 98 and 99, ranging in elevation from 94.34 - 94.43 m. It consists of a circular scatter of 36 burned rocks, as well as charcoal and burned clay. The scatter measures roughly 60 cm in diameter with the rocks, burnt clay and charcoal in a shallow depression 10 cm deep. The depression itself was not clearly defined and is assumed as indicated through the distribution of the clay and charcoal.

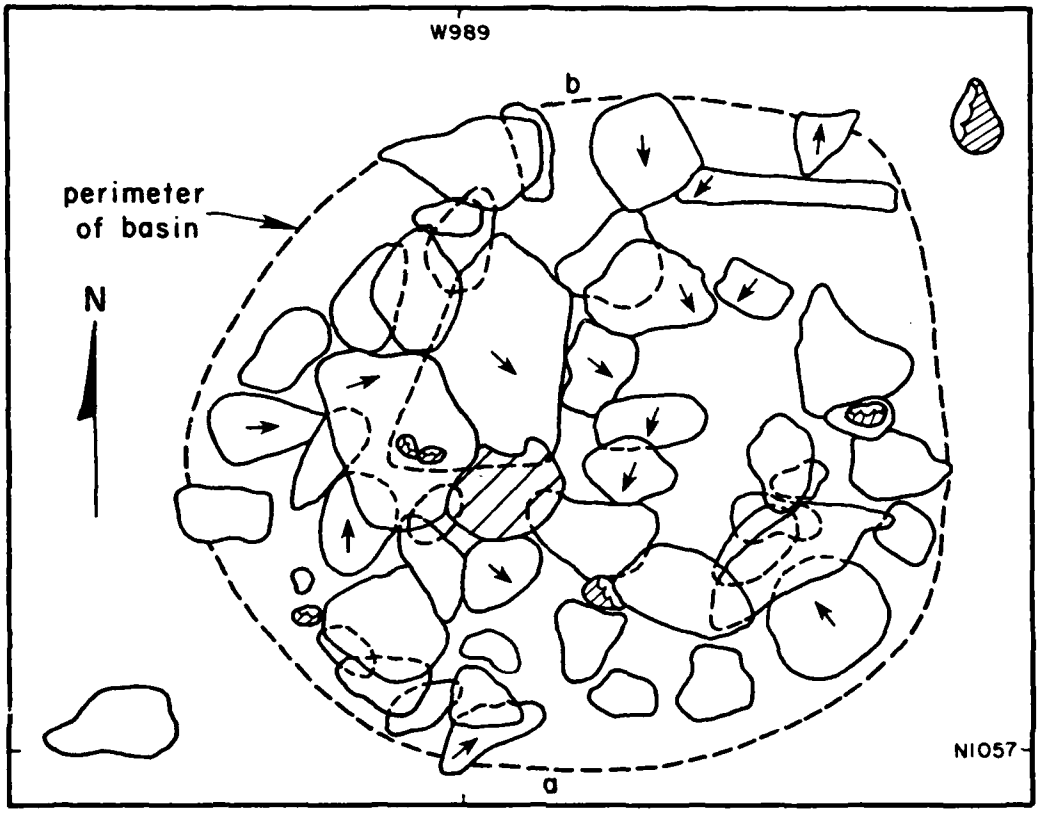
Approximately 10 cm to the west of the rock concentration was an 11 cm in diameter cluster of river conglomerate and snail shell. The presence of this deposit and the disturbed nature of the hearth may be interpreted as indicating a flood situation shortly after the abandonment of the hearth. A similar situation is seen in several of the other features and most probably means that the river was adjacent to the site during Early Archaic times.

Features 13, 17, 20, and 21 comprise the later occupations of this component. At least three occupational episodes are represented.

Feature 13 (Area D)

This hearth (Fig. 10-10) was built within a shallow basin shaped depression. The lack of cultural debris adjacent to the hearth orifice hindered an accurate identification of the associated living surface. The cross-section of the lens of burned rock and the underlying lens of burned soil suggest that the basin was approximately 10 cm in depth.

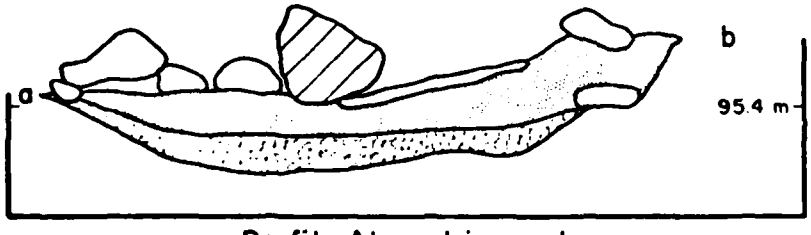
The hearth is 60 cm in diameter and consists of 43 limestone river cobbles (5-15 cm in diameter) and 2 fossil Exogyra shells (8-10 cm in diameter). Five bivalve specimens were also associated with the burned rocks. Charcoal flecking was present throughout the feature, but not in sufficient quantities for dating.



41 WM 267
FEATURE 13

Burned Rock
Fossil Exogyra
Mollusk
Direction of Slope of Selected Rock

0 10 cm



Profile Along Line a-b

Stratum 1
Stratum 2

Figure 8.10-10.

Feature 17 (Area D)

Feature 17 is a concentration of rather small river cobbles, snail shells and one utilized mussel shell in an area roughly 20 cm in diameter in unit E 5 at elevation 95.15 - 95.10 m. A few small blackish flecks of organic carbon were noted but no charcoal.

Ten of the snail shells were in a cluster and appear to have been deposited at the same time, perhaps during a flood situation. The mussel shell has a possible notch cut into its edge just beside the valve, but since the entire shell has experienced some wear it is difficult to determine if this was intentional.

The item within the feature and its configuration strongly argue for a natural origin or at least one which does not reflect any specific cultural activity.

Feature 20 (Area D)

Feature 20 is a circular arrangement of 43 rocks primarily on the northwestern side of E 12 and extending slightly into the southeastern corner of unit D 12 and the northeastern quadrant of E 11 between elevation 95.53 and 95.66 meters (Fig. 8.10-11).

A few small flecks of charcoal, one chip and several burned bone fragments were recovered from around the rocks during fine screening, but in general the hearth area was singularly clean when compared with those from the lower San Geronimo levels (Fea. 24).

The lack of debris and the relative intact nature of the hearth is taken as an indication that it was used for a relatively short period of time and then rather quickly covered over preventing scavengers or other natural and/or cultural elements from disturbing it. Cross sectioning the hearth failed to reveal any depression and it appears that the rocks were simply laid on what was the ground surface at that time (Fig. &10-11).

Feature 21 (Area D)

Feature 21 is a roughly circular distribution of ten burned rocks in unit E 10 at an elevation of 95.45 - 95.55 meters. The rocks do not appear to be in a basin and they probably represent either the remnants of a single-use formal hearth or the remains of a hearth in one of the adjacent unexcavated units. Some charcoal flecking was noted but not enough for a radiocarbon sample.

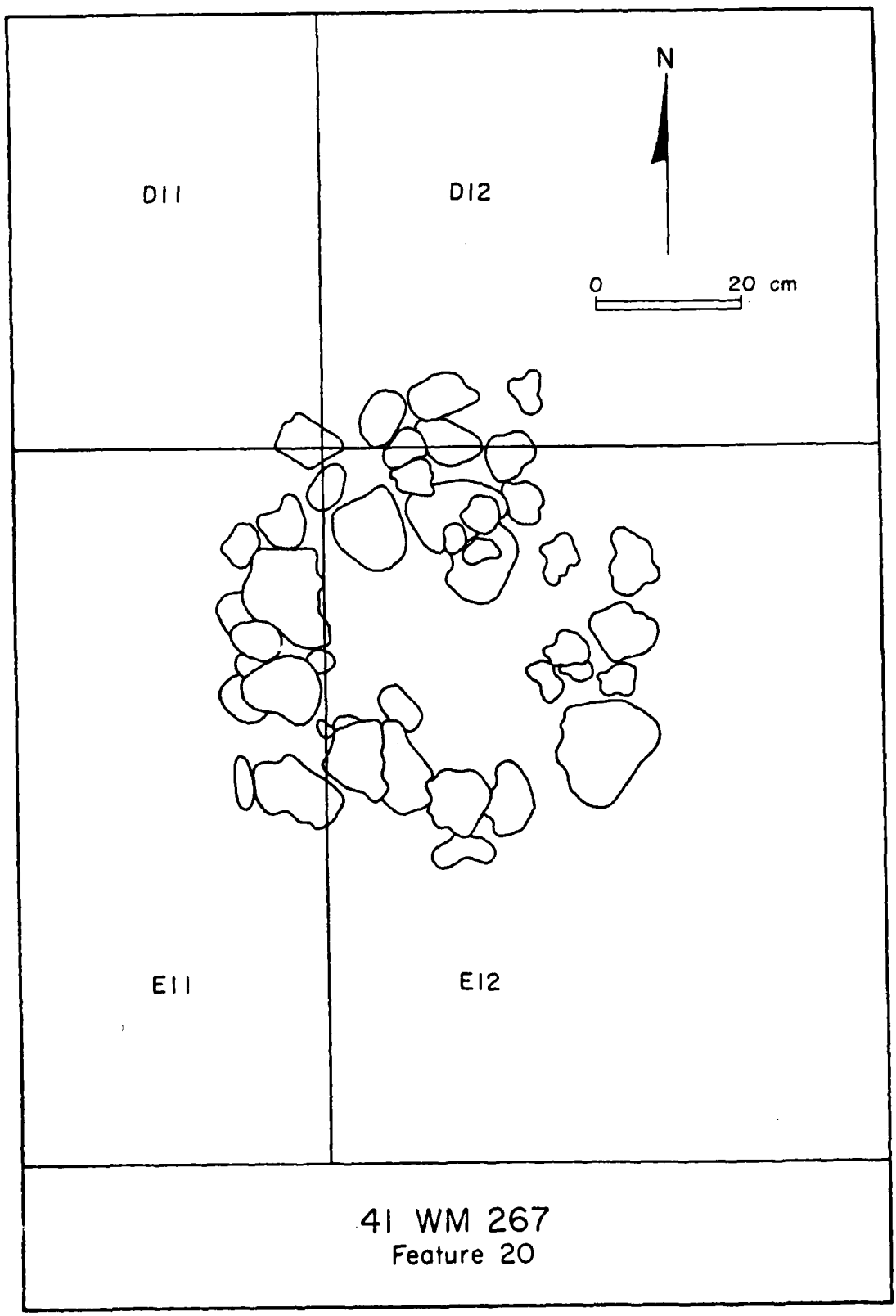


Figure 8.10-11.

This feature is reminiscent of those found in the higher San Marcos levels. The cleanliness of the fill in and around the rocks may indicate that the hearth was washed out by flooding following its abandonment. This might account for the disturbance of the rocks as well.

The one remaining feature associated with the San Geronimo stratigraphic unit is Feature 8, a basin shaped hearth situated within the Stratum 5 sediments of excavation area A. This hearth is associated with the earliest living surface within this portion of the site. Only partially exposed in the east wall of excavation unit N1000/W989, the hearth exhibits a diameter of 50 centimeters along its north-south axis. Cross-sectioning of the hearth demonstrated that the burned rocks lined a basin-shaped depression 15 cm. in depth (Fig. 8.10-12).

The lithic raw material comprising this hearth is different from most others at site 41WM267. Only this hearth and Feature 2, deeper yet in BHT#3B, are partially lined with cobbles of conglomerate rather than the more common limestone river cobbles. These cobbles of conglomerate, easily procured along the upland slopes bordering the valley, were evidently preferred for hearth construction during the earlier occupational episodes.

Clear Fork Component

Five features, recognized within the Clear Fork stratigraphic unit, were recorded in excavation units A, B, C, and D. These hearths are less formal in structure than those identified within the deeper San Geronimo unit. Only the feature within Area D yielded a radiocarbon date. The remaining features are assigned to this culture/time stratigraphic unit on the basis of associated diagnostic artifacts and their stratigrpahic position.

Feature 3 (Area C). Feature 3 represents a portion of the earliest living surface within Area C. Occupation of this portion of the site was situated upon a gravel bench deposited by an ancient channel of the San Gabriel River. Consequently, this first living surface is only 55 to 60 cm. below the present ground surface. Feature 3 (Fig. 8.10-12) is an isolated scatter of burned and unburned limestone cobbles, pelecypod remains, and flint debitage within a 60 x 72 cm. area. Charcoal flecking was abundant in the soil matrix surrounding the rocks. Density of lithic debitage surrounding this isolated scatter of rock is also much higher than in the levels immediately above or below it. Although the charcoal flecking suggests that this feature functioned as a hearth, the intermingling of burned and unburned limestone cobbles suggests that this cluster is merely the refuse from a hearth located outside the test excavation unit.

Feature 5 (Area A). Feature 5 represents a portion of a living surface within the Stratum 4 deposits. Although a formal hearth is not defined

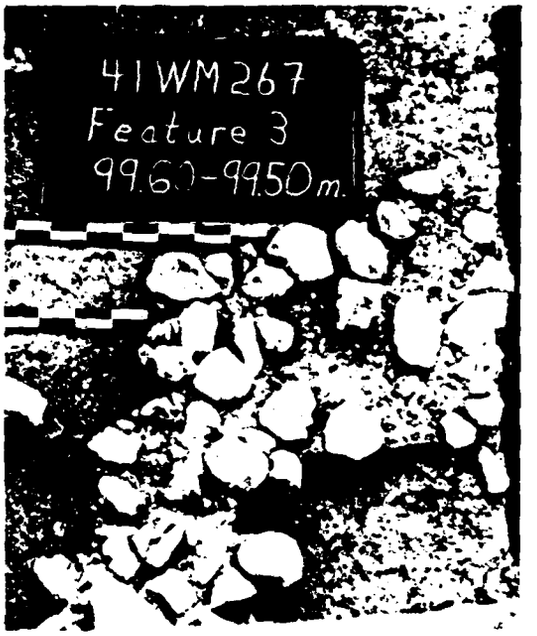


Figure 8.10-12. Photographs of Feature 3 and 8, 41WM267.

within this scatter of refuse, the irregular scatter (Fig. 8.10-13) of burned rock, lithic tools, and faunal elements represents an intensive use area. The burned rocks are likely secondary products of a more formal feature outside the Area A excavations, for very little charcoal flecking is present. No baked soil is associated with the greatest concentration of burned rock, either. The presence of a metate and a Clear Fork gouge suggest that the area served as a locus for certain specialized activities.

The distribution of projectile points within Area A (Table 8.10-1) indicates that Feature 5 is temporally equivalent to Feature 9 within Area D. In both areas, the respective living surfaces exhibit diagnostic projectile points of the Clear Fork Phase. Immediately beneath both of these features Hoxie points are also present. The radiocarbon sample from Feature 9 provided a date of 4,280 ± 240 B.P. (RL-1087) for that living surface. The stratigraphic correspondence of these two living surfaces within Stratum 4 indicates that Feature 5 was also the result of a Clear Fork Phase occupation during the fifth millenium B.P.

Feature 6 and 7 (Area B). These two basin-shaped hearths represent successive occupational episodes within area B. Feature 6 appears in the arbitrary 10 cm. level above that of Feature 7. Feature 7 may represent the earliest Clear Fork Phase occupation of this portion of the site. Structurally, the two hearths are very similar.

Feature 6 (Fig. 8.10-14) is a small cluster of burned rock which measures 38 cm. along its north-south axis and 33 cm. along its east-west axis. Individual burned rocks range from 8 to 12 cm. in breath. Cross-sectioning of the hearth revealed that the burned rocks lined a shallow basin which was 13 cm. in depth. Bone fragments and charcoal flecking were the only distinguishing characteristics of the feature fill. Flotation of the feature fill was non-productive.

Feature 7, a smaller hearth, was only partially exposed in the east wall of excavation unit N1017/W987. The fully exposed north-south axis of the hearth (Fig. 8.10-14) exhibits a diameter of 31 centimeters. Like Feature 6, the individual burned rocks are 8 to 12 cm. in breath. Although the compact cluster of rock is 10 to 16 cm. in depth, a shallow basin shaped depression is not so evident in Feature 7. The second layer of rock may have obscured any evidence of a depression. Faunal elements, lithic debris, and charcoal flecking were present within the feature fill. Flotation of the feature fill yielded no floral remains.

Although no diagnostic projectile points are directly associated with these hearths, the presence of Dawson and Bulverde-like points in the levels above them and a Hoxie point in the levels below them would indicate a Clear Fork Phase occupation.

Feature 9 (Area D). This feature represents a portion (8 square meters) of a living surface within Stratum 4 of Area D. The massive lens of faunal debris was first encountered within Level 62 (96.25 - 96.2 m.)

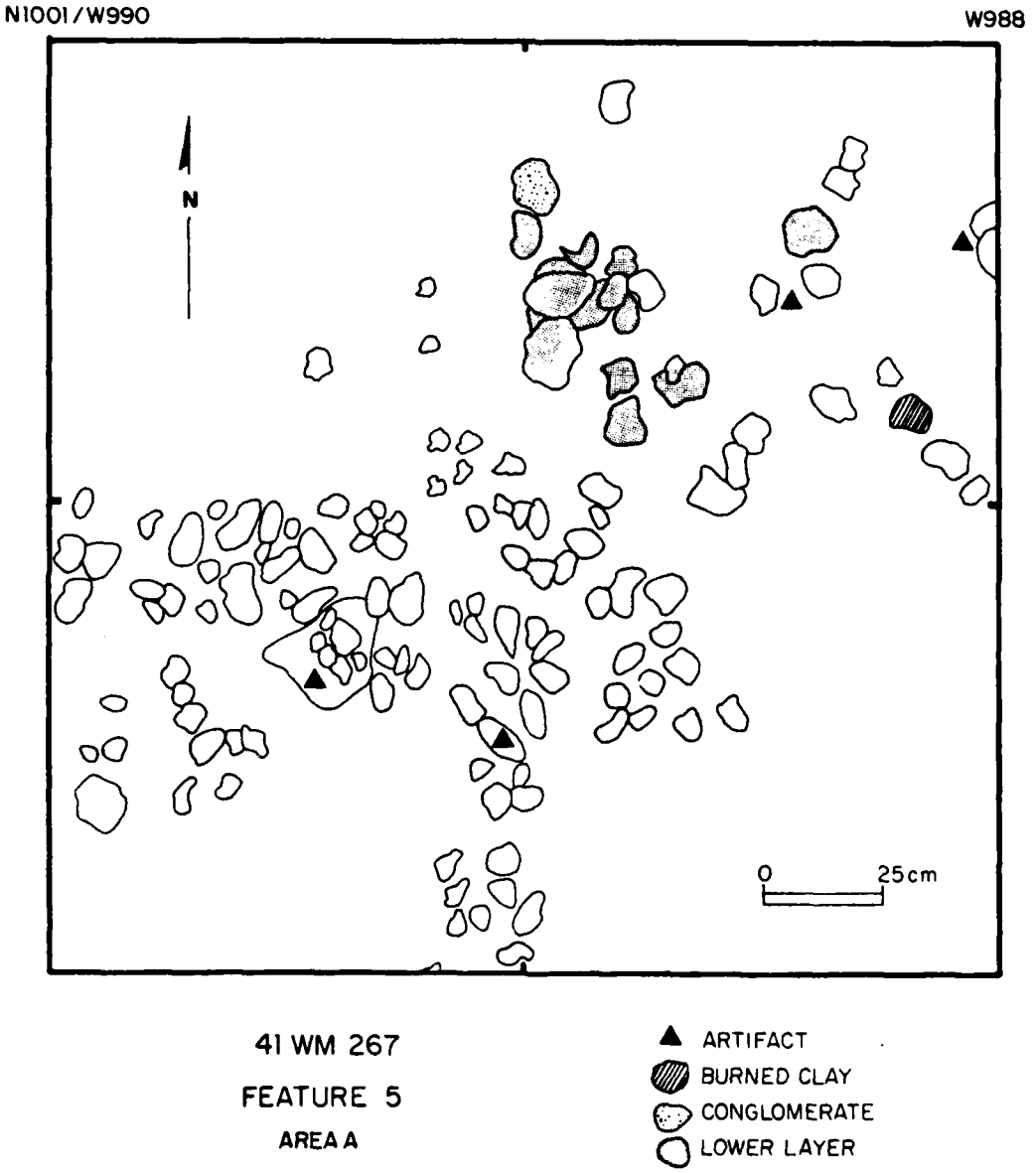


Figure 8.10-13. Horizontal plan view of living surface within Area A, Level 19-20 (97.3-97.1a).

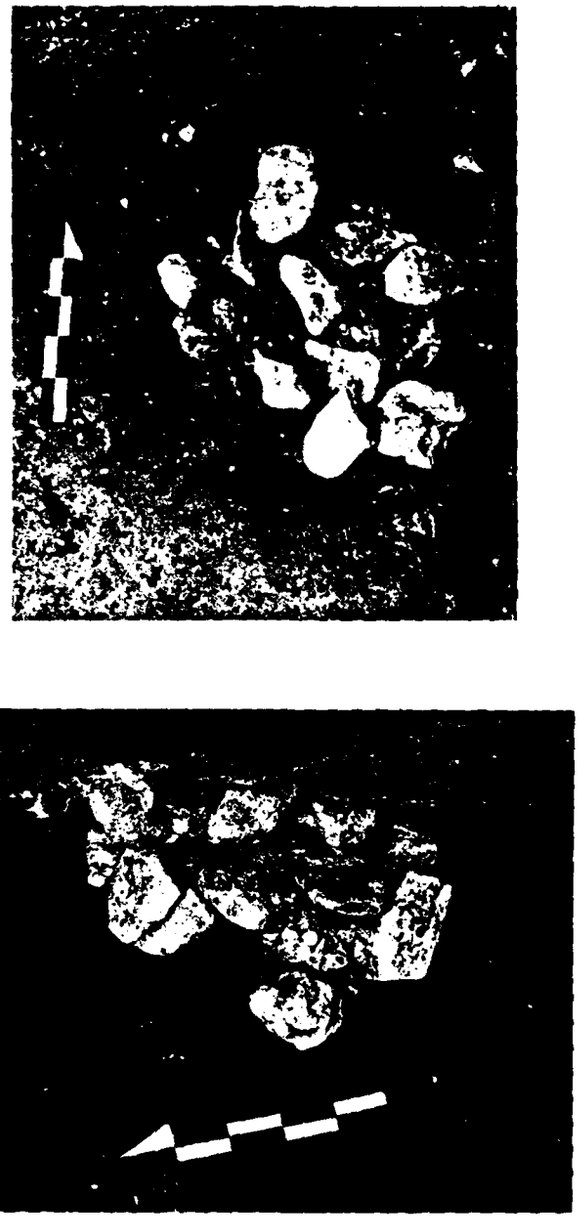


Figure 8.10-14. Photographs of Features 6 and 7, 41WM267.

of excavation unit N1057/W989.5. Exposure of Levels 63 and 64 (96.2 - 96.1 m.) revealed an even greater mass of faunal remains, burned rock, broken tools, and lithic debitage (Fig. 8.10-15). The greatest mass of faunal remains and burned rock is adjacent to a hearth area within units N1057/W989.5 and W988.5. This accumulation of faunal and lithic debris extends westward beyond the excavation unit. The eastern half of the excavation unit exhibits a much less dense accumulation of debris. Three isolated clusters of burned rock and associated faunal remains, primarily molluscan remains, and a few tools comprise this portion of the living surface.

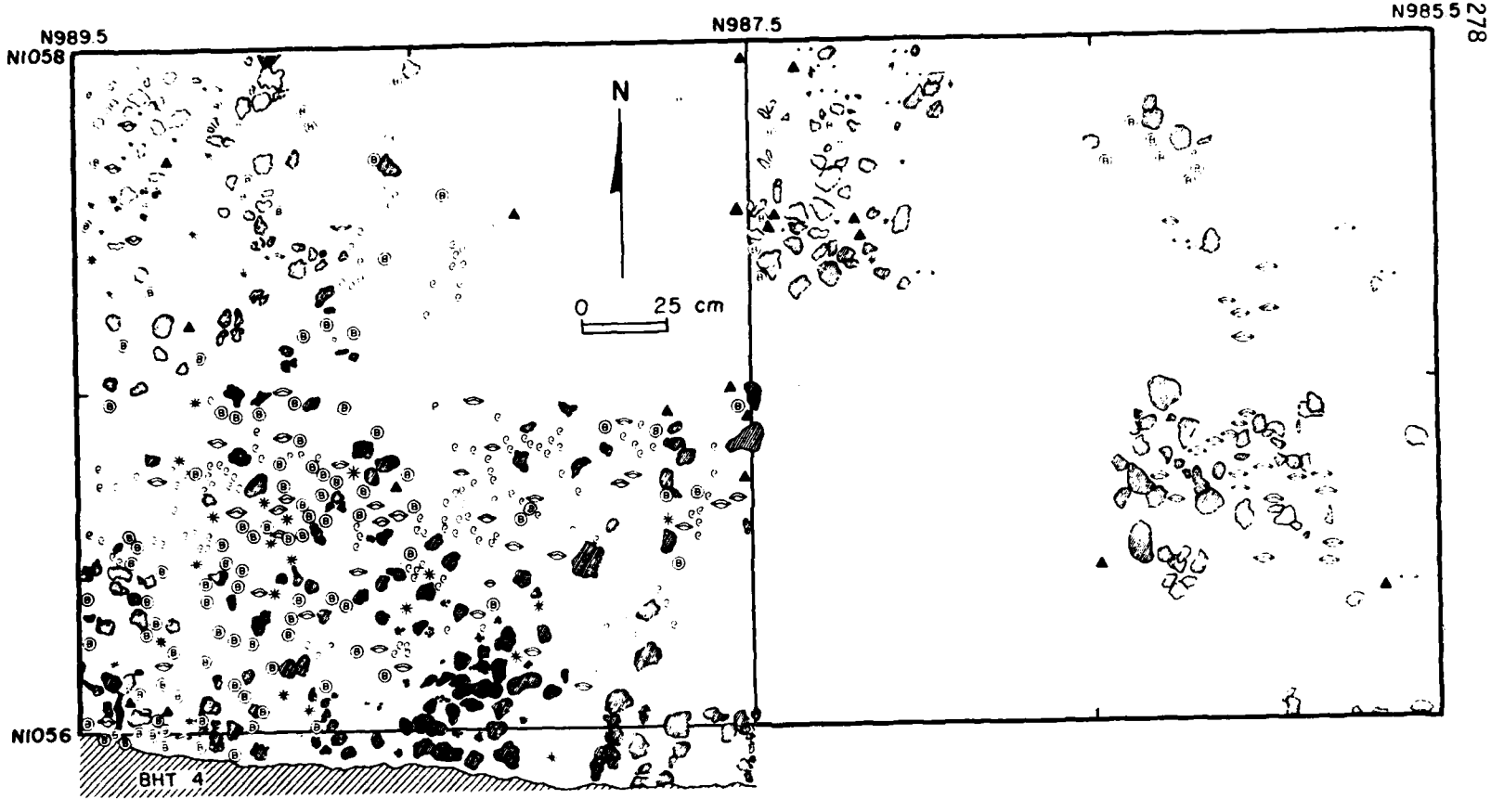
The faunal material was in an identifiable, but fragile, condition. The large number of species (23) represented, together with the fragmented and disarticulated state of the bone, suggest that this mass of debris may represent a dump area within this portion of the site. The unusually high density of faunal remains in the western half of area D in relation to the remainder of the site further supports such an hypothesis. Interestingly, very little of the bone (only 4%) exhibits evidence of burning.

The variety of species represented within Feature 9 indicates that the Cervenka site was apparently well situated for utilization of both the bottomland and upland prairie environments. Cottontail rabbit, deer, turtle, fish, and the molluscs were obtained from the bottomlands while jack rabbit, pronghorn antelope, ground squirrel, and prairie chicken were procured on the uplands. Although the flotation samples from the Cervenka site did not yield significant quantities of floral remains, the presence of one charred sunflower seed within levels 61/62 of N1057/W989.5 indicates that the inhabitants were also utilizing the local flora.

The only evident hearth within this portion of the living surface (Fig. 8.10-15) is a rather nondescript cluster of burned rock surrounded by abundant quantities of charcoal flecks. No prepared basin is present. The presence of the hearth is accented by the restricted distribution of the charcoal flecking and the relative lack of bone in comparison with the immediately adjacent areas. Processing of the radiocarbon sample from this hearth yielded a date of 4,280 + 240 B.P. (RL-1087). When calibrated this date becomes 4,907 $\pm$ 267 B.P. which places this occupation at the presently recognized beginning of the Clear Fork Phase. The associated projectile points (Bulverde, Nolan, Travis, Dawson, and Groups 2, 4, 7) also indicate an early Clear Fork association. Hoxie and Uvalde points (Table 8.10-1) appear beneath this living surface.

San Marcos Component

Interestingly, the next culture/time stratigraphic unit represented at the Cervenka site is the San Marcos Phase. Apparently, the site was



41 WM 267
FEATURE 9
Level 7

Limestone
Bone
Flint
Mussel Shell
Snail Shell
Charcoal
Artifact

Figure 8.10-15

not utilized during the Round Rock Phase. Six features were identified within the San Marcos stratigraphic unit. Excavation units A, B, and D account for all of these features. Features of this stratigraphic unit were also noted when the upper components of excavation unit D were sacrificed to implement the deeper excavations.

Feature 11 (Area B). This cluster of cultural debris represents the remains of both hearth related activities and grinding activities. The circular configuration of the northern portion of the feature (80 cm. in diameter) suggests that the burned limestone cobbles are the primary in situ remains of a hearth. However, charcoal flecking is quite sparse and burned soil is not present. Either the hearth was utilized for a very short time or was subsequently disturbed by natural forces (flooding) or cultural activities (Fig. 8.10-16).

To the south of the possible hearth area are two piles of debris. The southernmost cluster (30 cm. in diameter) consists entirely of burned limestone cobbles. The remaining cluster (35 cm. in diameter) however, contains four (4) fragments of a much used limestone metate. The thinness (6 mm.) of the central portion of the fragmented metate indicates that it was probably utilized until the slab broke under the continued pressure of grinding.

Although no recognized diagnostic elements were associated with Feature 11, the distribution of projectile points both above and below Level 10 in Area B (Table 8.10-2) indicates that the feature is the result of a San Marcos Phase occupation. Unfortunately, no radiocarbon samples are available from this feature.

Feature 4 (Area B). This feature represents a portion of a living surface exposed within Level 13 of Area B. One hearth and the associated clusters of refuse from hearth related activities comprise this feature. The primary hearth area (Fig. 8.10-17) is 60 cm. in diameter (E-W axis) and is partially enclosed by a single layer of limestone cobbles which are 8-10 cm. in diameter. The eastern half of the hearth is not so well defined, for it merges with a cluster of both burned and unburned limestone cobbles. The scatter of fire cracked limestone cobbles becomes less dense with increasing distance from the primary hearth area. Four pieces of conglomerate are also present within the northernmost cluster.

Charcoal flecking, lithic debitage, and burned bone fragments are present throughout level 13. However, the density of charcoal and burned bone is highest within the immediate hearth area. Four projectile points are directly associated with this feature. Two of these specimens, a Montell (heat altered) and a Marcos point, suggest that this living surface is the result of a San Marcos Phase occupation. The other two points, one exhibiting Wells-like characteristics and the other (heat altered) placed in a provisional grouping of type 34, suggest an earlier

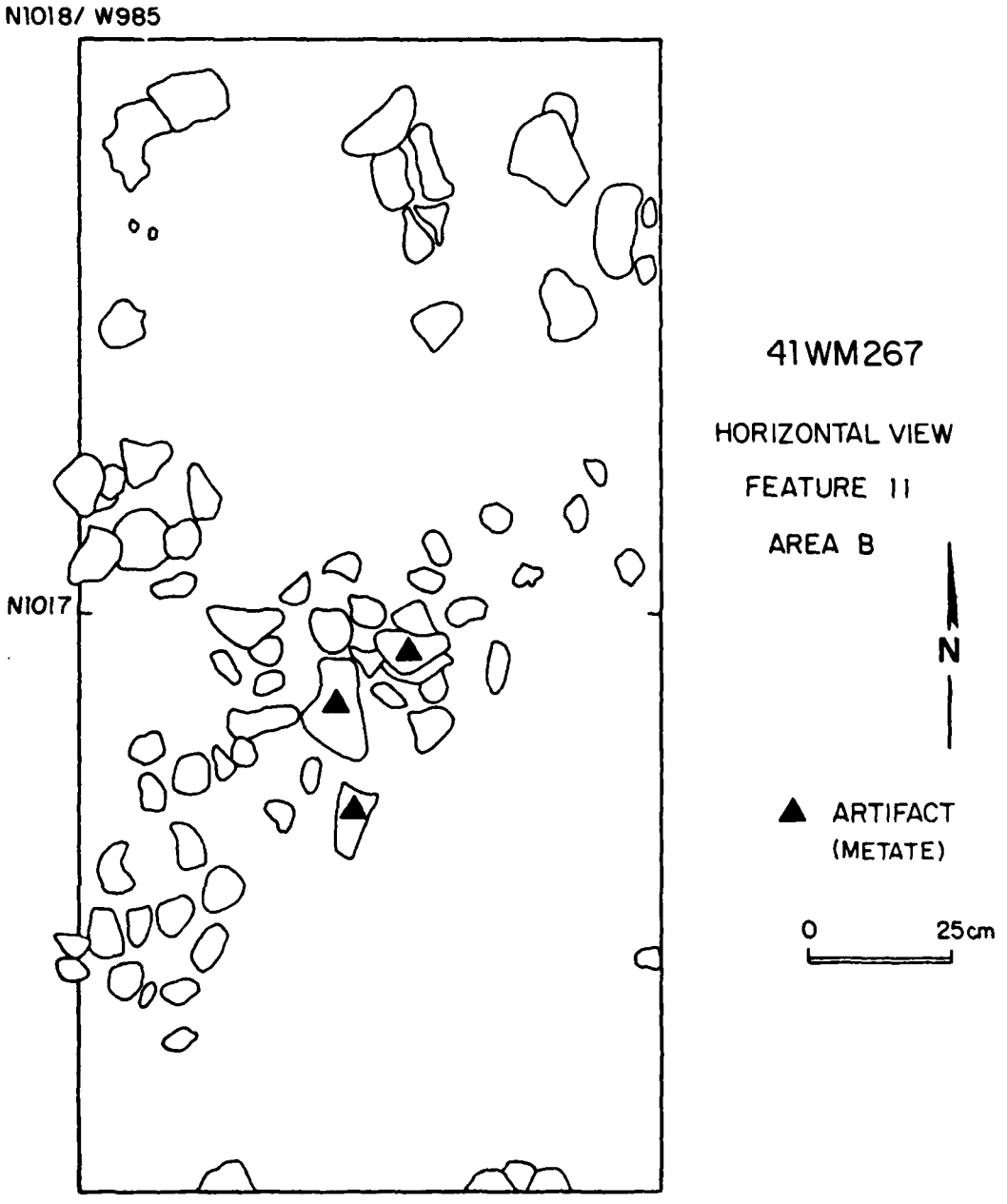


Figure 8.10-16. Horizontal Plan view of a probable hearth and related debris with Area B, Level 10 (98.2-98.1 m).

N1018/W987

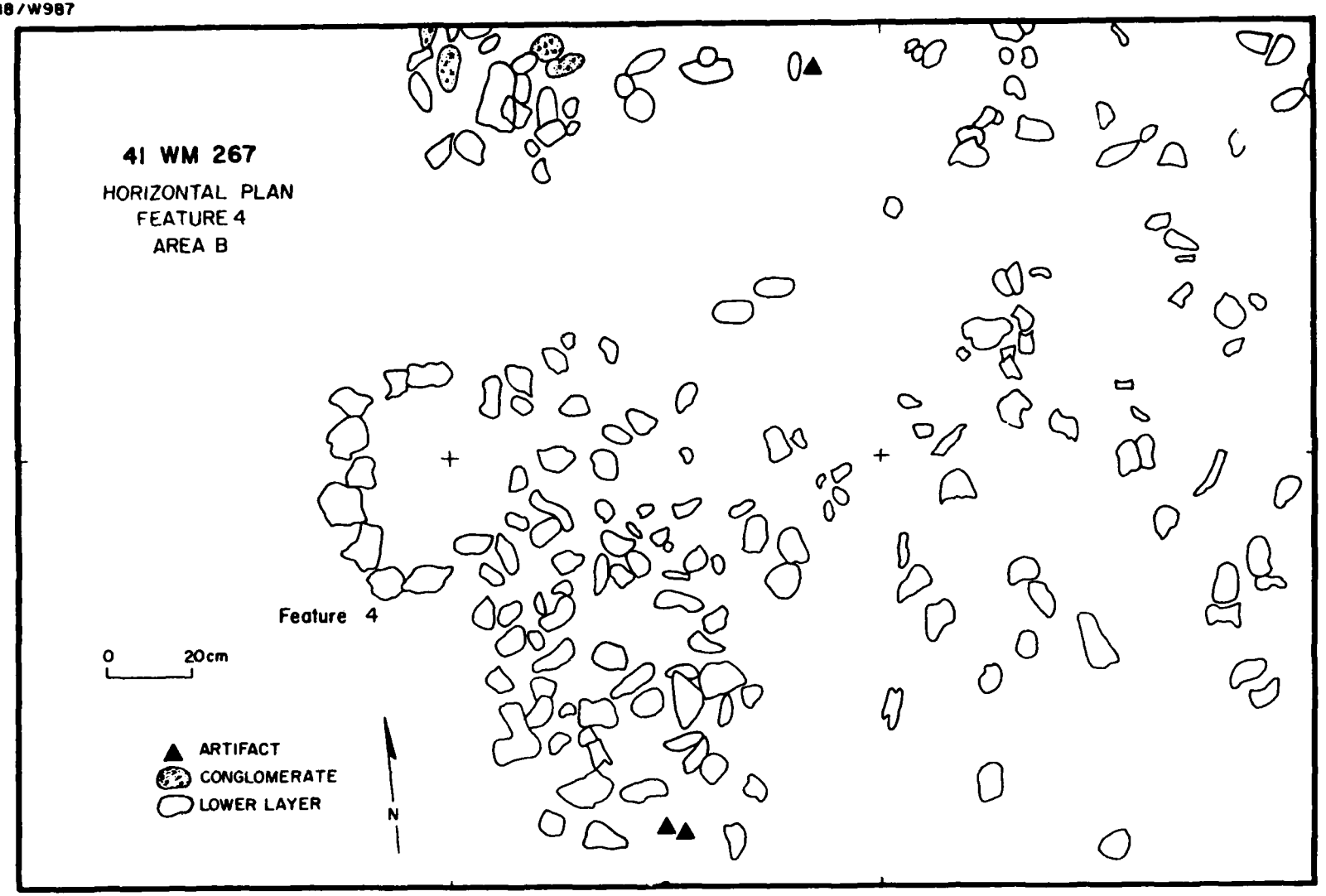


Figure 8.10-17.

occupation. The overall distribution of projectile points (Table 8.10-2) immediately above and beneath this living surface, however, indicates that this feature was likely the result of one of the earliest occupations of the site during the San Marcos Phase of the Archaic.

Feature 10 (Area A). This feature consists of an isolated cluster of burned rocks within Level 6 of Area A. The compact cluster is flat in profile and measures 76 cm. in diameter. The burned rocks are limestone river cobbles except for one specimen which is a fossil Exogyra shell. Other than the presence of the burned rock and a few burned bone fragments, there is no evidence of an intensive fire. Only scattered flecks of charcoal were present within the feature matrix. No burned soil was observed immediately beneath the rock cluster (Fig. 8.10-18).

Although this hearth likely represents one of the last occupations of this area of the Cervenka site, the lack of associated diagnostic elements and radiometric dates renders temporal placement of this occupation as largely conjectural. The distribution of projectile points (Table 8.10-2) beneath this feature merely suggests that the hearth may have been the result of a San Marcos or later Twin Sister Phase occupation.

Feature 14 (Area D). Feature 14 is a loose scatter of 30 fire-cracked rocks, a few snail shells and some charcoal flecking in unit E-12 at a depth of 98.15 - 97.96 meters. It appears that this feature represents the remnants of a hearth which suffered some sort of post depositional disturbance. The lack of a pattern and the diffuse nature of the feature does not lend itself to further interpretation.

Feature 15 (Area D). Feature 15 is a small rock clustering in unit C-15 at a depth of 98.230 - 97.975 meters which was disturbed by the backhoe during re-excavation of Area D. In all 15 fire-cracked river cobbles were noted, one being a fossil Exogyra shell. It is considered most probable that this feature was smaller but similar to Feature 16 in nature; a rock, burned earth and charcoal filled basin.

Feature 16 (Area D). Feature 16 is a large, slightly disturbed informal hearth in units B 12, C 12 and D 12 extending in depth from 97.91 to 97.70 m. in the exposed sections. It also presumable extends into units B, C, and D 13, but these could not be excavated under scope of work restrictions. The probable diameter is 1.40 meters.

Figure 8.10-19 shows the plan view and a profile of the hearth area. The accumulation of burned rock, clay and charcoal is clearly in a shallow basin sloping to the east at about a 25° angle. As is typical of the hearths in the Granger Reservoir area the exposed section of Feature 16 contained several fossil Exogyra shells. No particular importance is attached to their presence in this feature since they would have been available in the same deposits as the cobbles making up the remainder of the hearth stones.

Figure 8.10-18. Photograph of Feature 10, 41WM267.
Photograph of Feature 1, 41WM267.

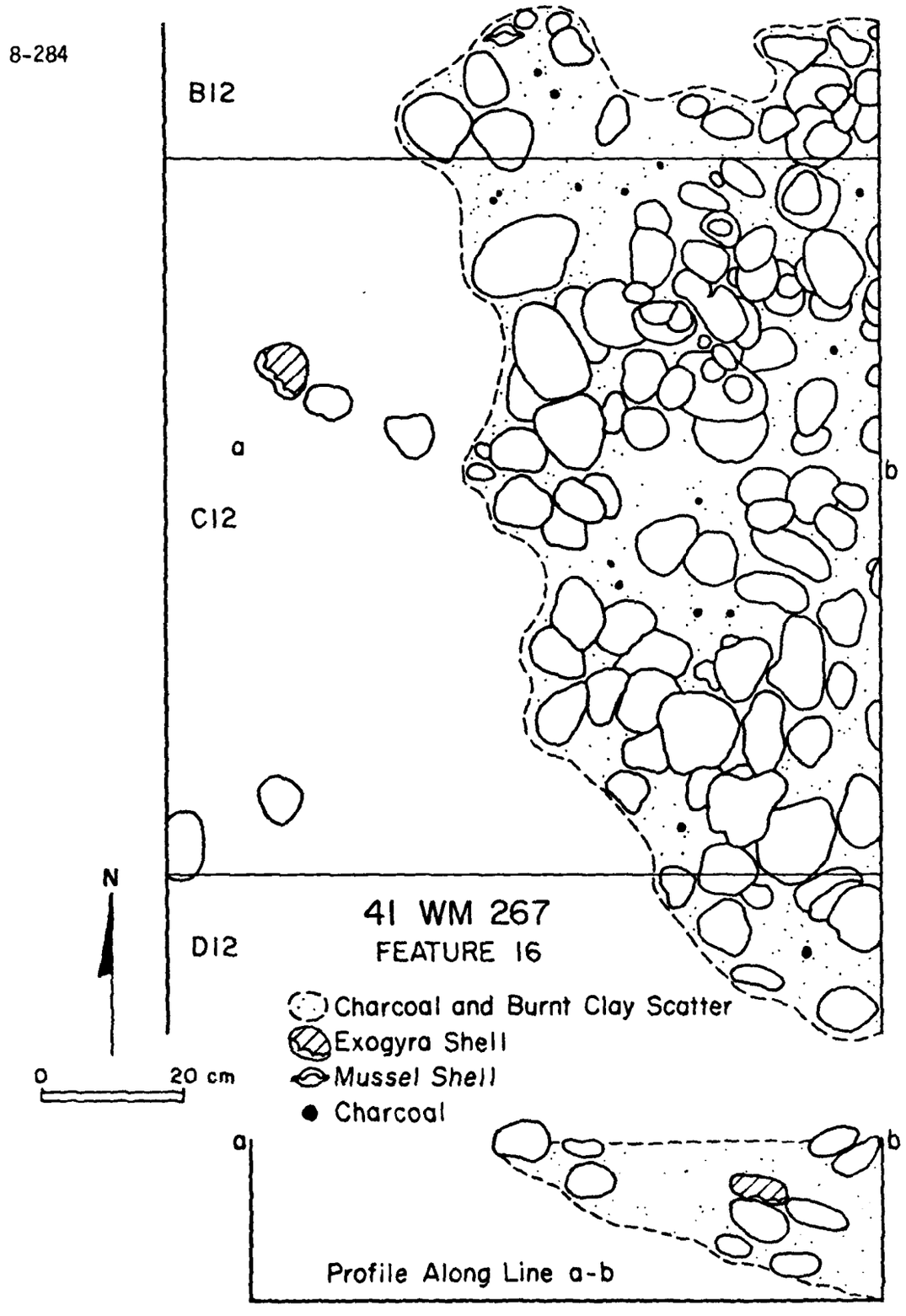


Figure 8.10-19.

The only artifacts recovered from in or around the hearth consisted of a core fragment, two secondary-A flakes and a single tertiary flake. While it is estimated that only about half of the hearth area was excavated this is still a rather disappointing artifact return considering the size of the feature. Similar situations were found at sites in both reservoir areas in which artifact counts increased in proportion to the distance from a formal hearth. No faunal elements were recovered.

Although somewhat speculative, it appears that the feature may have been utilized on more than one occasion. The limited profile of the feature shows several loose clusters of rocks and these may represent individual utilizations or activities. It is difficult to explain the presence of so many rocks in a restricted area which evidence a distinct lack of patterning. It may be that the same activities which created the burned rock middens found in the North Fork Reservoir area were also operant in Granger with intensity of occupation being the variable.

Unknown Temporal Association

Feature 1 (Area C). Feature 1 is an isolated cluster of burned rock within Level 3 of Area C. The cluster measures 76 cm. along its east-west axis and 43 cm. across its shorter north-south axis. Cross-sectioning of the feature revealed a single layer of burned rock with no apparent matrix differentiation within the feature. No evidence of burning such as charcoal, burned earth, or burned bone was associated with the cluster of rocks. The in situ fragmentation of the burned rocks, however, suggests that these stones were part of a hearth. The situation of a hearth on the upland slope may have allowed all other evidence of a hearth to be destroyed by slopewash. The lack of associated diagnostic artifacts or sufficient charcoal for radiocarbon dating precludes any determination of age for this feature.

Lithic Tools

A total of 1247 flint tools were analysed from Site 41WM267. The retouched pieces again form the most numerous tool class (470 or 37.69%) followed by biface fragments (253 or 20.29%). The restricted total shows the importance of the projectile points, followed by the notched pieces and complete bifaces (Table 8.10-4). Striking is the relative importance of axes and chopping tools, and to a lesser degree of gouges. Most of the other tool categories are also moderately well represented.

Most tools were from the Clear Fork component of the site (588 or 47.15%). A large amount of tools was also collected in the San Marcos (285 or 22.85%) and the San Geronimo components (230 or 18.44%). The excavated volume is much higher for the San Geronimo component, which results in a very low tool density. The highest tool density was found in the Clear Fork component. Debitage densities parallel the tool densities (Table 8.10-5).

Table 8.10-4. Tool Classes, 41WM267.

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
Twin Sisters	B	1																		-				
		2			1						1		2							4				
		3											1	1						2				
		4									1									1				
		5									3	1	3							7				
		6	1		1				1		4		2	4						13	27	9.41		
	D	1									1									1				
		2		1							1									2				
		3				1					4									5				
		4			1															1				
		5																		-				
		6																		-				
		7									1									1				
		8											1							1				
		9											1							1				
		10									1		2							3				
		11			1						1		1							3				
		12																		-				
		13				1					1									2				
		14																		-				
		15																		-				
		16																		-				
		17						1			2									3				
		18																		-				
		19			1						3		1							5				
		20		1							4	1		1						7				
		21									2		1	2						5	40	6.25	67	5.37
San Marcos	A	1																		-				
		2		1							1									2				
		3																		-				
		4											2	1						3				
		5		1	1	1					4	1	1							9				
		6		1		1			1			1	3							7				
		7			1								5	1						7				
		8	1		2				2		3	1	3	3						15				
		9				1		1			1		3	1						7				

Table 8.10-4. Tool Classes, 41WM267 (continued).

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
San Marcos (cont.)	A	10					1				1			1						[illegible]				
		11		1	1						2		2	1						7				
		12		2							2	1	2	3						10				
		13			1	1			1		8		4	4					1	20	90	39.47		
	B	7		1							1	1	1							4				
		8							1		5		3	3		1				13				
		9	3		1	1			1		9		5							20				
		10	2							1	6		5	1			1			16				
		11			1	1					13		6	5						26				
		12	3	1			2				17		5	4						32				
		13	1		2	2					10		3	4		1				23	134	46.69		
	D	22			2		1				4		2	1						10				
		23							1		4	1	1							7				
		24									4									4				
		25																		-				
		26		1	1															2				
		27				1		1			1		1							4				
		28							1			1								2				
		29	2	1			1				1		4							9				
		30			2						3						1			6				
		31											1							1				
		32		1	1						1		2							5				
		33										1	1							2				
		34									2		1							3				
		35											1							1				
		36					1	1			2									4	60	.38	285	22.86
	BHT	PF											1							1	1			

Table 8.10-4. Tool Clases, 41WM267 (Continued).

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
Clear Fork	A	14			2		1	1			13		7	7						31				
		15	1	1	1	1			1		11	1	3							20				
		16	1	2	2						8	1	9	2						25				
		17			2						9	1	3							15				
		18	1						1		4		4	2						12				
		19									2	1	2	7	1					13	116	50.88		
	B	14			1		1				1	2	2	4						11				
		15									4		4	2						10				
		16									3		2	6						11				
		17	1	1					2		7	2	4	7						24				
		18									3		4	3						10				
		19									2		4	3						9				
		20		1							4		3	2						10				
		21									2		3	4						9				
		22	1								2	1	3	1						8				
		23									2	1	6	4						13				
		24							1				2	2						5				
		25												1						1				
		26									2									2	123	42.86		
	C	6							1		1	1		2						5				
		7											2	1						3				
		8			1				1				1							3				
		9											1							1				
		10																		-				
		11									1									1				
		12																		-				
		13																		-	13	86.67		
	D	47				1														1				
		48																		1				
		49									1									1				
		50																		1				
		51-2											1	1						2				
		53-4		1	1		1				8	1	5	2			1			20				
		55-6			2	1	1	2			11	2	10	8						37				
		57-8	1	2	3	2			2		20		10	7						47				
		59-60			1	2			1		13		11	6						34				

Table 8.10-4/ Tool Classes, 41WM267 (Continued).

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
Clear Fork (cont.)	D	61-2		2	3	3	3		1		29	2	10	5						58				
		63-4	1	5	6		1	2	1		21	4	20	12			1			74				
		65-6	1	4	4	3	1	2			29	3	7	7				1		62	336	52.50	588	47.16
San Geronimo	A	20												3						3				
		21									1		1	3						5				
		22									1		1	3						5				
		23											1							1				
		24		1							2									3				
		25											1							1				
		26	1								2		1							4	22	9.65		
	B	27							1											1				
		28																		-				
		29																		-				
		30																		-				
		31		1																1				
		32												1						1	3	1.04		
	D	67-8		2	3		2	2	1		12	1	1	8			1			33				
		69-70		1	2						15		1	3		2				24				
		71-2	1	1	1	1			3		14			4						25				
		73-4			1						3	2		2		1				9				
		75-6	1			1		1			2			1						6				
		77-8		1									1	1						3				
		79-80		1																1				
		81-2									4									4				
		83-4	1		2						4									7				
		85-6			2	1					19	1	2	3						28				
		87-8			2		1				4									7				
		89-90																		-				
		91-2					1				1									2				
		93-4			1						1		1							3				
		95-6		1	1						3		3							8				
		97-8									2									2				
		99-100									1									1				
		101-2			1	1					4		2							9				
		103-4					1				3			1						5				

Table 8.10-4. Tool Classes, 41WM267 (Continued).

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
San Geronimo (cont.)		105-6																		-				
		107-8									1									1				
		109-10																		-				
		111-12												1						1				
		113-14			1						1									2				
		115-16												1						1				
		117-18				2														2				
		119-20			1															1				
		121-22																		-				
		123-24																		-				
		125-26																		-				
		127-28																		-				
		129-30									1									1				
		131-32											2	1						3				
		133-34			1								1							2				
		135-36																		-				
		137-38																		-	191	29.84		
	D	BHT	1					1	3		2	2	3	1		1				14	14		230	18.44
Unknown	C	1																		-				
		2					1													1				
		3																		-				
		4									1									1				
		5																		-	2	13.33		
	D	37			1						2									3				
		38									3									3				
		39																		-				
		40			1			1			1									3				
		41																		-				
		42									2									2				
		43																		-				
		44			1								1							2				
		45																		-				

Table 8.10-4. Tool Classes, 41WM267 (Continued).

COMPONENT	AREA	LEVEL	TOOL CLASSES: SCRAPERS	DENTICULATES	NOTCHES	'BORER' TOOLS	TRUNCATIONS	BACKED PIECES	BURINS	COMPOSITE TOOLS	RETOUCHED PIECES	BIFACES	BIFACE FRAGMENTS	POINTS & FRAGMENTS	GOUGES	AXES	CHOPPING TOOLS	SCALED/ BATTERED	UNIFACIAL TOOLS	TOTAL	AREA/ COMPONENT TOTAL	AREA/ COMPONENT %	COMPONENT TOTAL	COMPONENT %
Unknown (cont.)	D	46																		-	13	2.03	15	1.20
	BHT		1	1		1		1	4		10	(27)	4	8	3	1	1			62	62		62	4.97
Total			27	42	72	31	21	17	34	1	470	66	253	194	4	7	6	1	1	1247	1247		1247	
%			2.17	3.37	5.77	2.49	1.68	1.36	2.73	.08	37.69	5.29	20.29	15.56	.32	.56	.48	.08	.08	100.00				100.00
Total Restricted																				524				
%			5.15	8.02	13.74	5.92	4.01	3.24	6.49	.19		12.60		37.01	.76	1.34	1.15	.19	.19	100.00				

Table 8.10-5: 41WM267 Artifact Density by Area

Area	Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool Debitage Ratio
A	San Marcos	5.2	17	2028	1:117
	Clear Fork	2.4	48	8552	1:177
	San Geronimo	3.0	7	1157	1:158
	Total Area	10.60	22	3259	1:152
B	Twin Sisters	3.6	8	1038	1:138
	San Marcos	4.2	32	2848	1:89
	Clear Fork	4.8	26	4340	1:169
	San Geronimo	1.3	2	302	1:131
	Total Area	13.90	21	2656	1:129
C	Clear Fork	.9	14	934	1:165
	Unknown	.6	3	1362	1:406
	Total Area	1.50	10	1105	1:110
D	Twin Sisters	4.30	9	631	1:68
	San Marcos	3.15	19	912	1:31
	Clear Fork	2.65	127	7281	1:57
	San Geronimo	20.75	9	194	1:21
	Unknown	1.10	11	218	1:18
	Total Area	31.95	20	912	1:46
			$\bar{x}$	$\bar{x}$	$\bar{x}$
	TOTAL SITE	57.95	20	1765	1:87

Table 8.10-6: 41WM267 Artifact Density by Component

Component	Excavated Volume m^3	Tool Density N/m^3	Debitage Density N/m^3	Tool/ Debitage Ratio
Twin Sisters	7.9	8	816	1:96
San Marcos	12.55	23	2022	1:89
Clear Fork	10.75	55	5720	1:105
San Geronimo	25.05	9	315	1:36
Unknown	1.70	9	70	1:70
SITE	57.95			

Considering the site by area, the same general statements hold true, but there is an interesting areal distribution. Significantly higher tool densities occur in the northern part of the site in Area D compared to Area A (Figure 8.10-1). On the contrary, significantly higher debitage densities occur in the more southern part of the site, south of the gully, in Area A when compared to Area D. Area B falls between in both cases, which suggests that this is a gradual change, not an abrupt one. This distribution is the case for all cultural components, but especially clear in the Clear Fork component. This seems to indicate that there is a definite areal activity differentiation.

Table (8.10-6) summarizes the results of debitage and tool analysis by cultural component. Again it is clear that the densest cultural horizons are in the Clear Fork component. This time period has a high tool and debitage density, and also a high tool to debitage ratio. The San Geronimo component, which was the largest in excavated volume, has very low tool and debitage densities.

The highest variety in tool subtypes also was found in the Clear Fork component, where it was slightly higher than in the San Marcos component. The San Geronimo assemblage has medium variability, while in the Twin Sisters period it is very low.

The cumulative diagram (Fig. 8.10-20) of the components present at the site, shows an amazingly close relationship through time. All the variations are relatively minor, and some are due to a relatively low tool density (as for the Twin Sisters, n = 35). Especially the Clear Fork and San Geronimo curves follow very closely.

The San Marcos component is a little different, mainly due to a more important presence of scrapers than in any of the other cultural components, and the generally slightly higher presence of classes I through VIII. Retouched pieces are very important in all cultural components, but most prominent in the Twin Sisters period. This last period has few whole bifaces, and none of the classes XI - XIV, present in the other components.

All in all, the artifact classes and subclasses are very homogeneous and there seems to be very little temporal variation at the site. Statistical data on measurements are available for all tool classes with four or more complete tools in Appendix H-7.

Site Summary

The formal structure of the hearths identified at the Cervenka Site changes through time. The features of the San Geronimo component are quite varied, for informal clusters of burned rock, basin-shaped hearths, and concentrations of ash and heat altered soil are present. The duration of the associated occupation must have been relatively

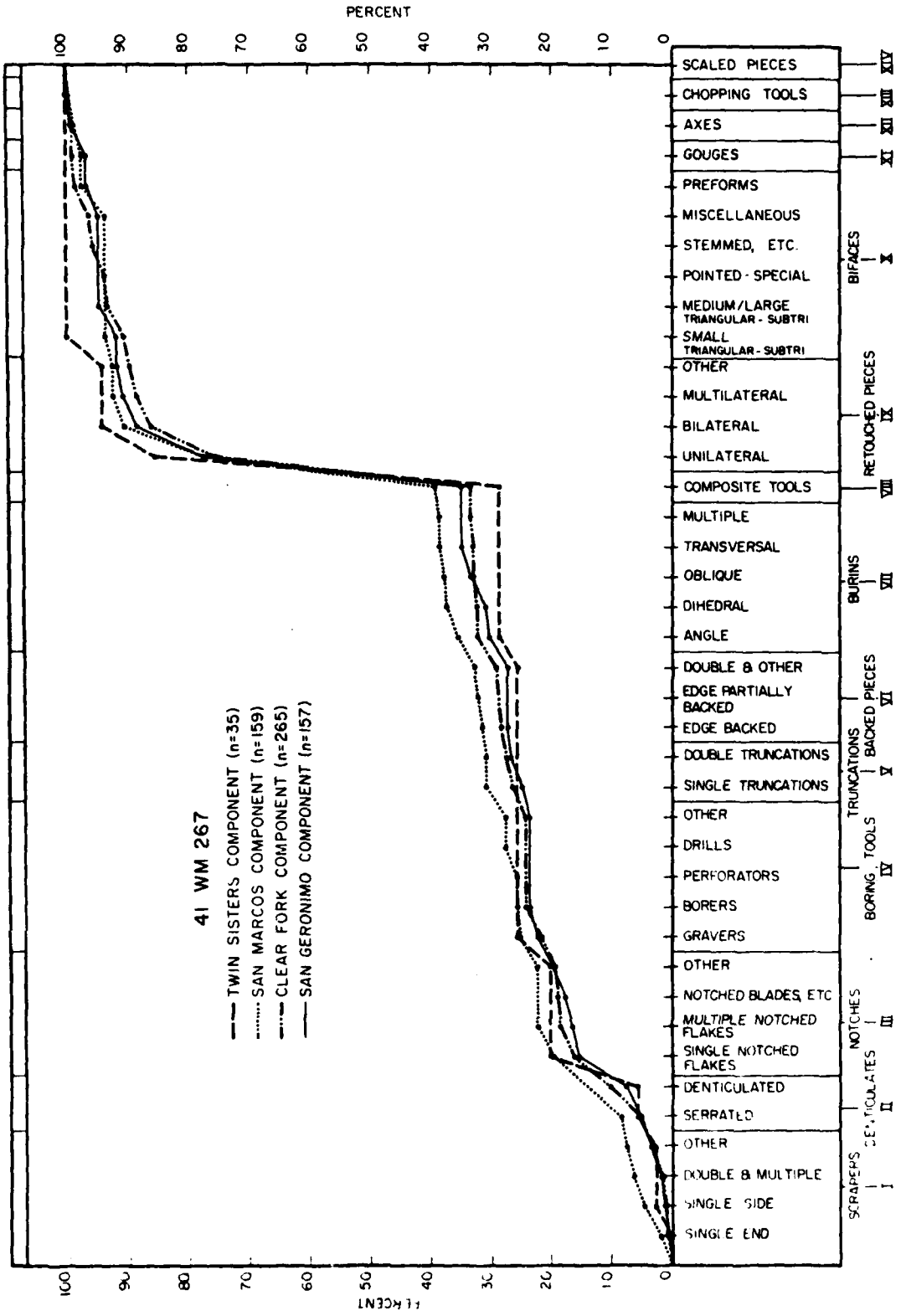


Figure 8.10-20. Cumulative Graph of Lithic Tools: Site 41WM267.

short for very little cultural debris was found either within the features or in adjacent areas (Table 8.10-6). The duration or intensity of occupation was definitely of greater magnitude during the Clear Fork stratigraphic unit. Within excavation areas A, B, and D dense accumulations of burned rock, faunal remains, and lithic tools and debitage were revealed (Table 8.10-7). Whether or not formal basin shaped hearths were also a part of these living surfaces is uncertain. Nevertheless, isolated basin-shaped hearths were identified within the Clear Fork stratigraphic unit of area B.

The hearths of the San Marcos stratigraphic unit are less formal in structure than those of the Early Archaic periods. Irregular clusters of burned rock are more common. The shallow depressions of these hearths are commonly irregular in profile. The perimeter of these hearths is also less distinctive and not as well defined as that of the Early Archaic hearths. This may be partially due to the intensity of the occupation and the potential for the cultural disturbance of the feature. Nevertheless, the general form for hearths of this period is apparently an irregular cluster of burned rocks.

This development of hearth form is especially interesting when one notes the formal pit hearths of the Twin Sisters stratigraphic unit represented at the Bryan-Fox site (41WM124). Perhaps, these structural differences are related to differences in function or duration of the occupation rather than a developmental trend in feature forms. Since the hearths of both the North Fork and Granger Lake assemblages are very similar during the San Marcos culture/time stratigraphic unit, the change in structure of the hearths of the Twin Sisters stratigraphic unit of the Granger Lake assemblages appears even more radical. Whether or not the differences in hearth structure reflect functional or stylistic differences continues to elude researchers. Given the structural differences and the associated heat altered soil surrounding the Twin Sisters Phase pit hearths, it is generally assumed that functional differences are represented. Unfortunately, the associated remains have exhibited no patterning indicative of functional varability.

Conclusions

The Cervenka site represents a very extensive deposit (both vertically and horizontally) of cultural refuse within the Granger Lake Reservoir area. The position of the site at the intersection of the upland prairie and the probable bottomland gallery forest was likely attractive because it allowed group of hunter-gatherers to utilize the resources of both environments. The broad horizontal expanse of the cultural remains suggests that the site was repeatedly utilized by numerous groups during the Archaic period.

Table 8.10-7. Lithic Materials 41WM267

Lithic Remains	Features															
	1	2	3	4	5	6	7	8	9	10	11	12	13	16	19	20
Primary Flake					2(1)*				1							
Secondary Flake >50% cortex	2(1)	2	3	3(1)	8	2			17(1)	1(1)	2(1)	6		2		
Secondary Flake <50% cortex	13(3)	6	9(1)	2	41(4)	10(2)		2	93(5)	5	17(6)	23				
Tertiary Flake	29(7)	24	47(5)	5	199(28)	46(5)	10(2)	4	213(18)	11(4)	56(11)	101(1)	5	1		
Tertiary Blade					1											
Microflake	12		12(1)		79(5)	26(1)			118(6)	8(2)	8(1)	22	1			
Microblade-ter.	1				2				2							
Biface Thinning Flake			1		4											
Core Trimming Flake	1		1			1			2							
Cores/Core Fragments			3(1)		2				3(1)		1	1		1		
Chunk	1(1)	9(1)			1	2(2)			2(2)							
Chert	126(41)	7(1)	27(4)	3(1)	266(45)	49(7)	7(1)	8	287(61)	23(13)	46(10)	138	10			1
Blade Fragment									1							
Scraper									1							
Denticulate										1						
Borer															1	
Graver															1	
Burin						1			1							
Retouched Piece					1				2		1					
Biface Fragment			1		1				6	1	2	1				
Projectile Point **			1						8			1				
Grinding Slab **					1						4					
Fire-cracked Flint			1						6	10						
Limonite									1							

* Heat Altered Specimens

** Includes Fragments

As previously noted, the site was intensively occupied during the Archaic period between 6000 and 1750 B.P. Although there is no direct evidence concerning the reasons for the decreasing utilization of the site after 1750 B.P., it is probable that the river was cutting a new channel farther away from the site. The increasing distance to water may have significantly altered the attractiveness of the site for even short term occupation.

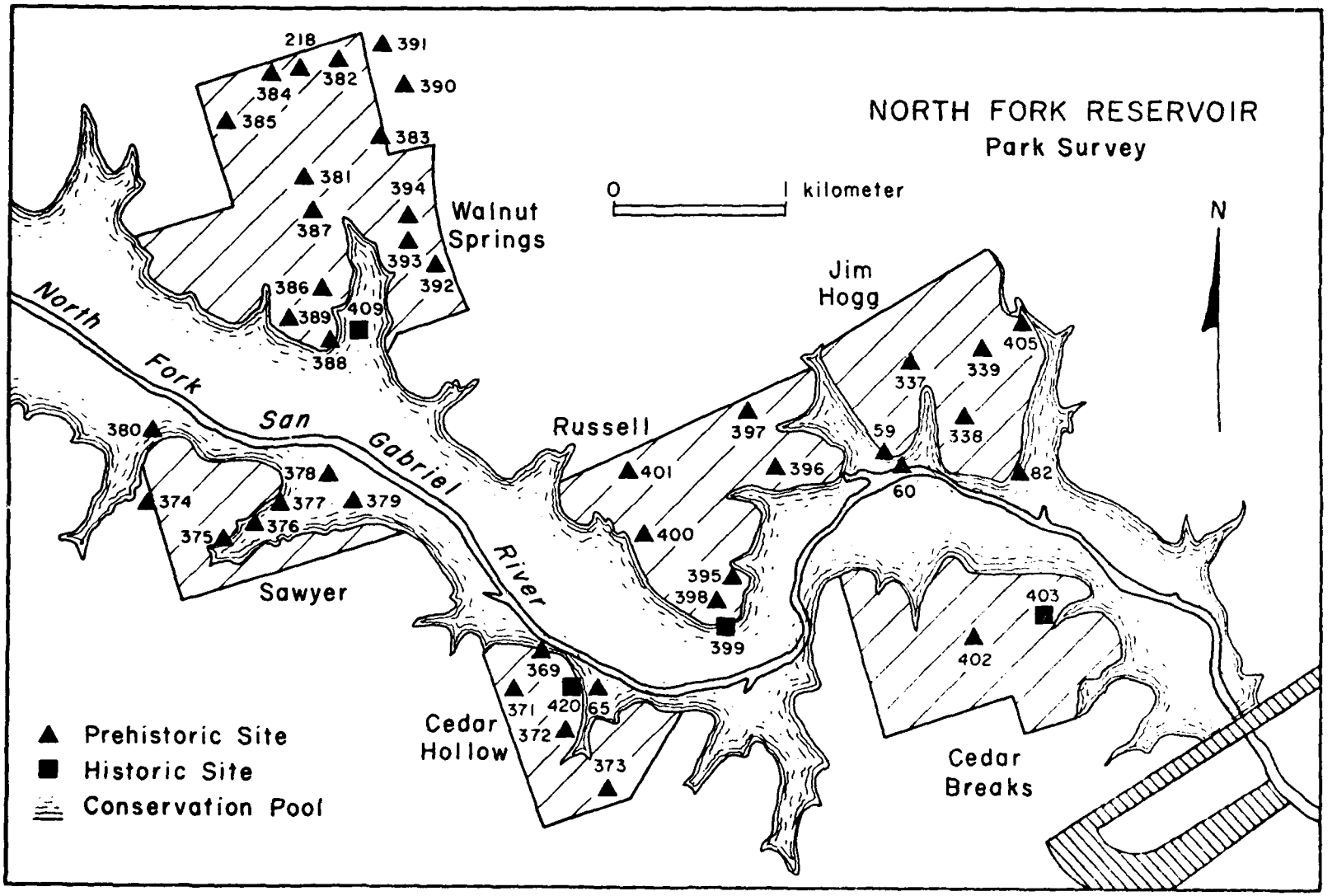
The evidence from the Cervenka Site presents some important questions concerning the relationships of sites within the prairie environment of Central Texas to those within the Edwards Plateau region. The most intensive period of occupation at the Cervenka Site is during the Clear Fork Phase. Although the upper temporal limits of this occupational phase are unknown for the Cervenka assemblages, it is apparent that the Clear Fork component is temporally equivalent to the Clear Fork Phase as defined for the Edwards Plateau region of Central Texas (Weir 1976). The resemblance ends there, however. Only a very few of the traditionally recognized diagnostics of the Clear Fork Phase are present within the Cervenka assemblages. Instead, the morphological affinities of the projectile points appear to be closer to specimens from assemblages found east of the Balcones Escarpment in the prairie lands. Similarly, the projectile forms from the Clear Fork component are minimally represented within the North Fork Reservoir. Whether these stylistic differences represent adaptations to different environments, actual social boundaries, or a combination of these factors is very difficult to interpret. It is not improbable that during the Early Archaic different social groups were adapting to the prairie and Edwards Plateau regions, respectively.

Equally interesting is the lack of artifacts diagnostic of the Round Rock culture/time stratigraphic unit within the Cervenka Site deposits. The Cervenka Site was apparently not utilized at the same time that occupation within the North Fork of the San Gabriel River valley was at its greatest intensity. Why the Cervenka Site is not utilized during this period is not immediately clear. Perhaps, the usual diagnostics associated with the Round Rock Phase of the Edwards Plateau region are not those utilized during the same period within the prairie areas. However, a Round Rock component has been recognized within the Loeve-Fox (41WM230). Several Pedernales points and a Marshall have also been recovered from site 41WM122 below the Granger dam. If these are the only components of the Round Rock Phase within the Granger Reservoir area, then there are significant differences in the adaptations to the two ecozones. The probability of other buried components of the Round Rock Phase within the prairie areas of the San Gabriel River drainage precludes any conclusion at this time that the Round Rock Phase occupations as defined for the Edwards Plateau region are not common within the Granger Reservoir area. Radiocarbon dates together with diagnostic artifacts will need to be recovered from these and other sites before the adaptations to the prairie area and Edwards Plateau region of Central Texas during the Round Rock Phase can be adequately assessed.

IV. RESULTS OF SITE SURVEY AND TESTING

This section consists of four chapters which present the results of site survey and test excavations in the North Fork and Granger Reservoir Districts. The initial contract with the Corps called for archaeological and historical surveys. The archaeological survey was limited to Government owned property above the flood pool, specifically the proposed park areas. The sites located during that survey are described in Chapter 9. Because no previous historical survey had occurred, the NTSU background research and survey was to include all lands in each reservoir. Chapter 10 presents the results of the historical survey. Chapter 11 presents research conducted on the Hoxie Ranch as a result of a contract modification. Another modification required test excavations at twenty two sites, most of which were discovered during the surveys. The results of testing prehistoric and historic sites are presented in Chapters 12 and 13 respectively.

Figure 9.1-1


NORTH FORK RESERVOIR
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1 kilometer
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Walnut Springs
Jim Hogg
Russell
Sawyer
Cedar Hollow
Cedar Breaks
North Fork San Gabriel River
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Prehistoric Site
Historic Site
Conservation Pool

9.0 Site Survey in Public Use Areas

by

Olin F. McCormick

During periods of inclement weather in mid-January 1978 some 5000 acres of park and recreation lands surrounding Granger and North Fork reservoirs was intensively surveyed for cultural resources. Sleet, snow and ice hampered the survey teams and several locations had to be surveyed several times in order to guarantee adequate coverage. The purpose of this work was to locate all the archaeological and architectural cultural resources within the park and recreation boundaries which might be adversely effected by the park construction or subsequent public use of these areas.

A total of 80 sites were located, or relocated, and evaluated. Figures 9.1-1 and 9.2-1 illustrate the general locations of the sites within the various parks. Pertinent data on each site will be discussed by reservoir and park. Sites previously identified by the Texas A & M survey effort were relocated and assessed in the same manner as the new sites. Here, as in the case with sites in the reservoir basins, it was soon discovered that for whatever reasons, many of the initial evaluations were incorrect or woefully inadequate.

9.1 North Fork Reservoir Parks

Cedar Breaks (Previously San Gabriel, Fig. 9.1-1)

41WM402. This large scatter is continuous over the majority of the proposed Cedar Breaks. The area was only surveyed to the park limits. The lithic debitage and now material obviously extends beyond the park limits to the south and west. The most dense concentrations lie above the 850' contour. Wherever, one can see the ground, debitage, broken bifaces, cobbles, and cores are abundant. The estimated area of occupation is in excess of 640,000 square meters and about 10 cm deep.

The vegetation is quite dense, primarily cedar trees, but the actual ground cover was sparse and appearing mainly in open areas or near oak trees. The site has been eroded by rain and gullying, but it has not been disturbed, excavated, vandalized, destroyed or tested. Field records and surface collections were made, but no photographs or special samples were taken.

The site appears to be a lithic procurement/workshop area and is recommended for further investigation.

41WM403. Thi s site is a historic house site. The foundations or collapsed walls are those of a historic structure. The structure lies

on the north side of a precipitous drainage that flows northeast into the North Fork of the San Gabriel River. The remaining structure consists of limestone slabs laid out in a 4x3m rectangular pattern. Mortar was used to hold the slightly irregular slabs together. In the northwest corner of the structure there maybe the base of a fireplace intact.

The estimated area of occupation is 100 sq. meters and the depth is unknown.

Very few historic artifacts were found in the structure itself. Pieces of glass and blue feather china were found outside the structure. Approximately 30 meters upslope from the structure there appears to be a historic dump. It's age appears to be post 1920's.

Photographs, field records and general collections were all made.

The site warrants further investigations. The age of the site is presently unknown but probably dates to the late 1800's. Historical records need to be checked. Also, a fireplace hearth area may still be intact under rubble as well as wall foundations.

Cedar Hollow (Fig. 9.1-1)

41WM65. This site was mislocated on the maps provided by the Texas A & M survey and the historic component of the site was assigned an additional site number, 41WM420. It is mentioned here simply to explain the numbering system and site 65 is discussed in section 9.4 of this report.

41WM369. This site is a small lithic scatter along the NW, or lake edge of the park area. The estimated surface area is approximately 70 square meters and is surficial in nature. The size of the site and its location on the upland slope make it highly likely that it is a small workshop area situated at an outcropping of flint. Complete field records were made but no collection was made and no further work is recommended.

41WM371. This site is an extensive lithic procurement/workshop area within Cedar Park area of North Fork Reservoir. The estimated area of occupation is 1000+ sq. meters and it is a surface site with no evidence of depth.

Several artifacts and quantities of debitage were found and collected.

The site is in an upland setting with sparse grass and timber cover. It has been somewhat disturbed by erosion and the surface is deflated.

Site survey forms and complete field records were made out for this site. A sketch map was also made but no collections or photographs were taken.

The site will be in Cedar Hollow Park of the North Fork. Any disturbance of this area by public utilization will result in the loss of information value for the site. All remains are surficial and as such are fragile and easily impacted. Some collecting has possibly gone on here. This site, however, is a series of workshop areas and appears to have been extensively utilized over a long period of time. Investigation could lead to the definition of in-situ debitage and the site is recommended for further study.

41WM372. This site is a lithic scatter/procurement area on an old terrace adjacent to Cedar Hollow Creek. The size of the site is 500 meters NE/SW x 25m and it is surficial in nature. Some chipped stone artifacts, fire-cracked rock, dart points, and debitage were found but not collected.

The site is located on a fluviatile terrace with scrub brush and grass cover and appears not to have been disturbed.

Field records were filled out on this site but no photographs or collections were made.

This site is separated from upland site 41WM371 and appears to continue to the west onto "posted" land.

It appears that the site is located along a horizontal outcrop of flint, probably the same one as 41WM369. No further work is recommended because it is felt much of the material is no longer in-situ because of soil movement down slope.

41WM373. The site is a surficial lithic scatter/procurement/workshop area. There appear to be distinct work areas and thus the chance of isolating the debitage from specific tool manufacture. The estimated area of occupation is 1000 x 250 meters.

Several artifacts were noted including bifaces, retouched pieces, point fragments and debitage were all seen.

The site is located on an upland slope with sparse scrub brush and grass cover. The site is not disturbed.

Field notes were taken but no collections or photographs were taken.

Further investigation is recommended for this site as a comparison with 41WM371 and 41WM402.

Sawyer (Fig. 9.1-1)

41WM374. This site is a lithic scatter on a deflated slope along the East side of Sycamore Hollow. The estimated area of occupation is 200 square meters. No depth to the deposits is expected.

Artifacts consisting of bifaces, unifaces, fire-cracked rock and debitage were noted

The site is located on an upland slope with sparse grass cover. The soil is tarrent stony clay and is eroded by gullying.

Photographs, field records and collections were all made. A map was also drawn. No further work is recommended for this site.

41WM375. This site is a small lithic scatter on the second major gully on the North side of Sawyer Hollow. The site is quite ephemeral in nature and appears to have been a one-time utilization of some naturally occurring flint cobbles eroding along the gully edge. The estimated area of occupation is unknown. The depth of the site is not known but thought to be only surface.

Several artifacts were noted including a retouched piece debitage a core and a retouched blade.

The soil type is tarrent stony clay and the site is located on an upland slope with ground cover consisting of grass, scrub brush and juniper trees. It has been eroded by rain, gullying and snow and ice. No further work is recommended for this site.

41WM376. This site is a lithic scatter on an arroyo from San Gabriel river up to Sawyer Hollow on the southwest side projection into Hollow bottoms. The estimated area of occupation is 15 sq. meters and there appears to have no depth to deposits.

No tools were found but some debitage was noted. No collections were made.

The soil type is tarrent stony clay and the site is located on an upland slope with the major gound cover being grass and juniper trees. The site has been eroded by rain, wind, ice and snow and gullying. No further work is recommended for this site.

41WM377. This site is a lithic scatter mixed with Late Historic house-type trash. The estimated area of occupation is 15-30 sq. meters with ro depth to deposits.

Some flint flakes were found but no diagnostic tools were noted. Glass, iron and other late historic trash was also noted.

The soil type is a tarrent stony clay and the major ground cover

is grass, scrub brush and juniper trees.

The site has been eroded by snow and ice, rain and gullying. No further investigations are recommended for this site.

41WM378. This site is a scatter of lithic debris, cores and biface fragments. The estimated area of occupation is 60 sq. meters with possibly 1 to 3 meters of deposit.

Several artifacts were found such as bifaces and chipping debris but no diagnostics were noted.

The soil type is tarrent stony clay and the site is located on a floodplain with improved pasture being the major ground cover.

Further investigations were recommended for this site to determine if it has in-situ deposits similar to those at 41WM53.

41WM379. This site is a terrace edge site which was exposed in the road. It runs west from two large oak trees covered with bromiliades. The estimated area of occupation is approximately 100+ square meters and the depth is unknown. Dart points were found as well as chipping debris.

This site is located on a fluviatile terrace with grass (very dense) being the major ground cover.

This site warrants further investigations. The only exposure of site is in an old farm road from river to Cedar Hollow. It may have some depth to deposits and is in a situation similar to 41WM419 which was destroyed by construction operations.

41WM380. This site is a smallburned rock midden NW of Sycamore Hollow in an old pasture some 400m SW of 41WM58. The estimated area of occupation is 35 sq. meters and it is thought to be from 1 to 3 meters in depth. A few bifaces and some debitage were noted.

The soil type is tarrent stony clay/loam and the site is located on a fluviatile terrace with cultivated grass being the major ground cover.

The site has had minor disturbance caused by a farm road crossing it, but is largely intact.

This site should be further investigated since it may have a relationship to 41WM47 and 58. The majority of the midden seems to be covered with alluvial deposits which may have protected it from vandals.

Walnut Springs (Fig. 9.1-1)

41WM218. The site is an archaic site. It is a burned rock midden with an associated lithic scatter. The midden is located on a small alluvial fan on the east bank of the western fork of Taylor Ray Creek. The burned rock midden is immediately northeast of an Anglo hunting cabin and just northwest of a gravel road. The road has damaged the southern edge of the site. The site was originally located by the Texas A & M survey but no information is presented on the site in any of their reports.

The site is located on an upland slope and a floodplain rise. It is sparsely covered with grass as well as juniper trees and limestone bedrock outcropping. The soil is a stony clayey silt with limestone bedrock. The estimated area of occupation is 10,000 sq. meters and the depth is estimated to be from 0 to 1 meter.

The site was slightly disturbed by the Anglo cabin and gravel road. A depression on the southern edge of the midden may be a pothole but it does not appear to be more than 15cm deep and has not seriously damaged the site.

It is unusual to find a burned rock midden in the upland setting, and the site should be tested to determine if it is functionally different from those which are nearer the river and at the base of the uplands. The site is similar in situation to that of site 41WM330.

41WM381. The site lies on the valley floor and the alluvial fan of a drainage to the west and consists of lithic debris and some tools (bifaces) on the valley floor. Scatter is continuous, however, concentrations are evident. The estimated area of occupation is 10,000 sq. meters and the depth is guessed to be not more than 20cm.

The first concentration is at the southeast end of the site. As one proceeds northwest, the scatter becomes thinner. Near the upper end of the scatter, bifaces and lithic debris become more concentrated again. At the southeast end of the scatter a concentration of large primary and secondary flakes were encountered. The second concentration appears at the northwest end of the site. Bifaces and smaller lithic debris elements are present. Some material is in the large clearing to the east, but it is much less dense. Juniper trees are dense throughout the site area. Grass cover is relatively thick.

It is considered unlikely that the site is in primary context because of erosion and colluvial movement of soils. No further work is recommended at this time.

41WM382. The age of this site is unknown. It is a very sparse lithic scatter, with no apparant depth to deposits. Noted were flint flakes, tools, and small lithic debris. Flint debris was seen on the surface on upland ridges on both sides of the upper eastern fork of

Taylor Ray Creek. The scatter was thin and discontinuous.

No diagnostic artifacts were found, although several bifaces were noted. The estimated area of occupation is 100,000 sq. meters. The depth is thought to be < 10cm.

The site is located on an upland area and is sparsely covered with grass and juniper trees. The soil is silty clay material with much limestone bedrock outcropping.

The site has been slightly eroded and shows evidence of deflation.

The site needs no further investigation because of its lack of depth, sparseness of artifacts and lack of defineable activity areas.

41WM383. This site is a lithic scatter on the north side of the fourth side drainage emptying into Taylor Ray Hollow from the east side. Small flint flakes and chips are thinly scattered over the site except for the extreme northern edges where some cores were also found.

The site encompasses an area approximately 150 meters from east to west and 100 meters from north to south. The estimated area of occupation is 15,000 sq. meters and the depth is estimated to be no more than 5cm.

The site is on an upland ridge which is running parallel with the drainage at the bottom of the slopes. The ground is sparsely covered with grass and juniper trees with limestone bedrock outcroppings. The soil is clayey silt material with limestone bedrock.

No further work is recommended because of the thinness of the artifact distribution and the lack of depth of deposits.

41WM384. Site 41WM384 is a lithic scatter along the terrace above the upper end of Taylor Ray Hollow (West Fork). An abandon hunting cabin is below this scatter on the opposite side of the creek. This scatter is more dense than the northern section of a similar scatter on the east bank of the creek. The scatter lies on a rock bench just above the creek. The site continues upslope approximately 10m above the rock bench and is directly west and above 41WM218.

The estimated area of occupation is 14,000 sq. meters. Dart points and retouched pieces were noted with retouched pieces common throughout the scatter. One biface and two biface fragments were located.

The site is on an upland slope area, sparsely covered with grass and dense cedar. The site is in good condition, however, some erosion has occurred.

The relationship of this site to the small burned-rock midden, 41WM218, should be established. It appears that 384 may have been

a lithic procurement/workshop area associated with the midden and any work on 218 should include collection of 384.

41WM385. This site is a large lithic scatter possibly a procurement/ workshop along the upland ridge between Taylor Ray Hollow and Walnut Spring Hollow. This scatter covers the entire ridge. The western limits are unknown because the site continues onto private land. A more dense concentration of primary and secondary elements appear on the northern slope of the hill. On the southeastern slope of the hill numerous large cobbles of chert indicate quarrying activities while smaller cobbles appear to have been utilized in the northern sections of the site. The estimated area of occupation is 960,000 sq. meters with a depth estimated to be 30 cm. One denticulate, one biface and three retouched pieces along with quantities of debitage were noted.

The site is located on an upland slope and the ground is covered sparsely with grass and dense cedar timber. The site was 15% cleared by bulldozing and it is partially eroded by rain and gullying.

One feature appears within this area. As one moves upslope, a mound appears that resembles a burned rock midden. However, no burned rock was seen. An oval formation of limestone slabs surrounds a 30-50 cm deep depression. The slabs were sloping into the depression and did not appear to be a natural position. However, there was nothing to indicate that this feature was necessarily of prehistoric origin. No further work is recommended for this site.

41WM386. This site is a sparse lithic scatter approximately five meters in diameter. A few burned rocks were noted downslope to the south from this scatter and this site may have served as a short-term chipping area. The estimated area of occupation is 25 meters and appears to be a surface scatter only.

No artifacts or retouched pieces were noted or collected. The site is located on an upland slope in heavy cedar timber and with some evidence of erosion. No further work is recommended at this site.

41WM387. This site is a scatter of broken cobbles, relatively few pieces of debitage and a few chert nodules. Bedrock protrudes from the soil in most places and much of the chert maybe naturally fractured and is not of as high quality as that on the ridges to the north and east. The estimated area of occupation is 110 sq. meters and does not seem to have any depth. Some chipped stone artifacts, bifaces and chipping debris was noted.

The site is located on an upland slope which is eroded. The ground cover is very sparse. Dense cedar is the dominant vegetation. Evidence of erosion is extensive and no further recommendations are made for work on this site.

41WM388. This site is a sparse lithic scatter located on a point

overlooking Taylor Ray Hollow and North Fork of the San Gabriel River. This scatter (25 x 10 meters) is like the others on this ridge except higher quality raw material was noted. The site was probably a short term lithic manufacturing station. The estimated area of occupation is 250 sq. meters and no depth was noted. Chipping debris and some biface fragments were seen, however, no burned rocks were noted.

The site is located on an eroded upland slope with dense timber cover in the form of thick stands of cedar trees. The site has been eroded by rain and gullying. No recommendations for further work on this site are made.

41WM389. This site consists of ten piles of porous limestone slabs. The piles or rock are obviously cultural, derived, but the reason for their existance is not known. There are no associated artifacts that might give some idea of their age. If any earth had been included in these mounds, it has long been eroded away. Nine of the mounds form a rough semicircle along the edge of the upland. The other sits by itself further upslope.

The site is approximately 600 meters in diameter and the depth is unknown. It is located on the upland edge above the North Fork of the San Gabriel River. To the west of the site is a gully and to the south the surface slopes downward to Jim Hogg Road.

The site is on an upland slope with bedrock present everywhere. Ground cover is very sparse except for cedar trees and occasionally an oak tree.

The origin of these obviously unnatural limestone piles warrant further investigations, and is so recommended.

41WM390. This site is an upland lithic scatter located on the 990 contour line in the northeastern edge of Walnut Springs Park. The entire site extends outside of the actual park area, but since boundaries were unclear, researchers reported the site.

The estimated area of occupation is 25,000 meters and the site measures approximately 200 meters from east to west by about 125 meters from north to south. The center of the site is 425 meters SE of the northern most corner of the park and it has a depth no more than 5 cm.

Lithic debris consisting of small secondary and tertiary flakes is thinly spread over the surface of the site and one biface was noted.

The site is located on an upland slope with sparse grass cover with juniper trees located among bedrock outcrops and has suffered some erosion and deflation of its surface.

No further work is recommended because of the sparseness of the

artifacts, the lack of depth, and the absence of definable specialized activity areas.

41WM391. This site is a lithic scatter east of northern most corner of Walnut Springs park. The estimated area of occupation is 25,500 sq. meters and approximately 10 cm deep. The area location measures 210 meters from east to west and 120 meters from north to south. The northern limits of the site were not established when it was realized it was outside park boundaries. The center of the site is approximately 150 meters due east of the northernmost corner of Walnut Springs Park. The known part of the site then is south and east of the extreme northern corner of the park. Debitage was the only evidence found at this site.

The soil is clayey silt and limestone bedrock and the ground is sparsely covered with grass with juniper trees present among the limestone bedrock outcrops. Limestone bedrock and limestone boulders cover 50% of the surface.

The thinness of the spread and the lack of definable activity centers make it undesirable for further investigation at this time.

41WM392. The site can be described as a lithic scatter covering a large horizontal area that measures at least 1,100 meters from north to south and more than 300 meters from east to west. The complete estimated area of occupation is 220,000 sq. meters with 10cm depth. The northern, southern and eastern limits were not located because they extend outside the park area. The site runs parallel with the eastern fenceline of the park beginning with the extreme southeast corner of the park and moving up the fenceline about 1,100 meters. The site extends downslope or westward from this fenceline from 150 to 300 meters in various spots.

Some collections were made of the various types of chert on the site. Several tools were noted such as bifaces, retouched pieces, biface fragments and one retouched blade.

A recently built Anglo home was discovered in the southeast corner of the site within the park boundaries. A newly built paved road running generally north and south devides the site in half. These constructions have damaged the site but the southeastern area might be good for surface collection. However, no further work is recommended at this time.

41WM393. This site is a very small but densely concentrated lithic scatter the center of which is approximately 300 meters northeast of the point at which the third drainage creek on the east side of Taylor Ray Hollow intersects the main creek. It is located on the southern upland slope of the side drainage.

The estimated area of occupation is 2500 square meters and 10 cm

deep. The site covers an area no more than 50 x 50 meters.

The site is located on an upland slope, dense grass cover with juniper outcropping among the limestone rock. It has been disturbed by moderate erosion caused by rain and gullying. No further work is recommended for this site.

41WM394. This site is a lithic procurement area. Flint cobbles are outcropping in an area measuring approximately 50 meters from north to south and 20 meters from east to west. There is evidence that someone was recently knapping flint in the immediate area. The outcrop is located on the Southern upland slope of the third eastside feeder drainage running into Taylor Ray Creek. It is approximately 425 meters northeast of this point at which the feeder creek empties into Taylor Ray Creek. It is approximately 425 meters northeast of this point at which the feeder creek empties into Taylor Ray Creek. The site is about 125 meters northeast of site 41WM393, a lithic scatter. The total estimated area of deposit is 1000 sq. meters and approximately 10 cm deep.

The site is located on a southern upland slope with sparse ground grass cover and juniper trees scattered among the limestone rocks. The site was slightly disturbed by erosion and a gravel road that cut through it. The erosion was caused by rain and gullying. No further investigations of this site is recommended.

41WM409. This is the site of the historic Taylor house and farm. It was located during the historical survey of North Fork reservoir and is discussed in the testing section of this manuscript.

Russell (Fig. 9.1-1)

41WM395. This site is a lithic scatter with flint debris spaced on the surface over an area measuring 200 meters from north to south and 40 meters from east to west. The site is located on the 830' contour line about 650 meters NW of the point where Jim Hogg Road crosses the San Gabriel River at Russell Crossing. It is just west of a dirt road shown on the USGS map on the east side of the first highland ridge on the north side of the San Gabriel River upstream from Russell Crossing. The estimated area of occupation is 8000 sq. meters and about 5 cm deep.

Debitage and one end scraper was noted by the survey crew, but no other tools were seen.

The soil type is a stony clay and limestone rubble over bedrock. Juniper trees are dense in the area and comprise 90% of the ground cover.

The site has been disturbed by the road and has also suffered from soil erosion and gullying.

Because of the nature of the cultural remains at this site, no further work is recommended.

41WM396. This site is a very extensive lithic procurement and workshop area. It occupies the southern side of the second drainage up on the east side of the first highland ridge jutting out southward on the north side of the San Gabriel River after one proceeds upstream from Russell Crossing. The site then swings westward around the head of this second drainage and continues on the uplands north of the drainage and extends eastward on the top of that ridge. Site 41WM61 is at the bottom of the east end of the ridge. The estimated area of occupation is 150,000 sq. meters and about 10 cm deep.

Several grades of flint, mostly coarse to very coarse grades are outcropping in this upland area. Cobbles were found both broken and unbroken. A few larger flakes, including primary, secondary and a few tertiary flakes were seen but for the most part only large cobbles are visable. The outcroppings were particularly dense around the head of the drainage. No diagnostic artifacts were found.

The soil is a stony clay and limestone rubble and bedrock. Juniper trees are dense and grasses only appear in small clearings created by projections of the bedrock. The site has been slightly disturbed by brush clearing and erosion caused by rain. No further work is recommended at this site.

41WM397. This site is a lithic procurement area on the north side of the third east side drainage on the first upland ridge jutting southward on the northern side of the San Gabriel River upstream from Russell Crossing. The estimated area of occupation is 70,000 square meters and 5 cm deep. The site measures about 700 meters from southwest to northeast. It is approximately 90 meters wide. The site is across the drainage or north of the northern part of 41WM396. It is similar in nature to 396 in that it is a lithic procurement area containing the same types and grades of flint.

The soil is stony clay with limestone bedrock outcropping. Juniper trees were dense among the bedrock.

The site was slightly disturbed by gullying and rain.

It should be noted that this site encompasses previously recorded sites 41WM193 and 41WM194. Both of the latter appear to simply be slight concentrations within the larger scatter and should not be listed as separate sites. No further work is recommended at this lithic scatter.

41WM398. This site is found on a series of terraces along County Road 262. The lower edge of the site starts just above the intersection

of Jim Hogg Road and County Road 262. The site extends westward to a small gully and stretches upslope over four terraces. Lithic debris and tools appear on the lower terraces while more cobbles and cores appear on the upper ones. Since the site lies on an eroded upland slope, the distribution of debitage and raw material maybe the result of slope wash. The estimated area of occupation is 6000 sq. meters with no recorded depth.

The site is located on an upland slope with dense cedar timber and sparse grass cover, making evaluation difficult. It has been eroded and deflated by rain.

Surface collections could provide valuable information about chipping stations and procurement areas if slope wash has not greatly affected the artifact distribution. Consequently it is recommended that this site be further studied, possibly in conjunction with site 41WM402 in Cedar Breaks park.

41WM399. This site is a historic scatter associated with a pile of rubble that maybe the remains of a chimney. The estimated area of occupation is 400 sq. meters and the depth is unknown.

Some of the glass scattered about appears to be burned, possibly from a dwelling which burned here in the past. Sherds of glass, crockery, fine ceramics and square nails are scattered about the pile of rubble. An ornately decorated piece of metal sheeting was also noted as well as part of a coffee grinder.

The site is located on an upland slope terrace edge. Dense timber and grass covers the area and the site does not appear to have been disturbed since abandonment.

This site may be of historical significance at the local level. Excavation and an interpretative exhibit could greatly enhance this park area's attraction for visitor. The site will be further evaluated during the historical surveys (see sections 9.3 and 9.4 of this report).

41WM400. This lithic scatter appears above an active spring on the upland surface. Near the bluff edge, lithic debris is thinly scattered. As you travel northward along an old fenceline, a prolific scatter of chert cobbles and debitage are present. This is the most dense area of the site. As with most of the upland sites, the material lies on a deflated surface. The estimated area of occupation is 1000 square meters, and is a surface scatter only.

The site is located on an upland slope with cedar trees the predominant vegetation.

The site is eroded and has several erosion gullies. No further work is recommended for this site.

41WM401. This site is a sparse lithic scatter extending from the upland edge at the western extremity of Russell Park to County Road 262 and beyond to the head of an eastward draining hollow. The scatter is rather sparse but quite extensive. The estimated area of occupation is 100,000 sq. meters with approximately 20 cm of depth maximum.

The site is an upland slope area. Vegetation varies from almost nothing to a dense cedar thicket. Grass cover is rather sparse even in clearings and bedrock appears at the surface in numerous areas. The site has been somewhat eroded by rain.

No further investigation is recommended for this site.

Jim Hogg (Fig. 9.1-1)

41WM59. This site was originally recorded by Texas A & M, but since no data were provided (Patterson & Moore 1976:33) it was checked again. The site is a burned rock and flint debris scatter on the surface of an area measuring about 50m x 50m. The southern half of the site has about 1 meter of depth but has been damaged by bulldozing. The northern half of the site is badly deflated to the point that brown sandy clay caliche is visible. The site is located north of the last big curve in Ox Hollow Creek. The estimated area of occupation is 2500 square meters and about 1 meter deep.

No diagnostic artifacts were found although substantial amounts of debitage were noted.

The site is located on a fluviatile terrace with sparse grass cover. The soil may be described as clayey sandy silt.

The site has been disturbed by bulldozing and eroded by rain.

No further work is recommended on this site because erosion has left the upper half of the site deflated and the southern area, which has some depth, has been damaged by bulldozing.

41WM60. This site is burned rock on the surface on a point south of which a south and westerly flowing side drainage enters the North Fork of the San Gabriel River from the north side. The side is approximately 1½ miles NW of the point where the main channel of the river hits the centerline of the dam. The site is located on the 740' and 750' contour lines. It is 100 meters outside of the southwest corner of Jim Hogg Park.

No flint debris was seen on the surface and the site measures about 20 meters from east to west and 10 meters from north to south. The burned rock was found mostly along the eastern edge of the site. Depth is approximately 1 meter in spots.

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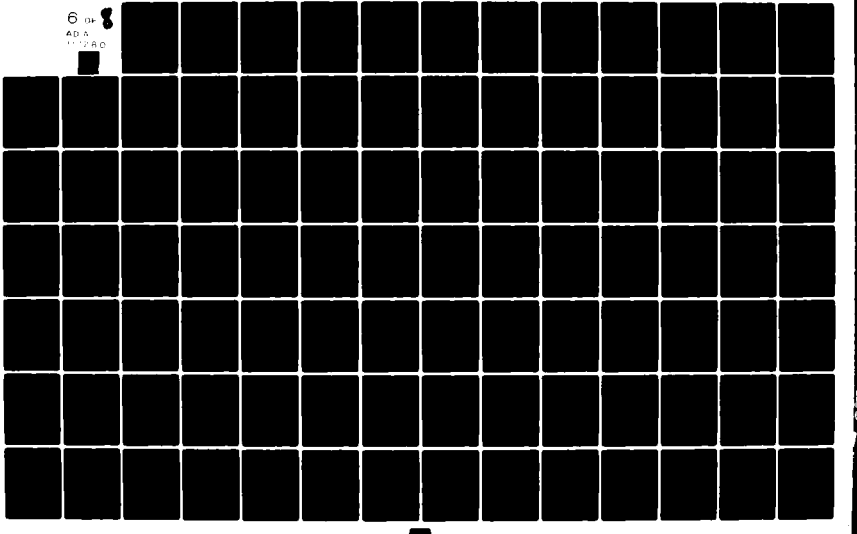

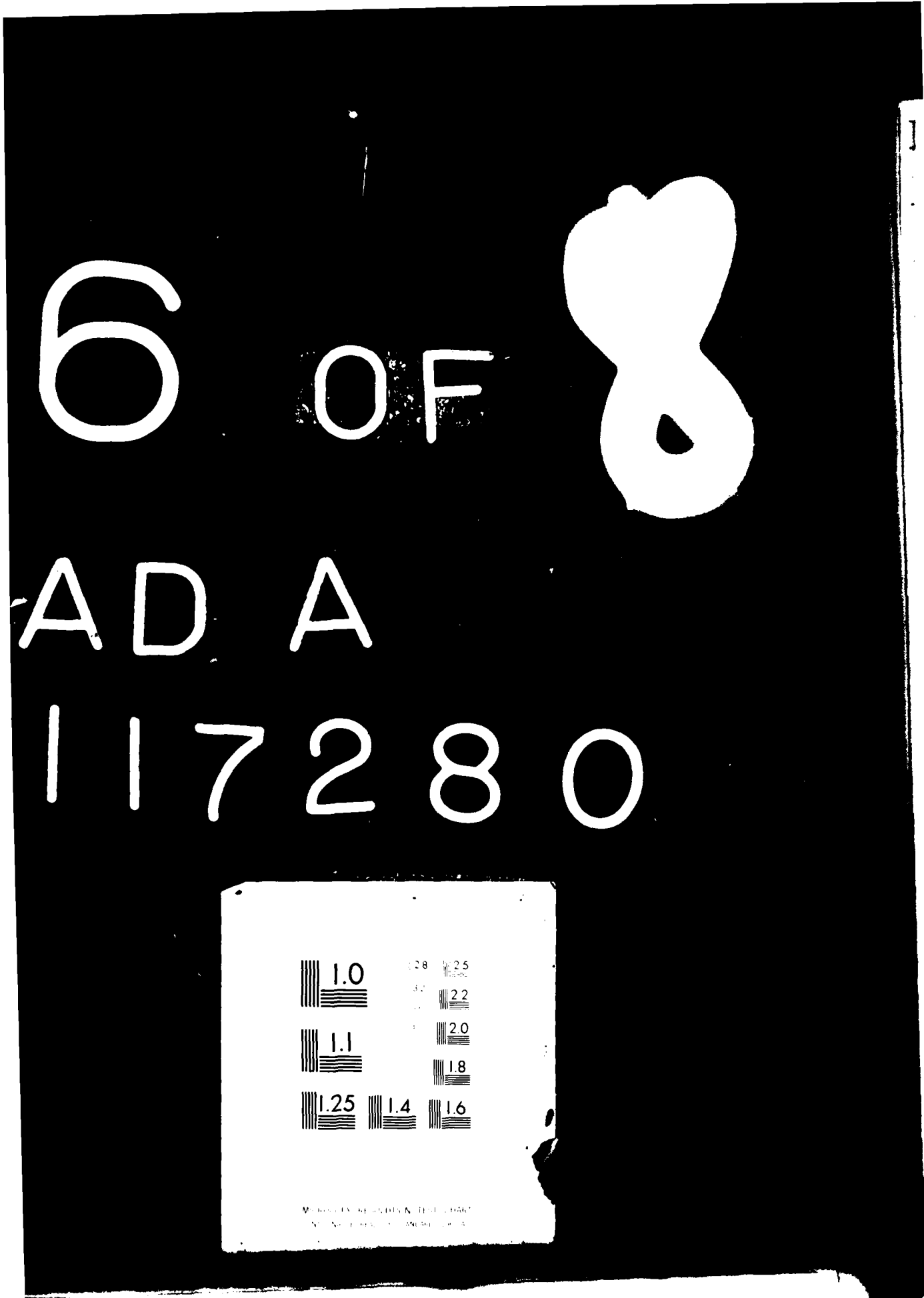
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This site is located on a river bank on a fluviatile terrace with dense grass cover and a few juniper trees growing on the surface.

The site should be tested to determine depth and to see if there are buried artifacts in addition to the burned rock already seen on the surface. Because of the site's location on the river terrace there is a possibility of features buried beneath the surface.

41WM82. Two burned rock middens (BRM) are located in the southeast corner of Jim Hogg Park on the top of a ridge that drops vertically about 25 meters to the San Gabriel River channel below. The burned rock middens are located on the north side of the channel. Combined with the lithic scatter, the site is about 180m from east to west and 100 meters from north to south except on the eastern edge which faces south running drainage that empties into the North Fork. Here the site is about 150 meters wide.

The eastern BRM is about 36 meters north of the edge of the cliff. It is about 6 meters in diameter. There is a small shallow pothole in the top of the mound and a larger hole about 1 meter in diameter in the western edge of the mound. Seventeen meters southeast of this BRM is a four sided 1 meter high rock walled corral which is about 9 meters on each of its sides. Two holes alligned on the cardinal directions and measuring about 1 x 2m have been dug and refilled on the North side of the corral. Other smaller holes have been dug within the corral.

The other BRM is about 40 meters west of the first and about 15 meters north of the cliff's edge. A large pothole about 2 x 2m has been dug in its center.

Flint debris is especially dense east of the BRM's and along the cliff's edge. Several diagnostic artifacts were noted including: 1 Marcus point, 1 possible Wells point fragment and 1 unidentified dart point. About 10 bifaces were also found. Burned rock and debitage were also seen over the entire area.

The soil type was a stony clayey silt material. The site is located on an upland slope with the major ground cover being sparse grass on limestone bedrock and juniper trees.

The site has been heavily damaged by pothunters and erosion has also been a problem The overall condition of the site is bad.

No further work was recommended for this site because of its almost total destruction by pothunters.

41WM337. This site is a dense accumulation of flint cobbles and chipping debris on the surface on the upland ridge that is the western half of Jim Hogg Park. The recorded part of the scatter has its northern boundary on the northern fenceline of the park. It extends north of this

fenceline but since this is outside the park area, it was not investigated. The site's eastern border is the western slope of a side drainage that divides the park area into eastern and western halves. The site's southern boundary is the 78' contour line where the ridge drops to the river channel. The site's estimated area is 165,000 sq. meters. The site's boundaries are hard to define because flint outcrops all along the ridge and flint chipping debris consisting of cores primary, secondary and tertiary flakes, etc. are everywhere. Depth appears to be minimal. Limestone bedrock surfaces over about 50% of the Northern half of the site and limestone rubble covers the slope going down the drainage. Elsewhere, pockets of stony clay are seen.

The site includes a previously recorded site 41WM337 which is located in the upper end of the drainage and is simply part of the larger site. In this area there is a good outcropping of chert. The entire Jim Hogg Park, Site C, may be described then as a lithic procurement area with good quality chert and an associated lithic scatter.

One Ensor point and some chert samples were collected. Several other retouched pieces, cores, a scraper and a denticulate fragment were all found.

The site is located on an upland slope with sparse grass cover and thick juniper trees along the ridge. Limestone outcroppings are also numerous. The soil type is limestone bedrock and stony clay.

Bulldozing has ruined most of the northeast part of the site. At the southern end of the site, an Anglo home site and barn were located. The site has been eroded and deflated.

No further work is recommended for this site.

41WM338 + 41WM339. This site is a lithic scatter on the east side of the drainage that divides Jim Hogg Park into eastern and western halves. The lithic scatter's western boundary runs on the eastern slope of this drainage at 800'. The scatter's southern boundary follows the 800' line along the ridge on the top of the bluff that runs eastward parallel with the North Fork channel. The eastern boundary of the site is along the middle of the flattened part of the ridge. The northern boundary of the river is along the 850' contour line. The overall shape of the site is an L with the vertical part running parallel with the side drainage. There it is approximately 200 meters wide and 600 meters long. The bottom or horizontal part of the L is about 500 meters from east to west and 100 meters from north to south. The bottom of the L runs parallel with the river. Some good quality flint was found in addition to several coarse grades. The densest outcropping appears to be at the head of the drainage.

Several artifacts were found including bifaces, retouched pieces and point fragments. The estimated area of occupation is 170,000 sq. meters and 10-20cm deep.

The site is located on an upland slope with sparse grass cover and limestone bedrock and juniper trees prevalent. The soil consists of stony clay pockets and limestone bedrock.

The site has been heavily disturbed by tree clearing, bulldozing and erosion, and the site is not recommended for further work.

Both sites 41WM338 and 41WM339 are actually small artifact scatters within the larger distribution of cultural materials. Here, as in the case of sites 377, 193, and 194, the previous surveys did not correctly assess the extent of the sites before assigning a site designation.

41WM405. This site is a lithic scatter and procurement area on the western upland edge of the side drainage that is the eastern boundary of Jim Hogg Park. Flint outcroppings are especially dense in three areas. Elsewhere flint chipping debris is thinly to moderately scattered on the surface. The site measures about 1000m long and approximately 150m wide. The northern boundary was not found as it is north of the parks' northern limits.

Some good quality chert and several coarser grades were seen. No diagnostic artifacts were found. The estimated area of artifact distribution is 150,000 sq. meters and 10 to 20cm deep. The soil type is stony clay and limestone bedrock and cover is cedar.

The site had been slightly disturbed by tree clearing and erosion and no further work is recommended for this site.

9.2 Granger Reservoir Parks

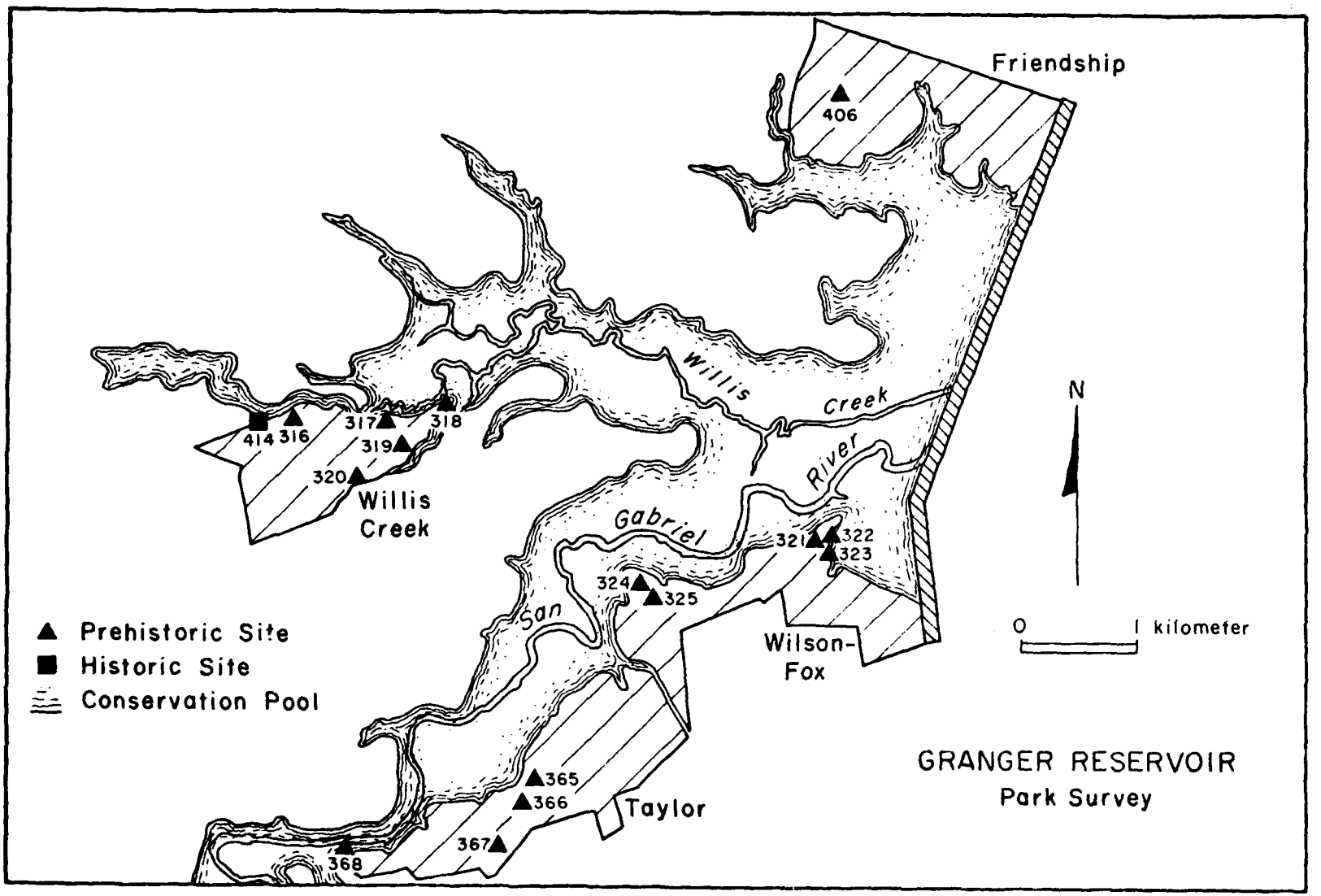
Wilson-Fox (Fig. 9.2-1)

41WM321. This scatter of burned rock and debitage is situated on an upland point jutting out into the San Gabriel valley. The scatter is relatively thin, but this may be due to the heavy vegetation cover. The site extends for approximately 400 m along the upland edge. It is approximately 100m in breadth. The northeast extremity of the point is unaffected by agricultural activities. However, some of the site area has been disturbed by pond construction and agricultural activities. Debitage cores and burned rock were also noted on the [illegible] surface.

The site covers an area of approximately 40,000 sq. meters and is probably not very deep since gravels appear near the surface in many areas. Vegetation over most of the site consists of long grasses and salt cedar bushes and in the Northeast section of the site are occasional hardwood trees.

The site has been damaged by erosion and farming.

No further investigation of this site was recommended since it


Friendship
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Willis Creek
River
Gabriel
San
414
316
317
318
319
320
Willis Creek
321
322
323
324
325
Wilson-Fox
365
366
367
368
Taylor
N
0
1 kilometer
Prehistoric Site
Historic Site
Conservation Pool
GRANGER RESERVOIR
Park Survey

Figure 9.2-1.

appears to be similar to 41WM165, the Tombstone Bluff site investigated by University of Texas at Austin and reported in Appendix J.

41WM322. This site lies on a dissected terrace of a minor drainage which flows northeasterly into the San Gabriel River at the eastern end of the park. Some lithic debris was noted on the terrace and in the creek. A minor gully cuts through the terrace just upstream from the site. The area of occupation is unknown as is the depth of the site. Some lithic debris was found as well as chipped stone artifacts.

The site was covered with dense grass and leaves. Oak and deciduous trees predominate along the drainage. The site has been disturbed by erosion.

Minimal testing (eq. shovel) should be conducted to determine site limits, depth, and the amount of preservation.

41WM323. The site is adjacent to and situated similarly to 41WM322, but seems to have suffered less from erosion than is the case with the latter. Artifacts were exposed on the eastern slope of the park area and were noted to a depth of 50cm in a small erosion gully. The exact extent of the site is unknown because of heavy forest cover. If, in fact, this site does have buried cultural materials then it could be unique in this setting where most of the sites are totally deflated. For this reason 41WM323 is recommended for limited testing to determine the nature and extent of subsurface artifacts and features.

41WM324. A few flint flakes and burned rock fragments were found in a series of subsurface probes on a Pliestocene gravel terrace. The limits of the site are unknown but flint debris was found in three separate subsurface probes with an entrenching tool.

The site is located on a prominent bluff which juts out northward toward the SG river which is about 400 meters due north of the site.

The site is an upland terrace with dense grass cover. The soil was Blackland Prairie sandy silt and the site has been eroded and disturbed by rain and cultivation.

The position of the site on a bluff overlooking the river makes it a likely location for a permanent base camp. Testing could determine horizontal extent, depth and cultural affiliation and is so recommended.

41WM325. A sparse scatter of flint debris and several burned rock fragments on the surface of a formerly cultivated field in the northwest section of the park.

Flint debris was found on an area measuring at least 50 meters from east to west and 40 meters from north to south. The estimated area of occupation is 2000 sq. meters. Depth is uncertain but the plow zone appears to go to a depth of 25 cm.

The soil is blackland prairie sandy silt. The major ground cover is sparse grass and dense scrub brush. The site has been disturbed by cultivation and erosion.

No further work is recommended because cultivation has probably mixed the cultural remains at the site.

Taylor (Fig. 9.2-1)

41WM365. The site is a thin lithic scatter located on an upland promentory. It is approximately 20 meters in diameter and contained one Bulverde-like projectile point, several cores and debitage.

The area is deflated and is suffering from erosion although part of the site is in grass and scrub cover. No further work is recommended for this site.

41WM366. This site is a small lithic scatter on an eroded projection of the upland edge. It is approximately 50 square meters in area and is lying on limestone/chert gravel deflation surface. Sparse tufts of grass cover the area and it was quite obvious that there is no depth to the cultural deposits. Numerous natural flint cobbles were noted, the majority of which showed no signs of alteration. No further work is recommended at this site.

41WM367. This site is similar in nature to 41WM366 discussed above. It is some 60 square meters in area with no depth to deposits. The only variation noted from the situation at 366 was the presence of several cores of a high quality grey flint not previously noted. No flakes or chips of this material were found and it is probable that the cores were either worked elsewhere and discarded here or that all of the flakes and chips from the cores were removed, a less likely interpretation. In either event no further work is recommended for this site.

41WM368. This is an extensive scatter of burned rock, debitage and tools covering the 1st terrace west of 41WM126. The artifact concentration appears to be heaviest adjacent to a small spring-fed creek separating the two sites. Inspection of several erosion cuts into the terrace face from the San Gabriel River indicate that the site may have cultural deposits to a depth in excess of 1 meter. Since the site is on the far western edge of the park area its exact limits are unknown, but it appears to continue along the terrace for some distance.

This site presents several interesting possibilities for investigation. It is in a cluster of sites including 41WM125, 126, 156, 157, and 158. It is possible that 368 may, in fact, be part of 126 which has only recently been separated by a small spring-fed creek; but the exact temporal relationship between all these sites is unclear. Limited investigations at 368, 125 and 126 are strongly recommended in order to

gather data on the temporal relationships, activity differences between various settings and possible changes in settlement patterns through time. Sites 41WM368, 125 and 126 are further discussed under the testing section of this report.

Friendship (Fig. 9.2-1)

41WM406. This site consists of lithic debris in a heavily cultivated and terraced field. Flint cobbles, some of which were obviously broken by agricultural machinery, red & purple quartzite cobbles and some good quality prehistoric cores and flakes were noted. No burned rock was seen. The estimated area of occupation is 45,000 sq. meters with no real depth for deposits noted. No diagnostic artifacts were found.

The site is located on an upland area with sparse grass and cocklebur plants being the major ground cover. It has been disturbed and eroded by moderate cultivation and natural elements.

Since cultivation and terracing have altered the surface and mixed cultural deposits, no further work is recommended.

Willis Creek (Fig. 9.2-1)

41WM316. This site is a light lithic scatter in an old cultivated field. The estimated area of occupation is 200 sq. meters and the depth is unknown. Site size is unclear because of grass cover.

A single biface was found along with chipping debris and fire-cracked rocks.

The site is located on a fluviatile terrace and the heavy ground cover made a complete assessment of the site difficult.

This site should be investigated further since it may contain in-situ deposits. The size, depth and nature could be easily documented through limited shovel testing.

41WM317. This site consists of lithic debris with some fire cracked rock. The estimated area of occupation is 160 sq. meters and the depth is unknown.

Bifaces were found but no other tools were noted.

Debitage and burned rocks were also observed. The major groundcover consists of dense cultivated grass with large trees along the creek.

The site has been disturbed by 4-5 potholes and some erosion has also taken place in those areas.

There was some historic material noted on the eastern end of the site. There maybe insitu material under the colluvial deposits. This is certainly suggested by the interest shown the site by vandals and collectors. This site is recommended for limited testing to determine the nature and extent of subsurface cultural deposits.

41WM318. This site is located on the easternmost extension of the uplands into the floodplain of Willis Creek. It is bounded on the north by Willis Creek and on the south by an unnamed drainage originating near Machu Cemetery. The exact size and depth of the site is undetermined because of heavy grass cover and alluvial/colluvial deposits, but prehistoric cultural materials were noted to a depth of 2 meters below the present ground surface in the cutback of Willis Creek. The upper 30-60cm of deposit contain turn of the century historic artifacts, most of which show signs of intensive heat alteration such as one would expect at a trash dump.

The location of the site and the possibility of deeply buried, in-situ deposits make it a most likely choice for limited excavations. The relationships between smaller sites on secondary drainages with those along the San Gabriel makes the identification and documentation of sites such as 318 critical for the definition of area settlement and subsistence patterns. This site is discussed further under the testing section of this report.

41WM319. This site is a small lithic scatter located on a cultivated fluviatile terrace. The exact size is speculative but does not appear to exceed 10 square meters. The depth of deposits is unknown because of heavy, continuous ground cover.

Aftifacts noted include bifaces, unifaces, debitage and fire-cracked rock. The size of the site and the cultivated nature of the area make it an unlikely spot for further investigations.

41WM320. This site is a small lithic scatter on a badly eroded sloping section of the southern boundary of the park. Several retouched flakes and a possible burin were noted along with debitage and fire-cracked-rock. However, the chances of in-situ deposits here are very small and no further work is recommended at this site.

41WM414. This is an historic house and farm which was removed by the 1921 flood. It is located adjacent to and overlapping with prehistoric site 41WM120, and is discussed in both the historical survey and testing sections of this report.

10.0 San Gabriel Historical Survey

by

Kathleen K. Gilmore

10.1 Introduction

A survey to record and evaluate historical sites in Granger and North Fork reservoirs was initiated by NTSU in March, 1978, although surveys to record and evaluate prehistoric sites were begun 15 years before in 1963 (Shafer and Corbin 1965).

Participating in the location and recording of the historical sites were Kathleen Gilmore, Linda Lavender, Jerry Humphreys, Steve Baker, and Roy Brooks. Nancy Reese wrote the historical background.

Historical archaeology by the nature of the discipline has more facets of study than prehistoric archaeology, albeit both are concerned with the culture of human beings--the adaptation to their surroundings and to other persons. Any work in historical archaeology is necessarily preceded by a literature and/or records search to become familiar with the area of research--when it was settled, by whom and the nature of the adaptation of the settlers. This also provides information to generate hypotheses to form a research design, as well as a model of what is to be expected. Information obtained in the literature research should be checked by oral histories of persons familiar with the area. Oral histories also provide additional information, but this information should not be taken as fact unless several persons agree about the data in question.

The next step is ground survey of sites expected and the search for unrecorded or unknown sites. Each site should be sketch-mapped, evaluated for temporal span and cultural or functional context, if possible. When all sites are recorded, they can be weighted and evaluated for significance in terms of National Register criteria for testing, mitigation or preservation. At any of these last phases, architectural recording and detailed maps should be made.

It is generally accepted that the survey is the most crucial phase of an archaeological project. If the survey is inadequate, then all remaining phases will be inadequate.

Construction of both reservoirs was well along by the time the survey was begun and most structures had been moved off or torn down and leveled. This, of course, precluded any recording of these structures. Because of practically "working in front of the bulldozer" few sketch maps were made, but photos were made. In all probability, some non-apparent or purely archaeological sites were missed because of time pressures. For example, local history and literature search

indicated sorghum mills had been a home and semi-commercial industry in the early part of the 20th century. Evidence of these mills was not located.

Seventy-one sites were recorded in Granger Reservoir; 23 were recommended for testing. In North Fork 29 sites were recorded and 15 were recommended for limited testing.

10.2 Historical Background

Williamson County is divided into two distinct physiographic sections by the Balcones Fault system which extends north-south across the county. The eastern section is rolling Blackland prairie which produces cotton, corn, oats, sorghum, fruits, melons, and vegetables. The western section, about 250 feet higher than the eastern section, is mainly rocky, rough and forested with few open prairies. It is especially adapted to cattle raising (Webb, 1952: 917).

The history of the European settlement of Williamson County actually begins in 1821 when Stephen F. Austin arrived in Texas with his first group of colonists. Although these individuals settled in Travis County to the south, their close proximity lent an early stability to much of the surrounding area, including Williamson County.

By the time what is presently called Williamson County became part of the municipality of the District of Viesca in 1830, a few isolated settlements had already been established along Brushy Creek and the San Gabriel River. Large portions of the county were at that time held by Mexican owners who had received land grants in what was then still part of Mexico. There is no evidence, however, to indicate that these individuals ever occupied their properties (Scarbrough, 1976:72).

When Texas gained her independence from Mexico in 1836, Williamson County became part of the municipality of Milam. During the 1830's settlement in the area began at a slow pace, with the "frontiersman" being the prevalent type of inhabitant. These men were more interested in hunting and trapping in the untamed forests than they were in establishing homesteads for growing families. The land itself was unsettled as well, for Mexico invaded Texas in 1842 and all settlements in the area were temporarily abandoned.

After Texas once again had firm possession of the land, a more permanent class of pioneers began to enter the district. While settlements during the 1830's had been few, they had been stable. In response to this stability and the relative inaccessibility of other markets, commerce began to grow. Washington Anderson established a grist mill in 1843 at what is now Round Rock. Although his mill was washed out by a flood in 1845, it would soon be replaced by others.

Texas became part of the United States in 1846 and settlement in the area quickened its pace. The same year saw the creation of a stage line from San Antonio to Waco running through the heart of Williamson County. John Berry became the first to establish a mill in the interior of the county in 1846, when he built a grist mill on Berry Creek northeast of present Georgetown. The area was beginning to develop politically as well. Brushy (Georgetown) became the fourth town in Milam District to receive regular mail delivery in 1846. By 1847 settlement in the study area had also begun. Elihu Crosswell Allison came in that year with his family settling in the area that would come to be called Old Allison (Scarbrough, 1975:414).

The year 1848 brought significant political and social development to Williamson County. The area had sufficient population to begin petitioning the state government for the creation of an independent county. This petition was quickly granted and on March 13 the county of Williamson was established. In May the county seat was selected, called Georgetown, after George Washington Glasscock, Sr., who along with his partner donated the tract of land on which the town was situated. The first school in Williamson County was also organized in this year; built of logs, it was located at Moss's Spring at the southern end of the county. Settlers no longer had to travel to Bastrop to purchase supplies when Nelson Morey set up his general store north of Brushy Creek. Religion also came to the county with the Missionary Baptist Church north of Round Rock, established by the circuit-riding Reverend R. H. Taliaferro.

All this combined to attract immigrants at a growing rate. By 1850 the census listed Williamson County with a population of 1,568 living in 230 dwellings (Texas Almanac, 1975:186) chiefly built of logs. The most densely populated areas were around Georgetown in the center of the county and Round Rock to the south. Swedish immigrants began arriving in substantial numbers by 1853. Hayden Hunt arrived in the area from Georgia in 1850. The fourth crossing on the San Gabriel from Georgetown was named after this family who also established a school and gin in the same area. Benjamin Gooch and George Washington Glasscock, Sr. also opened a mill near the junction of the North and South Forks of the San Gabriel River. Gooch and J. W. Owen built a flour mill at Knight's Springs between 1852 and 1855. And by 1856 Williamson County had its first newspaper, the "Georgetown Independent". The county was now firmly established. County rolls for 1858 show 22,618 acres in cultivation, 11,100 planted in corn, 1,350 in wheat, 1,378 in cotton (Scarbrough, 1975:141). This indicates the major emphasis was still on subsistence, but this would quickly change.

By the 1860's Williamson County residents had begun taking an interest in the bands of wild cattle roving the banks of the San Gabriel and Brushy Creek. Farmers had begun rounding up these cattle during their spare time. In 1867 Williamson County held its first major cattle drive; 35,000 head were driven to market up the Chisolm Trail, a branch of which ran through the county. The cattle business

would turn out to be a profitable one for the county and numerous fortunes were made, lost, and made again during the late 1860's and 70's.

Settlement was beginning to spread rapidly up and down the banks of San Gabriel. Frank Russell built a home of rock in 1868 at what would later be called Jenkins Crossing. This crossing, the second up-river from Georgetown, was named after Richard Jenkins who settled there shortly after Russell.

The population which had risen to 4,529 in 1860 was listed as 6,368 in the census of 1870. Of the 1,116 dwellings only 405 were farms--a sharp decrease from 1850 when three-fourths of the population were listed as farmers (Scarbrough, 1975:217). Large numbers of German, Austrian and Wendish peoples, as well as Swedish immigrants, began to arrive in the 1870's. Cotton production, which had been fairly insignificant, rose sharply during the 70's, suggesting that the area was established well enough to turn interest towards more profitable pursuits. Social concerns, as well as economics, increased during the 1870's. Schools and churches which had been few during the preceding decades began to grow in number. The Allisons built a school near their home on Willis Creek in 1873 (later called Old Friendship School) for the community which was rapidly growing there. Old Allison was large enough in 1878 for regular postal delivery.

A village had also been established at Draco on North Fork, the earlier site of an Indian camp. This area was later known as the Rock House Community. Although it is not indicated how early this area was settled by Europeans, enough of a community had gathered here by 1878 that the Rock Baptist Tabernacle was organized. Another small village had grown in the area of Knight's Springs as well. Sometimes called Crockett Gardens, the area had been the site of a flour mill since 1855. This mill, built by Gooch and Owens, was purchased in 1869 by James Knight who soon located a truck garden in the vicinity. Hunt's Crossing was now the site of a cotton gin and grist mill, both built on the north bluff of the river. This area was also the location of a school, although the date of its construction is not known.

The 1870's also mark the arrival of the railroad. One of these, the International and Great Northern completed through Williamson County in 1876, was particularly significant. The president of this railroad, John R. Hoxie, appreciated the rich lands of Williamson County enough to purchase 9,000 acres of ranch land along the San Gabriel bottoms and adjacent prairies in 1878. He then built an elaborate house and numerous ranch buildings--the nucleus of what would become a small community with a school, gin, general store, blacksmith shop and saddlery. The house itself, completed in 1882, would become a local landmark in the area (Scarbrough, 1975:430, Freeman, 1976).

The prosperity of Williamson County throughout the 1870's is reflected in the census for 1880 in which the population is seen to have more than doubled during the previous 10 years to 15,155 (Texas

Almanac, 1975:186). Cotton production continued to increase steadily. The invention of barbed wire in 1873, however, was beginning to have its effect on Williamson County; and by the mid-1880's fencing of the ranges made the sight of large heards of cattle being driven to market a thing of the past. Another invention of the '80's, the windmill, produced a more positive effect. Where in the past farms had been confined to the banks of rivers and creeks, the windmill made it possible to farm wherever a well could be drilled. This was especially beneficial to small farmers unable to purchase large tracts and opened the prairie lands, previously range, for cultivation.

The communities at Draco, Allison, Crockett Gardens and Hunt's Crossing continued to flourish and new ones emerged. Czechoslovakian, Moravian, and other Slavic peoples began migrating into the area during the 1870's with many settling around Taylor, Granger and Friendship (Stasney, 1938). The Fisher School built above Georgetown on the San Gabriel was a product of this period.

The Victorian period brought a new style of living to Williamson County. Sawed lumber for building, heavy machinery to work the land, appliances and furnishings for the home could now be acquired easily at nearby stores. Large, handsome, stone and frame houses lined the streets of Georgetown and according to one source "nearly every home in Georgetown had a picket fence in 1892" (Scarbrough, 1976:271). The Georgetown Chautaugua became an annual summer event during the 1880's and 90's, drawing large crowds of people from throughout the county. Speeches, contests, musical entertainment and exhibitions, to name only a few of the events, seemed to offer something for everyone.

This style of living continued to persist until after the turn of the century, and Williamson County continued to prosper and grow. By 1890 the population had reached 25,909; and by 1900, 38,072 people were reported by the census (Texas Almanac, 1975:186). Many of the settlements along the creeks and the San Gabriel River were destined to have a limited time span, however, when in September of 1921 a devastating flood hit the county. Brought on by a hurricane blown into the Texas coast, the greatest rainfall recorded in US history fell on Williamson County--36.40 inches at Thrall during an 18-hour period (Texas Almanac, 1975:165).

> Ten thousand square miles of farm bottomland was inundated and angry waters took out homes, bridges, railroads, roads, culverts and buildings (Scarbrough, 1976:371).

The community at Old Allison was completely removed, as were countless other homes and settlements throughout the county.

> Where residences in the wake of the flood were not swept completely away, they were often washed from their foundations and in numerous instances

> the personal effects of families were either wholly lost or damaged beyond further use (Scarbrough, 1976:371).

Although the county slowly recovered, the devastation of the flood was still felt in 1936 when the Brazos River Conservation and Reclamation District announced that surveys would begin on the North and South San Gabriel Rivers for proposed dams. After forty years of debate, this project was finally actualized, this report being a partial result.

10.3 Survey Method

The first step in the survey was to become familiar with the history of the area and to compile a list of potential sites in the area under consideration. These sites must then be ground checked; but, before this was done, several persons familiar with the area history were interviewed: Clarence Loeve, Granger area; Clara Scarborough, general history; Pete Hunt, North Fork area.

The tract register and segment maps were obtained from the Corps Granger Lake Project Office for information pertaining to former ownership of the potential sites under consideration and the location of additional sites and cemeteries.

Using segment maps, tract registers and topographic maps, both reservoirs were surveyed for sites. Clarence Loeve pointed out sites where the 1921 flood had removed homes in the Granger Reservoir and Pete Hunt pointed out former structure sites in the North Fork area. All recorded sites are listed in the accompanying Tables.

Since the historical survey was not begun until construction had been started, all cemeteries had been moved with some new gravestones being erected and all structures in the flood pool had been moved, or destroyed and leveled.

The town of Old Allison, for example, was established about 1847 (Scarbrough, 1976:414). The village contained at least a gin, a school, and a few residences. Although all buildings were gone by the time we arrived, archaeological materials could provide information about life in a small village at the turn of the century. The site, however, was completely leveled and mixed before the testing phase could begin, moving the artifacts from their context and destroying evidence of structures, streets and habitation, and therefore rendering testing almost useless.

Another site was flagged for recording where a structure had been moved but a little work needed to be done to determine the nature of the structure before recording. Before we could get back, the site was bulldozed level, destroying the remaining information.

10.4 Survey Results

North Fork Reservoir

The North Fork area is a dissected limestone plateau cut through by the North Fork Branch of the San Gabriel River. The upper areas contain a few small prairies where some crops are grown, but generally this area has been oriented toward cattle raising.

Of the 27 sites recorded, 21 were farmsteads, 3 were schools, 2 gins and one reported site of an Indian settlement (Rock House). Limited testing was recommended on 15 sites, some to determine the nature or function of the site. Other testing was designed to answer questions about the economic adaptive strategies as proposed by the research design (Figure 10.4-1, Table 10.4-1).

The Hayden Hunt house was standing by virtue of being on the boundary of Corps property. This house had an interior log house probably built mid-19th century with machine-cut nails. Information from this area would have been helpful in establishing early life-style patterns in the North Fork area. It is regretful that this house could not be recorded because it was outside the project area. A later report indicated it was bought and moved away for rehabilitation. Since this house was extant with the log nucleus, it was felt that in all probability other houses in the area may have had similar construction and had not been recorded before destruction. This is partly supported by the number of sites (12) where machine-cut nails were found. Machine cutting of nails came into practice about 1819 in the eastern US. It took some time for cut nails to spread westward,but by about 1900 wire nails were coming into use in this part of the country.

The mill/gin sites and the school sites could contribute information on early communication/transportation patterns. Interestingly enough, no churches were recorded. It is expected church services were held in the schools, which should be confirmed by oral history, records search, and archaeology.

Most of the farmsteads were those of early settlers. Several sites were located where the Hunt family lived at different times. Those sites would be excellent for determining change in economic patterns and land use.

The Crockett Gardens or Knight Springs site is a well-known landmark to area residents for its beauty and its contribution to the quality of life. Local informants told of the presence of a mill there, but no surface indications were found. Since the area is partly in easement, it should be preserved and protected.

The foregoing propositions were integrated into an overall research design to determine which sites should be tested to maximize information

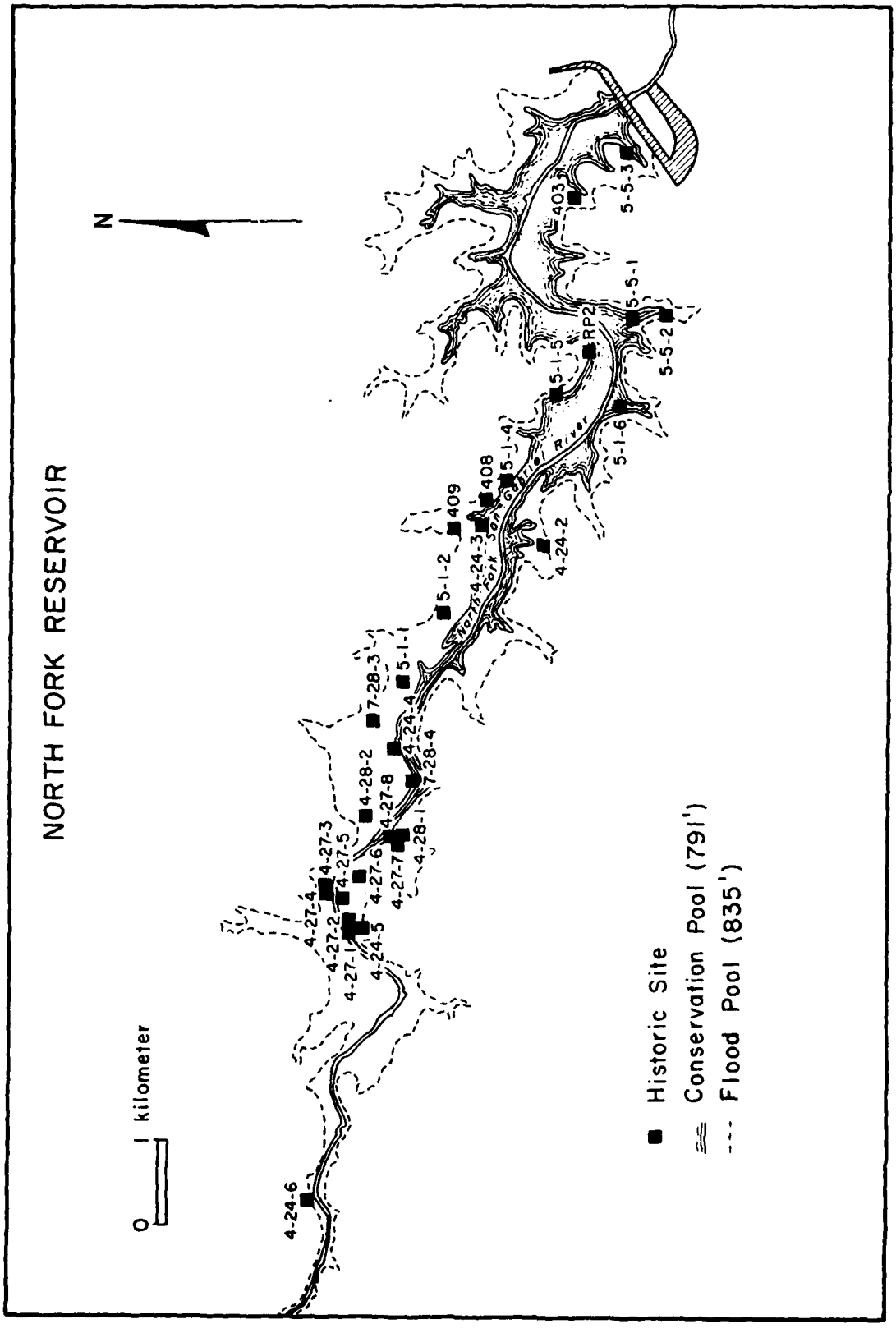

NORTH FORK RESERVOIR
N
0
1 kilometer
4-24-6
4-27-4
4-27-2
4-27-1
4-24-5
4-27-3
4-27-5
4-27-6
4-27-7
4-28-1
4-28-2
4-27-8
7-28-4
7-28-3
4-24-4
5-1-1
5-1-2
409
4-24-3
408
5-1-4
4-24-2
5-1-5
RP2
5-1-6
403
5-5-3
5-5-1
5-5-2
NORTH FORK SOUTH GRAND RIVER
Historic Site
Conservation Pool (791')
Flood Pool (835')

Figure 10.4-1

needed.

Rock walls of a structure (41WM403) were found in San Gabriel Park, high above the river in dense cedar groves. This had the possibility of being a corral, a hunter's or fisherman's house, or a homestead. Determining the age and function would provide additional information for land use patterns and adaptive strategies.

Another site, the settlement of Rock House or Draco, the reputed site of an historic Tawakoni Indian village should eventually be tested and preserved for several reasons: 1) few locations of historic Indian villages are known; 2) confirmation of the location; 3) analysis of adaptive strategies of an Indian group and comparison with other group strategies in the same area; 4) in the same vicinity is a highly disturbed burned rock midden area which may be entirely prehistoric, and which may indicate continuity of residence. This site is not in danger of being flooded and can be tested in the future if it can be protected from "treasure hunters."

Granger Reservoir

Seventy-one sites were recorded in the Granger Reservoir, with 23 recommended for testing (Figure 10.4-2, Table 10.4-2).

This reservoir is in an area of Blackland prairie with few eroded gullies. Many of the sites recorded are farmsteads which were washed away by the 1921 flood. Some of these may have been houses of tenants working the land on shares. Local informants spoke of Czech and Bohemian settlers who in order to survive when they first arrived in the area in the 1870's would work an area for shares until they could buy their own land (Stasney, 1938:47). Large farms or ranches had been established by the 1870's and many employed Czechs when they could. Moreover, some Czechs are still working for the family who first employed them. One informant related that the Allisons employed as many as they could. Testing of these house areas should provide information about the ethnic group occupying them and some concepts of their economic status.

Unfortunately, several houses which had been torn down or moved were not recorded while they were in place. For example, the Beard and the Dycus homestead, the former possibly built before the Civil War, would have been excellent examples of well-to-do farmers' homesteads. These families were neighbors and had had a long-standing feud. Folklore relates the feud began when the children of the two families were returning from school and the Dycus children threw dirt in the Beard family's milk. It is suspected, however, there were deeper causes, which research might discover.

Three plank bridges with iron super structure all spanning Willis Creek, were recorded in photographs. The westernmost bridge had an

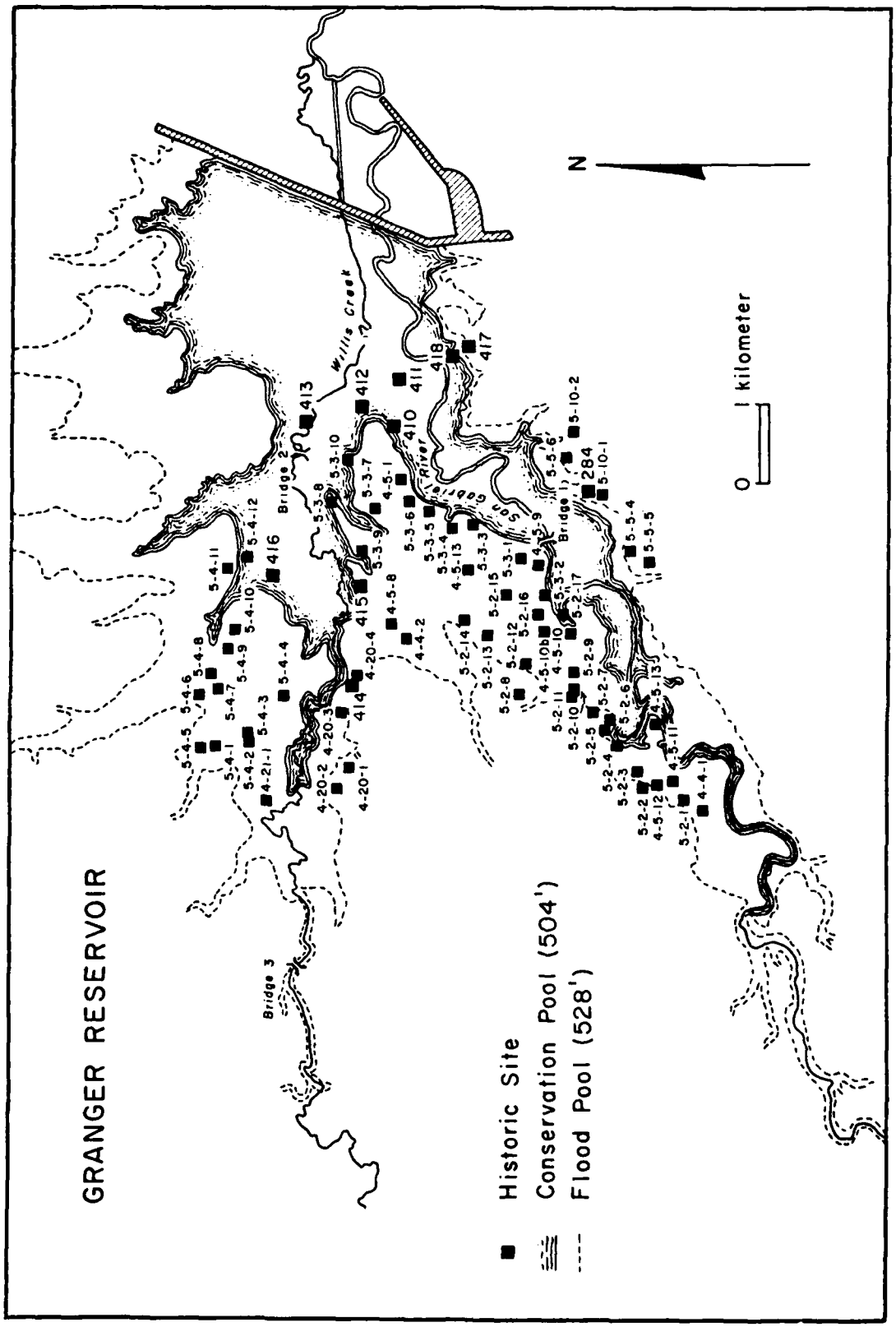

GRANGER RESERVOIR
Historic Site
Conservation Pool (504')
Flood Pool (528')
N
0
1 kilometer
Willis Creek
Bridge 1
Bridge 2
Bridge 3
San Gabriel River

Figure 10.4-2

attached iron plaque containing the date 1904. These bridges should be moved and preserved as characteristic of bridge building at that period.

10.5 Research Design

The following general research design was based, as we learned at a later date, on unrealistic formulations because of the status of the construction and destruction. It was learned during the negotiations for testing that a design was irrelevant. Had it been possible to implement the research called for, then detailed and specific propositions based on the general design would have been drawn up.

The Historical Archaeological Survey of the North Fork and Granger Reservoirs, Williamson County, Texas, recorded 100 sites. Further work is recommended at 38 sites; 23 in the Granger Reservoir and 15 in the North Fork Reservoir.

Because of differing physiography, natural environment, and ethnic group settlement during the 19th century the two reservoirs offer a unique contrast in adaptive strategies. Consequently, the sites recommended for further study (including archaeological testing, local interviews, and records search) are those which should provide further information on the strategies used by the Indians, Anglo and other northern European, and Czech and Bohemian settlers.

In the Granger area, in contrast, agriculture became the major economic source. It is postulated that this was intensified after Czechs began moving into the area, first as tenant farmers and later as they became landowners. Although economic strategies differed, the settlement pattern was similar with dispersed communities in the two areas. Yet, the educational, religious and social patterns differed; several schools were located in the North Fork area, but many small cemeteries were in both areas. It is postulated that the school houses acted as churches and as centers of social activity with the probability that ethnic groups had little social interaction until the 20th century.

10.6 Conclusion

The Research Design called for the testing of 15 sites in the North Fork and 23 in Granger in order that adaptive strategies and economic status could be compared between the reservoirs. Because of construction and lack of money eleven sites were actually tested. These were selected to attempt to enhance the information about individuals at each site. This sample was too biased to integrate into an overall research design, which had become irrelevant to the project. Suffice it to say, important information concerning the life ways--the communication, the interaction, the economics of persons in this area of the late 19th century and early 20th century have been irretrievably lost.

TABLE 10.4-1. NORTH FORK RESERVOIR HISTORICAL SITES

Site	Type	Approx date	Conditions and Extent of remains	Artifacts	Recommendations	Justifications	Deposition of locations
4-24-1 WH408	House site (Fisher)	Pre 1900	Building demolished, no clearing	cut nails, 1 piece transfer ware	testing	Early Fisher homestead	Conservation pool
4-24-2	House site, possible Sawyer house	Post 1900	Demolished	cut nails in road	None		Sawyer Park
4-24-3	House site	Post 1900	Buildings demolished	no cut nails	None		Flood pool
4-24-4	House site	Pre 1900	2 standing chimneys, burned 1940s	grass cover	Data on chimneys test depression artifacts for dating	Early loghouse, economic status and adaptation	Flood pool
4-24-5	Hayden Hunt House	Pre 1900 1850s	Standing interior log house	cut nails	Record - purchase & preserve limited testing	Only standing log cabin in area	Edge CORPS property
4-24-6	Rock House, Draco, historic Indian settlement	Pre 1840	Unknown	flint debris	testing within CORPS property	One of few sites reputed to be an historic Tawakoni Village	Edge CORPS property
RP-2	House Site	Pre 1900	Destroyed, collapsed rock chimney	cut nails, "Iron stone" crockery	testing		Russell Park
SG-2 WH403	Rock house or corral structure partly down		Standing rock walls, ca. 1m high	1 small piece window glass	clearing and limited testing	To determine function and age	San Gabriel Park
4-27-1	Gin site? Hayden Hunt	Pre 1900	None visible	none found	small test	Possible site of early industry	Flood pool
4-27-2	House site	1900-20s	Scatter of artifacts no remains of house	ceramic "screw head" brick	None		Flood pool

Site	Type	Approx date	Conditions and Extent of remains	Artifacts	Recommendations	Justifications	Disposition of locations
4-27-3	John Wesley Hunt gin	Pre 1900		bottles, cut nails	testing	Early industrial site	Flood pool
4-27-5	Sanford Hunt 1st house	Pre 1900	2 wells	cut nails in road	test for location of house	homestead of early settler	Flood pool
4-27-4	Out of CORPS property						
4-27-6	Sanford Hunt, 2nd house moved 1922	1922+	Ceramic pipe well, out buildings house demolished	nails, ceramics grass cover	limited testing	Continuity of changing economic patterns	Flood pool
4-27-7	2 house site, J. W. Hunt	ca. 1900	House demolished, chimney, pier stones in place	glass, chimney	limited testing	Economic patterns of early settler	Flood pool
4-27-8	Boulting house, cemetery	Moved					
4-28-1	1st house site J. W. Hunt	Pre 1900	House demolished, some bulldozing	ceramics 1850s, 60s, late 1800s, metal, cut nails	limited testing	Continuity and change to 2nd house	Flood pool
4-28-2	House site Box Family	ca. 1900		cut nails, wire nails	None		Flood pool
4-28-3	Jim Hogg School Site	1920s	No evidence	None	None		Flood pool
4-28-4	Baker School	Pre 1921	2 out house pits, flue	no artifacts	test	Educational patterns	Flood pool
5-1-1	Daniels house site	Post 1900	House demolished	no pre 1900 artifacts	None		Flood pool

Site	Type	Approx date	Condition and Extent of remains	Artifacts	Recommendations	Justifications	Deposition of locations
5-1-2	Daniels House site	Late 1800s	House demolished Well(?) filled in	bottle pieces late 1800s, no cut nails found	None		Flood pool
5-1-3 WM409	House site (Taylor?)	Late 1800s Early 1900s	House demolished evidence of 2 wells; out buildings	cut nails in road, chimney, handmade brick; cotton gin parts	testing	Pattern of settlement	Walnut Spring Park
5-1-4	Fisher school	Pre 1883 to 1900s	Possible remains of flue	1 desk side plate; bricks, cut nails in road	testing	Educational patterns	Flood pool
5-1-5	Home site	Late 1800s	Bulldozed	bottle glass	None		Flood pool
5-1-6	Home	Late 1800s	Badly damaged by bulldozer; chimney down	cut nails purple glass chimneys .	None		Flood pool
5-5-1	Small Home site	Post 1900s	Bulldozed	wire nails	None		Flood pool
5-5-2	Crockett Gardens House site Possible mill site	1850; mostly post 1900		cut nails cut stone	Excavation in area of pool for gin — Further investigation for disposal of area	Unique area for region — should be preserved	Flood pool and easement
5-5-3	House	Post 1900	Standing; formerly used by CORPS, area leveled		None		Flood pool

TABLE 10.4-2. GRANGER RESERVOIR HISTORICAL SITES

Site	Type	Approx date	Condition and Extent of remains	Artifacts	Recommendations	Justifications	Deposition of locations
4-4-1	House site	Post 1900	House demolished	F.F.B. Bricks	None		Flood pool
4-4-2	House site, Lenderman property		House moved		None		Willis Creek Park
4-5-1	Possible early house site	Pre 1900 1850-70s	Plowed scatter of artifacts	Transfer, edge ware, cut nails	Test	Establishment of early house site	Flood pool
4-5-2 WM410	Bartosh Cellar	Late 1800s to 1930s	Part of cellar removed by gravel operations	English earthen ware	excavation of cellar shown in profile	Trade and interaction patterns; Construction of cellar, stratified artifacts	Conservation pool
4-5-3 WM411	House site, removed by 1921 flood	Late 1800s Early 1900s	Artifact Scatter	grass cover high	Test	Establishment of house site	Conservation pool
4-5-4 WM412	Possible tenant house	Late 1800s Early 1900s	Some clearing in area; well present	cut nails	limited testing	Economics of tenant farming	Conservation pool
4-5-5 WM413	Allison Community, composed of a school, houses, lodge, tabernacle, gin	Late 1800s Early 1900s	Some clearing no apparent ruins; large well serving gin filled ca 5-5-78	cut nails, transfer ware	extensive testing	Establishment of community patterns & artifacts of early Anglo settlers	Conservation pool
4-5-6 WM414	House site, removed by 1921 flood, with dump	1850s 1870s	Surface scatter, plowed	ceramics, edge ware, cut nails	limited testing	Establishment of homestead and pre 1900 economic status & possible ethnic interaction	Willis Creek Park
4-5-7 WM415	House site, removed by 1921 flood	late 1800s	Surface scatter, plowed	purple glass bottle neck, grass cover thick	limited testing	overlap w/ above in time, farming economy	Willis Creek Park
4-5-8	House site?	late 1800s	Surface scatter, plowed	cut nails	None		Willis Creek Park

Site	Type	Approx date	Condition and Extent of remains	Artifacts	Recommendations	Justifications	Deposition of locations
4-5-9	House site?	ca. 1900+	Dense scatter of artifacts	domestic and agri. artifacts	None		Flood pool
4-5-10	House site, removed by 1921 flood	ca. 1900+	well, grass cover thick	None	None		Flood pool
4-5-10B	House site	Pre 1900	Field, covered with prairie willow	bottle fragments	None		Flood pool
4-5-11	House site, removed by 1921 flood, early Circleville Community	Pre 1900	Scatter of artifacts, plowed	transfer ware, cut nails	limited testing	Establishment of early occupation area, and interaction among ethnic groups	Flood pool
4-5-12	House site, removed by 1921 flood	1850s 1900	None noted	grass cover high	None		Flood pool
4-5-13	House site, removed by 1921 flood	Pre 1900 to 1900+	Scatter of artifacts		limited testing	as above	Flood pool
4-20-1 -2	House sites, Provasnik Brothers	Post 1900	Demolished	1920s and 30s	None		Wildlife Refuge
4-20-3	House site	Post 1900	Demolished	no cut nails	None		Flood pool
4-20-4	Old Granger Dump	Post 1900	Intact		limited testing		Flood pool
4-21-1	Beard homestead	1850s	Demolished	cut nails, hardware, spatterware dump	testing	Economic level of early settler	Flood pool
5-2-1	Homestead	1930s	Demolished	Grosebeck red bricks	None		Flood pool
5-2-2	Clarence Loeve's grandfather's house site	Late 1800s	Demolished	grass cover	limited testing	Early German and Bohemian adaptation	Wildlife Refuge

Site	Type	Approx date	Condition and Extent of remains	Artifacts	Recommendations	Justification	Disposition of locations
5-2-3	House site	1920s+	Demolished	glass, metal	None		Flood pool
5-2-4	House site	1940s, 50s	Demolished	swimming Pool 1954, 56	None		Flood pool
5-2-5	House site	1920s+	Demolished	drilled well	None		Flood pool
5-2-6	House site	1920s+	Demolished	2 wells	None		Outside edge flood pool
5-2-7	Small House site, probably share-cropper	1920s	Demolished and burned		limited testing	Economic and cultural information about tenant farmers	Outside flood pool
5-2-8	House site possibly tenant	1920s+	Demolished or moved		None		Wildlife Refuge
5-2-9	House site	Last 40 years	Destroyed, well filled in and collapsed		None		Flood pool
5-2-10	Well and cistern, 1925	1920s		None	None		Flood pool
5-2-11	House site	Post 1900 well date 1912	Removed	none, high grass cover	limited testing	Economic status of early 20th century farmer	Outside edge flood pool
5-2-12	House site, well & building	Last 40 years 1930 auto plate	Removed	piers of Groesbeck brick	None		Flood pool
5-2-13	House site, well	Pre 1900	Plowed field, chimney	scatter in plowed field	None		Flood pool
5-2-14	House site	Last 40 years, well may be older		bottles, ceramics	None		Flood pool

Site	Type	Approx date	Conditions and Extent of remains	Artifacts	Recommendations	Justification	Disposition of locations
5-2-15	House site	last 20 years	Removed	None	None		Flood pool
5-2-16	House site	1920s	Demolished bulldozed	cut nails in road	None		Flood pool
5-2-17	2 wells	unknown	#1 open with water #2 covered with dirt plug	1) handmade brick, dug by hand 2) steel casement well, grass cover	None		Conservation pool
5-3-1	House site with out buildings, well	Post 1920	Demolished	glass, crockery	None		Flood pool
5-3-2	Small tenant house	Last 40 years	Burned	glass, crockery	None		Flood pool
5-3-3	House amd out buildings site, wells	Last 50 years	Wells filled		None		Flood pool
5-3-4	House site, well	Last 50 years	Removed		limited testing	Comparison for economic check	Flood pool
5-3-5	Well & scatter of artifacts	Late 1800s		cut nails, crockery, sponge ware	limited testing	Comparison for early economic status	Flood pool
5-3-6	House with out building & well	Not dated	Removed	None			Flood pool
5-3-7	House site with storm cellar	Last 50 years			record in detail construction of storm cellar	Documentation of construction	Flood pool
5-3-8	House with well and storm cellar	1890s, 1900s	Possible foundations of chimney, house removed?	cut nails	testing	Economic status and ethnic group interaction	Edge of Flood pool
5-3-9	House site on brick piers	Last 30-40 years well may be older	Torn down or burned		None		Flood pool

Site	Type	Approx date	Condition and Extent of remains	Artifacts	Recommendation	Justification	Disposition of locations
5-3-10	House site with cellar, well	Last 40 years	House Removed		None		Edge of conservation pool
5-4-1	Home site with cistern, well	Last 50 years	Building removed, concrete slabs remain	high grass cover	None		Flood pool
5-4-2	House site	Last 30 years	Moved	high grass cover	None		Flood pool
5-4-3	Well, hand dug, brick-lined	Not dated	Open	None			Flood pool
5-4-4	Dychus home?	Pre 1900	Demolished & burned	wire & cut nails, 15 cut limestone blocks, edgeware	testing	Economic status and ethnic group interaction	Flood pool
5-4-5	House site, well or cistern	Last 30 years	Bulldozed well filled in	scatter of bricks	None		Flood pool
5-4-6	House with out buildings	Last 30 years	Removed and burned		None		Flood pool
5-4-7	House	Last 50 years	Demolished, burned	high grass cover	None		Flood pool
5-4-8	House, tenant?	Last 30 years	Moved	high grass cover	None		Flood pool
5-4-9	House, possible tenant	Early 1900s	Moved or scattered	tongue and grove-groove boards	test	Economic status and ethnic group interaction	Flood pool
5-4-10	House site	Pre 1900	Probably moved	cut nails, 2 flues	test	Early adaptation	Flood pool
5-4-11	House well, hand dug	Last 50 years	Moved, burned	wire nails	None		Edge of conservation pool
5-4-12	House and out buildings	do	Demolished, burned		None		Conservation pool
5-4-13 WM416	House, cistern	Pre 1900	Moved or salvaged, fire place wrecked	cut nails; concrete columns, fireplace	testing	Economic status and ethnic group interaction	Conservation pool

Site	Type	Approx date	Conditions and Extent of remains	Artifacts	Recommendations	Justifications	Deposition of locations
5-5-4	House site	Last 50 years	Removed		None		Elm Grove Park
5-5-5	House site	Last 50 years	Demolished and burned	1 cut nail	None		Elm Grove Park
5-5-6	House with out building & well	Last 50 years	Moved		None		Elm Grove Park
5-5-7 WM417	Benight House with log *barn formerly a house*	Pre 1925	Removed or torn down	none collected	limited testing	Established age of barn, tenant economic status	Elm Grove Park
5-5-8 WM418	House storm cellar, barn, *Rubal place*		Demolished		limited testing of barn or old house	Possible recovery of grave stones from "Walker?" cemetary	Elm Grove Park
5-10-1	House	Last 50 years	Moved	recent wire nails	None		Elm Grove Park
5-10-2	House	do	Probably moved	high grass cover	None		Outside flood pool
Bridge #1 "Hoxie Bridge"	Iron super-structure, plank	Early 1900s			removal and preservation	Extinct bridge building method	Conservation pool
Bridge #2, Willis Cr. on Hoxie Rd.	Iron super-structure, plank	Early 1900s			removal and preservation	Extinct bridge building method	Conservation pool
Bridge #3 western-most, over Willis Cr.	Iron super-structure, plank	1904		attached plaque dated 1904	removal and preservation	Extinct bridge building method	Conservation pool

71 sites
23 tests

11.0 Hoxie San Gabriel Ranch

by

Kathleen K. Gilmore

11.1 Introduction

In March 1979, the Archaeology Program, North Texas State University was charged by the Corps of Engineers, Fort Worth District, to complete the known picture of the history of the Hoxie Ranch, Williamson County, Texas. This study is part of the Archaeological and Historical Survey of North Fork and Granger Lakes, San Gabriel River, Texas.

Interviews with senior citizens related to or knowledgeable of the Hoxie Ranch and its people, functions, productivity, and importance were to be conducted and documented in order (a) that the known history of the ranch, specifically the period between 1938, the burning of Sunnyside, to its acquisition by the Corps; (b) to record the existence of the artifact culture of the residents and tenants of the Hoxie Ranch; this was to include a representative sample of known artifacts, identification of the current owner or location of each artifact with drawings, photographs, or descriptions of each artifact as feasible; (c) to document any folklore related to the ranch or its people that would come from the interviews.

It was C.C. Allison, DVM, Austin, Texas, the recent owner of part of the Hoxie Ranch and the site of Sunnyside, the ranch house (41WM284), who realized the history of the ranch continued past the burning of Sunnyside in 1938. The history to 1938 previously had been researched and recorded in a scholarly work by Martha Doty Freeman entitled, "A History of the Hoxie San Gabriel Ranch" (1976), which is essentially a history of the Hoxies and ownership of the ranchland.

Dr. Allison views himself as a "steward of the land." He would like to see several things accomplished in a report on the Hoxie Ranch. He feels the thorough documentation of local history softens the blow of change. The following are major concerns of Dr. Allison:

1. Documentation of the chronological line of people associated with Hoxie post 1937.
2. A lineage of the Hoxie house since its erection in the 1880's, including documentation and conservation of associated artifacts and features.
3. A report inclusion of the case he, Charles Allison, filed against the government concerning the dam project, its objectives, impact and disposition.

In addition, he would like to see excavations of Hoxie house and the recording of area folklore.

This study of the ranch is concerned with the people who lived on the ranch. It fills in the Freeman study from 1910 when it was sold, to the present. The interviews were set up and conducted by Linda Lavender

and Roy Brooks. Brooks initiated and conducted interviews with 26 persons, and was responsible for supervision of transcribing, editing of the taped interviews. He was also responsible for photographing artifacts from the Hoxie-Sunnyside house. All taped interviews were copied. Unfortunately, during the transcribing process, Brooks left the project and took with him the original tapes and photographs of furniture from the Hoxie House, among other things. All efforts to obtain these data have failed. The copies of the tapes are inferior to the originals, some of the conversations being unintelligible. Consequently, it has been impossible to return these transcripts to the narrator for approval, and a summary only is included with this report.

Summaries of all other interviews are included, but only three transcripts corrected by narrators are included, because the process of editing, returning to the narrator for correcting, and retyping with corrections was not completed. Five are included without being seen by the narrator.

The first section of this study discusses the methods used. The second contains a summary of the history taken from Freeman and information gained from the interviews. So-called "folk lore" is also included in this section, because in some instances it is difficult to separate folk lore from fact. Fact may also be enlarged upon until it seems to be folk lore. Therefore, no attempt has been made to separate fact from fiction. Also within this section is what could be determined about the extant artifacts from the ranch. The last section contains the summary and conclusions. The appendix contains summaries of all interviews, and the entire transcriptions of those interviews which have been edited and returned from the narrator.

11.2 The Project Methods

Interview Method. Dr. Charles Allison furnished a list of persons who would have information about the ranch. Because of lack of time and money all could not be interviewed. Others could not be interviewed because of sickness, lack of interest, or inability to contact.

A list of pertinent question was made up for each interviewer, this was more a mnemonic device than a questionaire, since specific questions would depend upon the person being interviewed (hereafter termed narrator). Each person to be interviewed was contacted by phone and a time specified for the interview. All were informed about the nature and orientation of the project, and permission asked for recording on tape. Most of those interviewed had visited the ranch or had lived on it.

Most narrators were asked about their memories of the ranch, but

they were not held to this subject specifically since some were elderly people and it was felt it was important to record their "remembrances of things past" about the area, since otherwise this personal history might forever be lost. This approach is also beneficial in establishing good rapport between the interviewer and the narrator.

Transcription and Editing.* With completion of the bulk of interviews, all tapes were copied in order that copies could be used to transcribe and edit, thus preserving and preventing accidental loss of the original tapes. These copies were vastly inferior to the original tapes and quite distorted. That this was due to the copying process and not the transcribing or taping equipment was not discovered until several months after transcribing began. This, together with the fact that it was quite difficult to obtain willing, skilled transcribers, caused some delay in processing.

The tapes were transcribed word for word with blank spaces left for words and names that were unclear or impossible to hear. Transcriptions were double spaced and wide margined to allow room for editorial work. An average hour to hour and a half taped interview took about ten hours to transcribe; some tapes took as few as six hours while others took as many as fifteen hours. These discrepancies were due to the age and ethnic background of the speaker, the number of people present and speaking during the interview, poor taping conditions such as an unusual amount of background noise or traffic sounds, misplaced microphones, and equipment malfunction. Some of these problems might be corrected if the interviewer could possibly do a test with the recorder and microphone in the interview setting for a few minutes before he begins the actual interview. This could then be played back to determine if any problems exist and if any physical changes could be made to rectify the situation.

Most problems in transcription stemmed from the poor quality of some of the tapes and the lack of information available to the transcriber about the tapes. The basic source book for information on transcribing and editing procedures is Transcribing and Editing Oral History by Willa K. Baum (1977). According to Baum (1977:8) "During the interview session, the interviewer should keep a running list of names, dates, words, or phrases that may be hard to hear, old-fashioned, technical or otherwise difficult for the transcriber." This was not done by the interview team. A pre-interview form which was devised by Kathleen Gilmore, project director, and included basic biographical and statistical information would also have been extremely helpful to the transcriber but, unfortunately, these forms were not utilized.

Our primary goal in editing was the production of a manuscript that would be acceptable to our narrators. It was felt that although as little as possible should be changed or deleted from the taped interview, the transcript needed to be readable and grammatically correct in order that the narrator would not be so displeased with the final product that

*This section was written by Sally Melant.

he would fail to return it or give permission for its use. To this end, repetitions were cut out, crutch words such as "well" and "you know" were deleted, rambling questions by the interviewer were made more concise, unidentified pronouns were cleared up, and false starts by the narrator were taken out.

The editing stage took approximately the same length as transcribing. In some cases where the narrators were elderly or difficult to understand, this step took even longer than transcription. Ten to twelve hours per one hour tape was about average for editing.

The length of editing time was probably due, in part, to the fact that the person editing the transcripts had not been present at the interviews. The interviewer is familiar with the narrator's speech patterns. He knows what was said by all parties present at the interview and is able to see facial expressions and catch inflections and tone changes which might not come through on tape. Baum (1977:48) notes that many decisions must be made by the editor which will influence the meaning of the transcript. "These sorts of decisions require a great sensitivity on the part of the editor to the whole interview situation and to the character of the narrator. This is why I strongly recommend that the interviewer do the editing." However, in this case, the interviewer, Brooks, was unavailable during the editing process.

Upon completion of editing, the transcript was typed in draft form with editorial corrections. This draft was sent to the narrator with an accompanying letter and a self-addressed stamped return envelope. Gaps and unclear portions of the transcript were marked in red on the narrator's copy and the accompanying letter pointed out the flagged portions and included specific questions which were not asked during the interview but were necessary for a complete manuscript.

Narrators corrected and returned the transcripts. All corrections the narrators wished to make were inserted and answers to specific questions incorporated into a final draft. The only difficulties which have occurred during this stage have had to do with misunderstandings on the part of a few of the narrators about the purpose of the interview and their role as a narrator. It is felt this could be easily handled in future projects through use of a simple agreement to be signed by the narrator at the interview and a copy left with him. This need be no more than a statement of purpose and a general release. The narrator will have a copy in his possession and the project will have evidence that the purpose was clearly explained (Baum 1977:73).

Due to the length of the process of transcribing and editing oral history, it is highly desirable that one person should supervise all stages of production of the manuscript. This person, ideally, should be involved in the project from its inception. Brooks was the person designated for this task. Had he been available throughout the entire Hoxie San Gabriel Oral History Project many of the problems encountered in transcribing and editing could have been avoided.

11.3 The Ranch

Previous Work. Although work was initiated in the San Gabriel reservoirs as early as 1963 (Shafer and Corbin 1965), no historical work was done until the history of the Hoxie Ranch was investigated by Freeman (1976). During the 1960s the late Mrs. Stacy Labaj interviewed persons in the Granger area. Many had stories of the ranch. Her notes and interviews are deposited at the Texas Institute of Cultures in San Antonio. These were helpful to Freeman as well as this study, although they have not been used in this report since that information is in possession of Brooks.

The following is a summary taken from Freeman (1976). All quotes are from that report.

The history of the Hoxie San Gabriel Ranch began in 1830 when Pedro Zarza applied for an 11-league grant on the south bank of the San Gabriel River. The grant was the result of the State Colonization Law of 1825 which allowed foreigners and empresarios to settle in Texas. Eleven-league grants, however, were reserved for Mexican citizens.

Six leagues were sold to Dr. Asa Hoxey by Robert M. Williamson (for whom Williamson County is named) as agent for Zarza in 1838. Hoxey had moved from Alabama to Washington County, Texas in 1832 and became deeply involved in the move for Texas independence. Hoxey never lived on the San Gabriel property. He died in 1863, and his wife 2½ years later. Both left wills, but litigation over the two wills was long and complex and it was not until 1875 that the legal heirs were named. By 1876 they were disposing of their shares, some selling to H.M. Hoxie.

H.M. Hoxie's great grandfather was Asa Hoxey's grandfather, and when H.M. Hoxie began purchasing the former Hoxey property, he was living in Palestine, Texas. How he knew about the property is unknown, but since he helped establish the town of Taylor in 1876, it is possible the story of the property was made known to him at that time. H.M. became prominent in the railroad activities, but kept his hand in at the San Gabriel Ranch by being active in stock raising.

John R. Hoxie, cousin to H.M. Hoxie, probably by urging of his cousin, began to purchase land from Asa Hoxey's heirs in 1878. At the same time he began to purchase property that was to become his Flag Springs ranch. He formed a loose partnership with W.W. Mumford and F. Allison, probably relying on them to manage his properties while he was in Chicago.

In probably early 1884, Hoxie made a contract with his nephew Mortimer Hoxie to take charge of both the San Gabriel and Flag Springs ranches. He developed the ranches into models of stock raising. J.R. and his family visited the ranches in 1886, not only to check on his properties but probably to check on the construction of the house "Sunnyside", on the San Gabriel Ranch. Although the date construction started is unknown,

the Taylor newspaper of January 24, 1887, noted that the residence was "just completed".

The house had approximately 12 rooms, and a large basement. The basement "was one large room with a dirt floor and plastered stone walls. Entrance was by way of stairs which led from an enclosed closet in the kitchen on the first floor. Furnishings consisted of butcher blocks, two large refrigerators, meat hooks, and a large stove which was used for cooking and preserving fruits and vegetables" (Compiled by Freeman from interviews).

"Furnishings in the house were massive and generally excellent in quality. At one time, pieces included beds, washstands, a writing desk, sideboard, sofas, dressers, settees, various chairs, a large dining room table, and a hatrack with a mirror and marbletop that stood in the first floor hall. . .when John R. Hoxie died, his furniture was shipped from Chicago to Circleville."

It was during the late 1880's that the Hoxie San Gabriel Ranch reached its peak. Besides the mansion, there were the numerous out buildings, including a white one-story frame house directly north of the main house, east of this a long narrow building used as a commissary, to the north a stable built into the side of the hill, and a barn located above the stable. There were more than 8,000 acres of land, and stock included horses, sheep, hogs, thoroughbred Herfords, and shorthorn Durhams. Four thousand acres or about 1/2 of the ranch was in cotton, corn and alfalfa.

John R. Hoxie's visits to the ranch were very brief. Mortimer Hoxie managed the ranches and a foreman, R.O. Lankford, lived in Sunnyside.

John R. Hoxie died November 21, 1896. His wife Mary administered the estate until 1910 when she sold the San Gabriel Ranch to a partnership composed of her son Gilbert H. Hoxie of Chicago, Francis A. Allison, and Fred Welch, both of Taylor. Some years before, Allison and Welch had bought the Flag Springs Ranch and subdivided it, and by late 1910 a subdivision plat of the San Gabriel Ranch was filed. Parcels of land ranging from 60 to 200 acres were sold.

Allison died in 1914 and the tract where the Hoxie house, "Sunnyside", stood was retained by Mrs. F.A. Allison and Mrs. S.G. Gernert (a member of the Welch family). It was managed by Mrs. Allison's son, Ferguson Allison. Following 1910, a number of tenants lived in the house and on the ranch. This is detailed in the next section of this report.

The house burned on March 31, 1938, but the land is still there, as is the effect of that land on the lives of the people who lived on it.

History 1910 to Present. It is, indeed, fortunate that many persons connected with the Hoxie Ranch are still living, and total interpretation of ranch life and style are not entirely dependant on archaeological remains, although archaeological data can add significantly to an historical or oral picture.

This section is compiled from interviews of people who lived on or had knowledge of the Hoxie Ranch.

1910 was the year F.A. Allison and F. Welch bought the Hoxie San Gabriel Ranch. The Allison family had been associated with the property for a long time. According to Agnes Allison Whatley (1979), the two Allison brothers, E.C. and James A. came to Texas before the Revolution and bought the Pedro Zarza Grant, but with a change in government the same land was granted to someone else. This may account for Allisons as claimants during the litigation after Asa Hoxey and his wife died. Part of this land apparently was either claimed or settled on by Joseph Rubarth (Mrs. J.B. Martin 1978) who came to the area after 1840 since the 1840 census shows him in Brazoria County.

F.A. Allison's father had been offered the land that eventually comprised the Hoxie San Gabriel Ranch shortly after the Civil War (Freeman 1976:21fn) or in the 1890's for 50¢ per acre, but he couldn't raise the money (Allison 1978). When he and Welch bought it, 7,000+ acres, it had gone up to $50.00 per acre. In order to pay for it, the land was subdivided and sold in small tracts. Many of these farmers "would pay one-half rent, live on one fourth, and use the other fourth to pay for his place" (Allison 1978).

C.G. Wuthrich purchased part of the Hoxie land in 1910. One of the Wuthrich daughters married Theo Schroeder (see interview). During the early part of the 20th century most farms were small, a common size being between 50 to 100 acres. One hundred fifty acres was a large farm, and 300 acres consituted a ranch. The size of most farms was determined by the animal power and human effort needed to keep the land under cultivation in the pre-tractor era (Shroeder 1979).

F.A. Allison was killed in 1914, and his four children inherited one half of 3,800 acres. During the partnership of Allison and Welch therewere as many as 142 tenant families on the acreage (Allison 1979). Allison readily rented to or employed Bohemians who were coming into the area, and many bought tracts of the subdivision (Martin 1978). The tenants worked the land on halves, where the landlord furnished all the equipment, and each tenant got 1/2 the production. Cotton and corn were the major crops.

In 1910, R.O. Lankford, foreman, and his family lived at Sunnyside.

He had two daughters, Mary and Ruby, and one son, Jack Walton. Lankford had come to the ranch about 1902 and left about 1914. Lankford had a livery stable in Taylor before he was foreman at Hoxie. His daughter, Mary Lankford Redwood recalls Gilbert Hoxie and his brother John, "the kind of retarded one..." visited the ranch once or twice a year. She believes that before Allison and Welch bought the ranch they leased it from Gilbert Hoxie.

There was one bedroom in the house designated for Mr. Allison when he came to the ranch. He came often and would stay almost a week at a time. He would always call to let the Lankfords know when he was coming. Mr. Allison's room was in the front of the house on the east side.

Mrs. Redwood has vivid recollections of the Hoxie house. She describes the rooms on the first floor as huge with high ceilings. Despite the fireplaces, they were hard to heat in winter because they were so large. Mrs. Redwood noted some descrepancies between her memories of the first floor plan and Martha Freeman's (1976) floor plan of the house. Freeman's "parlor" was used as a master bedroom by Mr. and Mrs. Lankford; the room labeled "phone room" was the parlor, and the room labeled "all purpose room" was the phone room. She states that the stairway came between the phone room and the back of the hall. This first floor stairway which came up from the main hall was beautiful. It curved and had a pretty landing. Steps were wide and shallow. There was a "cut out place" in the curved landing where a flower vase or statue could sit. Behind the stairway was a large bookcase which ran almost the full width of the hall. At the side of the bookcase was a door which opened into a small hall leading back to the porch. So, there actually were two halls, a large one and a smaller one. A beautiful coat rack stood in the large hall. From the small hall stairs led down into the basement and up a back way to the second floor bedrooms. There was a closet in this small hall and also a small galvanized stand surrounded by wet cheesecloth in which milk and butter were kept. There was an attractive lavatory in the kitchen which was arched over and set back into the wall.

The dining room contained a huge, long table. Meals were large family style, often with a variety of meats served. Some of the men working on the ranch took meals with the family in this dining room.

The phone room which had plastered walls, contained two cabinet type telephones. These were set close together on two adjoining walls in one corner of the room. Since they were so close together only one could be used at one time. Both lines were in working order, one was the old system, and the other a new system.

The basement was large but Mrs. Redwood does not feel it extended under the entire house. This space was divided into two large rooms. The basement was entered from the stairs coming from the small hall.

The stairs went down into the first room which was mainly used for meat storage. The other room was used for keeping milk and cream and churning butter. Mrs. Lankford had a large range in this room and did canning and preserving there. She occasionally did washing in this room during inclement weather, but she had a separate wash house outside and usually washed and ironed there. Mrs. Redwood does not recall a door leading to the basement from the outside of the house.

There were seven bedrooms on the second floor. In addition to Mr. Allison's room in the front of the house on the east side, there was one other room on the east side, a large guest room off to the right at the top of the stairs. This room was big enough to easily hold two double beds and two dressers with lots of space between. Mrs. Redwood describes the guest room furniture as "gorgeous". On the west side of the second floor were five other bedrooms and a large bathroom. The bathroom, situated directly above the kitchen, had running water with a commode and a white enamel bathrub on legs.

The third floor contained no furniture. Although Mrs. Redwood was told it had once been a ballroom, when the Lankfords were at Hoxie it contained pipes and fixtures for the acetylene lighting in the house at that time.

Stairs led from the second floor to the "ballroom" and on up to the cupola. The stairway on up from the second floor was much narrower than the first floor stairway. At one time the cupola was used as a bedroom by Mr. Lankford's brother, Lon.

Outside, there was a cistern directly behind the back porch. Two small buildings for the acetylene lights were on the west side of the house. A road came around the west side of the house and went between the barn and these acetylene houses. The house was fenced all the way around with a large iron gate at the end of the driveway on the front side of the house. The acetylene houses were not inside the fenced yard, but on the other side of the road to the west of the house. The barn was inside the fenced yard. Also inside the yard was the long ranch style bunkhouse with porch which Freeman (1976) describes. Redwood does not remember a ranch store or commissary. The large barn set on the side of a hill had many stalls and some saddle rooms. Many horses were kept there.

Overlapping with the Lankford family and the Lewis family who lived in the Ranch House after the Lankfords were the Oscar J. Blum family. They lived on the ranch as tenants from about 1902 to 1919. Since Mrs. Lankford and Mrs. Blum were related, the Blums may have come to the ranch about the same time or shortly after the Lankfords. Blum farmed thirds and fourths for Mr. Allison on the Hoxie Ranch. Willie Blum Knox (1979)

recalls C.F. Allison coming to the ranch nearly every day and occasionally eating lunch with them.

The land on the Hoxie Ranch was wonderful and her father raised everything, according to Mrs. Knox. Cotton, corn, and sugar cane were raised primarily. Maize was not grown or known of at the time. Although the cane was real sugar cane, it was not pressed into molasses but was used instead for feeding the stock. Mr. Blum only kept what livestock he needed to work his farm. He farmed with mules. Two horses were kept to pull the fringe-top surrey and a buggy.

After the Lankford family left Hoxie, the Lewis family moved into the Hoxie house. This family had a number of children; one of the sons, Orin Lewis, is still living at Marble Falls.

It was about 1919 the Blums moved from Hoxie Ranch. At this time the Lewis family was still in the house. She returned to the house later to attend dances when the Benight family were living there. Mrs. Knox met her husband of 59 years at a dance held by the Benight family in the big hall of the Hoxie house. She recalls a large attendance at these functions, but could not recall whether there was a charge to attend the dance. She believes the Benights came when the Lewises left around 1920.

The Blums' tenant house was described as being an ordinary house with a kitchen, dining room, three bedrooms and a porch. The Blums also had an outside cellar in their yard where they went when storms came up. If Mrs. Lankford was at home by herself when a storm came up she would hitch up her buggy and ride over from the Hoxie house to take shelter in the Blums' cellar.

Rudolph Polacek, born in 1908, lived most of his life on the Hoxie. His parents bought land from Mr. Allison. At one time Rudolph rented a house from Ferguson Allison and worked for the Maleks. He used to sleep in the Hoxie house and remembered it was full of Hoxie furniture. He remembers pool tables, one each on the first and second floors where he would shoot pool with the Malek boys.

Mr. Polacek recalls a store at Hoxie for the "hands" and feels it was west of the house. He remembers the big barn that was partially underneath the ground and several other outbuildings including the blacksmith shop. He can recall cowboys still being on the ranch when he was a boy of four or five. For a time there were a great many sheep kept on the ranch before the land was cleared and cultivated for growing crops.

Mr. Polacek attended dances in the Hoxie house while the Sefcik family was living there. The youths of the area would travel as much

as ten miles to attend a dance, often wedding dances. They would come on horseback in groups. The boys usually went to dances without "dates" and would meet girls, who came with their parents, at the dance. Polacek remarked that if the boys couldn't find enough girls to dance with, they just stood around. There was usually some "home brew" available.

After Rudolph was married in 1937, he and his wife lived on a small farm near the Hoxie house. They watched the house burn in 1938 from their field. In 1947, the couple bought 64 acres on the Hoxie Ranch and lived there until the land was bought by the Corps of Engineers.

Ernest Malek, of German-Czech descent, lived on the Hoxie Ranch site for a number of years. The family came there from El Campo, Texas, shortly after the big flood of 1921. Malek's father was a trained blacksmith and had had his own blacksmith shop in El Campo. The Malek family, which included twelve children, farmed on the former ranch site for Mr. Gernert--president of the First National Bank of Taylor at that time--and lived in the Hoxie Ranch house (Sunnyside). Since Gernert's wife belonged to the Welch family, it is possible Gernert was managing the property for Allison/Welch interests before it was divided among the heirs.

Ernest's wife never resided on the ranch but was born and raised in Williamson County. Her father was Paul Malish of Williamson County and her mother was Anastasia Stresinger who came to Williamson County from Moravia, Czechoslavakia when she was eight years old.

Of the twelve Malek children who came to Hoxie Ranch, seven were boys. Ernest's father was able to farm quite a large area for Mr. Gernert with the help of his sons. As a youth, Malek helped a sheepherder, Bibliano, care for sheep that Mr. Gernert kept on the land and was rewarded for his work by Gernert with paper boxes of Prince Albert tobacco.

Malek recalls a few details about the ranch house, including the basement and cupola, especially. He describes large double doors on the north side of the house opening to wide steps which led down into the cellar. Fixtures for carbide lighting were in place in the basement but lanterns were used instead during the Malek's stay there. To Malek, the cellar seemed so large that a wagon could have almost been turned around in it. He feels both Granger and Taylor could be seen from the cupola and was told by Mr. Livingston, an old cowboy still residing on the ranch, that a lantern was hung in the cupola at night as a beacon to guide the cowboys back to the ranch house. Malek also recalls the porch of the house being so high off the ground that the children could play tag underneath without bending or stooping.

Malek was the second brother of the family; his oldest brother

lived in a small house east of the Hoxie house and farmed his own place which included bottom land next to the San Gabriel River. 1925 was a very dry year in the area and everyone had to sell cattle. During this period Malek's brother left his small tenant farm to seek work and Malek eventually took this place over for Mr. Gernert. Malek borrowed money from Mr. Gernert to purchase a team of mules. Mules could be used for as long as 15 years and at that time all farming was done with mules; ". . .we didn't know what a tractor was."

Malek grew cotton, corn and some cane at his place on the Hoxie Ranch. Maize was not grown at that time. Malek worked on thirds and fourths for Mr. Gernert but states that Gernert also had a lot of half renters working for him.

When the Maleks lived in the ranch house most of the fancy furniture was still in it. Mr. Gernert gave Mr. Malek a dresser from the house when he moved out of the big house to his small tenant house. This was a reward for the good work Malek had done while living with his father on the large place.

At the time Malek was living on the ranch most of the land was under cultivation but he understands that when the Hoxies were the owners it was mostly pasture land used for running cattle. Malek can recall no large animals or even deer on the Hoxie while he was there. There were lots of fish, however. Malek also recalls many large soft shell pecan trees near the Hoxie Bridge on Mr. Gernert's property. These trees bore many large nice pecans.

The bottom land near the 'Gabriel is the richest farming land in the area but much of the bottom is flat with no banks; when the river comes up everything is flooded. One year, Mr. Malek lost most of his cotton crop, which was in a trailer ready for ginning, to high water from the Gabriel. "They must have had a big rain in Georgetown, all that water come up and my trailer was halfway under water, cotton in it."

Malek's father stayed in the big house and farmed until his sons began to get married and leave home. Mr. Malek had great strong forearms and had a blacksmith shop east of the Hoxie house. The blacksmith shop was probably already on the site when Malek came to the Hoxie (Polacek 1979). Feeling he could no longer farm such a large area without his sons, he moved to a smaller place. Ed Sefcik rented the house and land after Malek's father left.

Malek remained on his small tenant farm several more years after his father left, but eventually moved off the Hoxie. Although his reason for moving is vague, concern over flood damage seemed to be at least a partial cause. Malek is unsure when he left but it can be

estimated from other dates he gave that it was between 1927 and 1933.

Mr. and Mrs. Herman Lenz began farming at Hoxie with seventy acres in 1934. They raised hogs, chickens, and cattle, which they sold at auction. They did all the farm work themselves, growing most of their food, and selling milk, cream, and eggs for cash. Mrs. Lenz "put up" vegetables regularly from the kitchen garden. The main crop was cotton, for the land was "good cotton land." Corn and maize were of less importance and more difficult to harvest. They had to "top by hand' these crops, lacking machines to do the work. Corn and maize were fed to the chickens, seeds were saved for planting, and the stalks went to the other animals. Although Herman, Jr. remembers his father always having a tractor, one with metal lug wheels, mules were used extensively. Mrs. Lenz remembers working corn with four mules and a double row cultivator. Fertilizer wasn't used much, though dry manure was sometimes spread on the fields. Yields weren't as much as one bale per acre. Harvest began in July for cotton and corn, and hay was stacked for the cattle. Most people owned their own cotton strippers, but combines were often rented for other crops. The usual payment was "so much per hundred pounds to cut and haul."

Most of the Lenz's neighbors were Germans and Bohemians who helped each other out in times of need. When Mr. Lenz was ill, twenty-four friends and neighbors spent two afternoons stripping over one hundred acres of cotton for the family.

What they didn't provide for themselves the Lenz's bought in Taylor. "Odds and ends" were purchased at the Hoxie store which carried canned goods, bread, and flour. Prices there were higher on some items and lower on others than stores in town.

In 1966 Mr. and Mrs. Lenz moved to a small white frame house near the Hoxie house. This farm consisted of approximately 400 acres. By this time most farms had become larger. Most of the land was used for cattle, but some crops were still grown. This last residence was very near the old Hoxie basement which had been filled in some years before.

Rose Marek David (b. 1912) lived briefly on the Hoxie property when her father bought the cotton gin at Hoxie, but it burned before it could begin operation.

In 1942, after her marriage to Elo David, the couple moved back to the Hoxie Ranch. They lived in two houses at various times--the first was a small house "on the road that would go straight across the old rickety bridge." The second house was "on the hill where the old house stood." While they lived at Hoxie the barn was rebuilt, she thinks, by brothers John and Albert Benight. The three-story Hoxie barn was torn down in 1942. It had begun to deteriorate in 1936, was abandoned

in 1938 when the house burned. Robert Crenig was hired to tear it down starting on a Monday. But he and his brother got drunk on a Saturday, went to the ranch, tied ropes and chains around it and pulled it off the foundation with a John Deere tractor. A barn was built of the old timbers. Allison tore the barn down after the property was bought by the Corps of Engineers and he retained the old timbers (Allison 1979). Some of these seem to be hand hewn and contain machine cut nails, as well as wire nails.

After the Hoxie house burned, the property had deteriorated. There was no water in the cistern and debris and rubble filled the basement which seemed to Mrs. David to be about five feet deep. Other tenants on the property were the Beliciks and George Simcik. Mrs. David noted that although a close knit group, the Czechs tended to separate into Moravian or Bohemian segments. The Davids left their Hoxie residence after a rental dispute with the land owner, Mrs. Danna Allison, who wanted money per acre for rent rather than the "thirds and fourths" arrangement Mr. David preferred.

Mr. and Mrs. Alvin Bryan and son Bobby lived in a four-room bungalow near the site of Sunnyside from 1951-1967. They moved there at the suggestion of Charles Allison. They raised cotton, corn, and maize on thirds and fourths. Corn was mainly raised for feed.

According to Charles Allison, the house was built around a nucleus of a "lean to" which was pulled away from Sunnyside when it burned. This house was about twice the size of the original "lean to". The house was next to the gaping hole of the old basement which had been used as a dump through the years. It was about 1953 that Mrs. Danna Allison hired "Shorty" Renicanek to fill in the hole with bulldozers.

Mr. and Mrs. Curtis Ging lived on the Hoxie Ranch near the site of the old Hoxie house from 1968 to 1974. They farmed for Dr. Charles Allsion, the present owner and descendant of Francis Allison. The Gings took over the property after Mr. Lenz, the previous tenant, died.

The Ging children are the fourth generation of Mrs. Ging's family living in the "'Gabriel Valley." She is a member of the Polacek family. Her grandfather Polacek came to Williamson County from Czechoslovakia in the late 1800's.

When the Gings took over the farm on the Hoxie Ranch in 1968, the river bottom land was very overgrown. This was probably due to the extended illness of the previous tenant, Mr. Lenz. It was impossible to walk through this "bottom land" which was overgrown with briar, small trees and brush. Mr. Ging and Dr. Allison shredded and cleared this area and thereafter it had to be cut four to five times a year to be maintained.

At the Hoxie place the Gings raised cotton and maize on thirds and fourths and cattle on halves. The sixty head of cattle grazed on a 250-acre pasture. By this time, the use of sophisticated farm equipment was much in evidence. The Gings mention using such things as a 6 row shredder with hydraulic lift, stripper trailers, 560 Farm All tractor, John Deere tractor, and a combine for maize.

Mr. Ging states lots of artifacts could be found just laying around the pastures on the Hoxie. He mentions snuff bottles, arrowheads, and parts of an old wagon in particular. At the time the Gings lived near the old Sunnyside site the cistern and evidence of a brick sidewalk from the old house were still there. Mr. Ging feels sure he could point out the parts of the foundation wall of the old cellar. The well on the site never dried up the entire time the Gings were living there.

Often University of Texas and Southwestern University fraternity groups would bring freshman students down to the San Gabriel River bottom for initiations. The Gings recall several incidents of students being dumped near their house dressed only in tow sacks. This was usually done in freezing weather and the semi-clothed students would be expected to find a way back to campus on their own. The Gings speculate that the area was popular for this sort of thing because it was rather isolated and there were no towns nearby.

There was a beautiful picnic spot on the "bottom" land near Hoxie Bridge. The Gings went there often to picnic and also gave permission for groups and individuals to camp and barbecue there from time to time. This spot was underneath a large pecan tree. Mrs. Ging's father, Mr. Polacek, recalls this tree as being large when he was small (he is now, 1979, seventy).

A cooperative beef club met once a week in the basement of the Hoxie house. It is unknown when it was formed, but it was probably in the 1930's during the depression. There were about forty people in the club and each contributed a yearling. Each week a different part of the meat was given out so each family would have an equal share of the good and poor cuts. A written weekly record was kept of which parts were given to which families. The Germans had their own club at Hoxie Community and used a different method of dividing up the meat. Usually the men went to pick up the meat. After it was brought home, it was put in a jar and put down the well in a separate bucket to keep cool. Many people ate meat three times a day at that time. The club continued to meet at Hoxie Community through World War II, but at some point before 1947 it was moved to Waterloo.

Many stories circulated in the area about the cause of the fire at the Hoxie house. Some say the house burned for two days. It was rumored that Sefcik was making home brew inside the house which set it on fire.

Others said a crack in the chimney caused the house to ignite. It was also thought that Ferguson Allison owned 21,000 acres and wanted to divide and sell it in thirds, and this was related to the fire.

Many people thought the house had thirty-two rooms, that a team and wagons were driven into the basement, and the basement was built to hide horses during Indian raids. A light was also kept in the cupola to guide the cowboys home.

The story is also told of the ghost of Hoxie Bridge. During the '21 flood, the bridge washed out and drifted about three hundred yards from the bridge site. Prisoners were brought from Huntsville to build the bridge back up. One of these prisoners made trouble and had his head shot off on the bridge by a guard. From this time the ghost haunted the new bridge when it had been a full moon on a Friday night. Horses would refuse to cross the bridge when the ghost was there. Only certain people could see this ghost. Mr. Malek and Mr. Ging never saw it, but Mr. Polacek saw him many times. The ghost would be sitting on the right side of the bridge as Polacek crossed back over it from the Hoxie house. It had no head and never spoke or moved. Polacek doesn't remember what year the ghost left the bridge, but it was after the priest prayed for the soul in church. The ghost was never seen again after that time.

There is another story told by Mr. Pope, of a group of young people going to the Hoxie Bridge to check out the ghost stories. There were five or six young men in the group but by the time they got to the bridge all of them had "chickened out" except one who didn't get scared. No one saw him for two or three days after this. When the young man did appear, his black hair had turned completely white. Mr. Ging feels the rest of the boys went back and scared him badly causing the hair to turn white. Mrs. Ging feels her Uncle Luke was present on this occasion. Mr. Pope feels sure it is true that the young man's hair turned white, as he has heard it from many different sources. Mrs. Ging states her father (Mr. Polacek) tells this story and it is true.

Stories circulate about gold buried at the ranch. $20,000 in gold from a bank robberty was reportedly buried near the old Hoxie barn by a gunman. The Maleks, the Crupps, and others have looked for it but nothing has been found. Once a young boy named Simcek was hunting for gold at night with a metal detector and began to dig where the detector indicated metal. It turned out he was digging in a grave and, suddenly, a ghost appeared before him and hit him. This boy had dark hair and when the ghost hit him, his hair turned completely white.

It was in 1954 that Congress authorized a system of reservoirs for flood control and other purposes in the Brazos River Basin (Federal Reporter 1973: 1125). The Laneport Reservoir on the San Gabriel River was approved and partially funded. A modification in the plan, emanating at the request of Congress, added North Fork and South Fork to

Laneport. Fourteen years later, 1968, the Corps produced a revised plan.

Sometime after this, Dr. Charles Allison began to study the situation, gathering information and then filed suit against Robert C. Froehlke, Secretary of the Army. The suit, seeking a permanent injunction against the construction of the three reservoirs was denied by the U.S. District Court for the Western District of Texas, Judge Roberts, June 8, 1972. An appeal was taken to the U.S. Court of Appeals, Fifth Circuit (New Orleans) before John R. Brown, Chief Judge, and Moore and Roney, Circuit Judges, on December 27, 1972.

The plaintiffs allegations were that the project as presently planned had not been authorized by Congress and (2) that it violated specific environmental and related statutes. The plaintiffs consisted in part of Charles C. Allison and others, Lloyd O. Doggett for Save Our Streams and others, and Bob Burleson for himself and for the Texas Explorers' Club. These composed a group, according to the Federal Reporter (1973: 1125), having "personal and property interests in the areas which they assert will be adversely affected." Allison was fearful his land would be condemned; Burleson believed his enjoyment of canoeing on the river would be lessened, and as President of the Explorers' Club, wild life would be in danger. The others shared worry about the effect on the environment.

The Circuit Judge, Moore, denied a preliminary injunction. He held "that upon the facts and the law, and in view of a balancing of the respective interests involved, including the fact that issuance of an injunction would irreparably injure defendants at the rate of $49,000 per month increased construction costs." Further, as a matter of law, the fact that a botanist, a zoologist, a demographer, or an economist were not on the staff which prepared the environmental impact statement did not render the statement inadequate. Neither was the statement inadequate because of omission of consideration of the white crappie, a well-known game fish.

In addition, "Judicial notice" could be taken that the habitat of the rare golden cheeked warbler would be adversely affected by the project, and that the creation of reservoirs would affect the lives of turkey and deer in the area.

As to the accusation by the plaintiffs that the Corps ursurped the function and powers of Congress by proceeding with its own plans and redesign and ignoring Congress, the Judge cited several opinions where such projects had "a built in margin for error, leaving room for necessary changes." The Congress authorized the project "substantially in accordance with the recommendations of the Chief of Engineers,"--substantially being the key word.

The judge quoted (Federal Reporter 1973: 1127) Mr. Justice Douglas in Sierra Club v. Morton: "The river, for example, is the living symbol of all the life it sustains or nourishes--fish, aquatic insects, water ouzels, otter, deer, elk, bear, and all other animals including man, who are dependent on it or who enjoy it for its sight, its sound, or its life." Quoting further--"But the San Gabriel, even assuming it serves these beneficent purposes in its more placid moments, may well, in its more angry rampaging in moments of flood, cause extensive damage to thousands along its banks unless flood control measures are adopted. This case as all similar cases, calls for a balancing of these respective interests."

This opinion was limited to granting or denying a preliminary injunction. The trial for a permanent injunction remained to be set. The plaintiffs then had an opportunity to assemble relevant facts. The trial never took place, and on June 30, 1975, the "Defendants now seek Summary judgement and dismissal upon evidence addressed at the preliminary injunction hearing" (Allison vs. Froehlke, Civil Action No. A-71-CA-84). Since the plaintiffs did not come forward and show a "genuine issue for trial", the summary judgement was granted and the action was "DISMISSED on the merits."

There were mixed opinions in Williamson County about the merit of the dams and reservoirs. With the initial word of a proposed reservoir about 1964, there was local support, but when the size and impact of the project became clearer, opinions changed. Most were in favor of flood control, but would have preferred small check dams. A meeting in Georgetown conducted by the Corps, overwhelmingly opposed the project. (Fox 1979) According to Fox, a year or so after this meeting, the Corps held another meeting in Austin, but notified only those in favor of the project, therefore the vote was unanimous in approval of the project.

Most of the resentment and "hard feelings" toward the Corps was the method of acquiring the land (Fox, Scarbrough, Ging, Polacek, Pope). Threats of condemnation seemed to be aimed at "weaker" landowners or those near retirement and unfair prices resulted. Seventy-year old Mr. Polacek was the third person to sell his land. He sold his land (60-70 acres) for $480.00 per acre. He felt this was a good deal since he originally paid $68.00 per acre, but toward the end of the land buying process much more was being paid to those who held out, easement priviledges going for $400.00 per acre.

There was also the general feeling that the dams were political, with only a few politicians actually wanting the project. The story is told that the late Wilson Fox (County Democratic Chairman) could not sell his property because of legal ties unless it was condemned, and consequently he was in favor of the project.

Land surveyors began coming about 1972. They cut fences and drove across crops to gain access to bottom lands. Some of the land owners ran them off at gun point (Ging).

When the word was out that property was being bought, people began coming onto the land to fish or camp, thinking it was government land. After hosues were beginning to be sold and vacated, a lot of stealing began to occur. The Popes had three gates stolen. The Gings had an 18-foot metal gate, chain and lock stolen near the picnic grounds by Hoxie Bridge. Another resident, a neighbor of the Polaceks, had his well pump stolen during the hour and a half he left his house one Sunday to attend church services. These people, however, felt such incidents were not done by local people but by people from farther away who knew the situation.

Extant furnishings of the Hoxie Ranch. The ranch house was furnished at least in part after John Hoxie's death from his house in Chicago (App. I). Some of this furniture presumably was consumed in the 1938 fire, but some of it had undoubtedly "wandered off" or was given away. For example, Mr. Malik (see summary) possesses a dresser from the ranch which was given to him by Mr. Guervert.

This dresser is not as ornate as the one in Mrs. Cornforth's possession, but is of the same style and time period. Mrs. Cornforth bought a dresser from a Mr. Welch (now decreased) who lived on Lake Drive, Taylor at a time when they bought secondhand furniture. It was said to have been in the Hoxie San Gabriel house. Welch had the dresser stored in an outside storeroom and asked Cornforth's if they wanted to buy it. It has a reddish marble top and is probably of walnut. Mrs. Cornforth, who has been an antique dealer states that the dresser is probably 100 to 125 years old. She would call it late Victorian in style, and evaluates it at about $850 (1979). Pictures of the dresser are in Roy Brook's possession.

Flournoy Allison Carradine (deceased) had a walnut marble topped desk, and according to Ruby Cornforth, her son F. A. Carridine of Houston has it at present. Apparently, he also has other pieces, one of hwich is an oak rocker. Roy Brooks interviewed Mr. Carradine in Houston , and was assigned to take pictures of the furniture. Presumably these are in Brook's possession.

Charles C. Allison states there are 6-8 pieces of furniture in his and Mr. Carradine's possession. Mrs. Danna Allison stated that Agnes Allison Whatley and her sister, Betty, own needlepoint covered divans, but these were probably from the Flag Springs house, rather than the Hoxie house on the San Gabriel River. Allison has a chair that came

from the Hoxie House which he had refinished about 20-25 years ago. It was the host chair of a set of 12 chairs, Allison believes. Four of the chairs were saved. The girls, Mrs. Carradine, Mrs. Latham, and Mrs. Whatley took the others. The chairs were upholstered in leather, tooled with a flowerlike design. The padding was a hairy, jute-like material. It was a very comfortable chair. They also have a dresser which was part of a bedroom suit.

Allisons also have a candelabra lamp, a large serving bowl, a tablecloth and 12 napkins, and some crystal which Mrs. Allison believes may have come from the ranch house.

Pictures presumably were taken by Roy Brooks and presumably are in his possession.

Conclusions. The Hoxie Ranch, or the ownership of land by the Hoxies, was one episode in the history of the land. Its history of human occupation started thousands of years before Pedro Zarza's grant, with Indians fishing and living on the banks of the San Gabriel. A history of the land is essentially a history of the people who used it, lived on it and loved it. This report has placed in an historical perspective some of the people connected with that segment of land known as the Hoxie Ranch to preserve information of changing processes that might be forgotten. Change is a constant process that must be adjusted to, but the effort must be made so the process is positive and progress and forward movement are accomplished.

Acknowledgements. Both Linda Lavender and Roy Brooks conducted excellent interviews for the project. Sally Melant did most of the transcribing and editing, and has been extremely helpful during the trying phases of the project. Sally and Gretchen Niendorff wrote the summaries. C. C. Allison, Austin, was instrumental in getting the project accomplished. Pam Ristow type the manuscript. To all my appreciation.

RESIDENTS ON HOXIE RANCH

DATE	RESIDENT OR TENANT	LOCATION	LANDLORD	FARM PRODUCTS
1902 - 1914	R. O. Lankford, Mrs. Fanny Lankford, Ruby, Mary D., Jack	Hoxie House	Gilbert Hoxie, Francis Allison	cattle, sheep
1902 - 1919	Oscar J. Blum (dau. Willie Knox)	Tenant House	Francis Allison	cotton, corn, sugar cane
1913 - pres.	Schroeder (?) (wife Wuthrich)	Own farm; father bought from Race 1913	Self-owned	cotton, corn, maize
1914 - 1920	Lewis Orin (son)	Hoxie House	?	
1918	J. A. Marek (dau. Rose David)	Owned Hoxie Gin (?)	?	
1920 - 1923	John Benight	Hoxie House	?	?
1921 - 1927	Malek	Hoxie House	Gernert	sheep, cotton
1926 - 1933	Ernest Malek (son)	Tenant House	Gernert	cotton, corn, cane
ca. 1929 - 1938	Ed Sefcik	Hoxie House	Gernert	
1938 - ?	Ed Sefcik	Bungalow House Hoxie House Site		
1934 - 1966	Mr. & Mrs. Herman Lenz, PeeWee	Tenant House		hogs, chickens, cotton, cattle corn, maize

RESIDENTS ON HOXIE RANCH, continued

DATE	RESIDENT OF TENANT	LOCATION	LANDLORD	FARM PRODUCTS
1937 - 1941	Mr. & Mrs. Rudolph Polacek	Tenant House		Cotton
1942 - 1951	Mr. & Mrs. Elo David (Rose Marek)	1st Tenant House 2nd Bungalow House Hoxie Ranch Site	Danna Allison	
1947 - 1974	Mr. & Mrs. Rudolph Polacek	Own farm on Hoxie	Self-owned	Cotton
1951 - 1966	Mr. & Mrs. Alvin Bryan, Bobby (son)	Bungalow House Hoxie House Site	Charles Allison	cotton, maize corn, cattle
1966 - 1968	Mr. & Mrs. Herman Lenz, PeeWee	Bungalow House Hoxie House Site	Charles Allison	cotton, corn, maize
1968 - 1974	Mr. & Mrs. Curtis Ging	Bungalow House Hoxie House Site	Charles Allison	cotton, maize, cattle

12.0 Test Excavations at Prehistoric Sites

by

Olin F. McCormick

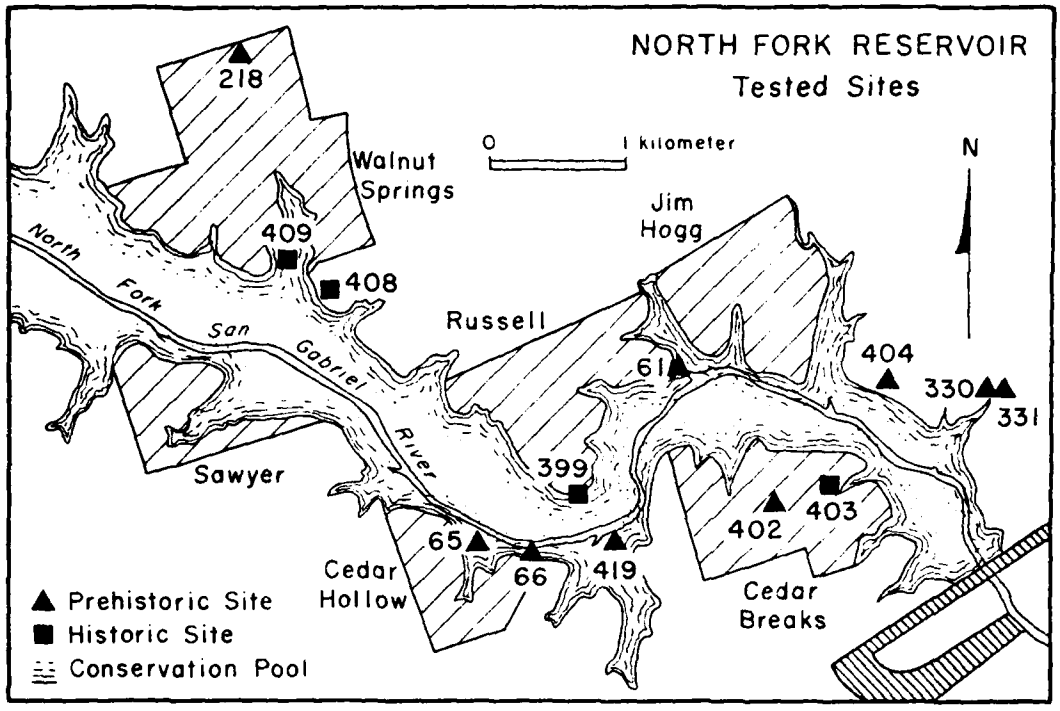


Figure 12.0-1

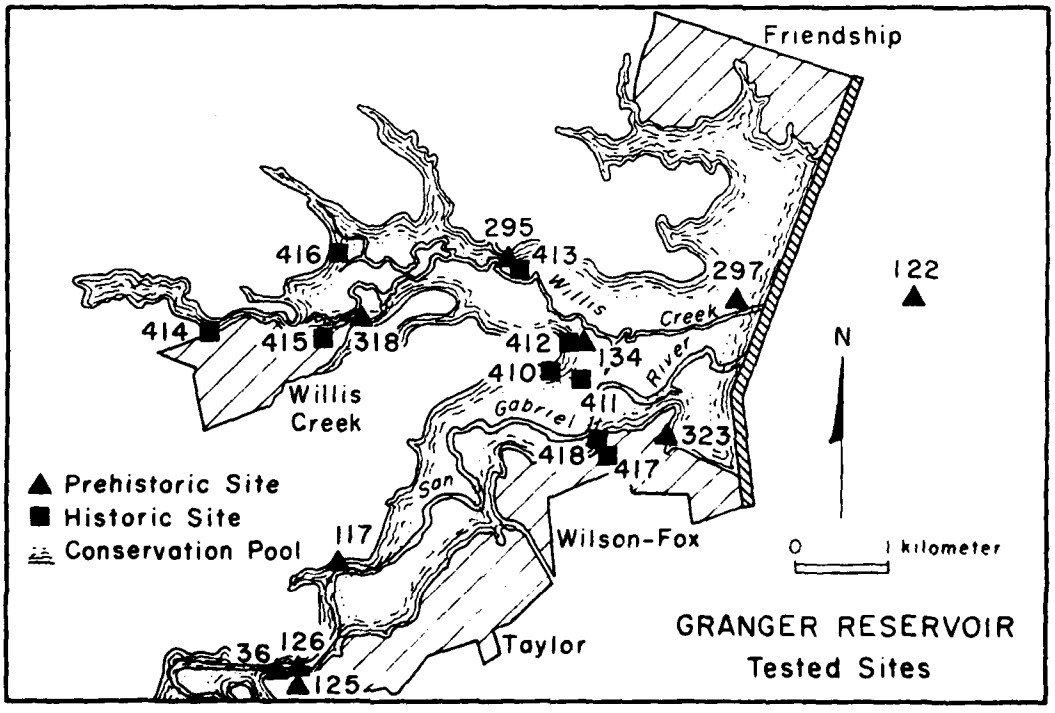


Figure 12.0-2

12.1 Site 41WM61

Investigations

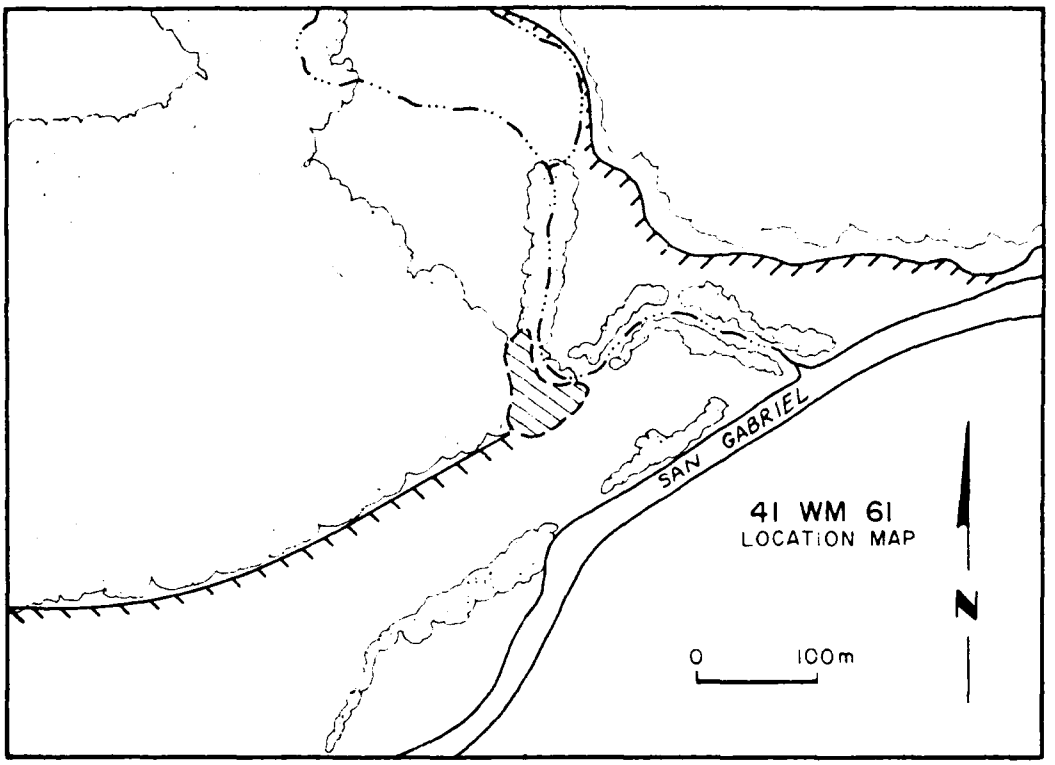
The site was one of the better known in the North Fork reservoir area. It had provided a source of projectile points for local collectors, pot-hunters, and Boy Scouts over a period of at least 20 years, according to local informants. In checking several of the local collections, many contained artifacts diagnostic of the Paleo-Indian period which reportedly came from the bottom sections of site 41WM61. Several of the collectors felt that the site went considerably deeper than their diggings and one even had plans to bring a backhoe to the site to look for the early occupation levels. The possibility of recovering data from an in-situ Paleo-Indian occupation prompted the recommendation to document whether such a cultural deposit existed and to design mitigation efforts if such proved to be correct.

The site is on a sloping terrace remnant between the junction of "Spring Creek" and the North Fork of the San Gabriel River. Cultural deposits measure approximately 26 meters N/S by 20 meters E/W at their widest part. The western edge of the site abuts a 60° upland slope on the southeastern end of Russell Park (Figure 12.1-1).

When first visited by NTSU archaeologists, the site area resembled a battlefield with potholes in potholes. There could be absolutely no doubt that the upper 1 to 2 meters of the site were totally mixed. A series of three backhoe trenches were cut into the site and a large pothole in the cutbank of Spring Creek was cleaned out (Fig. 12.1-1).

In order to most expeditiously utilize the allotted time, a series of one meter profiles were cleaned and drawn for each backhoe trench rather than attempting this procedure for the entire length. Where a particularly complicated section was found, longer profiles were cleaned. A total of five soil strata were identified across the site. Actually seven were found, but two of these occupied such a small area that they could not be classified as "strata". Figure 12.1-2 illustrates the profiles drawn for backhoe trench (BHT) #2 and shows the strata relationships generally found across the site. The description of these is as follows:

Stratum 1 - Loose, high organic content loam soil with numerous burned and unburned limestone cobbles, roots, rootlets, and leaf mold, a few scattered flint flakes and snail shells. This zone has suffered extensively from pot-hunting activities and can not be considered natural or in situ. Color 5YR2.5/2 black.


SAN GABRIEL
41 WM 61
LOCATION MAP
0
100m
N

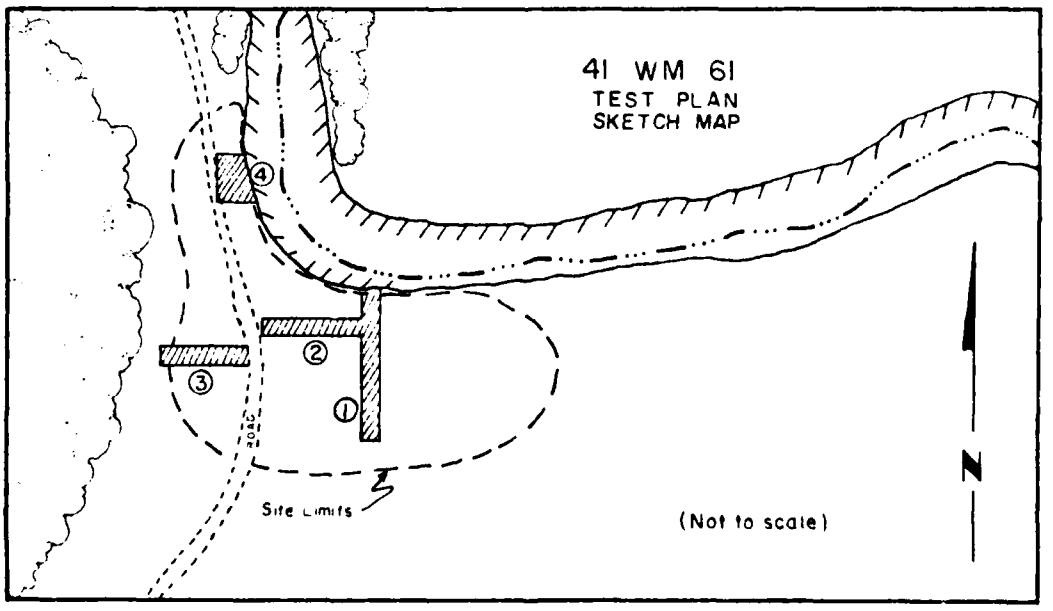

41 WM 61
TEST PLAN
SKETCH MAP
4
2
3
1
Site Limits
(Not to scale)
N

Figure 12.1-1

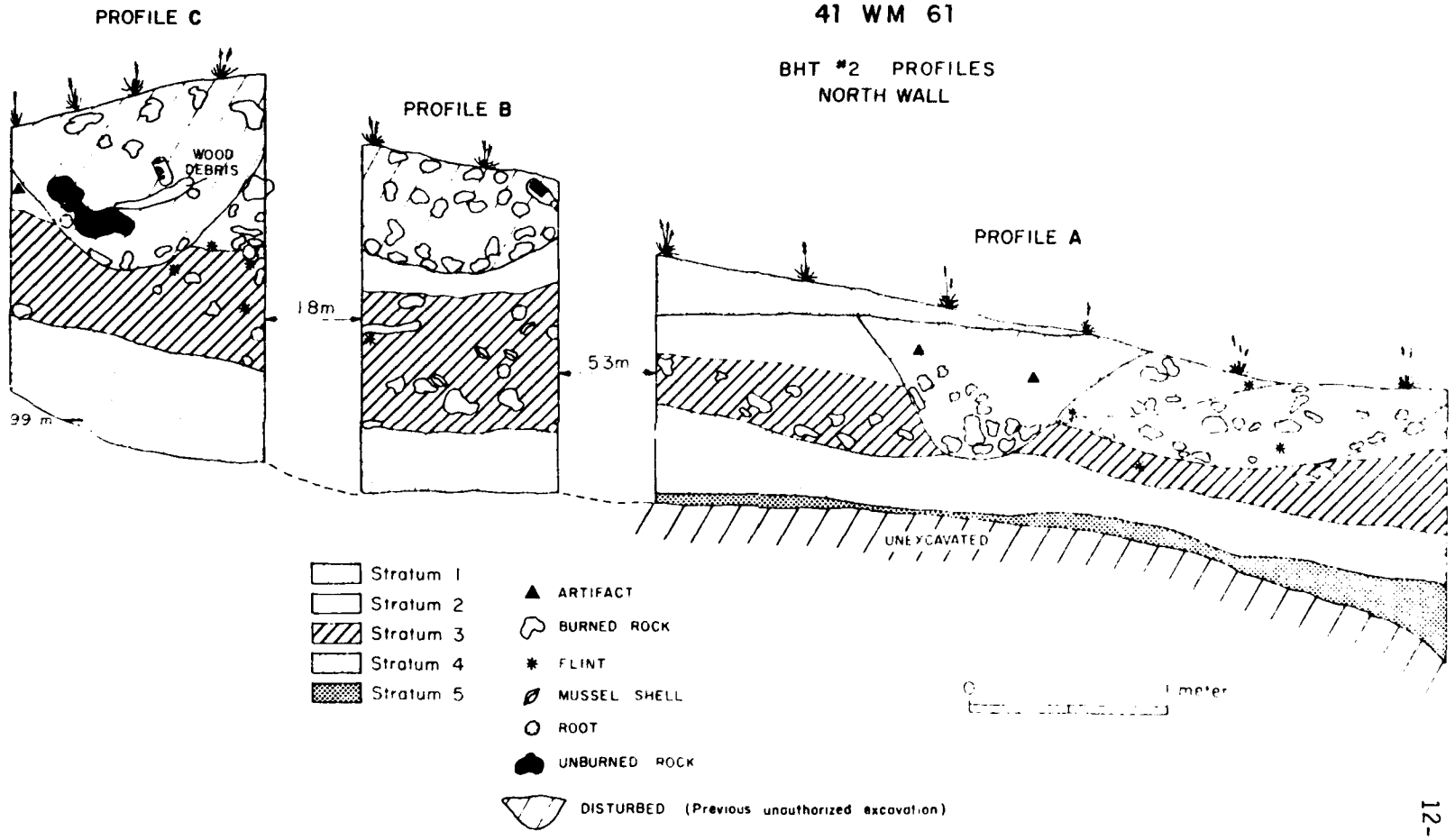

41 WM 61
BHT #2 PROFILES
NORTH WALL
PROFILE C
PROFILE B
PROFILE A
WOOD DEBRIS
18m
53m
99 m
UNEXCAVATED
Stratum 1
Stratum 2
Stratum 3
Stratum 4
Stratum 5
ARTIFACT
BURNED ROCK
FLINT
MUSSEL SHELL
ROOT
UNBURNED ROCK
DISTURBED (Previous unauthorized excavation)
0
1 meter

Figure 12.1-2

Stratum 2 - Lightly consolidated humic-looking clayey loam soil with numerous rootlets, burnt limestone fragments, snail shells, and flint flakes. This zone appears to be the remnants of a cultural midden, the upper portions of which are mixed in Zone 1. Color,2.5Y2/0 (black).

Stratum 3 - Compact loam clay with burnt limestone fragments, snail shells, mussel shells, flint debris and small rootlets. This zone, where it remains intact, represents the earliest occupation of the site. Color, 5Y2.5/2 to 2.5Y2/0 (black).

Stratum 4 - Compact loamy clay with a few large roots, burnt limestone cobbles and snail shells but no flint. Color, 10YR4/4 (dark yellowish brown).

Stratum 5 - Highly compact clayey loam with a few roots and snail shells, but no cultural debris. Color, 7.5YR4/4 (brown).

From the profiles in the backhoe trenches it was evident that Stratum 3 offered researchers the only opportunity for recovering undisturbed samples and for determining if a Paleo-Indian and/or Paleo-Indian to Archaic transition component existed at the site. Because a large area (designated "4" Fig.12.1-1)had all of strata 1 and 2 and the upper portions of Stratum 3 removed by pot hunters, it was decided that the low number of man-hours allotted could most effectively be utilized by beginning controlled test excavation where the vandals had stopped. With this in mind, the pothole was cleaned out and profiles straightened. This operation was necessary to determine the exact extent of damage and to ensure future control over both the natural and cultural stratigraphy.

It was at this point that the investigations suffered a most unfortunate occurrence. The site was left over the weekend and upon returning to it the following Monday, it was discovered that every last portion of Zone 3 which was exposed in the backhoe trenches and the test unit had been totally dug into and damaged.

Since time was running out rapidly, it was decided not to try and clean the general area up again, but rather to concentrate all efforts on the three contiguous 1 x 1 m test units in area 4. An amorphous cluster of limestone cobbles was found to cover the bottom of stratum 3 and this was designated as Feature 1. Unfortunately, time constraints did not allow for the following-out of this feature and it is not known if it represents the remnants of some cultural activity or is simply a natural occurrence of limestone typical to local talus slopes.

Artifacts

Eighty four (84) tools and 2 cores were collected from this site (Table 12.1-1).

Table 12.1-1. Tools, Site 41WM61

TOOL TYPE	TEST AREA A	SURFACE	BHT#1	BHT#2	BHT#3	TOTAL	%	BURNED
Points	3	4	2		1	10	11.90	
Point Fragments		2				2	2.38	
Bifaces	5	4		2		11	13.10	1
Biface Fragments	15	9	5	3	1	33	39.29	4
Scrapers	4			2		6	7.14	2
Burins	1					1	1.14	
Truncations	2					2	2.38	1
Backed Pieces	1					1	1.19	
Denticulates		2	1			3	3.57	
Notches	1		1	2		4	4.76	2
Axes				1		1	1.19	
Composite Tools		1				1	1.19	1
Retouched Pieces	2	3	1	2	1	9	10.71	1
TOTAL	34	25	10	12	3	84	99.99	12
%	40.48	29.76	11.90	14.29	3.57	100.00		14.29
Cores		1	1			2		1
Tool/Core Ratio						42.50		

Projectile Points

A total of 10 projectile points were recovered from this site. Three of these could not be identified as to a known type and the remainder are as follows:

Castroville (1) surface
Nolan (1) Stratum 2
Darl (1) surface
Montell (1) surface
Bulverde (1) surface
Pedernales (1) surface
Hoxie-like (1) surface

This is admittedly a rather small sample, and a highly suspect one considering the amount of vandalism at the site. However, it appears that the full range of the Archaic Period is represented. If, as the quantities of burnt rock suggest, the site was a burned rock midden, then one might expect the Middle Archaic points to be better represented. Unfortunately, the only point found in situ is the Nolan from stratum 2 of BHT#1, and it is generally placed in the Clear Fork phase representing the last of the Early Archaic Period and dating from approximatley 4000-5000 B.P.

Bifaces

Five completed whole bifaces were recovered. One is a small triangular biface with a slightly convex base and thin cross-section; another one is a subtriangular small biface with strongly convex base, also thin in cross-section. One larger triangular biface has a concave base, similar to a tool recovered from site 41WM258 (Chap.9.9). The other larger biface is similar to the subtriangular specimen mentioned above. The last completed biface belongs in the miscellaneous category, quadrangular in outline, with careful bifacial retouch producing unusually sharp edges. The other whole bifacial tools are probably unfinished specimens and are noticeably less carefully worked. Two are suboval irregularly bifacially retouched tools. Two others are more or less pointed on one end, convex at the other extremity and less well flaked at the latter. The last preform is an elongated tool, not sharply pointed at either extremity, but intensively bifacilly retouched.

Biface Fragments

Twelve basal fragments:

--1 fragment with a more or less straight base and edges at sharp angles to the base
--1 with the edges at obtuse angles to the base
--1 with the edges at a sharp and straight angle to the base

--6 fragments with a convex base outline (one of the fragments was made of quartz)
--1 fragment had a slightly concave base
--1 was possibly a shouldered fragment
--1 fragment was roughly retouched, probably unfinished

Ten pointed top fragments:

--7 large sharp angled fragments, 2 of which are finely retouched into a very sharp point
--3 large obtuse angled fragments

Four medial fragments:

--3 medium wide fragments
--1 very wide fragment

There are also 5 edge fragments and 2 unidentifiable ones.

Scrapers

There is only one single endscraper made on a non-retouched secondary (Sa) flake. There is also only one single sidescraper made on a further non-retouched secondary (Sb) blade. Three specimens are double scrapers: 2 double endscrapers, one made on a tertiary flake, retouched alternate; the other one was made on biface fragment. One double scraper: single end and singleside scraper was made on a secondary (Sb) flake. The sixth scraper was a "giant" scraper made on a large secondary (Sb) flake. All scrapers except the single side-scraper are whole tools.

Burins

One oblique burin was made on a secondary (Sb) blade, from a steeply backed edge.

Truncations

Both truncated secondary (Sb) blades were made by steep dorsal retouch on the distal end.

Backed pieces

A backed piece was made on a secondary (Sa) blade by steep dorsal retouch. The backed edge is concave.

Denticulates

All three pieces are simple denticulated secondary (Sb) flakes, two by dorsal retouch and one by ventral retouch

Notches

Two notched pieces are single notches, made on a secondary (Sb) and a tertiary flake, the latter one with additional retouch. One notched tertiary flake has multiple non-adjacent notches, and one secondary (Sb) flake is a strangulated piece.

Axes

One axe with a straight bit was heavily encrusted with Calcium Carbonate ($CaCO_3$). The tool appears to be completely bifacilly retouched.

Composite tools

A composite tool was made on a secondary (Sb) flake, and consist in a single endscraper and a single angle burin on snap.

Retouched pieces

Three flakes were retouched unilateral, all by dorsal retouch. Two tertiary flake fragments were retouched along one edge, 1 only partially and the third flake was retouched on the distal end. Three flakes were retouched bilateral, a secondary flake with dorsal retouch on both edges, a secondary (Sb) flake by bifacial retouch over both edges, and a secondary (Sb) blade with discontinuous retouch over two edges. One secondary (Sb) blade was retouched multilaterally by mixed bifacial and unifacial retouch. One tertiary flake had no retouch, but a "smoothed" rounded edge with a gloss, both very visible to the naked eye. There was one unidentifiable retouched piece, made on a tertiary flake fragment.

Cores

Only two cores were recovered from the site, and as a consequence the tool/core ratio is very high. One specimen is a thick and heavy subdiscoidal core, battered extensively in places. The other one is a slightly damaged multiple platform core.

Comments

The prime purpose in checking site 41WM61 was to determine if undisturbed cultural deposits dating from man's earliest occupation of the

San Gabriel river valley existed at a depth which would have protected them from the ravages of modern artifact collectors. It now appears that the first occupation of the site, if one is willing to accept one projectile point as evidence, came during the end of the Early Archaic Period. The Paleo-Indian projectile points found in local collections and attributed to this site could have been curated items; or modern collectors could have given investigators faulty information on the exact find location for their collection.

The site was probably a small burned rock midden, possibly built on an earlier Early Archaic site. The nature and extent of disturbance through the agency of modern man would make any further investigation expensive and give it a low probability of success. Consequently no further work is recommended for this site.

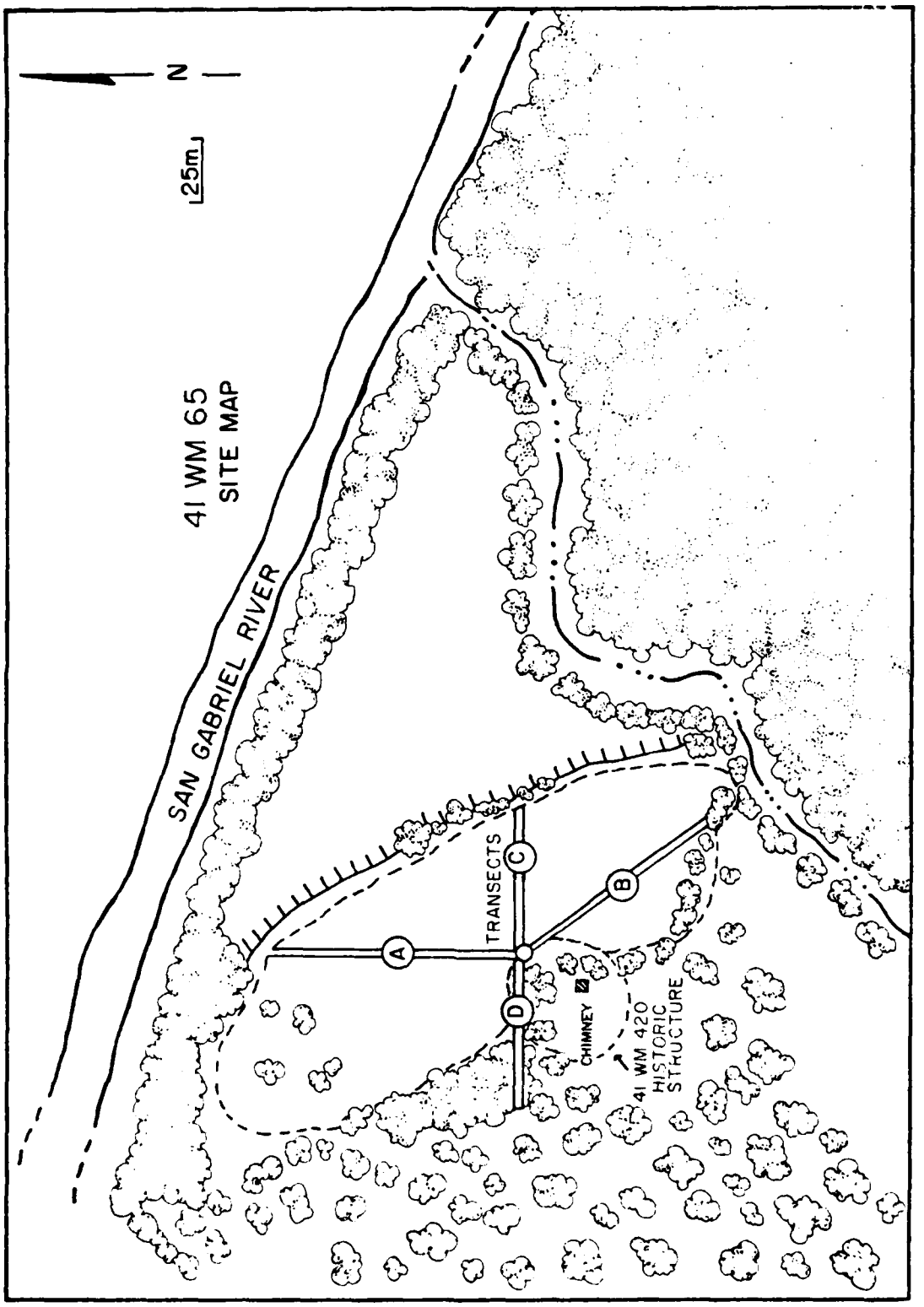

N
25m
41 WM 65
SITE MAP
SAN GABRIEL RIVER
TRANSECTS
A
B
C
D
CHIMNEY
41 WM 420
HISTORIC
STRUCTURE

Figure 12.2-1

12.2 Site 41WM65

Investigations

The site is located in North Fork Reservoir on a terrace projection on the south side of the San Gabriel River just northeast of its junction with a small unnamed creek originating in Cedar Hollow. 41WM65 spreads, apron fashion, around the base of a bluff between the river and the creek, and extends eastward to the edge of an old terrace (see Fig.12.2-1). No cultural remains were noted on the lower section of the peninsular-like section between the river and the creek.

Originally the site was assessed as a "lithic scatter and procurement area" (Patterson and Moore 1976:34), and was considered unique because of its topographic setting. Site 41WM420, an historic house (41WM420), is located on the southwestern edge of the area, and is discussed elsewhere in this report.

The site has experienced loss of topsoils resulting in a deflation of the artifacts down to a very thin mantle of colluvium over culturally sterile clays.

An orientation inspection of the site indicated that it had been surface hunted by local collectors as evidenced in a number of "cull" piles around the periphery. This, of course, heavily biases any sample from the site since the more easily recognizable and collectable artifacts will not be represented in their true frequencies, if at all. This fact, in conjunction with the time restrictions, effectively precluded anything but the most rudimentary investigations at the site.

Two transects were run through the seemingly denser artifact areas, and then a general collection of everything except the debitage was made.

Artifacts

Ninety tools and 31 cores were collected from this site. The heaviest concentrations were along transect A, and also transect C. For the distribution, see Table 12.2-1.

Projectile Points

Three projectile points were recovered during investigations. Two of these were unidentified as to type and the third is a Marcos type from the San Marcos focus of the Late Archaic dating between 1750 and 2600 B.P.

Table 12.2-1. Site 41WM65

TOOL TYPE	GENERAL SURFACE	TRANSECT A	TRANSECT B	TRANSECT C	TRANSECT D	TOTAL	%	BURNED
Points		2		1		3	3.33	
Point Fragments								
Bifaces	10					10	11.11	1
Biface Fragments	13	4	1			18	20.00	1
Scrapers	5	2	1	2	1	11	12.22	2
Burins		1				1	1.11	
Truncations		2		1		3	3.33	
Backed Pieces			1	1		2	2.22	
Denticulates	1		1			2	2.22	
Notches	2	2		2	1	7	7.78	1
Gravers				1		1	1.11	
Borers								
Drills								
Gouges	1					1	1.11	
Unifacials	3					3	3.33	
Retouched Pieces	1	22	1	3	1	28	31.11	5
TOTAL	36	35	5	11	3	90	99.98	10
%	40.00	38.89	5.56	12.22	3.33	100.00		11.11
Cores	8	12	7	3	1	31		1
Tool/Core Ratio						2.90		

Bifaces

Of the ten bifaces collected, only 1 seems to be a completely finished tool. This specimen is a small triangular biface with a slightly convex base, thin in cross-section. One biface is an irregularly oval tool, thick and roughly worked, a ventral face still visible. Two other tools are somewhat elongated bifaces, not pointed at either end, intensively retouched, but still irregular in outline. There are 4 irregularly retouched rectangular preforms, and one oval large tool, bifacially retouched by large centripetal flaking. The last biface is only minimally worked.

Biface fragments

Ten fragments are basal fragments:

--1 fragment with a more or less straight base, the edges at sharp angles to the base
--3 with the edges at obtuse angles to the base
--4 fragments with a strongly convex base
--2 fragments were roughly retouched, probably unfinished

Four fragments are pointed top fragments:

--2 large sharp angled fragments
--2 large obtuse angle fragments

There is one medial, very wide fragment, 2 edge fragments and 1 unidentifiable fragment.

Scrapers

Five scrapers were single side scrapers, 2 of which are fragments, made on a tertiary flake and a secondary (Sa) flake. Two more were fragmentary and made on retouched flakes. One whole sidescraper was made on a secondary (Sb) flake and was notched. A double scraper, single end and single side, made on a secondary (Sb) flake, was denticulated on both scraperbits. The multiple scrapers was the largest category, and all are complete tools. One was made on a tertiary blade, one on a tertiary flake, and one on a primary flake. The fourth one was made on a secondary (Sb) flake of a coarse flint variety. A "giant" scraper was made on a large secondary (Sb) flake. All scrapers were made by dorsal retouch.

Burins

Only one burin was recovered at the site; it is a single angle burin on snap, made on a secondary (Sb) flake.

Truncations

Two fragmentary and one complete dorsal truncations were made on the distal end of 2 secondary b and 1 tertiary flake respectively.

Backed pieces

A secondary (Sb) flake was cortex backed along part of the edge, and this natural back was continued by steep dorsal retouch. The edge outline is slightly convex. The other backed tool is also truncated, and made on a tertiary flake. The backing retouch is strengthened by retouch from the dorsal rib towards the edge.

Denticulates

Both denticulated pieces were made on secondary (Sb) flakes, and had some other additional retouch on the rest of the flake.

Notches

Five flakes were notched only once, two have multiple occasionally adjacent notches; the latter tools were made on a secondary (Sa) and a tertiary flake. Of the former, 2 fragments are on tertiary flakes and had no other additional retouch, the 3 others had some additional retouch. Two of the latter were made on tertiary flakes and 1 on a secondary (Sb) flake.

Gravers

The only graver found at this site is a double "beaked" type, very carefully retouched, and made on a biface fragment. No other similar tool was collected during the project.

Gouges

The gouge recovered from this site is a typical Clear Fork type and made of a coarse variety of flint.

Unifacials

Three unifacial tools were found, 2 were made on tertiary flakes, one had some cortex left on one face.

Retouched pieces

The retouched pieces form the largest tool category at the site. There are 14 unilaterally retouched pieces:

--dorsal retouch, 1 whole edge: 2 whole flakes and 5 fragments
--dorsal retouch, less than a ½ edge: 2 whole flakes
--ventral retouch, 1 whole edge: 2 whole flakes
--bifacial retouch, 1 whole edge: 1 fragment
--bifacial retouch, the proximal end: 1 fragment
--bifacial retouch, the distal end: 1 fragment

Eleven pieces were retouched bilateral:

--dorsal retouch, whole edges: 1 fragment
--dorsal retouch, 1 edge and 1 end, both partially retouched: 2 fragments
--alternate retouch, 2 whole edges: 1 whole and 1 fragment
--alternate retouch, 1 edge and 1 end: 1 fragment
--mixed bifacial and unifacial retouch, 1 end and 1 edge: 1 fragment
--discontinuous retouch, 2 edges: 3 fragments
--discontinuous retouch, 1 edge and 1 end: 1 fragment

There were three multilaterally retouched pieces:

--mixed unifacial retouch, on all except 1 end: 1 whole and 1 fragment
--mixed unifacial retouch, all edges: 1 whole

The majority of these retouched pieces were made on tertiary flakes (15), then on secondary (Sb) flakes (10) and secondary (Sa) flakes (3).

Cores

Many large and a few small cores were collected from the site. Single platform cores form the largest category (10), several with very few or only one flake scar. There are 4 double platform cores, two 90^{0} cores, on different faces, and two opposed platform cores, one on the same face, the other one on different faces. There are 10 multiple platform cores, one of them with one blade scar, 6 more or less subdiscoidal or suboval cores and 1 wedge core.

Table 12.2-2. Debitage totals for site 41WM65

ITEM	TOTAL #	%
Primary Flakes	65	3
Secondary Flakes	409	17
Tertiary Flakes	484	20
Secondary Blades	1	-
Tertiary Blades	1	-
Biface Thinning	1	-
Core Trimming	32	1
Core Fragments	25	1
Chunks	442	18
Burin Spalls	1	-
Micro Elements	88	4
Chips	856	36
TOTAL	2405	

Comments

The assessment of this site as a lithic procurement area appears to be in error (Patterwon and Moore 1976:34). The diversity in tool types, the finished nature of most of them, and high number of utilized flakes could be interpreted as evidence for a living site. Additional support for this hypothesis comes from the debitage (Table 12.2-2) in the form of low percentages for primary flakes, biface thinning flakes, and core trimming flakes. All of these would be expected to be higher if the site were a lithic procurement/workshop area.

When the tool distribution of 41WM65 and 41WM360, the only other site in a similar physiographic setting, are compared no substantial differences were noted with the exception of the retouched flake category; and that is very high at 41WM65. This may indicate processing of various type of foods, and activity one would not expect at a lithic procurement site.

The limited time allotted to investigations at this site and the slightly biased sample preclude any further speculation on its nature of potential contribution to knowledge concerning the prehistory of the San Gabriel river valley.

12.3 Site 41WM66

Investigations

This site was noted by the previous Texas A & M survey as being located some .81 km. northwest of Crockett Gardens between the bluff edge and the south side of the San Gabriel. It was reported that the site was a burned rock midden, covered an area of $10m^2$ and had a depth of 25 cm. (Patterson and Moore 1976:34-35).

Four separate attempts were made by a team of archaeologists to relocate this site by walking over the entire area. All were unsuccessful. Several small natural talus heaps were noted but no burned rock or cultural debris was found. A team of researchers accompanied the land-clearing crew when they began in this area, but still no evidence of the reported site could be located. Finally, the clearing contractor blade-raked the entire terrace edge from its constriction at Crockett Gardens northwestward to the edge of Hogg Hollow. The area was again inspected before and after a rain. This effort also proved unfruitful, and it was concluded that site 41WM66 either does not exist, at least where the survey maps located it, or it was so ephermeral that previous surface collecting effectively removed evidence of the site.

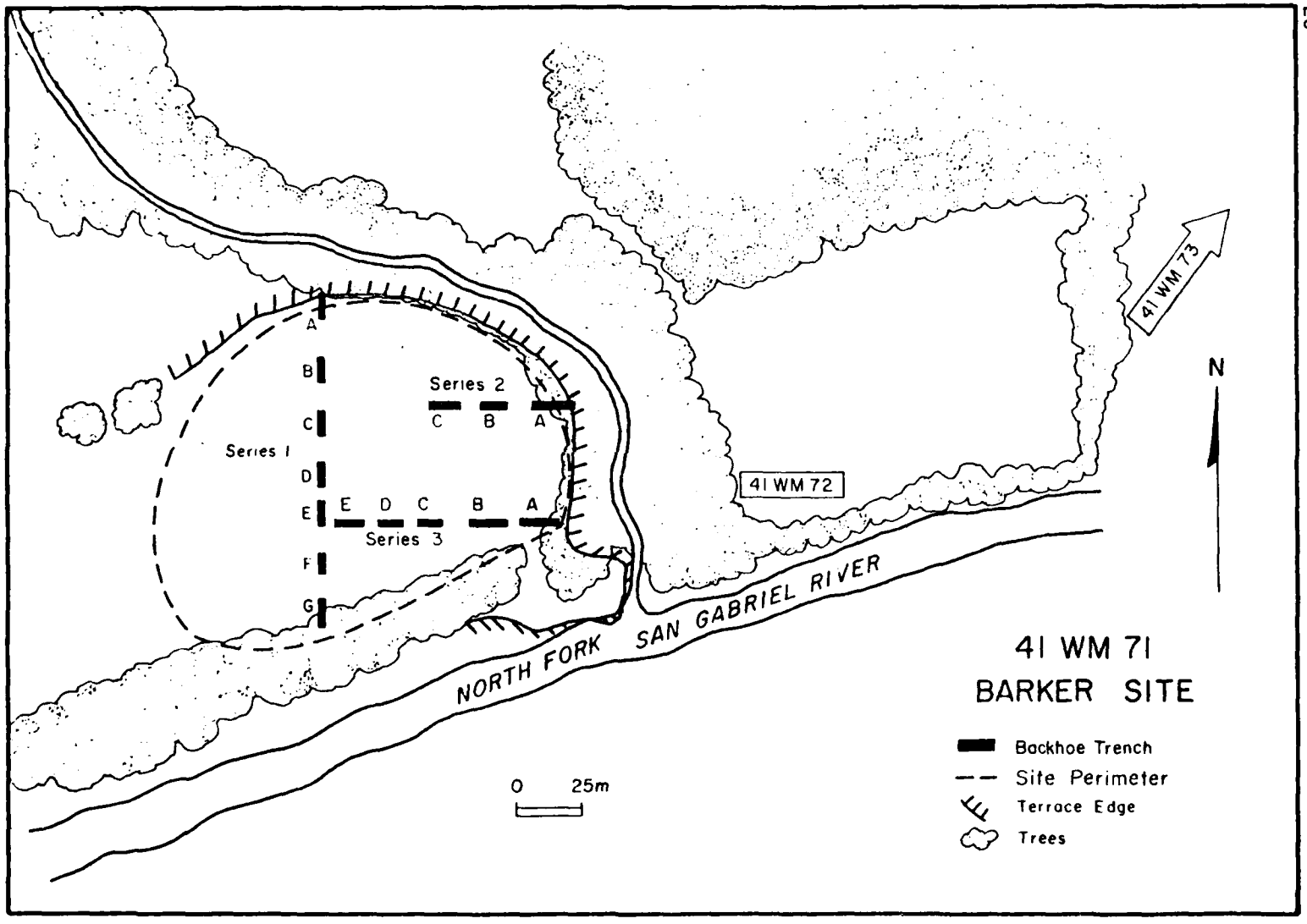

A
B
C
D
E
F
G
Series 1
Series 2
C B A
Series 3
E D C B A
41 WM 72
41 WM 73
N
NORTH FORK SAN GABRIEL RIVER
41 WM 71
BARKER SITE
Backhoe Trench
Site Perimeter
Terrace Edge
Trees
0 25m

Figure 12.4-1

12.4 41WM71

(Barker Site)

Investigations

The Barker site was first noted by Shafer and Corbin during their 1965 survey in the North Fork Reservoir area as the only site in the area to produce ceramics in association with Neo-American projectile points. Some 21 potsherds, 16 end scrapers, 2 Late Archaic points, and 14 Neo-American (mostly Toyah Focus types) points were recovered (Shafer and Corbin 1965:24).

The lack of comparable sites in the area and the fact that there existed a possibility of recovering buried in-situ cultural materials prompted "testing" of the site by William Sorrow in 1970. During this operation, Sorrow dug 7 backhoe trenches and excavated four 5 x 5' test units. Sorrow noted that the vast majority of artifacts were recovered in the upper one-half foot. His work substantiated that of Shafer and Corbin, adding quantitatively to what had previously been collected. It was on the recommendations from this work that additional investigations were suggested since the site appeared to have the potential for providing information on late prehistoric times (Sorrow 1970).

The site is located on an alluvial terrace on the north side of the San Gabriel River adjacent to its junctin with a small unnamed spring-fed tributary (Fig.12.4-1). The site has been cultivated for some time with the exception of a thin strip around the edge of the terrace projection. From Sorrow's site map (1970:20) and the still visible remnants of his test pits, it appears that he concentrated his efforts in the southeastern end of the site just outside the cultivated area. Unfortunately the site has subsequently been used as a campsite by the ever present Boy Scouts. Much damage was done to the site including the utilization of the old excavation units as fire-pits and latrines. Several pot-holes were also noted along with spoil piles from these recent diggings.

Following and intensive search of the surface of the site for artifact concentrations, it was decided to run several series of backhoe trenches across the site in areas not tested by Sorrow in an attempt to define the site limits and to look for areas containing cultural features. When features, such as hearths were found, the top soil was to be stripped away in order to expose the horizontal limits of the campsite.

With the exception of the southeastern edge of the site, no cultural deposits were encountered. Figure 12.4-2, Trench 1A profile is typical of the natural stratigraphy found throughout the site. Cultural material, primarily small pieces of lithic debris were encountered in Zone 1 and occasionally Zone 2 in BHT Series 1 and 2 and in BHT Series 3 except for Trenches A and B. It was in this latter area that an Archaic occupation was found in Zone 6 (Fig.12.4-2, Trench 3A). It extends some 2 meters to the west into Trench 3B and then disappears. The bottom of Zone 6 was "paved" with a single layer of angular limestone cobbles for a short distance from the terrace edge. Two sections of this were cleaned in BHT 3A, but since the purpose of work at the site was to define the late Toyah Focus occupation, the N/S limits of the concentration were not traced.

It appears that occupation of the site both during the Archaic and during the subsequent Neo-American Period was primarily confined to the extreme southeastern projection of the terrace. The Neo-American occupation was epheral at best, and it appears that the Shafer/Corbin survey and the testing by Sorrow removed most of the diagnostic artifacts for this period (i.e., ceramics and projectile points). Sorrow's testing did not go to sufficient depth to pick up the Archaic occupation, although he and the previous surveyors did recover several late Archaic projectile points. One Pedernales point from the Middle Archaic Period (Round Rock Focus) was found in Trench 3A in the dirt removed directly above the rock concentration.

It would appear that the site contains a buried Middle Archaic occupation and has a mixed Late Archaic and Neo-American occupation on the surface. It is passingly strange that no pottery was found even though ground visibility was fairly good.

Artifacts

Projectile Points

Only one projectile point was recovered, a Pedernales form BHT 3A. Three cores were also recovered from this site, as there are few tools, the core/tool ratio is high. There are 2 small multiple platform cores, and one medium large wedge core. All three retain only small amounts of cortex.

Bifaces

The only complete biface recovered from this site is a probably still unfinished tool, with one convex and one pointed extremity. Both faces are virtually covered by irregular primary bifacial retouch.

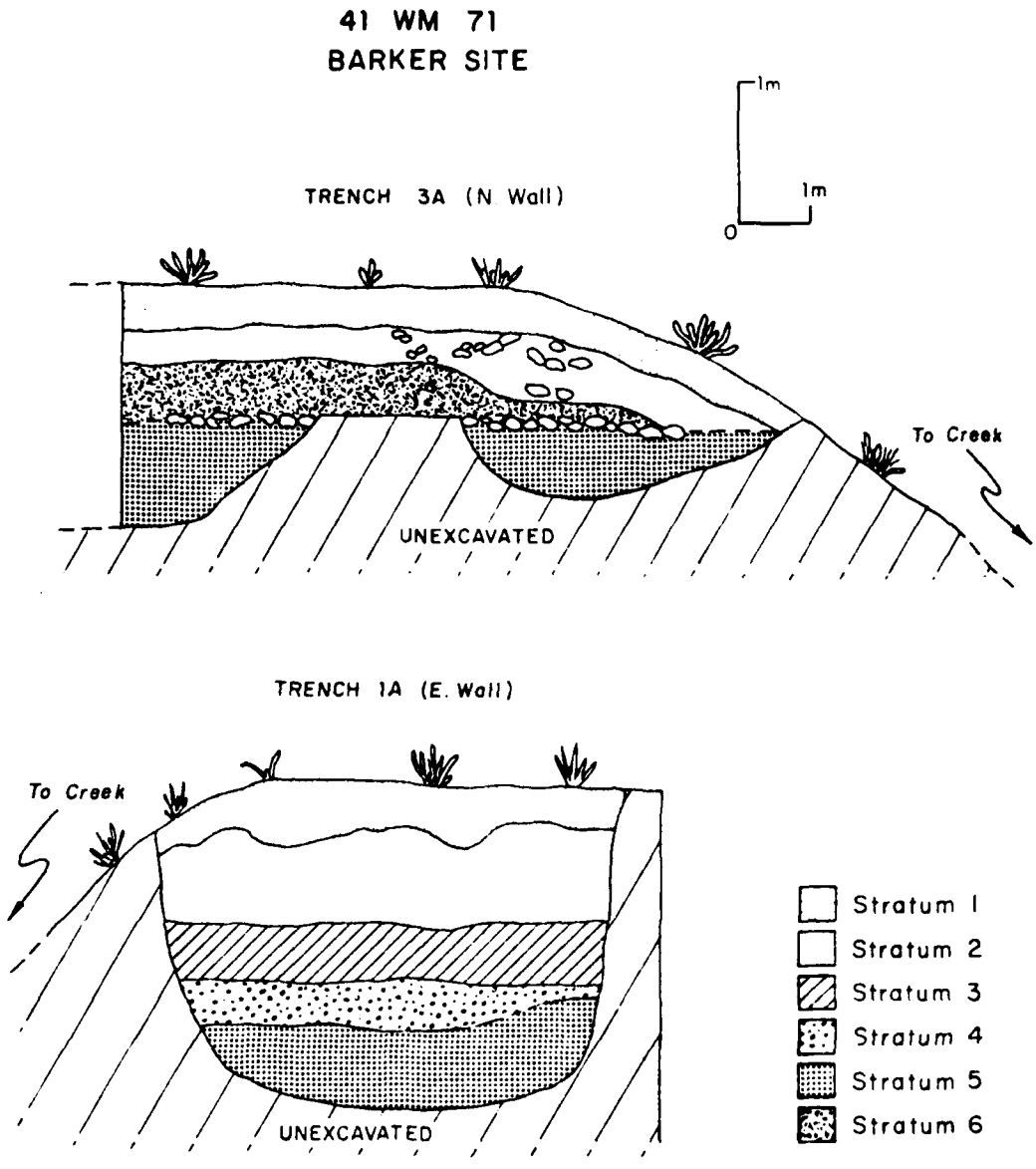

41 WM 71
BARKER SITE
1m
1m
0
TRENCH 3A (N. Wall)
To Creek
UNEXCAVATED
TRENCH 1A (E. Wall)
To Creek
UNEXCAVATED
Stratum 1
Stratum 2
Stratum 3
Stratum 4
Stratum 5
Stratum 6

Figure 12.4-2

Biface Fragments

One biface fragment is a base fragment with a convex outline; another fragment is a medium wide medial fragment, and two are edge fragments. One if them is possibly a burin, but the tool is damaged; the other fragment was made in an uncommon white fling variety.

Scrapers

One scraper is a fragment of a single endscraper on the distal end of a flake; the other endscraper is a complete tool made on a retouched flake. The third scraper is a single sidescraper on a retouched flake. All three scrapers were made on secondary (Sb) flakes.

Retouched Pieces

Four retouched pieces were retouched on one edge only: three by dorsal retouch, one on a whole edge (1 flake fragment), and 2 on a small part of the edge (1 whole and 1 flake fragment). One tertiary flake was ventrally retouched along most of one edge.

One tertiary flake fragment was flaked by alternate retouch on both edges, partially on one edge only.

One secondary (Sb) flake was retouched by mixed unifacial and bifacial retouch on both edges and its distal end.

Comments

Sorrow (1970:9-12, 19-21) found a disproportinate number of scrapers, especially endscrapers, at the site. He hypothesized that this represented specialized hide preparation during the Toyah occupation. Since Sorrow did not recognize any "retouched pieces", it is likely that at least some of his scrapers could be classified in that category. However, the fact remains that in the recent limited investigations 60% (Table 12.4-1) of the recovered artifacts are either scrapers (66% endscrapers) or retouched pieces.

The obvious problem here is associating the scrapers with the projectile points from the Toyah Focus since there can be little question but what those artifacts are mixed with ones from the Lake Archaic Twin Sisters Focus. In any event there does not appear to be enough left of the last prehistoric occupation at the site to warrant intensive investigation.

Table 12.4-1 Tools, Site 41WM71

TOOL TYPE	SURFACE	N/S TRANSECT	E/W TRANSECT	TOTAL	%	BURNED
Points			1	1	6.67	
Point Fragments				-	-	
Bifaces			1	1	6.67	
Biface Fragments	1	1	2	4	26.67	
Scrapers	2	1		3	20.00	
Retouched Pieces	2		4	6	40.00	2
TOTAL	5	2	8	15	100.01	2
%	33.33	13.33	53.33	99.99		13.33
Cores	2		1	3		
Tool/Core Ratio				5.00		

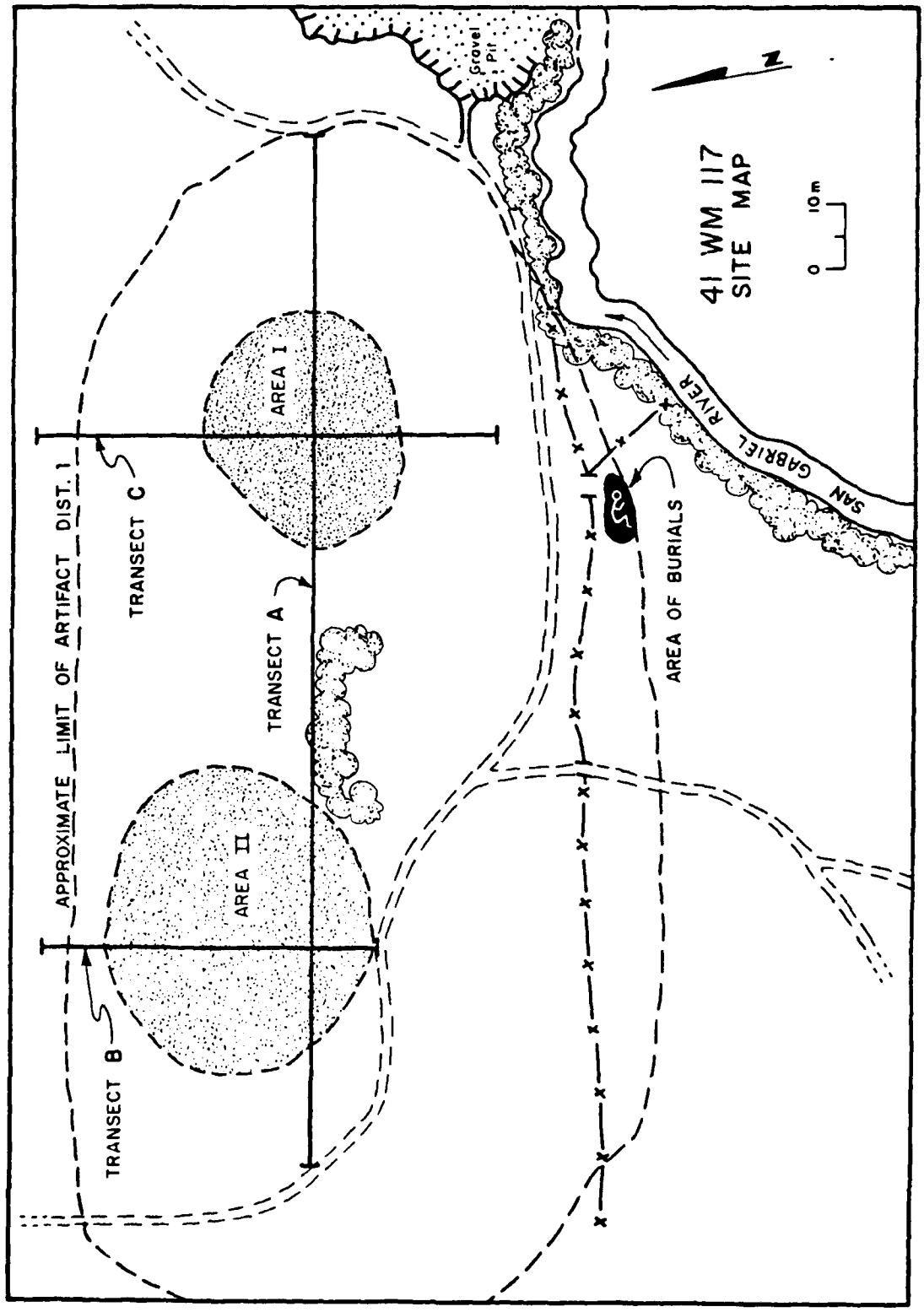

41 WM 117
SITE MAP
N
0
10m
Gravel Pit
SAN GABRIEL RIVER
AREA OF BURIALS
APPROXIMATE LIMIT OF ARTIFACT DIST. 1
AREA I
AREA II
TRANSECT A
TRANSECT B
TRANSECT C

Figure 12.5-1

12.5 Site 41WM117

Notes on this site provided by the 1976 Texas A&M survey indicate that this site is a lithic procurement area with a depth of less than .50 meters covering an area in excess of 100,000 square meters. It was further noted that horizontal displacement of cultural materials was expected because of recent agricultural activities (Patterson and Moore 1976: 63).

Upon visiting the site, NTSU personnel found that several potholes had been dug into the southern areas of the artifact distribution, and several local informants reported that the site had been a favorite of collectors for many years. With these facts in mind, it was decided that an intensive surface collection would not be time effective. Three 1 m wide transects were staked out and these were collected in 1 x 2 m units (Fig. 12.5-1). All recognizable tools were plotted within each 1 x 2 m grid unit, an activity which provided no patterning data. However, two areas of slight artifact concentration were noted and labeled Area I and II.

Several months later while cutting firewood on one edge of the site, Clarence Loeve, a local farmer and artifact collector, had discovered human bone eroding out of the terrace face at the southern edge of the site. Fearing that the burials, if such they were, would continue to erode out, he had covered the area with river alluvium and brush. He was able to locate the burials for investigators and there are at least two, one of which appears to be a cremation. The Ft. Worth District Corps of Engineers project archaeologist was notified of this development, but no action was ever taken to recover or protect the exposed burials.

Artifacts

Projectile Points

Three projectile points were found at this site. One was not identified as to type and the other two came from the Late Archaic Period: one Ensor (Twin Sisters Phase, 1250-1750 B.P.) and one Castroville (San Marcos Phase, 1750-2600 B.P.). Caution must be used in interpreting this since it is known that many points have been removed by collectors. But, if the site does date to the Late Archaic Period, then it is possible the burials do too, and this would add a unique dimension to the site. The only other burials known from the Granger Reservoir area are at 41WM230, the Loeve-Fox site, and date to the later Austin Phase occupation.

Bifaces

Two complete bifaces are subtriangular tools which were not sharply pointed and bifacially retouched on all edges by more or less regular retouch. Another tool is a short triangular biface, relatively wide at the base, and pointed at the other end.

Two preforms are suboval, bifacially irregularly retouched tools, with a relatively thin cross-section. The 5 other preforms are slightly elongated tools, rather small, and more or less pointed at one end. They were retouched very irregularly by bifacial retouch, and retain cortex on at least one face.

Biface fragments

Nine fragments are basal fragments:

-- 1 fragment with a more or less straight base, the edges at sharp angles to the base
-- 2 fragments with the edges at obtuse angles to the base
-- 4 fragments with a strongly convex base
-- 2 fragments were roughly retouched, probably unfinished

Three fragments were top fragments which are all three large and sharply pointed. Six fragments are medial fragments, 4 medium wide and 2 very wide. Four fragments are edge parts.

Scrapers

One scraper was a single inverse endscraper, made on the distal end of a coarse and heavy secondary (sa) flake. Another scraper was a single sidescraper fragment, also made on a secondary (Sa) flake. The third scraper was a core scraper.

Burins

All 3 burins recovered from this site are angle burins, 2 single angle burins on snaps, one made on a crude biface fragment, and the other one on a point stem. The third burin was made on a single facetted platform of a secondary (Sb) flake.

Truncations

One secondary (Sa) flake was truncated on the distal end by steep dorsal retouch. The truncation was straight oblique, the flake is pointed.

Backed pieces

A secondary (Sa) flake has a deep concave backed edge made by steep dorsal retouch. Two other flakes were also backed dorsally, but only partially on 1 edge. A fourth flake fragment was double backed.

Denticulates

Both tools are simple denticulated secondary (Sb) flakes made by slightly irregular dorsal retouch.

Notches

Only two notches were found, one a single notched tertiary flake, dorsally retouched; the other flake has 2 non-adjacent notches, one on each edge, one made by dorsal retouch, the other one by ventral retouch.

"Boring" tools

The only boring tool recovered from this site was a sharply pointed borer fragment made on the edge of a tertiary flake.

Retouched pieces

Few retouched pieces were collected. One tertiary flake was retouched ventrally on 1 whole edge. The two other tools were retouched multilaterally, one by dorsal retouch, the other one by mixed unifacial retouch. All three pieces are complete.

Cores

A large number of cores were collected from the site, the majority of them (13) are multiple platform cores, all different sizes. Six large subdiscoidal or suboval cores, 4 single platform cores and 1 wedge core were also collected. Finally, there are also 2 double platform cores, one 90° core, on the same face, and 1 opposed platform core, on different faces.

Comments

Site 41WM117 appears to have been a small campsite which was occupied on at least two occasions as seen in areas I and II. This distribution may also be interpreted as evidence for separate activity areas. However, if the latter were the case one would expect some differences in artifact

and debitage content. Table 12.5-1 does not show any particular differences between the various collection units. Additional support for the site being a campsite of some duration is supported by the presence of burials; something that would not be expected at a transitory encampment.

It is of interest to note the similarity between the two burials at 117 and those investigated at 41WM230 (Loeve-Fox). Since no further investigations were allowed it is unclear if these represent a cemetary or simply isolated internments; but the practice of cremation may have begun prior to the Neo-American period if the burials at 117 proved to be Late Archaic.

An inspection of the artifact tables shows that the controlled transect type of collection nets a more representative sample of the sites artifactual content than the "general" collection technique. It seems that even trained researchers tend to select for the more recognizable and/or larger pieces of cultural debris. This is well illustrated when the debitage totals from the three transects are compared with those from the general collection of Area II (Table 12.5-2).

In conclusion, site 41WM117 is not interpreted as a lithic procurement area (Patterson and Moore 1976: 62), but rather a campsite which was probably utilized on several occasions. The longeviety of the occupation is speculative, but at some time it was long enough for at least two burials to have occurred. Further investigation is recommended at this site to determine the nature and extent of the burial situation and its relationship to Loeve-Fox.

Table 12.5-1 Tools, Site 41WM117.

TOOL TYPE	SURFACE	AREA II	TRANS."A" E/W	TRANS."B" N/S	TRANS."C" N/S	TOTAL	%	BURNED
Points		1	1		1	3	5.56	
Bifaces	3	2	2	2	1	10	18.52	
Biface Fragments	1	8	8	2	3	22	40.74	2
Scrapers	1	1	1			3	5.56	
Burins		1	1	1		3	5.56	
Truncations				1		1	1.85	
Backed Pieces			1	1	2	4	7.41	1
Denticulates			1	1		2	3.70	1
Notches				2		2	3.70	
Borers				1		1	1.85	
Retouched Pieces	1	1	1			3	5.56	
TOTAL	6	14	16	11	7	54	100.01	4
%	11.11	25.93	29.63	20.37	12.96	100.00		7.41
Cores	8	5	11	2		26		
Tool/Core Ratio						2.08		

Table 12.5-2

a. Debitage totals for site 41WM117, transect "A".

ITEM	TOTAL	%
Primary Flakes	17	3.5
Secondary Flakes	199	41.0
Tertiary Flakes	201	41.5
Secondary Blades		
Tertiary Blades		
Biface Thinning		
Core Trimming		
Core Fragments	1	.2
Chunks	33	7.0
Burin Spalls		
Micro Flakes	4	1.0
Chips	29	6.0
TOTAL	484	

b. Debitage totals for site 41WM117, transect "B".

ITEM	TOTAL	%
Primary Flakes	13	3.0
Secondary Flakes	149	35.0
Tertiary Flakes	159	37.5
Secondary Blades		
Tertiary Blades		
Biface Thinning	1	.2
Core Trimming		
Core Fragments		
Chunks	23	5.4
Burin Spalls		
Micro Flakes	4	.9
Chips	75	18.0
TOTAL	424	

c. Debitage totals for site 41WM117, transect "C".

ITEM	TOTAL	%
Primary Flakes	5	7.0
Secondary Flakes	25	36.0
Tertiary Flakes	26	37.0
Secondary Blades		
Tertiary Blades		
Biface Thinning		
Core Trimming		
Core Fragments		
Chunks	4	5.7
Burin Spalls		
Micro Flakes	2	3.0
Chips	8	11.4
TOTAL	70	

d. Debitage totals for site 41WM117, General, Area II.

ITEM	TOTAL	%
Primary Flakes	3	13.6
Secondary Flakes	8	36.4
Tertiary Flakes	7	31.8
Secondary Blades		
Tertiary Blades		
Biface Thinning		
Core Trimming		
Core Fragments	1	4.5
Chunks	3	13.6
Burin Spalls		
Micro Flakes		
Chips		
TOTAL	22	

12.6 Site 41WM122

Investigations

The Site 41WM122 was first noted during the initial reconnaissance of the Granger reservoir area (Shafer and Corbin 1965:50). Although outside the limits of the reservoir investigators felt that the site was most promising for future investigations since it was just behind the confluence of Willis Creek and the San Gabriel River and showed a rich buried occupation zone in an erosion gully. The site was recommended for "extensive excavation". Subsequent investigation of the site by Moore (Patterson and Moore 1976:63) mentioned that it was "... a profile site which is largely undisturbed by cultivation or erosion" and no further comment was made. In the final report on the A&M survey of Granger no further work was recommended for the site, but additional monitoring was suggested to insure that channel and water flow changes resulting from the dam construction did not contribute to further destruction (Moore, Shafer and Weed 1978:34).

When the site was first visited by archaeologists from NTSU it was found that the outlet channel running from the dam to a point on the San Gabriel River had cut through the middle of the site leaving portions on both sides. At this time three distinct, vertically separated midden zones and numerous hearths were observed eroding from the channel banks. 41WM122 was subsequently included in the original scope-of-work for determination of the depth and character of remaining portions of the site.

Unfortunately here, as in the case of several other sites in both North Fork and Granger reservoirs much of the collected data and field notes were stolen by the acting crew chief before they could be duplicated. Such data as is presented here is from the observations of the field director and several crew members. Should the missing field data ever be recovered additional interpretation will be necessary and warrented.

Testing of the site included a series of four backhoe trenches and a controlled test unit (Fig.12.6-1). Inspection of the northern bank of the diversion channel indicated that the midden zones were separated by lighter alluvial deposits and gently sloped from west to east. The very northern edges of the two upper zones were also noted as sloping to the south in BHT 2-B and it appears that the site was located on a low sloping terrace which was truncated by the San Gabriel river along its eastern limits.

The bottom two midden zones seemed to begin at approximately the same western limits, continuing parallel for approximately 100 meters, and then coalescing in a thick single midden band before vegetation

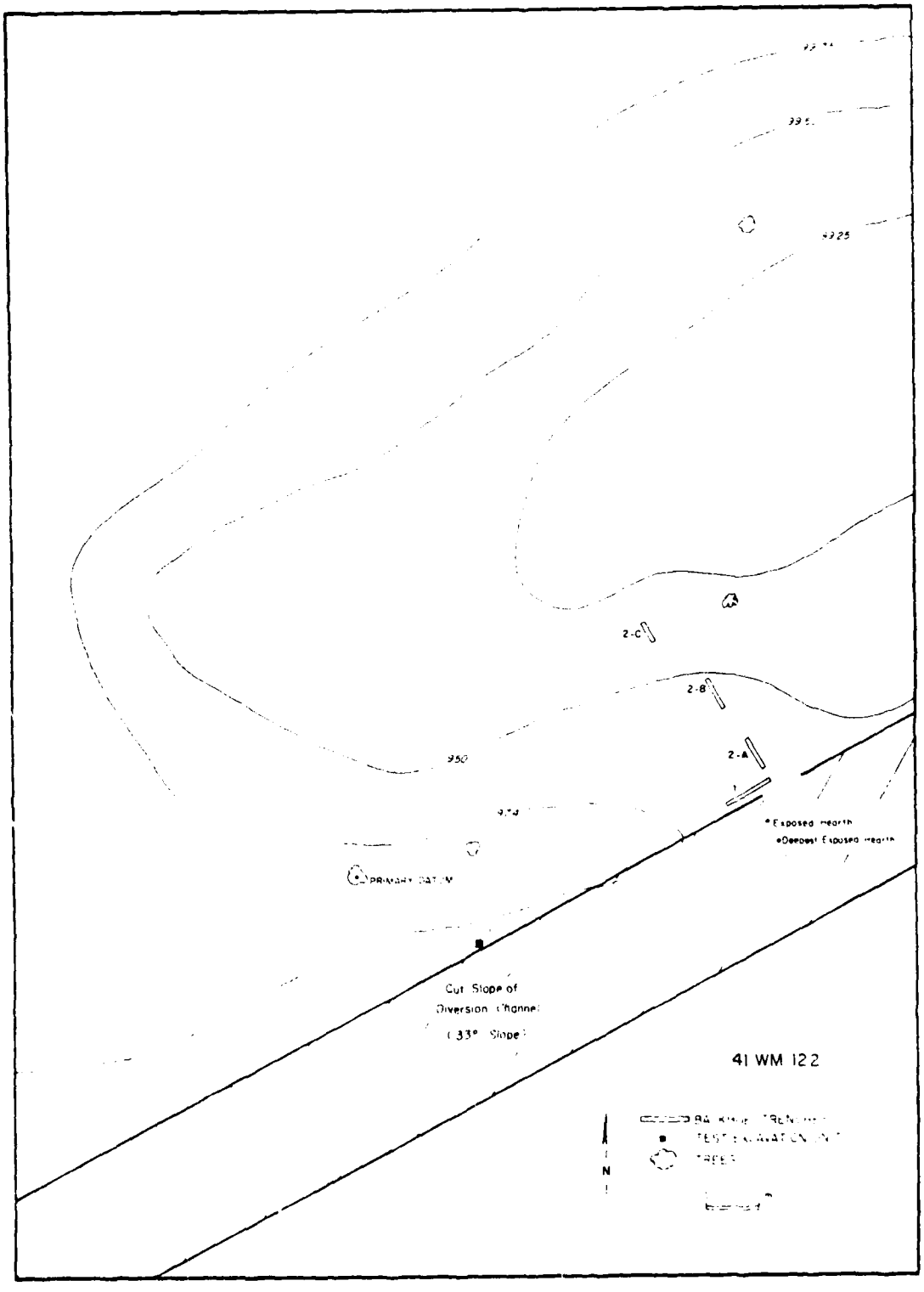

950
2-C
2-B
2-A
Exposed Hearth
Deposit Exposed Hearth
PRIMARY DATUM
Cut Slope of
Diversion Channel
(33° Slope)
41 WM 122
N

Figure 12.6-1

obscured its eastern end. The upper midden zone is not quite as pronounced in terms of definition or coloration. Exact vertical distances between the various zones was difficult to assess since they were only observable along the 33% slope of the diversion channel north wall.

The southern extension of the site could be inspected only on foot since the entire area between the dam, the San Gabriel channel and the diversion channel was surrounded by water and swamp. If, however, one continues the slope of the upper two middens observed in BHT 2-A and 2-B southward, then the fire-cracked rock, bone, shell and artifacts observed along the southern cut bank of the diversion channel are most likely related to the upper midden.

Following the trenching it was decided to place a controlled excavation test unit into the western extension of the upper midden zone. It was realized that time restrictions precluded such an effort reaching even the second midden, much less the lowest. However, one of the hearths eroding out of the lowest midden zone contained quantities of charcoal and this was collected for later dating.

Since it appeared that there was approximately 1 meter of recent deposition before the first midden zone was reached it was decided to use the backhoe to remove the upper 70cm. Recent historic trash, such as aluminum beer cans were encountered to a depth of 50cm. The 1 x 1 meter test unit was begun at that point and taken down 80cm in 10cm increments. All removed soil was passed through a water screen.

The following is an explanation of the stratigraphy illustrated in Fig.12.6-2 of the eastern wall of BHT 2-B.

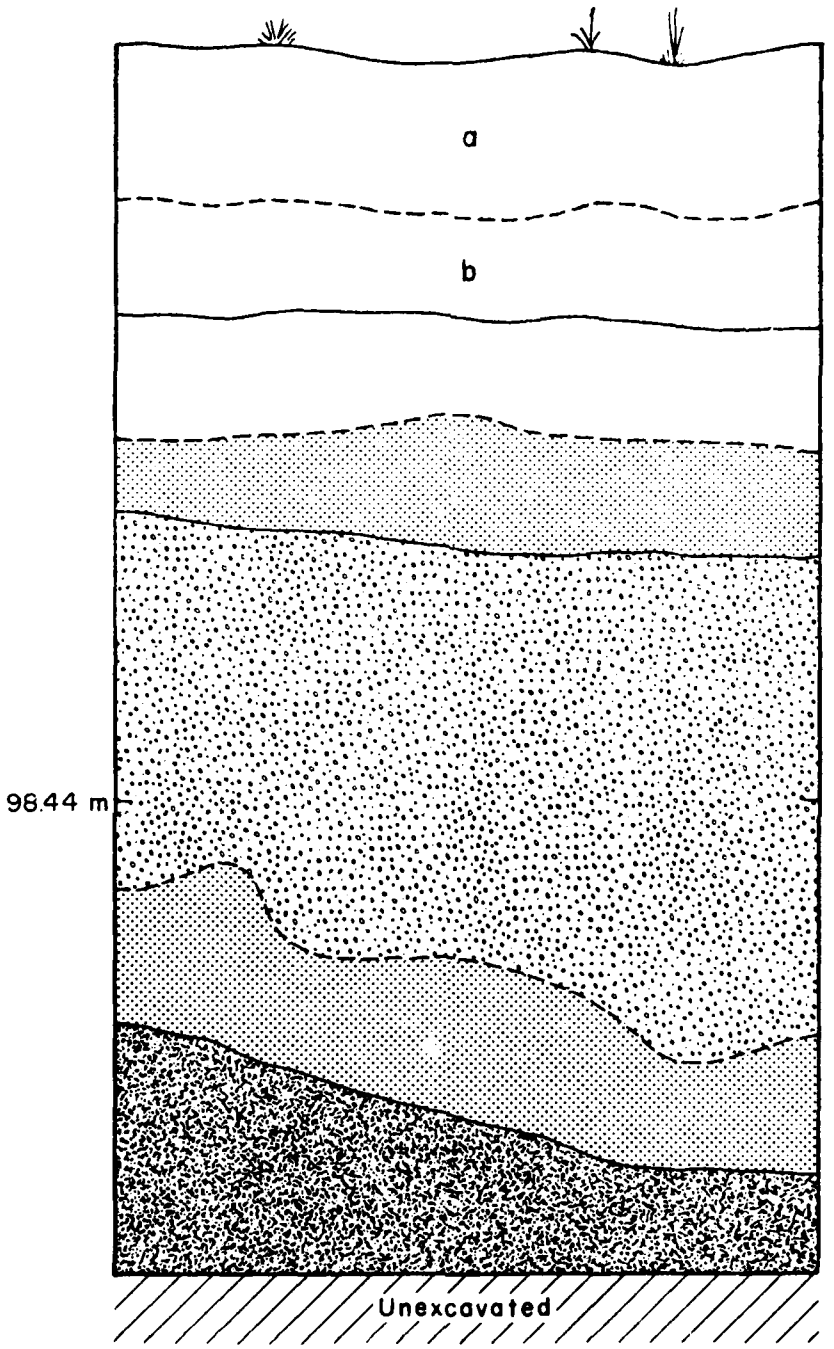
1A Dark grayish brown silty loamy clay prairie type soil with many rootlets and snail shell fragments. It forms a coil easily when wet and shrinks and cracks when dry.

1B The same as 1A but much more compact and with slightly less snail shell and fewer rootlets.

2 Brownish grey to lighter medium brown silty clay loam with rootlets, snail shell and deteriorated limestone fragments. The soil forms a weak coil when wet and cracks when dry.

3 Dark brown midden zone with a high organic content, fire-cracked rock and cultural debris. The clay content of this zone seems to be slightly higher than #2.

4 Light orangish brown with grey mottling silty clay loam with large numbers of snail shells and $CaCo_3$ nodules throughout. The soil forms an extremely good coil and becomes very hard when dry.



Stratum 1
Stratum 2
Stratum 4
Stratum 6
Midden Zone

41 WM 122
Backhoe Trench 2B
East Wall Profile

0 25 cm

Figure 12.6-2

5 Dark brownish midden zone similar to #3.

6 Light tanish brown silty clay with few snail shells but some $CaCo_3$ nodules and little cultural material.

Lithic debris, charcoal and deteriorated mussel shell were encountered in all levels. The second and third levels contained a scatter of fire-cracked-rock, probably the remnants of a hearth. No diagnostic artifacts were found until the 5th level, and that was a Pedernales type projectile point. Very few tools were recovered from the test unit (Table12.6-1) most of the materials falling in the debitage category (Table 12.6-2).

Artifacts

Projectile Points

One Pedernales in Level 5 (1st midden zone) of test unit.

Bifaces

Three complete bifaces were collected from this site, all from the surface and backhoe trenches. One finely bifacially retouched narrow and elongated tool was burned partially, on the tip only. Another biface is a unique stemmed tool, no other tools were recovered with a similar stem. The third biface is a roughly retouched, elongated tool, pointed at neither extremity.

Biface Fragments

As for the whole biface, all fragments were equally found on the surface and in the backhoe trenches. Three are basal fragments, 2 with a strong convex base, one with a roughly retouched, unfinished base. Two other fragments are tip fragments, both large, one is sharply pointed, the other one is obtuse. Further there is one edge fragment and 1 medium wide medial fragment.

Scrapers

The only scraper recovered is a very finely retouched denticulated endscraper made on a secondary b flake.

Notches

A small notched flake fragment was recovered from the testpit. The

notch was made by dorsal retouch.

Chopping tools

The chopping tool was made on a deeply patinated nodule, by unifacial large retouch from a naturally flat surface.

Retouched pieces

Eight retouched piece fragments were recovered from the testpit, 5 of which are retouched bilateral. Four of these were retouched alternatingly, all partially only. One flake fragment was ventrally retouched along the length of both edges.

One fragment was dorsally retouched on a small part of one edge only, the 2 other fragments were ventrally retouched, one also on part of one edge only, the other one on part of the distal end.

Cores

Eleven cores were also recovered, but only one from the testpit. Three cores are single platform cores, one of which was once a multiple platform core, but was re-used. There are four multiple platform cores, and 1 suboval core. The last three are double platform core with opposed platforms, on the same face.

Table 12.6-1. Tools from Test Unit at 41WM122

	TP #1	Surface	BMT's	TOTAL	% Burned
Points	1			1	
Point Fragments				-	
Bifaces		2	1	3	
Biface Fragments		3	4	7	
Scrapers			1	1	
Notches	1			1	
Chopping tools			1	1	
Ret. pieces	8			8	
TOTAL	10	5	7	22	
%					
Cores	-	7	4	11	

Table 12.6-2. Debitage Totals for Test Unit at 41WM122

	Level										
PRIMARY FLAKES	5	2			9	1		2	1	20	2
SECONDARY FLAKES	34	17	20	8	11	15	10	11	5	131	14
TERTIARY FLAKES	55	32	43	11	37	27	22	21	10	258	28
BIFACE THINNING FLAKE	4	1	2	1	2	2		1		13	1
CORE TRIMMING			1							1	.1
CORE FRAGMENTS	1									1	.1
CHUNKS	1	1			3	1		1		7	.8
MICRO ELEMENTS	28	5	15	13	13	13	4	15	2	108	12
CHIPS	98	58	39	56	40	28	27	35	4	385	42
TOTAL	226	116	120	89	115	87	63	86	22	924	
%	24	13	13	10	12	9	7	9	2		

It should be noted here that two additional projectile points have been recovered from the surface and backhoe trench fill dirt. These were found and reported to the reservoir ranger by a construction worker and were identified by him as a Marshall and another Pedernales.

Comments

Very limited testing of site 41WM122 indicates that it is a deeply buried, stratified, and possibly multi-component site. All indications so far point to it having been occupied during the Middle Archaic time period, representations of which are singularly lacking at other Granger sites investigated. Shortly after the completion of testing the site was visited again to check the condition of the back-filled trenches and test unit; and it was discovered that virtually every exposed hearth and rock concentration in the channel wall had beer dug out by pothunters. This fact along with the statement that the site warrented strong preservation measures was transmitted to the Ft. Worth District Corps Archaeologist in the August 1978 monthly report and with a personal telephone communication. The decision not to accomplish further work at the site was predicated on assurances from the Corps Archaeologist that the site would be preserved and protected and thus further work would only diminish the resource at this time.

When the site was checked again in October, 1979 it was found that both pothunting and erosion had continued at the site. This was

communicated to the Ft. Worth District Corps Archaeologist in a letter of 12 November 1979. In response to this second written communication on the continued destruction of the site, the Chief of the Engineering Division of the Ft. Worth Corps of Engineers responding in a letter of 27 November 1979 assured both NTSU archaeologists and the Texas Historical Commission that "We are exploring ways and means to help safeguard the sites using such means as ranger patrols, fencing, public education, and in extreme cases, the possibilities if riprap, gravel, gunite, or fiber mat protective layers...". Further assurances were given to the effect that the Corps would investigate site 12? in order to determine the necessary preservation techniques.

Communication with the Reservoir Ranger on 21 September 1981 that pothunter activity at the site continues and that the release of 6000 c.f.s. of water from the dam during the month of July 1981 had scoured the channel surface "...exposing several distinct hearths and quantities of bone and antler materials including a deer skull with attached antlers". Despite all the assurances of the Corps to the contrary, this is a classic example of benign neglect of an important cultural resource in their keeping! Since the site quite obviously can not be protected, it should be immediately subjected to strenuous mitigation efforts before it is totally destroyed.

12.7 Site 41WM125

Investigations

This site is located on southern upland edge of the San Gabriel River valley. It was first recorded as a midden site warranting testing because of its location and artifact content (Shafer & Corbin 1965: 51-2). The 1976 A & M survey listed the site as a lithic procurement area covering approximately 850 square meters (Patterson & Moore, 1976). Only a small area, about 4 square meters is within the reservoir as defined by the property line fence. It is this section within the fence that was subjected to testing although a general surface collection of the area on both sides of the fence was made (Figure 12.7-1).

A 1 x 1 meter test unit was placed just to the north of the reservoir property line fence. This was taken down in arbitrary 10 m levels to bedrock which was reached at 83 cm below the surface. Recent historic artifacts were encountered to a depth of 50 cm below the surface. From 50-60 cm artifacts were very scarce and found only in pockets of soils which appear to have originated in the upper levels. The association of a few artifacts found below about 50 cm with darker sandy loam in a lighter decomposing limestone matrix is interpreted as support for the contention that these darker deposits are not in-situ, but rather were caused by bioturbation (Table 12.7-1).

Artifacts

Projectile Points

All of the identifiable projectile points were recovered from surface of the site and fall within the time range of the late Archaic and early Neo-American Periods. The types are as follow: 5 Ensor, 1 Darl, and 2 Scallorn.

Bifaces

The only complete finished biface is a vaguely stemmed tool, i.e., the biface body narrows gently towards the base. The other complete bifaces are all roughly bifacially retouched tools, and most of them are probably unfinished artifacts. One is a small, irregular oval tool, relatively thin and intensively worked; two tools are more or less pointed at one end, while the other end is convex, and the pointed end is a little more carefully worked than the base. Two more tools are very similar to these two, but they were not pointed at one end.

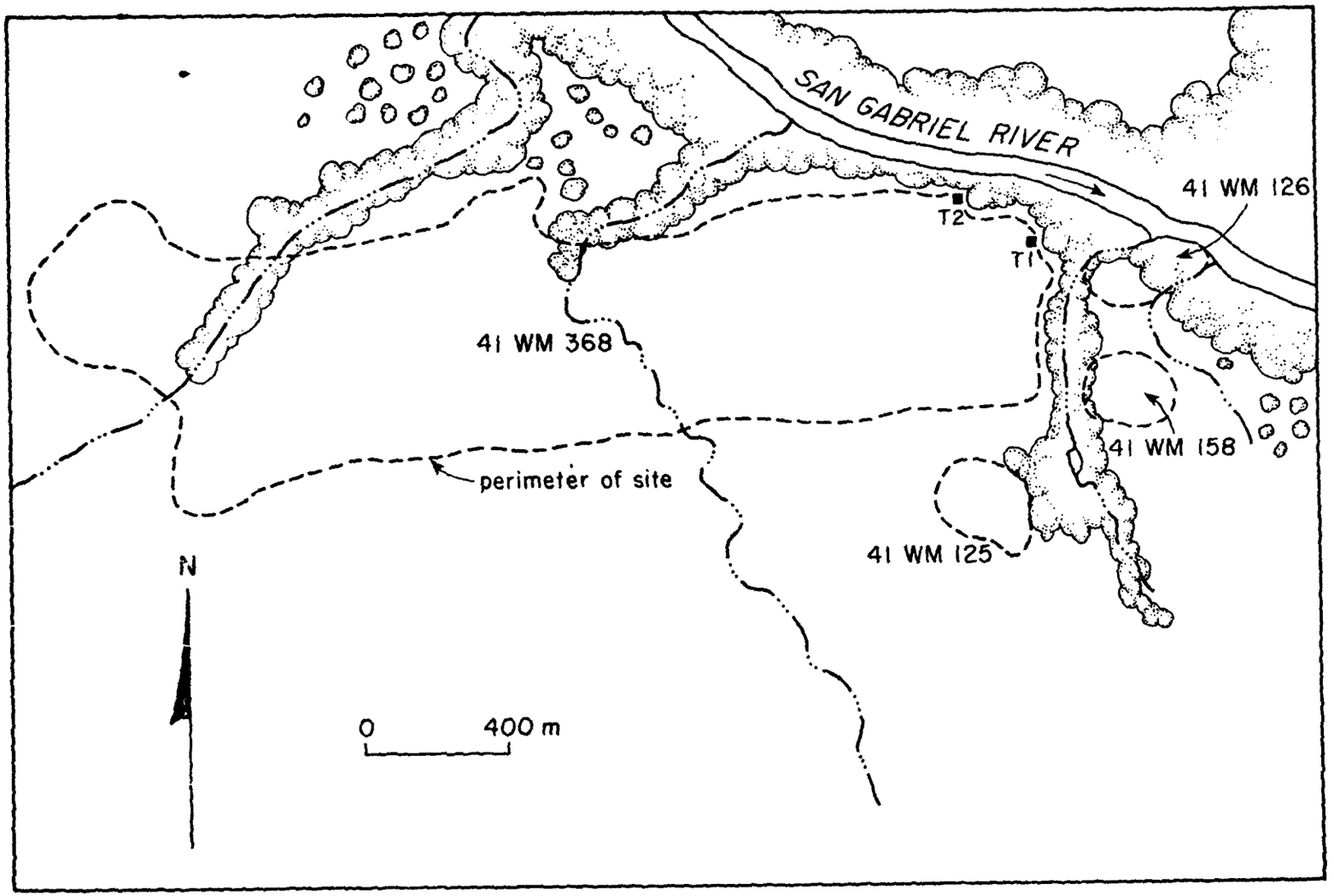

SAN GABRIEL RIVER
41 WM 126
T2
T1
41 WM 368
41 WM 158
perimeter of site
41 WM 125
N
0
400 m

Figure 12.7-1

Table 12.7-1. Tools, Site 41WM125

	TEST PIT 1									
TOOL TYPES	SURFACE	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	LEVEL 6	TOTAL	%	BURNED
Points	10		1					11	8.87	
Point Fragments	1							1	.81	
Bifaces	9			1				10	8.06	
Biface Fragments	12	3	2	2	2		1	22	17.74	4
Scrapers	1							1	.81	
Truncations		1	4					5	4.03	1
Backed Pieces		1	2			1		4	3.23	
Denticulates		1		1				2	1.61	
Notches		2	4		2			8	6.45	2
Gravers		2	6					8	6.45	4
Borers			1		1			2	1.61	
Drills		1						1	.81	
Axes	1							1	.81	
Retouched Pieces	8	12	18	5	4		1	48	38.71	6
TOTAL	42	23	38	9	9	1	2	124	100.71	17
%	33.87	18.55	30.65	7.26	7.26	.81	1.61	100.00		
Cores	5	1	1		1			8		
Tool/Core Ratio								15.50		

The other bifaces are rather large tools, bifacially retouched by large centripetal retouch, retaining some cortex at one or both faces.

Bifaces fragments

Most biface fragments at this site are basal:

- 1 basal fragment with a more or less straight base, the edges at sharp angles to the base
- 1 fragment with the edges at right angles to the base
- 1 fragment with the edges at obtuse angles to the base
- 4 fragments with a strong convex base
- 1 fragment with a slightly concave base
- 1 somewhat pointed fragment

Six fragments are sharply angled top fragments, and 4 are edge fragments. There are also 3 medial fragments: 1 narrow fragment, and 2 medium wide fragments.

Scrapers

Only one scraper fragment was found, namely a "giant" scraper fragment, made on a large secondary a flake.

Truncations

All truncated pieces were retouched on the distal end; three were made by dorsal retouch, 2 by ventral retouch, and only one tool is fragmentary. One of the dorsally retouched pieces was made on secondary b blade.

Backed pieces

Only 1 of the 4 backed pieces could be identified properly; this tool is a ventrally backed secondary b flake, with a slightly concave backed edge. The 3 other fragments were made on tertiary flakes.

Denticulates

Both denticulated pieces are complete tools, one made on a secondary b flake, the other one on a tertiary bladelet.

Notches

Most notched pieces are single notched flakes, 2 are fragmentary,

3 are complete. One was made on a primary flake by ventral retouch, all the others are dorsally retouched. One secondary b flake had multiple, occasionally adjacent notches, with some additional continuous retouch along a flake edge, and another tertiary flake also had multiple notches, but none were adjacent. One unidentifiable fragment was made on a secondary b flake.

'Boring' tools

Eight boring tools are gravers, most of which are made on the flake axis. Two tertiary flakes are dorsally retouched with very sharply pointed gravers, and another similar one was made by a small straight edge and a notch. One whole and 2 fragmentary tools are heavy gravers, with a triangular cross-section. Two more gravers were made on flake edges, one is a normal graver, made by dorsal retouch, the other one is a 'beaked' graver, made by regular ventral retouch.

Two other tools are borers, one made on the edge of a secondary b flake, the other one is an oblique graver with a square working end. One drill fragment was also recovered, a bifacially retouched basal fragment with a straight base, probably chiselended.

Axes

One axe was found, a tool with a straight bit profile, bifacially retouched except on the bit, which was secondary unifacially retouched. The tool retains a little cortex on 1 face.

Retouched pieces

There were 32 unilaterally retouched pieces:

- dorsal retouch, 1 whole edge: 2 whole secondary b flakes, 9 fragments, mostly on tertiary flakes
- dorsal retouch, less than ½ edge: 1 whole flake and 1 whole tertiary blade, and 3 fragments
- dorsal retouch, proximal end: 1 secondary a flake fragment
- distal end, dorsal retouch: 3 whole secondary b flakes and 4 fragments
- ventral retouch, 1 whole edge: 1 whole secondary b flake a 3 tertiary fragments
- ventral retouch, less than ½ edge: 1 whole secondary b flake and 1 secondary b flake fragment
- alternating retouch on 1 edge: 1 secondary a flake fragment.

Thirteen flakes were retouched bilateral:

- dorsal retouch, both edges: 3 secondary b fragments
- dorsal retouch, both edges partially in unequivalent loci:

whole tertiary blade and 2 flake fragments
- dorsal retouch, 1 edge and 1 end: 1 secondary b flake fragment was partially retouched, 1 tertiary flake fragment was retouched totally
- ventral retouch, both edges: 1 secondary b flake fragment
- alternate retouch, 2 edges: 2 fragments
- alternate retouch, 1 edge and 1 end: 1 whole secondary b flake
- discontinuous retouch, both edges: 1 whole secondary b flake.

Four flakes were retouched multilateral:

- dorsal retouch: 2 whole flakes, one tertiary flake was very finely retouched, and 1 fragment
- mixed unifacial retouch: 1 secondary a flake fragment.

A secondary b flake fragment has a very smooth edge, is rounded and has a faint shine. The flake is otherwise modified.

Groundstone

1 mano fragment of quartz measuring 5.5 x 6 x 4 cm
1 metate fragment of quartzite measuring 9 x 8 x 9 cm

Most cores that were found are small ones, especially 3 subdiscoidal cores. In total there are 4 discoidal cores, 1 large, 1 single platform core, 1 small multiple platform core, 1 large wedge core and 1 double platform core. The latter one has opposed platforms, on different faces.

The following artifacts were collected during the 1965 survey (Shafer and Corbin 1965: 52):

1 triangular knife
1 burin
2 end scrapers
2 side scrapers
9 bifaces
2 choppers
5 manos
1 hammerstone

Comments

The diversity and manufacturing stage of the tools recovered during the 1965 survey and the 1978 testing strongly indicate that the site was one of habitation rather than as suggested by the 1976 A & M assessment, a lithic procurement site. The large number of bifaces, mostly basal fragments; the unusual number of gravers and retouched tools, not to

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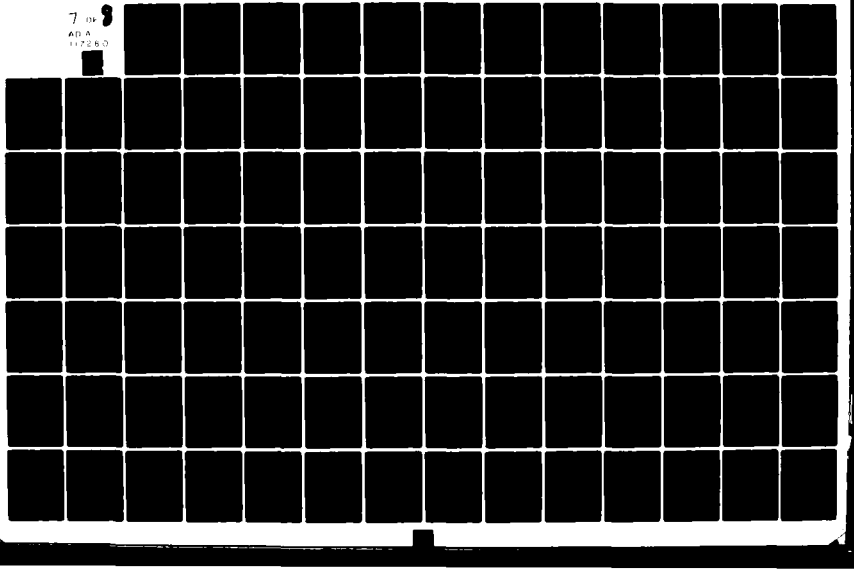


7 OF 8

AD A
117280

1.0
1.1
1.25
1.4
1.6
2.8
3.2
2.5
2.2
2.0
1.8

mention the groundstone all are interpreted as the remains of at least a seasonal campsite. The fact that chert and quartzite cobbles are available along the upland edge is simply insufficient evidence for interpreting the sites function as a highly specialized raw lithic material gathering station.

The debitage totals (Table12.7-2)do not show any significant differences within the first 50cm. Levels 6 and 7 are shewed because of the small sample size. The high count of biface thinning flakes is obviously related to the high count of bifaces and biface fragments. There undoubtedly was a great deal of biface reduction and/or resharpening going on at the site. The lack of core trimming elements and small numbers of primary flakes may be interpreted as an indication tool use and refurbishing rather than primary manufacturing.

Unfortunately modern agricultural activities, bioturbation, and disturbance caused by the fencing of the reservoir all contribute to the lack of in-situ deposits within the small section of the site on government property. It is therefore suggested that no further time and effort be expended at this particular site unless a larger section could be sampled.

Table 12.7-2

Debitage distribution by 10cm excavation level in Test Unit #1, 41WM125

ITEM	LEVELS 1		2		3		4		5		6		7	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
PRIMARY FLAKES	2	.1	10	.7	4	.5			2	.7	1	2.6		
SECONDARY FLAKES	168	12	130	8	72	9	66	17	48	16	13	34	2	10.5
TERTIARY FLAKES	254	18	192	14	175	23	119	31	110	36	22	58	9	47
SECONDARY BLADES			2	.1										
TERTIARY BLADES									2	.7				
BIFACE THINNING FLK	21	1.5	22	1.6	10	1.3	16	4	9	3			1	5
CORE TRIMMING														
CORE FRAGMENTS														
CHUNKS	7	.5	8	.6	7	.9	3	.8	4	1	2	5	2	10.5
BURIN SPALLS														
MICRO ELEMENTS	68	5	33	2.5	26	3.4	18	4.7	14	4.6			1	5
CHIPS	883	63	937	70	482	62	164	42.5	114	37.6			4	21
TOTAL	1403		1334		776		386		303		38		19	

12.8 Site 41WM126

Investigations

This site is located on the south side of the San Gabriel River on the western end of Taylor Park in Granger Reservoir. It is on a terrace remnant between the junction of two seasonal tributaries with the San Gabriel. During the 1976 survey it was estimated to have cultural deposits in excess of 1 meter, but was not recommended for further investigation (Patterson and Moore 1967:63). The subsequent park survey by NTSU personnel indicated that the site was probably Late Archaic in time, did have some depth to deposits, and warranted limited testing.

While the site had never been cultivated, the previous owner, Mr. Johnson, related that it had been utilized by the Boy Scouts as a camping/picnic area for many years, not so much because of its esthetic virtues as the fact that they could always find "Indian-heads" eroding from the terrace edges. The surface of the site contained several scout related fire and trash pits, but these were easily distinguished by the presence of sardine cans and aluminum pull-tabs from soft drink cans.

Since the site had not been cultivated recently and virtually no material was visible on the surface, it was decided to place a series of systematic shovel tests across the site in an effort to locate subsurface cultural features, thus maximizing data retrieval in the limited time allotment. Figure 12.8-1 shows the distribution of these tests. They were taken down to a depth varying between 50 and 80 cm and the fill was carefully trowelled through for cultural remains. While not as rigorous a technique as might be desired, it did allow the identification of two general areas of heavy artifact concentration and the possible features such as rock hearths. Five 1 x 1 m test pits (t-1, 2, 3, 5, 6) were placed in these promising areas. Test pit (T-4) was placed in a most unpromising section as a control.

In addition, a vertical section of the terrace edge adjacent to the unnamed creek before its junction with the river was cleaned back and profiled to determine the overall stratigraphy of the terrace. The resulting profile is illustrated in Fig. and is discussed below.

Stratum 1-A - This is a dark brown (10YR3/2) silty loam with a high organic content, rootlets, worms, insects and recent snail shell. Several chert flakes were noted.

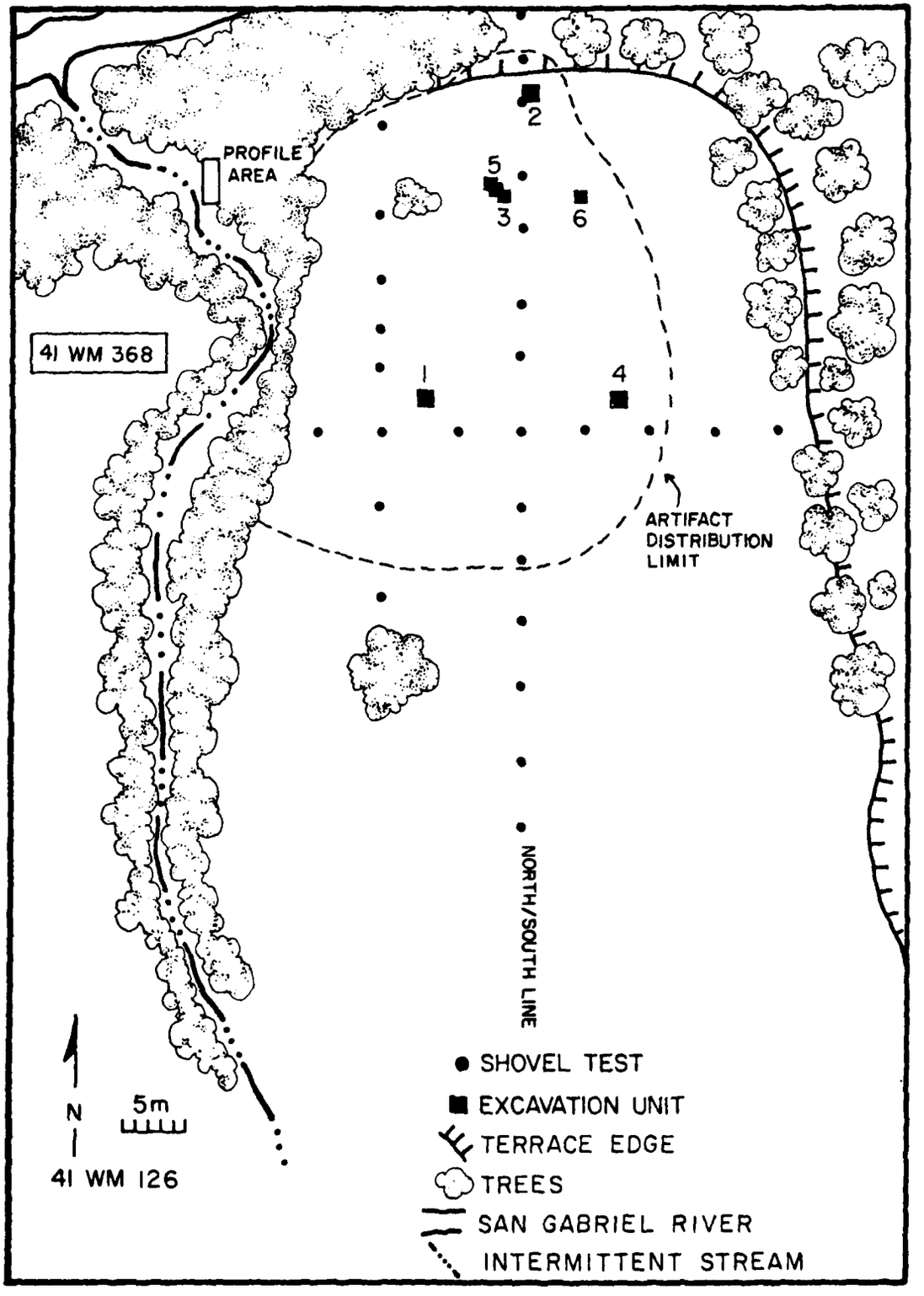

PROFILE AREA
41 WM 368
1
2
3
4
5
6
ARTIFACT DISTRIBUTION LIMIT
NORTH/SOUTH LINE
N
5m
41 WM 126
SHOVEL TEST
EXCAVATION UNIT
TERRACE EDGE
TREES
SAN GABRIEL RIVER
INTERMITTENT STREAM

Figure 12.8-1

Stratum 1-B - Dark brown (10YR3/2) silty loam with small inclusions of organic staining and tan clay mottling. Roots and rootlets occur less frequently than in 1-A, while limestone cobbles (both burned and unburned), lithic debris and snail shells increase.

Stratum 1-C - Dark brown (10YR3/2) silty clayey loam with heavy tan clay mottling. This zone contains many snail shells (R. dealbatus), fresh water mussel shells, bone fragments, lithic debris, artifacts and quantities of burned and unburned limestone.

Stratum 2-A - Tan (10YR4/2) clay silt with heavy brown (10YR3/2) silty clay loam mottling. This zone also contains a medium amount of small decomposed limestone stains, a few rootlets, and several pieces of lithic debris (most probably worked down from Zone 1-C).

Stratum 2-B - Dark grayish brown (10YR4/2) compacted clayey silt with some decomposed limestone and organic staining, but no cultural materials.

Stratum 3 - Tan grayish brown (10YR5/2) compact silty clay with decomposed limestone fragments throughout. Culturally sterile.

Stratum 4 - Tanish pale brown (10YR6/3) find compacted silty sand with no cultural remains.

It is evident that Stratum 1-C represents the major occupation of the site; and since the area is downslope from site 41WM158, it is probable that some of the materials noted on the surface at the southern end of the site in Strata 1-A and 1-B were derived by colluviation from site 41WM158. Undoubtedly site 126 has experienced periodic flooding which resulted in both the removal of some soils and cultural materials and the deposition of other soils as evidenced in the remainder of the profile.

Features

Two well defined features, both burned limestone rock concentrations, were noted and are illustrated in Fig. 12.8-2 . While Stratum 1-C was replete with limestone chunks, the features stood out as discrete concentrations. Unfortunately, neither contained charcoal or other datable materials.

Feature 1. This feature is a roughly circular concentration of burned limestone cobbles measuring 60 cm in diameter. A shallow depression some 45 cm in diameter and slightly higher on the western end was found beneath the initial cluster of rock (see Fig. 12.8-2).

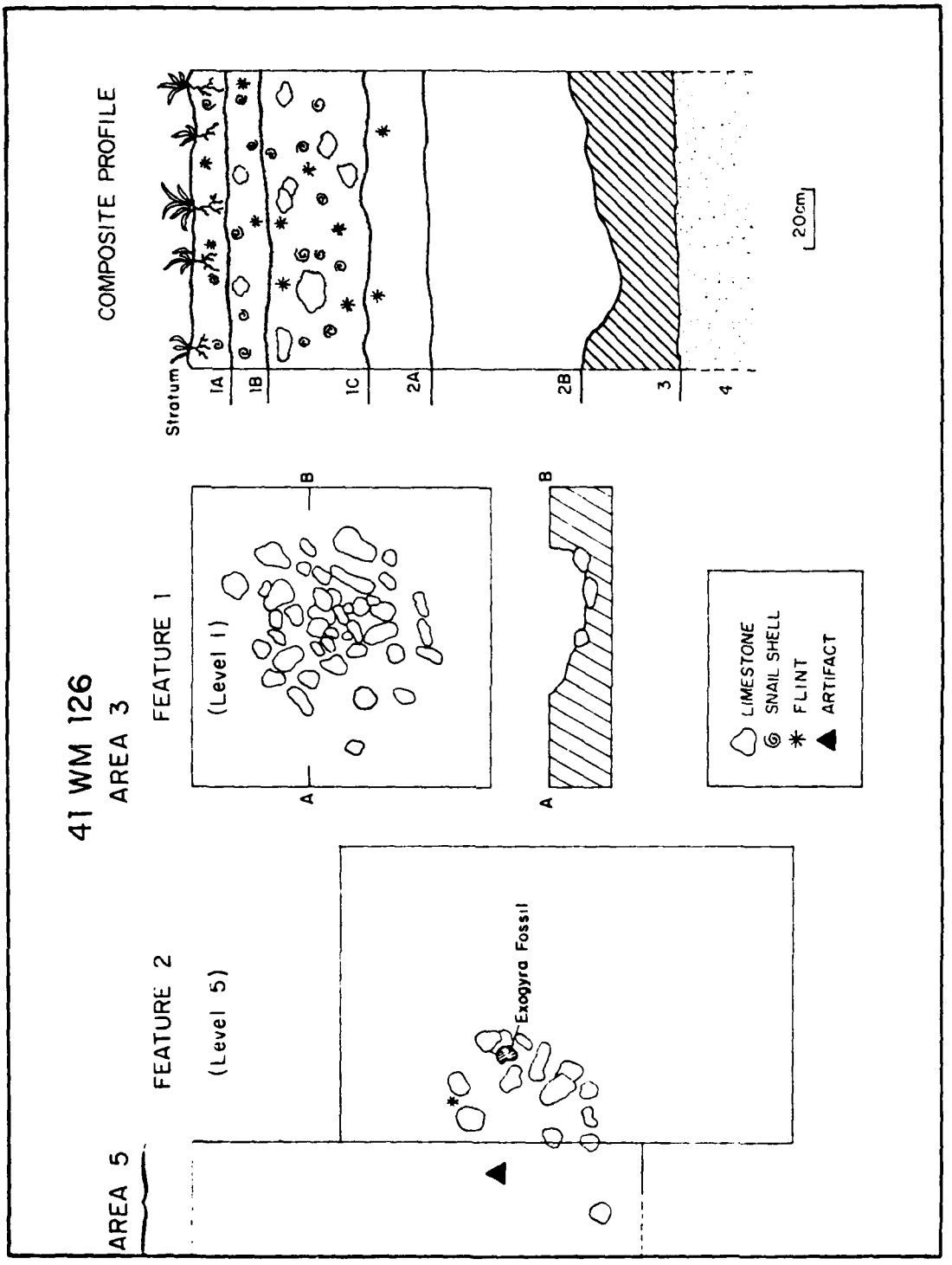

41 WM 126
AREA 3
COMPOSITE PROFILE
Stratum
1A
1B
1C
2A
2B
3
4
20cm
FEATURE 1
(Level 1)
A
B
A
B
AREA 5
FEATURE 2
(Level 5)
Exogyra Fossil
LIMESTONE
SNAIL SHELL
FLINT
ARTIFACT

Figure 12.8-2

Several of the rocks comprising the feature were visible once the light grass cover was removed and it was feared that the hearth was of recent origin, probably relating to the Boy Scout activities at the site. This is possible, but no modern artifacts were found in the feature fill as was the case with several obviously recent non-stone lined trash filled pits in the eastern quarter of the site.

Surface elevation in the vicinity of the feature was 99.63 cm (datum= 100.00 m) and the feature began at 99.61 m extending to a depth of 99.46 m. Cultural materials recovered in and around the rock cluster were kept separate from those encountered in the general fill of test unit 3. While a great deal more material was recovered around the "hearth" than in it, the types and relative percentages do not differ significantly. No diagnostic tools were found in either area. The only perceptible difference relates to the percentage of burned versus unburned pieces of lithic debris. In the "hearth" 48% of the debitage was heat altered; outside the limits of Feature 1 from 99.63 m to 99.58 m some 34% of the debitage was burned. This becomes significant when one compares it with the $\bar{x}$ of 22% for burned debitage in areas not associated with anything resembling a hearth.

The only other artifact of comment are biface thinning flakes, of which one (1) was found within the rock cluster and fourteen (14) outside but in the immediate vicinity. Considering that 62% of the lithic debris within the feature and 69% outside were tertiary flakes, it appears that tool reworking was going on around a small campfire. That primary manufacture was not an activity here is reflected in the fact that of the 279 pieces of debitage recovered from both areas only 9 (3%) were classified as "primary". Of course, an equally viable interpretation is the finishing of previously prepared blanks.

Feature 2. This feature showed up as a rock cluster in the northwest corner of Test Unit #3 only 29 cm. below the origin of Feature 1. While there is a slight horizontal overlap of the two features, no connection is postulated. No depression or pit could be discerned with Feature 2 and it may represent a situation similar to Feature 1, but in a disturbed context or possibly a discarded pile of rock from the dismantling and/or cleaning of a formal hearth.

A total of four (4) pieces of lithic debris were recovered among the rocks and little can be deduced from them. A single Exogyra fossil, a common element in most hearths found in the Granger area, was also a constituent of Feature 2. The only other items of note were a small unfinished biface found at an elevation of 99.12 m , a burin and 2 biface fragments all found in the vicinity of the feature.

Artifacts

Projectile Points

The identifiable projectile points recovered from the site all fall

into the Late Archaic Period, Twin Sisters (73%) and San Marcos (27%) phases. The upper levels, elevations 99.90 - 99.20 or from the ground surface to approximately 80 cm. below datum, contained nothing but points diagnostic of the Twin Sisters Focus (1250-1750 B.P.). From elevation 99.20-99.10 or 80 to 90 cm. below datum appears to be a transitional or mixed zone with Twin Sisters and San Marcos materials. Below about 99.10 to varying depths across the site (98.90-98.40) or after about 1 meter below datum artifacts diagnostic of the San Marcos phase (1750-2600 B.P.) were found. A listing of the recovered projectile points is presented below:

Darl (1): 99.80-99.70 m
Ensor (5): 99.50-99.40 m (2); 99.40-99.30 m (1); 99.30-99.20 m (1); 99.20-99.10 m (1)
Frio (1): 99.40-99.30 m
Fairland (1): 99.50-99.40 m
Montell (3): 99.20-99.10 m (1); 98.80-98.70 m (1); 98.70-98.60 m (1)

The remainder of the 17 projectile points were unidentifiable as to type, primarily because of their fragmentary nature.

Bifaces

Twelve complete bifaces were collected at this site, 6 are entirely finished tools, 6 others are less regularly retouched, and are possibly unfinished tools. Two of the former are small bifaces, one triangular with a more or less straight base, and thick cross-section, the other one is subtriangular with a strong convex base. Three others are medium to large bifaces, the one from near feature 2 a large, very regularly retouched pointed tool with a concave base. There was a similar tool found in the Round Rock levels at site 41WM56 (679). Another one was a wide short triangular tool, relatively wide at the base. The last one was a sharply pointed tool, carefully retouched at the pointed end, less carefully on the base. Most of the preforms are rather roughly bifacially retouched with a varying amount of cortex left on one face. One artifact without any cortex was a roughly circular tool, very irregular in outline.

Biface fragments

There were 63 biface fragments in the sample, 12 of which were basal fragments:

--1 fragment with a more or less straight base, the edges at sharp angles to the base
--3 fragments with the edges at obtuse angles to the base
--4 fragments with a strongly convex base
--4 fragments were roughly and irregularly retouched, and might be unfinished tool fragments. One of these was found near feature 2.

Eighteen specimens were top fragments:

--3 were fragments pointed at a 90°angle, 1 small and 2 large fragments. The small one was associated with feature 2.
--14 were sharp angled fragments, 3 small and 11 large fragments
--1 large fragment, obtuse angle

Ten fragments were medial fragments, 4 narrow, 4 medium wide and 2 wide fragments. There were also 22 edge fragments and 1 unidentifiable fragment.

Scrapers

Ten scrapers and scraper fragments were found, two of which are single endscrapers on non-retouched secondary (Sa) and secondary (Sb) flakes, the latter one damaged on the scraperbit. Two others were single sidescrapers on non-retouched secondary (Sa) and tertiary flakes. One multiple scraper was made on a secondary (Sa) flake. Two others are corescrapers, and three are unidentifiable scraperbit fragments.

Burins

The majority of the burins are angle burins, three of which are single angle burins on snap; 2 were made on secondary flakes, one on a biface fragment. Four others are double angle burins on snap, all made on 1 extremity on opposed edges; two were made on tertiary flakes, one of which also was backed steeply along the edge. One was made on a point fragment and one on a biface fragment. Two tools were single dihedral angle burins, both made on flakes. The two remaining tools were multiple burins, both also made on flakes. Relatively few burins were made on biface or point fragments.

Truncations

Eleven of 14 pieces were distal truncations, two of which were made by steep ventral retouch, the others by steep dorsal retouch. Most flakes are complete, only 2 are fragmentary; most truncations are straight or nearly so, 2 are concave. One tool was made on a secondary (Sa) microflake. Only one flake (tertiary) was truncated proximally by steep dorsal retouch, and two other tools were unidentifiable fragments.

Backed pieces

Thirteen backed pieces were collected, 5 of which were backed along a whole edge; 1 was made on a tertiary flake, 2 on secondary (Sa) and 2 on secondary (Sb) flakes, one of the latter is a large flake. Three of the above artifacts have nearly straight edges, 1 backed by

dorsal retouch, 2 by ventral retouch. Two other tools are concave and backed by dorsal retouch. Two tertiary flakes were partially backed, 1 by dorsal, 1 by ventral retouch. The six remaining tools are unidentifiable fragments of backed pieces.

Denticulates

Two tertiary and 2 secondary (Sb) flakes were denticulated, 3 by irregular dorsal retouch, 1 by alternating retouch. Two other tertiary flakes were serrated, one by mixed dorsal and ventral touch.

Notches

Seventeen of 21 notched pieces are single notches, made on flakes, many only fragmentarily preserved. Most of the flakes have no additional regular retouch, in fact only 1 tertiary flake has some continuous flaking other than the notch. A secondary (Sb) flake has multiple non-adjacent notches, a secondary (Sa) flake has also multiple notches, but 2 are adjacent. A secondary (Sb) flake has 2 adjacent notches made by alternating retouch. One tool is an unidentifiable fragment of a notched piece.

Boring tools

Gravers.

One artifact is a beaked graver on axis made on a tertiary flake. Four other tools are beaked gravers made on the flake edge, all are preserved only fragmentarily. Three were made on tertiary flakes and one on a secondary (Sa) blade. The last 4 tools are oblique gravers, all made on tertiary flakes; 3 are normal gravers, 2 of which are fragmentary. One is a coarse, heavy graver, triangular in cross-section at the graver-point.

Borers.

Three borers were collected. One is a normal borer on the axis of a tertiary flake, the 2 others are oblique borers, with a triangular cross-section at the borerpoint. One of the latter two was made on a tertiary flake, and 1 on a secondary (Sb) flake.

Drills.

A small burned drillbit fragment was recovered at the site during testing.

Retouched pieces

Nearly half of the tools that were collected from this site are retouched pieces. There are 120 unilaterally retouched pieces:

--dorsal retouch, 1 whole edge: 9 whole and 23 flake fragments
--dorsal retouch, less than ½ edge: 5 whole and 10 flake fragments, and 1 whole tertiary bladelet
--dorsal retouch, diskal end: 5 whole and 8 flake fragments
--ventral retouch, 1 whole edge: 6 whole and 14 flake fragments, and 1 whole tertiary bladelet
--ventral retouch, less than ½ edge: 5 whole and 8 flake fragments
--ventral retouch, proximal end: 1 tertiary flake fragment
--ventral retouch, diskal end: 5 whole and 7 flake fragments
--bifacial retouch, less than ½ edge: 1 tertiary flake fragment
--alternating retouch, 1 edge: 2 whole and 3 flake fragments, and 1 whole secondary (Sa) blade
--discontinuing retouch, 1 edge: 3 whole and 2 flake fragments

There are 24 bilaterally retouched pieces:

--dorsal retouch, both edges completely: 2 tertiary flake fragments
--dorsal retouch, both edges partially in unequivalent loci: 2 whole and 2 flake fragments
--dorsal retouch, 1 edge and 1 end, both partially: 1 whole secondary (Sa) flake
--dorsal retouch, 1 edge and 1 end completely: 2 tertiary flake fragments
--ventral retouch, both edges: 1 whole and 1 tertiary flake fragment
--ventral retouch, both edges partially in equivalent loci: 1 tertiary flake
--alternating retouch on one edge, other edge unifacially retouched: 2 whole and 1 flake fragment
--alternate retouch, both edges completely retouched: 1 whole and 3 flake fragments
--alternate retouch, 1 whole edge and 1 partial: 1 secondary (Sb) flake fragment
--alternate retouch, both edges partially in unequivalent loci: 1 tertiary flake fragment
--alternate retouch, both edges partially in equivalent loci: 1 tertiary flake
--alternate retouch, 1 edge and 1 end: 1 tertiary and 1 secondary (Sb) fragment

There are 3 multilaterally retouched pieces: a whole secondary (Sb) flake was retouched on both edges and 1 end by mixed bifacial and unifacial retouch, and 2 flake fragments were discontinuously retouched on 3 edges.

One tertiary flake fragment was pointed; there are 2 flakes, 1 fragmentary, with a heavy triangular cross-section, retouched also from the prominent dorsal rib. One tool is a "plunging" tertiary flake fragment, carrying part of an unidentified tool. Four retouched pieces are unidentifiable fragments, 1 made on a tertiary fragment, 3 on chunks.

Cores

Twenty cores were also collected from the site; 7 are single platform cores, 3 are wedge cores, 2 of which were battered. There are 4 multiple platform cores and 6 double platform cores; of the latter 3 have opposed platforms, 1 on the same side, 2 are 90° cores on the same face, and 1 is a diagonal double platform core, on different faces. Most cores are medium to large, retaining cortex. Very few cores are small.

Ground Stone

Three pieces of ground stone were recovered during testing operations.

1 mano fragment of quartz measuring 4.5 x 8 x 2.5 cm (test 1, level 1)
1 metate fragment of sandstone measuring 13.5 x 15 x 2.5 cm (Test 1, level 5)
1 mano/hammerstone of quartz measuring 12.5 x 9 x 6 cm. (Test 6, level 4)

Comments

Site 41WM126 appears to be a campsite occupied during the Late Archaic. At least two components are culturally and stratigraphically represented, an upper Twin Sisters Phase occupation and a lower San Marcos Phase occupation separated by a mixed Twin Sisters/San Marcos transition zone. The differences in artifact types and debitage characteristics are expectedly minor. All of the ground stone was found in the Twin Sisters levels and the micro elements (flakes and blades) comprise 11% of the debitage while only 5% in the San Marcos levels (Table 12.8-2,3).

Both biface thinning flakes and bifaces themselves comprise a greater percentage of the recovered materials in the San Marcos levels when compared with the Twin Sisters component. Both debitage and tool categories compare favorably with these from site 41WM126 and it is suspected that both served the same functions in the local prehistoric settlement pattern, mainly that of temporary (less than permanent) campsites. The difference between the two sites is that 41WM126 has not suffered the disturbance evident at 125 and, further, it has two reasonably descrete components. This situation offers researchers a chance to deal with a small contained site requiring much less time and effort than some of the larger more diffuse examples within the reservoir property. Accordingly it is recommended that this site be preserved for future investigation. However, at the time of testing the exact plans for the park area were not finalized and if

Table 12.8-1. Tools, Site 41WM126

TOOL TYPE	TESTHOLES SURFACE	TESTPIT #1	TESTPIT #2	TESTPIT #3	TESTPIT #3 + #5 FEATURE 2	TESTPIT #4	TESTPIT #5	TESTPIT #6	TOTAL	%	BURNED
Points	1	3	4	6			2	1	17	5.07	1
Point Fragments		1							1	.30	1
Bifaces	5	1	2		1		2	1	12	3.56	
Biface Fragments	9	13	7	9	2	1	13	9	63	18.69	21
Scrapers	3	2		3			2		10	2.97	1
Burins	2	2	2	1	1		3		11	3.26	3
Trunca-tions	2	2	3	3			3	1	14	4.15	6
Backed Pieces	2	6		3			2		13	3.86	4
Denticu-lates	1	1	1				1	2	6	1.78	1
Notches	2	4	1	6			6	2	21	6.23	10
Gravers		1		2			5	1	9	2.67	3
Borers		1		1					3	.89	1
Drills							1		1	.30	1
Retouched Pieces	18	34	14	28		3	33	26	156	46.29	44
TOTAL	45	71	34	62	4	4	73	44	337	100.02	97
%	13.35	21.07	10.09	18.40	1.19	1.19	21.66	13.06	100.01		28.78
Cores	4	5	2	4		2	3		20		
Tool-Core Ratio									16.00		

construction activities would further damage the site mitigative archaeological preservation efforts should be accomplished prior to such activity.

Table 12.8-2. Debitage distribution by components at site 41WM126

ITEM	TWIN SISTERS		TWIN SISTERS/ SAN MARCOS		SAN MARCOS	
PRIMARY FLAKES	107	.9	6	.3	8	.5
SECONDARY FLAKES	1,333	11	240	13	217	13.7
TERTIARY FLAKES	3,336	27	554	30	397	25
SECONDARY BLADES	7	.1	1	-		
TERTIARY BLADES	3	-	1	-		
BIFACE THINNING FLK	310	25	77	4	71	4.5
CORE TRIMMING	8	.1			2	1
CORE FRAGMENTS	4	-				
CHUNKS	335	2.7	30	1.6	102	6.4
BURIN SPALLS	2	-	1	-	1	-
MICRO ELEMENTS	1,368	11	138	7.5	84	5
CHIPS	5,435	44	782	42.7	702	44
TOTAL	12,248		1,830		1,584	

12.9 Site 41WM134

Investigations

During the 1976 Texas A & M survey of the proposed Granger reservoir area, this site was thought to be a lithic manufacturing station, some 45,000 square meters in area adjacent to two "lithic procurement" sites (41WM135 and 136). The site lies in the old fields which were cultivated until recently and overlaps with historic site 41WM412 on its western border (Fig. 12.9-1).

41WM134 is on what appears to be the T-2 terrace between Willis Creek and the San Gabriel River, approximately 2 km west of their junction. The fact that gravels, some suitable for artifact manufacture, were available in this area is attested to by the presence of a series of modern gravel pits just below the 500' contour.

Two 2 m wide transects were staked out across geographic center of the site in cardinal directions and these were collected in 2 m long increments. A preliminary analysis of the materials collected in this manner showed this technique to be unproductive in producing intersite differential activity information, but did produce a good controlled sample of the site. The average artifact count per 2 x 2 m unit was 25.5 pieces. Unfortunately, 98% of this material was debitage (flakes, chips, and chunks, etc.) while only 2% fell into recognized tool categories; and 34% of these were biface fragments. When this information was combined with the known disturbance of the site surface through at least 70 years of cultivation, it was decided to spend the remaining allotted time on a thorough general collection of tools, but not debitage, from the surface of the site (Table 12.9-1).

Artifacts

Projectile Points

Only three projectile points were recovered from the site and one of these was so amorphous in shape as to be unidentifiable. One Scallorn (Austin Focus, 650-1250 B.P.) and one Uvalde (San Geronimo, 5000-7000 B.P.) were recovered from opposite ends of the N/S transect. The paucity of projectile points is undoubtedly caused by many years of surface collecting. Local informants report that this is one of the better known sties in the area. If, however, the points are indicative of occupations at the site, then it contains materials from at least two components: one during the Early Archaic and one during the Post Archaic or Neo-American Period.

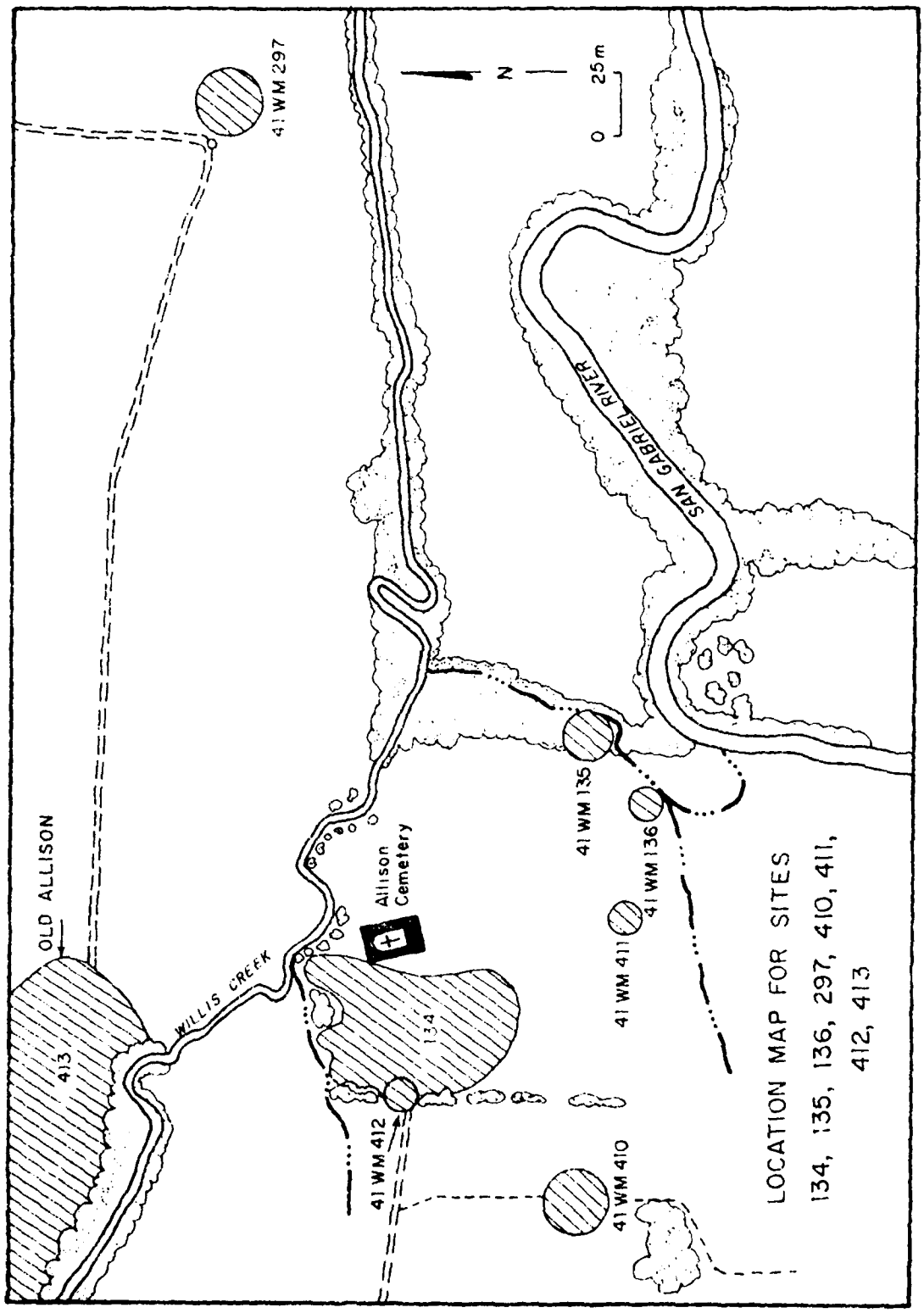

41 WM 297
N
0 25m
SAN GABRIEL RIVER
OLD ALLISON
Allison Cemetery
WILLIS CREEK
413
134
41 WM 135
41 WM 136
41 WM 411
41 WM 412
41 WM 410
LOCATION MAP FOR SITES
134, 135, 136, 297, 410, 411,
412, 413

Figure 12.9-1

Table 12.9-1.Tools, Site 41WM134.

TOOL TYPE	SURFACE	N/S TRANSECT	E/W TRANSECT	TOTAL	%	BURNED
Points		3		3	1.46	
Bifaces	17	1	1	19	9.22	1
Biface Fragments	30	26	15	71	34.46	9
Scrapers	1	1	2	4	1.94	
Burins	2	3	1	6	2.91	
Truncations	1	1	2	4	1.94	
Denticulates	3	4	5	12	5.83	1
Notches	1	6	7	14	6.80	
Gravers	1		1	2	1.97	
Borers		1		1	.49	
Drills	1			1	.49	1
Perforators			1	1	.49	
Gouges	1			1	.49	
Retouched Pieces	2	39	26	67	32.51	6
TOTAL	60	85	61	206	100.00	18
%	29.13	41.26	29.61	100.00		8.74
Cores	7	15	12	34		
Tool/Core Ratio				6.06		

Bifaces

Four complete finished bifaces were found at this site. One is a small triangular tool, with a slightly concave base and a thin cross-section. Another tool has a stong convex base and is sharply pointed at the other end. One small biface is an unfinished artifact, subtriangular in outline with a strongly convex base. The last finished tool is a sharply pointed biface, very carefully bifacially retouched on the sharp working end, and only roughly primarily worked at the base. The 4 other bifaces are irregularly retouched, probably unfinished tools, 3 are very irregularly bifacially worked tools, 3 others were more carefully worked, but still retained a considerable amount of cortex on one face. The eight others are fairly regularly bifacially retouched, completely covering or nearly so; 6 are irregular round or oval tools of which 2 are larger than the others and more or less pointed at one extremity. One artifact is slightly pointed and more carefully worked at its point than at its convex base.

Biface Fragments

There were 71 biface fragments at the site, 23 of which are basal fragments:

--1 fragment with a more or less straight base, the edges at right angles to the base
--3 fragments with the edges at obtuse angles to the base
--10 fragments with a strongly convex base
--1 fragment tapering towards the base
--1 shouldered fragment
--1 special fragment
--6 fragments were roughly and irregularly retouched, possibly from unfinished tools

Eighteen were top fragments:

--2 large fragments, with a right angle
--13 sharp angled, large fragments
--3 obtuse angled large fragments

Sixteen fragments were medial: 4 narrow, 9 medium and 3 wide ones. Thirteen fragments were edge fragments, and 1 was unidentifiable.

Scrapers

A single endscraper was made on the distal end of a secondary (Sa) flake; the raw material for this tool is chalcedony. A single side-scraper was made on a retouched secondary (Sb) flake. A single end and single side scraper fragment was made on a secondary (Sb) flake also. Another small fragment is a scraper bit renewal flake.

Burins

Two single angle burins were made on snaps, one on a tertiary flake, the other one on a pointstem. One dihedral burin on angle was made on a biface fragment. Two transversal burins, a single one and a double one, were both made on pointstems too. The last burin is a multiple one, made on a secondary (Sa) flake.

Truncations

Three truncations were made on the distal end of a flake, 2 by steep dorsal retouch, one by ventral retouch. One tool is a double truncation, made on a tertiary flake.

Denticulates

Two denticulates are partially serrated flake fragments, one made on a tertiary flake, the other one on a secondary (Sb) flake. The former fragment is also backed along the other flake edge. The other denticulates are mainly simple denticulated flakes, some with additional retouch (5), some without (5).

Notches

Five flakes are single notched, 2 of them on retouched flakes. Eight flakes have multiple, occasionally adjacent notches, some on retouched flakes. One secondary (Sb) flake has a meganotch on 1 edge. All tools were made mainly by dorsal retouch.

Boring tools

Two gravers were found, both made on tertiary flake fragments. They were both made on the flake edge, one by normal dorsal retouch, the other one is a "beaked" graver. A perforator was also made on a flake edge, the only such one recovered at this project. A small drill bit fragment was burned intensively. The last boring tool is a crude and heavy tool made on secondary (Sb) flake.

Gouges

An unusually small gouge was made on a flake which had no cortex left on either face. The tool is basically triangular and completely unifacially retouched on all three edges. This tool is a unique specimen at this project (and no similar tools were found in literature either).

Retouched Pieces

There are 38 unilaterally retouched pieces, the majority of which are fragments (29):

--dorsal retouch, 1 whole edge: 11 fragments
--dorsal retouch, partial edge: 6 fragments
--dorsal retouch, distal end: 6 pieces, 3 of which are fragments
--ventral retouch, 1 whole edge: 9 pieces, 6 of which are fragments
--ventral retouch, partial edge: 2 pieces, 1 of which is a fragment
--bifacial retouch, 1 whole edge: 1 fragment
--alternating retouch: 3 pieces, 1 of which is a fragment

Nineteen flakes were bilaterally retouched as are the majority (11) fragments.

--dorsal retouch, 2 whole edges: 4 pieces, 2 of which are fragmentary
--dorsal retouch, 1 edge and 1 end, both partially: 5 whole pieces
--dorsal retouch, 1 edge and 1 end, both entirely retouched: 4 pieces, only 1 of which is a complete tool
--ventral retouch, both edges completely: 1 fragment
--alternating retouch on 1 edge: 1 fragment
--alternate retouch, along both edges entirely: 1 fragment
--alternate retouch, crude retouch along both edges: 1 fragment
--alternate retouch, 1 edge and 1 end: 2 fragments

Eight flakes were multilaterally retouched:

--dorsal retouch only: 1 whole piece
--ventral retouch only: 1 whole piece
--mixed unifacial retouch: 2 pieces, one of which is a fragment
--discontinuous retouch: 4 fragments

One flake fragment was retouched to a point on the distal end. Another tool with a triangular cross-section, was retouched from the prominent dorsal rib towards the edge.

Cores

Many cores were collected from this site, the majority of them are small but a fair amount are medium large. Most cores are multiple platform cores (18), usually intensively flaked, but from some only few flakes were detached. The second largest class are the double platform cores, 4 are platform cores, two are 90° cores and 2 are diagonal cores. Six suboval or subdiscoidal and only 2 single platform cores were also collected at the site. Most of the suboval cores were large. Nearly all cores have some cortex left. No bladecores were observed in the sample.

Ground Stone

1 Mano/Hammerstone of quartzite measuring 9 x 5.5 x 3cm (general surface)
1 Mano Fragment of quartzite measuring 8 x 6 x 3 cm (general surface)

Comments

It should be noted here that site 41WM134 is well known to all of the local artifact collectors and it is an absolute shurity that the site has had many of its diagnostic artifacts removed over the years it was in active cultivation. With this fact in mind it seems a little pretentious to speculate on the periods of utilization except to note that the diagnostic projectile points found were either from the Early Archaic or Neo-American Periods. On the basis of information gained at other sites in the Granger reservoir area it is considered likely that the site was visited throughout the interim periods and that the present investigations simply failed to find the evidence through surface collections.

The site was originally classified as a lithic manufacturing area. Whether this is the only function the site served it certainly appears that the manufacture of stone tools could have been one of the activities represented in the collected samples. A surprising number of cores (34) core fragments (56) and core trimming elements (17) were collected, primarily from the transects (Tables 12.9-2, 12.9-3). In addition there is a high percentage (32%) of retouched pieces, some of which may be the by products of platform preparation.

A large number of bifaces and biface fragments were recovered, which by themselves might also represent manufacturing except that the biface thinning flakes, a necessary by-product, are singularly lacking.

It is not pushing speculation too far to suggest that individuals or even groups camped at the site while gathering raw materials and manufacturing stone tools. If this were true then one would expect the presence of general living debris. That this might be the case is illustrated by Figure 12.9-2 which compares overall debitage from site 41WM126 with that of 41WM134. At the former the percentage of chips (broken flakes) stands out as the largest deviation from the materials collected at 134. It must be remembered, however, that the sample from 134 is a surface collection; and although every piece visable on the surface in the transects was collected, an excavation sample which was screened would naturally produce more small elements (eg. micro-flakes and blades). In other words, the differences in artifact types from the two sites is preceived as resulting from differences in sampling techniques, not in site function.

It is therefore concluded that site 41WM134 is not a specialized lithic manufacturing station, but rather a multi-purpose campsite at which stone tool manufacture most assuredly took place. However, the disturbed nature of the site and the presence of similar and more easily investigated sites,

Table 12.9-2. Debitage totals for site 41WM134, N/S Transect

ITEM	TOTAL #	%
Primary Flakes	24	1.7
Secondary Flakes	379	27
Tertiary Flakes	606	43.7
Secondary Blades		
Tertiary Blades		
Biface Thinning	19	1
Core Trimming	13	1
Core Fragments	39	3
Chunks	121	8.7
Burin Spalls		
Micro Elements	58	4
Chips	125	9
TOTAL	1387	

Table 12.9-3. Debitage totals for site 41WM134, E/W Transect

ITEM	TOTAL #	%
Primary Flakes	13	1
Secondary Flakes	368	31.5
Tertiary Flakes	490	42
Secondary Blades		
Tertiary Blades	1	.1
Biface Thinning	18	1.5
Core Trimming	4	.3
Core Fragments	17	1.5
Chunks	92	8
Burin Spalls		
Micro Elements	35	3
Chips	131	11
TOTAL	1169	

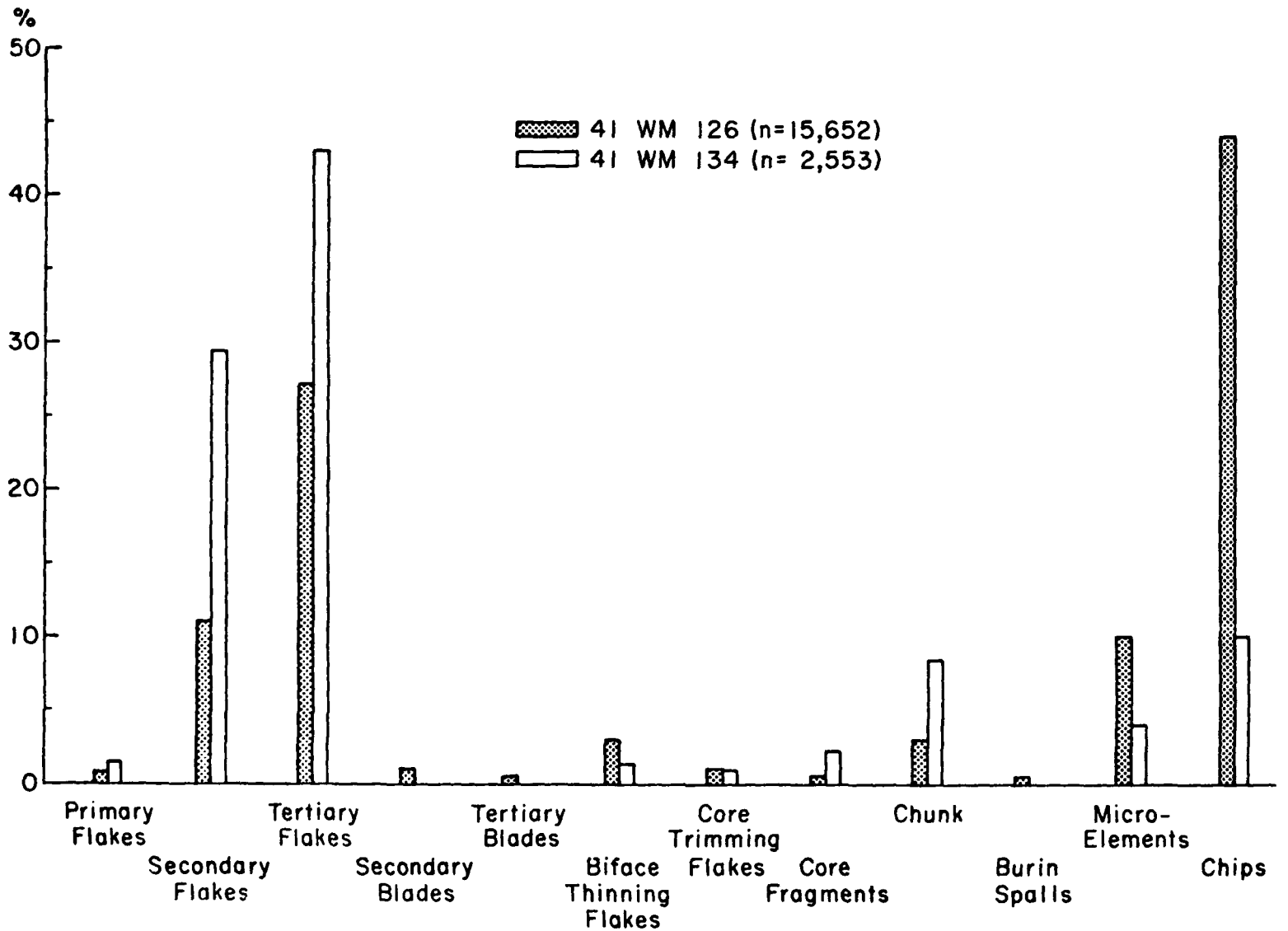

%
50
40
30
20
10
0
41 WM 126 (n=15,652)
41 WM 134 (n= 2,553)
Primary Flakes
Secondary Flakes
Tertiary Flakes
Secondary Blades
Tertiary Blades
Biface Thinning Flakes
Core Trimming Flakes
Core Fragments
Chunk
Burin Spalls
Micro-Elements
Chips

Figure 12.9-2

such as 41WM126, within the reservoir would not make site 134 a choice for further investigation at this time.

12.10 Site 41WM286

The "site" was originally classified by the 1967 Texas A & M survey team as an extensive (800,000 square meters) lithic procurement area. It is located on an upland remnant between Sore Finger and Alligator Creeks, and initial inspection did indeed verify it as a potential source of quartzite and flint. A conservative estimate would place the percentage of rock noted throughout the "site" at between 30 and 40% of soil composition. Unfortunately, there is no evidence that man ever exploited the raw materials. Four very experienced archaeologists carefully scrutinized the entire area, but were able to find nothing but plow-fractured cobbles. These are easily distinguished from cores and core fragments by the presence of rust streaks and lack of platforms. It can only be surmised that the original surveyors mistook these accidents of modern agriculture as evidence of prehistoric man's presence at the "site".

As a secondary precaution, the site was visited again by the team following cultivation. This second visit produced no evidence to alter our diagnosis that the site was a natural gravel deposit which was either not visible or not utilized during the Indian occupation of the area.

12.11 Site 41WM295

This site was originally located and evaluated during the 1976 Texas A & M survey of Granger Reservoir. It was listed as a thin lithic scatter covering 7,500 square meters. It is further stated that the cultural deposits at the site are 8 meters in depth. One can only assume that this is an error (Patterson and Moore 1976:70).

The site was found to indeed to be a lithic scatter, but to cover approximately 10,000 square meters and overlap with 41WM413, the historic community of Allison. The southern 1/3 of the site had been badly disturbed by recent landclearing operations. The northern 3/4 of the site were in heavy pasture which was in the process of reverting to a natural state (Fig. 12.11-1).

Intensive pedestrian inspection of the entire area failed to reveal only a few scattered artifacts and no concentrations of cultural materials. A general surface collection was accomplished. Following this a series of ten 2 meters deep x 10 meters long backhoe trenches were spaced over the site beginning at Willis Creek and running north. No materials or features were noted below the immediate surface in any of these trenches.

Artifacts

Very few flint tools were found at this site (Table 12.11-1) and as a consequence little may be said concerning them.

Projectile Points

One unidentifiable large projectile point fragment was found.

Biface fragments

The only biface fragment recovered from this site is a very small sharp angled pointed fragment.

Burins

One single oblique burin on snap was made on a biface fragment. One large wedge core was also recovered from this site. Since the tool density is very low, the core/tool ratio is high.

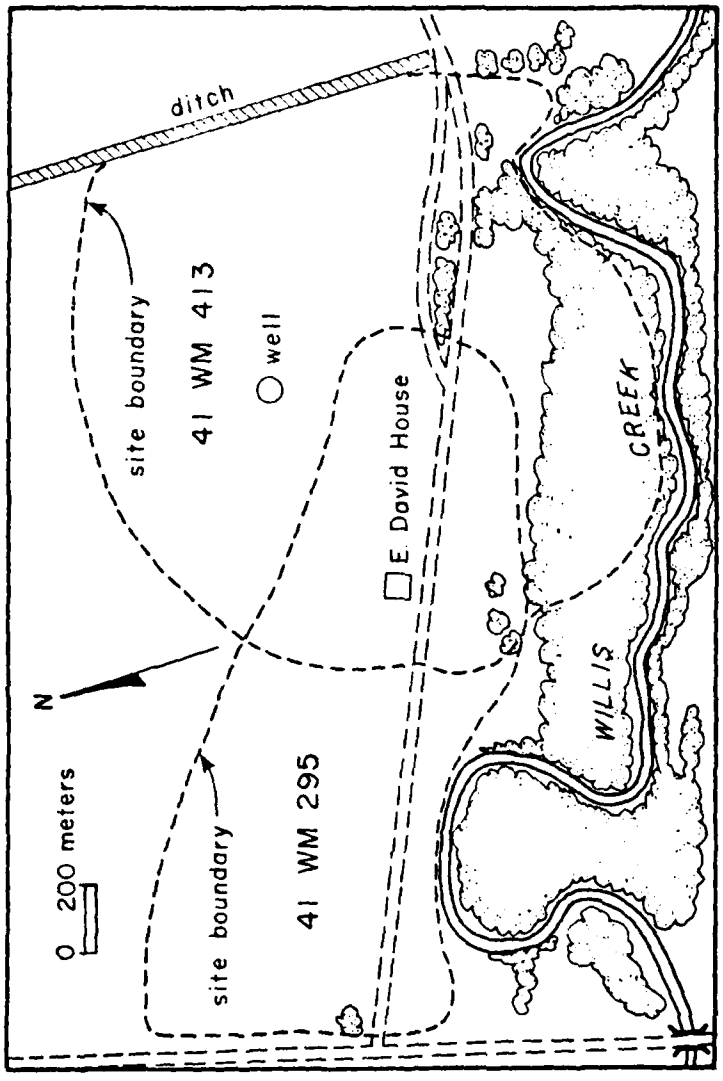


Figure 12.11-1

Debitage

One core trimming flake and one chunk comprise the total debitage noted on the surface.

Table 12.11-1. Tools, Site 41WM295

TOOL TYPE	SURFACE	%	BURNED
Points	1	33.33	
Biface Fragments	1	33.33	
Burins	1	33.33	
TOTAL	3	99.99	0
Cores	1		
Core/Tool Ratio	3.00		

Comments

Little can be said concerning this site except that it should never have been recommended for investigation by the original survey team. Although the site evidences some occupation evidence, it is ephemeral in nature and no further investigation is recommended.

12.12 Site 41WM297

Investigations

This site is located on the northern side of Willis Creek just west of the dam for Granger Lake. The 1976 survey listed the site as a lithic scatter with burned rocks extending to a depth of 1.50 meters below the surface. This cultural deposit overlay ". . .four fossil bone deposits. . ." dating from the late Pleistocene (Patterson and Moore 1967).

When the site was returned to for testing, it was discovered that 95% of the area had been subjected to either borrowing operations or topsoil stripping up to 1 meter in depth. The only remaining section of the site which was not damaged was around a concrete porch (early 20th century) and along an old fence line.

In view of the recent disturbance at the site, it was deemed expedient to machine test in the form of backhoe trenches before conducting any hand excavations. Several short 15 meter trenches were placed adjacent to the porch area and across the fence row. These produced a few recent historic artifacts, but no prehistoric ones. Following this, a series of 10 meter long skip-trench lines (alternating every 10 meters) were run through the geomorphological center of the terrace formation. The profiles of these trenches proved to be culturally sterile.

A thin scatter of lithic debris was noted on the surface but no collection was made. A drainage ditch had been dug along the western side of the site and near the base of this, some 2-4 meters below the present ground surface, the fossil bone deposits were located. At each outcrop of bone a small metal encircled cardboard tag on a nail was noted as if someone had mapped the bone, but had not collected samples.

Comments

It appears that the 1.5 meters of cultural deposit was either removed for dam fill or, represented nothing more than debitage eroded and transported from the top of the terrace over the edge of the "V" shaped drainage ditch giving the appearance of depth to the cultural deposit. Here, and at several other sites, the lack of coordination between construction and archaeological investigation schedules proved to be critical for the preservation of cultural data.

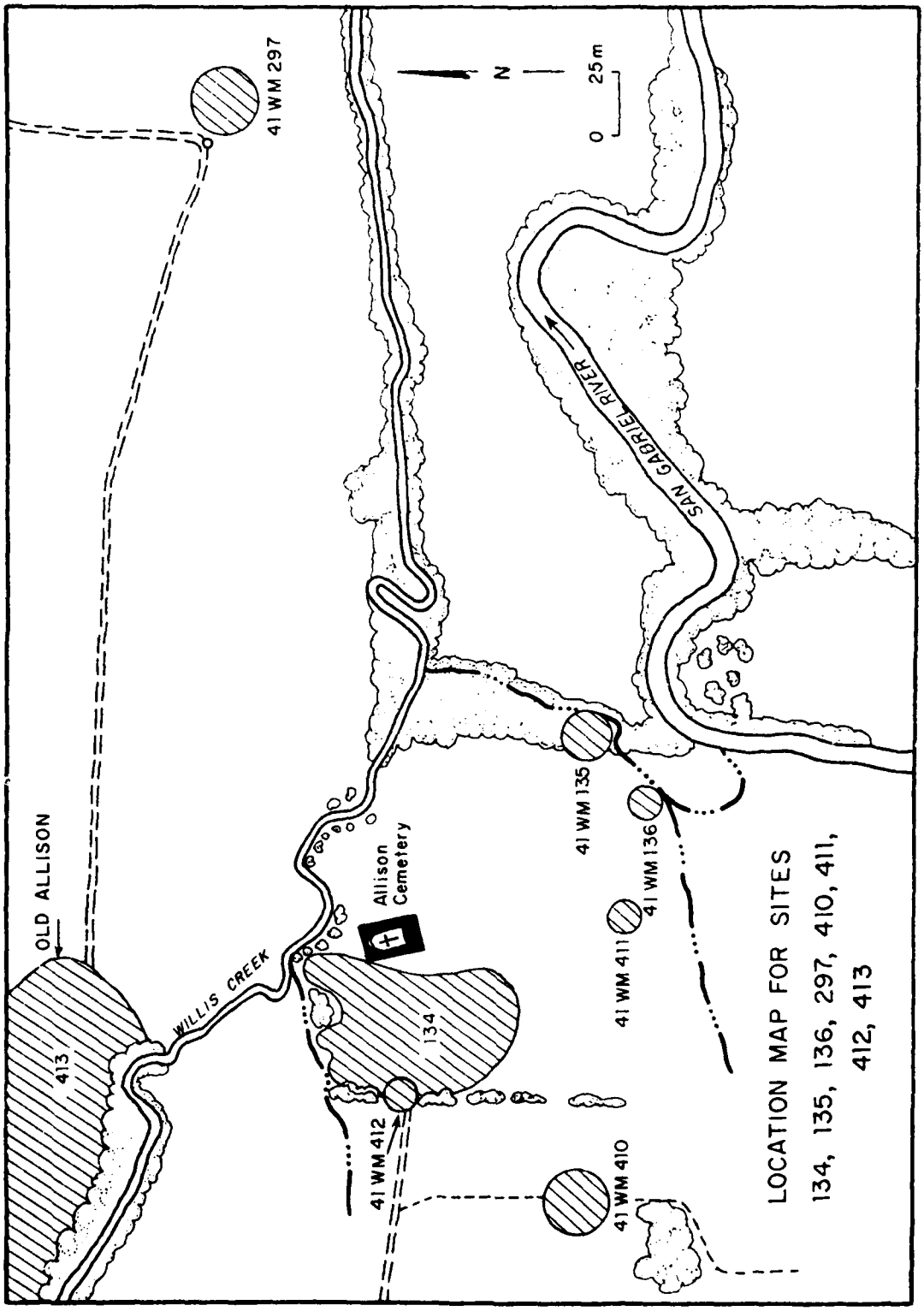


Figure 12.12-1

12.13 Site 41WM318

Investigations

This site was located during the 1978 survey of Willis Creek Park on Granger Lake. It is at the terrace/floodplain interface of Willis Creek and a small unnamed branch which forms the southern boundary of the park area northeast of Machu cemetary. Historic cultural materials were noted on the surface along with a few pieces of prehistoric lithic debris. Careful scrutiny of the cutbank area of Willis Creek revealed that prehistoric cultural materials were eroding out from ½ to 1 meter in depth. At this time testing was recommended to determine the nature and extent of the buried deposits (Fig. 12.13-1).

When the site was returned to some nine months later, it was found that clearing and grubbing operations had obliterated the in situ deposits and totally mixed the prehistoric and historic components. A general surface collection of cultural materials was accomplished, but since a modern beer can was found at a depth of .90 cm below the surface in the creek bank wall, further testing was considered of dubious value.

Artifacts

Very few artifacts were collected from this site (Tables 12.13-1, 12.13-2).

Biface fragments

Both biface frabments are patinated. One is a base fragment, with a more or less straight base and edges at obtuse angles to the base. The other fragment is a sharp angled large top fragment.

Retouched Pieces

Four retouched pieces are unilateral. A tertiary bifacial thinning flake is dorsally retouched along one edge and a secondary (Sb) flake is dorsally retouched on its distal end. There is ventral retouch along one edge of a secondary (Sb) flake. The fifth piece is bilaterally retouched, by alternating retouch on one edge only. This tool was made on secondary (Sb) flake. Only one of these retouched pieces is patinated, all the other pieces are fresh.

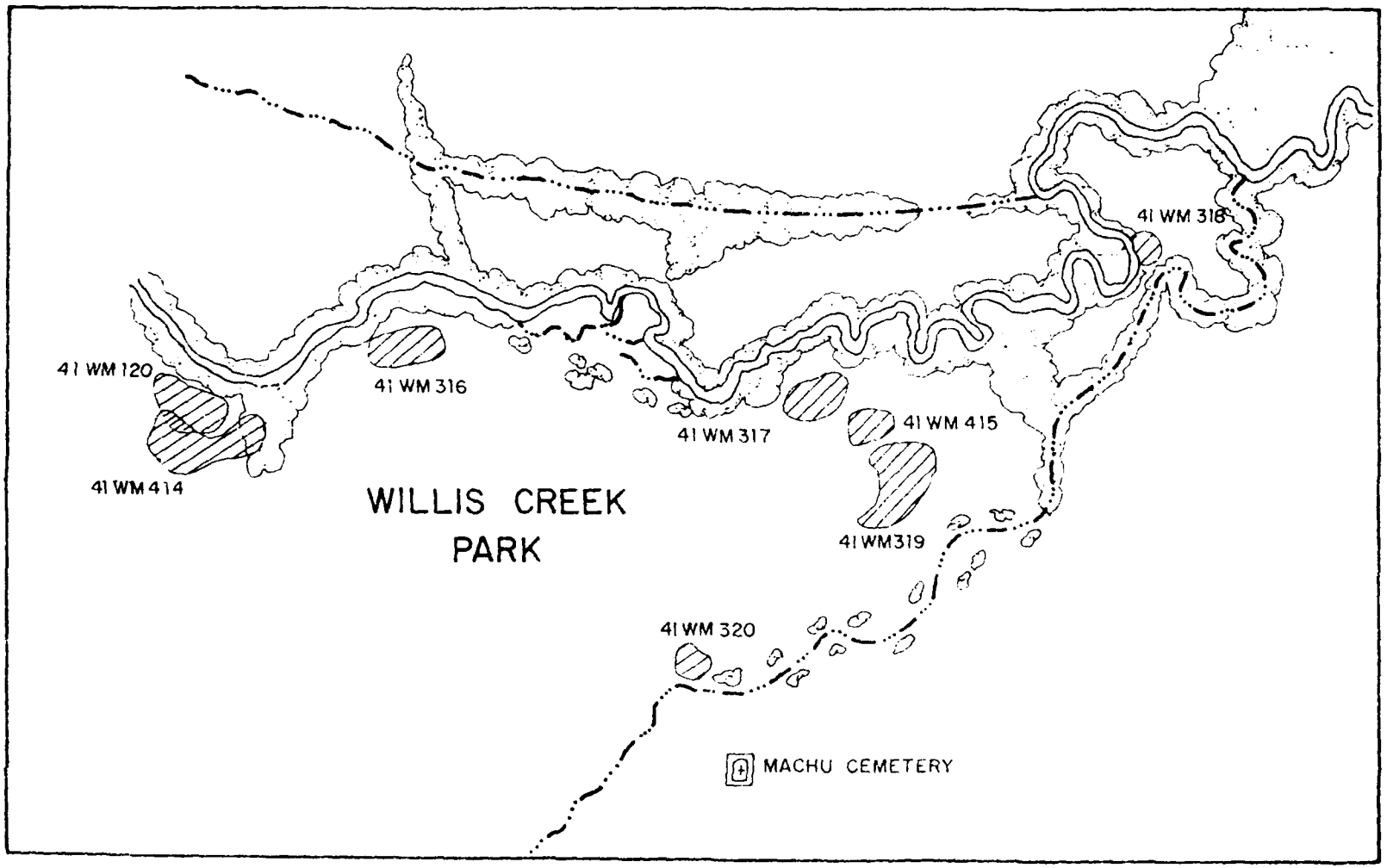


Figure 12.13-1

Table12.13-1.Tools, Site 41WM318.

TOOL TYPE	SURFACE	%	BURNED
Points	-	-	
Point Fragments	-	-	
Bifaces	-	-	
Biface Fragments	2	28.57	
Retouched Pieces	5	71.43	
TOTAL	7	100.00	0
Cores	2		
Tool/Core Ratio	3.50		

Table 12.13-2. Debitage totals for site 41WM318

ITEM	TOTAL #	%
Primary Flakes	4	6
Secondary Flakes	30	45
Tertiary Flakes	12	18
Secondary Blades		
Tertiary Blades		
Biface Thinning		
Core Trimming	1	1
Core Fragments		
Chunks	16	24
Burin Spalls		
Micro Elements	2	3
Chips	2	3
TOTAL	67	

Cores

One small subdiscoidal core with a little cortex left on one face has a plano-convex cross-section. The other core is a medium size multiple platform core, very intensively flaked. The core/tool ratio is high.

Comments

Here, as at 41WM295, 297 and other sites, the potential for data recovery and preservation was destroyed by construction operations between the time of the original location and evaluation of the site and the scheduling of testing operations. The continued practice by sponsoring agencies of investigating the cultural resources only after construction has reached a point of no return, rather than during planning stages, will continue to result in the loss of significant segments of this country's cultural heritage.

12.14 Site 41WM323

Investigations

This site is located on the northeastern end of Wilson Fox Park in Granger Lake (Fig. 10.2-1) When first noticed in an erosion gully, it was decided that much of the site was obscured by heavy forest cover and several inches of snow. The above mentioned artifacts appeared up to .50 m below the surface in an erosion gully and it was thought that the site might contain buried cultural deposits.

In order to determine the depth and extent of the site, a series of twenty-five (25) shovel tests were placed at approximately 10 meter intervals across the terrace top and edge. No cultural materials were noted beneath the actual ground surface (beneath about 6 cm of leaf mold) and much of this appears to have been fire-cracked and spalled. Much of the debitage has been in a fire (24%) but none of the tools show evidence of heating. Since no trees were noted older than about 50 years, it is likely that the area had been burned over in recent times, perhaps explaining the fired nature of the debitage on the site. The unanswered question is why the tools were not burned. The materials noted in the gully at a depth of .50 m are in a colluvial wash context, originating further upslope near the terrace edge.

Artifacts

Few tools were recovered from this site, but there is a large number of cores. For the distribuion, see Table 12.14-1.

Bifaces

Two complete bifaces were recovered from this site, both roughly retouched by bifacial retouch: one is an elongated, not pointed tool, with a little cortex left on 1 face; the other tool is a rather large suboval biface, bifacially retouched on all edges.

Scrapers

All three scrapers are complete tools and all were made on secondary (Sb) flakes. One is a single endscraper on a retouched flake, one is a single sidescraper on a retouched, and the third one is a "giant" scraper.

Table 12.14-1. Tools, Site 41WM323

TOOL TYPE	SURFACE	%	BURNED
Points	-	-	
Point Fragments	-	-	
Bifaces	2	15.38	
Biface Fragments	-	-	
Scrapers	3	23.08	
Truncations	1	7.69	
Denticulates	1	7.69	
Notches	3	23.08	
Retouched Pieces	3	23.08	
TOTAL	13	100.00	0
Cores	30		
Tool/Core Ratio	.43		

Table 12.14-2. Debitage totals for site 41WM323

ITEM	TOTAL #	%
Primary Flakes	6	9
Secondary Flakes	13	19
Tertiary Flakes		
Secondary Blades		
Tertiary Blades		
Biface Thinning		
Core Trimming	38	56
Core Fragments	2	3
Chunks	9	13
Burin Spalls		
Micro Elements		
Chips		
TOTAL	68	

Truncations

A secondary (Sa) flake was truncated on the proximal end by steep dorsal retouch, and also had some additional retouch on the flake edges.

Denticulates

A secondary (Sb) flake was denticulated by dorsal retouch, and one of its edges was backed by steep dorsal retouch.

Notches

All three notches are single notches on flakes with additional continuous retouch. Two were made by ventral retouch; one notch was present on the platform anterior to the flake removal.

Retouched Pieces

Only 3 retouched pieces were collected at the site:

--dorsal retouch, less than ½ edge: 1 whole flake
--ventral retouch, 1 whole edge: 1 flake fragment
--dorsal retouch, 2 edges and 1 end: 1 whole flake

All flakes used as raw material for tools were secondary, most with less than 50% cortex, and no tertiary elements were used. Also, all the cores have cortex left on at least one face.

Cores

Thirty cores were collected; most of them are large. There are 15 single platform cores, 2 multiple platform cores, 2 wedge cores and 1 subdiscoidal core. All the remaining cores are double platform cores, 3 with opposed platforms, five 90^{o} cores and 2 diagonal cores. Two cores had 1 blade scar, and 3 of the single platform cores had only 1 flake scar.

Comments

Admittedly the artifact sample from this site is small, but from all appearances what was found could represent a lithic manufacturing site. This is seen in the high percentage of cores, core trimming elements and the fact that very little tertiary debitage was found (Table 12.4-2) Additional evidence supporting the manufacturing station hypothesis comes in the form of low general tool densities compared to cores, core trimming flakes and chunks (72% of debitage and 71% of all collected materials).

The site appears to lack any depth of cultural deposits and has been subjected to clearing and cultivation in the past. With these considerations in mind it is recommended that the site be left in woods to be included in the park area, and no further investigations be conducted at this time.

12.15 Site 41WM330

This site was a small burned rock midden located on a sloping terrace of the first northern spring-fed drainage emptying into the San Gabriel northwest of the North Fork dam site. It is almost due south and slightly downslope of site 41WM332, a small rockshelter (Fig. 12.15-1)

When first visited by the Texas A & M survey team, the site had been partially vandalized by pot hunters, but researchers felt that enough of the original deposit remained to warrant investigation (Patterson and Moore 1976:21). The A & M team "tested" the site by cleaning several pot-hunter profiles and placing a controlled 1 x 1 m. pit at the junction of the two profiles. Of particular interest is the fact that the only projectile points recovered during the testing were found in the upper 20 cm. of the test pit, and they all (6) are diagnostic of the Neo-American period (Ibid: 149-156).

In any event, the test excavations were apparently left open which caused increased interest in the site by local collectors; and by the time North Texas State University archaeologists reached the site in February, it had all but been destroyed. As a consequence, further work at the site was considered to be counter-productive.

12.16 Site 41WM331

Site 41WM331 is another small burned rock midden located .97 km north of the North Fork dam and just northeast of 41WM330, but up on the bluff top. According to the previous survey, the site is some 200m^2 with a depth of approximately 1 m. Close inspection by NTSU and Texas Historical Commission archaeologists indicated that the site had been almost totally potted and had a depth of less than 40 cm. Much of the site, in fact, is resting directly on limestone bedrock. A decision was made at that time that further investigations would be unlikely to produce usable data.

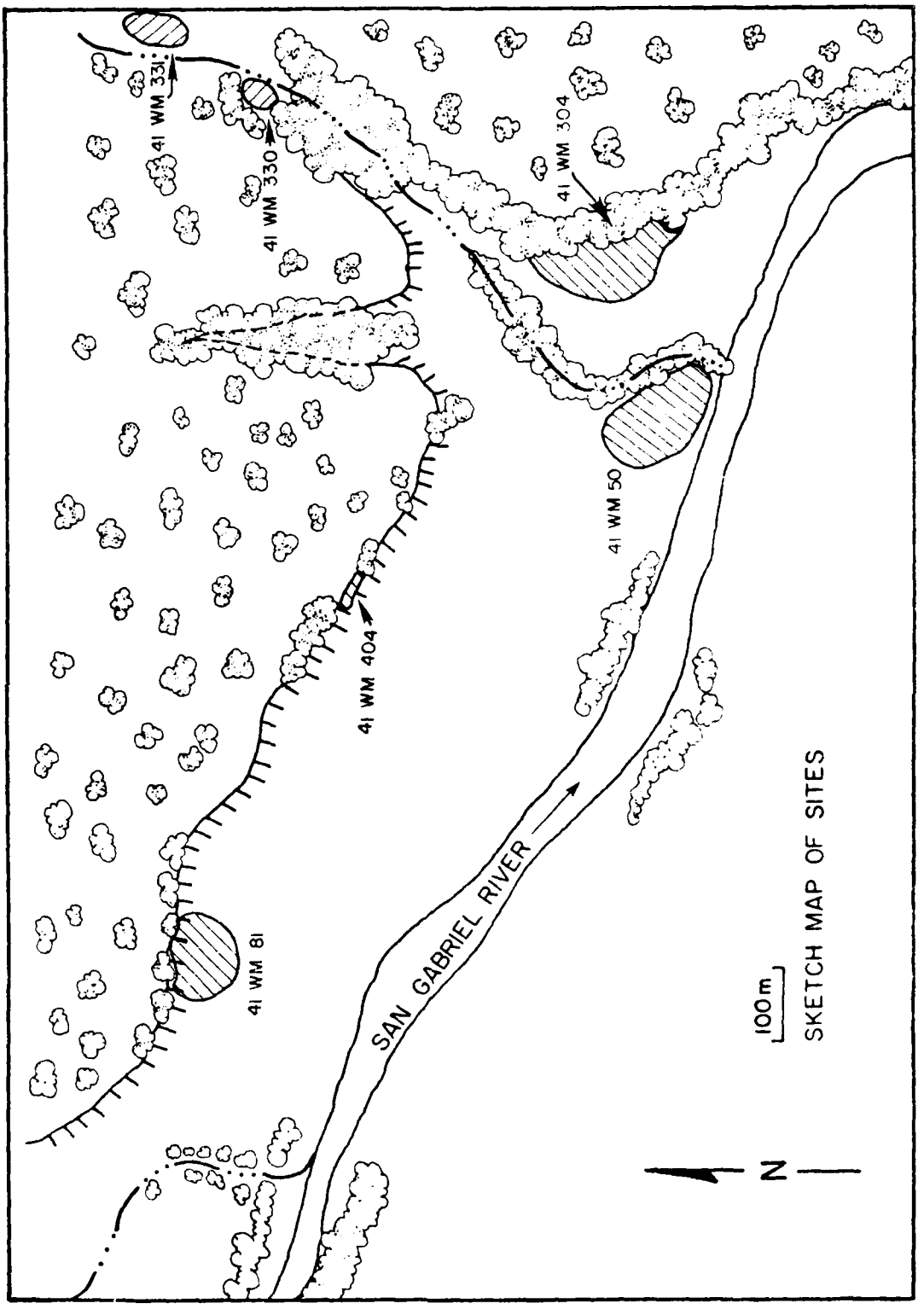


Figure 12.15-1

12.17 Site 41WM360

Investigations

This site was originally recorded as a "burned rock scatter" on the western edge of Bullion Hollow, north of the San Gabriel, and just northwest of Hunt Crossing (Fig.12.17-1). The site is some 420 m E/W by 215 m N/S at maximum with artifact distribution in a roughly oblong shape. Two small burned rock middens or accumulations were noted on the southwestern edge adjacent to the river at the terrace edge. Midden "A" measures 21 m N/S by 18 m E/W and is approximately 60 cm above the ground surface at its center. Midden "B" is 14 m. in diameter and is less than 40 cm high. Both middens show evidence of disturbance; Midden "B" the most pronounced with a large hole in its center.

Undoubtedly the site has been spread by intensive cultivation over many years. Only the small southwestern section containing the two middens has escaped the plow. It is probable that rather than one large site, the area was originally a number of smaller spatially continguous, temporally distinct camps. With this hypothesis in mind, the site was reconnoitered to identify differences in artifact densities. As only six (6) man-days were allocated for obtaining a representative surface collection from the site, it was thought that collecting semi-discrete artifact clusters might result in the definition of intersite activity and/or temporal differences. Unfortunately, two situations precluded the accomplishment of this goal. First, intensive artifact collection over the years had removed many of the time-diagnostic artifacts; and second, plowing at least twice a year for the past 50+ years has tended to mix remains on this shallow site until the artifacts distribution is fairly continuous over the majority of the site. Several low density areas were noted, but these were attributed to old erosion scars which had been filled in with colluvium.

Since the field had been recently plowed and heavily rained on it was decided to sample it by two transects. These were run so as to cover the major portion of the site while missing large areas of standing mud and water. Each transect was 2 m wide. All cultural debris within this boundary was recovered for later analysis. Midden "A" and "B" were collected separately, and all of these collections were followed by a brief general collection focusing on tools rather than all cultural debris (Table 12.17-1).

Artifacts

Projectile Points

A wide range of projectile points covering the Archaic and into the Neo-American Period were recovered from the surface of 41WM360. They are as follows:

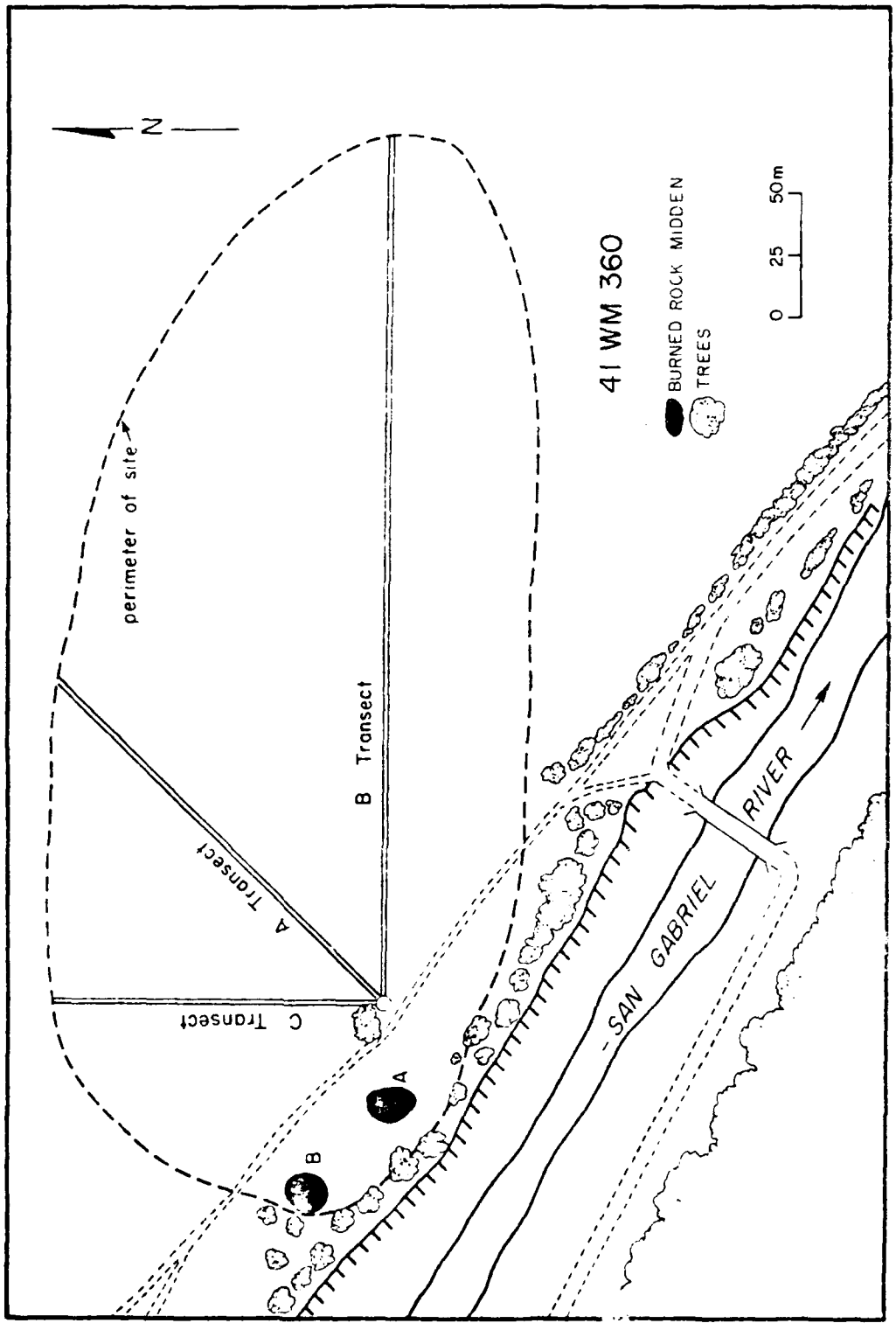


Figure 12.17-1

Table 12.17-1. Site 41WM360 Lithic Tools

Tools	Burned Rock midden A	B	A+B	Transect A	B	C	Surface	TOTAL	%
Points	3	2	2	7	8	3	21	46	9.11
Point fragments						1		1	.20
Bifaces			12	3	5	1	20	41	8.12
Biface fragments	14	7	4	17	45	9	73	169	33.46
Axes							1	1	.20
Scrapers	5	2	1	6	13	5	25	57	11.29
Burins				3	7	1	3	14	2.77
Truncations	2	1		7	4	2	5	21	4.16
Backed pieces	1		1	3	10		5	20	3.96
Denticulates	4		2		1	2	2	11	2.18
Notches	5	3		5	10		3	26	5.15
Gravers	3			2	3	3		11	2.18
Borers	1			2	1	1	1	6	1.19
Drills							1	1	.20
Composite tools	1			1	1			3	.59
Scaled pieces					1		1	2	.40
Retouched pieces	11	7	3	17	17	7	13	75	14.85
TOTAL	50	22	25	73	126	35	174	505	
%	9.90	4.36	4.95	14.46	24.95	6.93	34.45	100.00	100.00
Cores	7	12	12	16	22	2	23	94	
Tool/core ratio								5.37	

Fresno (1) Austin Phase (650-1250 B.P.)
Darl (3) Twin Sisters Phase (1250-1750 B.P.)
Ensor (6) Twin Sisters Phase (1250-1750 B.P.)
Montell (1) San Marcos Phase (1750-2600 B.P.)
Marcos (1) San Marcos Phase (1750-2600 B.P.)
Castroville (1) San Marcos Phase (1750-2600 B.P.)
Williams (1) San Marcos Phase (1750-2600 B.P.)
Pedernales (4) Round Rock Phase (2600-4000 B.P.)
Bulverde (1) Round Rock and Clear Fork Phase (2600-5000 B.P.)
Gower (1) San Geronimo Phase (5000-7000 B.P.)

Assuming that all of the various types of projectile points were shown equal preference by local collectors and further that they were present in approximately equal numbers to begin with; then one might hypothesize that heaviest utilization of the site occurred during the Late Archaic (Twin Sisters occupation) with a secondary popularity during the Middle Archaic (Round Rock occupation). However, such assumptions are highly tentative since it is known that artifacts have been selectively removed from the site over a period of years.

Bifaces

A large number of complete, bifacially retouched tools were collected from site 41WM360. Most of them are irregularly retouched by bifacial retouch, but occasionally part of a tooledge remains unworked or unifacially worked only. Few of the collected tools seemed to be finished artifacts.

--Two bifaces are rather irregularly worked, small triangular tools, thick in cross section, and with a straight base. One tool has an unworked cortex base, the other tool is damaged at the base.
--Two small to medium artifacts are also rather irregularly worked, triangular bifaces with a strong convex base.
--Eight tools are more or less round to oval irregularly bifacially worked small tools, relatively thin. One tool is much more regular in outline than the other tools.
--Five more tools are very similar to the above, but larger.
--Three artifacts are irregularly worked bifaces, more or less pointed at one end, and with virtually no cortex left on either face. One tool is very large, and one is clearly triangular.
--One tool is a roughly oval biface, not pointed at either extremity.
--Five elongated bifaces are all but one irregularly flaked, but have very little cortex preserved on either face. One tool is partially unifacially reworked.
--One very irregularly worked tool, slightly elongated with a large amount of cortex on one face, is slightly pointed at one extremity.
--Four irregularly but fairly intensively worked bifaces or preforms taper slightly, but are not really pointed at one extremity.
--Nine large preforms were worked centripetal by large irregular bifacial retouch. Some tools retain some cortex.
--The last biface was classified under miscellaneous because of its irregularity. The tool is probably damaged and unfinished.

Biface Fragments

Next to the many complete bifaces, a large amount of biface fragments were also recovered. There are 63 basal fragments:

--Two fragments with a more or less straight base, the edges at right angles to the base.
--Four fragments with a more or less straight base, the edges at sharp angles to the base.
--Ten fragments with a more or less straight base, the edges at obtuse angles to the base.
--Two fragments with a more or less straight base, the edges at mixed angles to the base.
--Sixteen fragments where the base has a strongly convex outline.
--Five fragments where the base has a concave outline.
--Seven fragments with a more or less pointed basal end. One fragment is possibly a drill base fragment.
--One shouldered basal fragment.
--Sixteen very irregularly retouched basal fragments, most probably fragments from crude or unfinished tools.

There are 37 distal fragments:

--28 sharp angled fragments, 25 large and 3 small ones.
--Three fragments forming an angle of 90^{o}, all large.
--Six obtuse angled fragments, also all large.

There are 27 medial fragments:

--Two narrow medial fragments.
--20 medium wide medial fragments.
--Five wide medial fragments.

There are also 40 edge fragments, and two fragments were unidentifiable.

Axes

One small complete axe was recovered from the site. Its bit is convex, slightly damaged (at least partially recently).

Scrapers

A total of 57 scrapers was collected from the surface. Of these, 23 are single endscrapers. There are six single endscrapers on flake, four whole and two fragments. Two were made on primary flakes, one on a Sb flake and three on tertiary flakes. Sixteen were single endscrapers on retouched flakes. All these scrapers are complete artifacts. Two were made on the proximal end of a Sa flake. Eight scrapers were made on Sb flakes by regular dorsal retouch. One of these artifacts has a small

carefully retouched thorn at one end of the scraperbit. The six other tools were made on tertiary flakes, one on the proximal extremity of the flake. This last tool was also the only one with additional bifacial retouch along the edges. The last single endscraper is an atypical denticulated one, made on the distal end of a Sa flake.

Eighteen scrapers are single sidescrapers. Eight of these tools were made on simple flakes, one on a chunk. Two are fragments, the others are whole artifacts. Two tools were made on Sa flakes, two on tertiary flakes. The others were made on Sb flakes; one of these was a rather large tool, partially bifacially flaked on the scraperbit. Six scrapers are single endscrapers on a retouched flake, three of which are fragments. Four were made on tertiary flakes, one of which has additional bifacial retouch on its proximal end and is slightly pointed at the distal end. The other two were made on Sa flakes. Two sidescrapers are inverse, one whole tool made on a Sb flake. The other one is a fragment, made on a tertiary flake; this fragment is possibly part of a double scraper. A steepended keelscraper or 'rabot' was made on a Sb flake.

There are eight double scrapers; four are double sidescrapers, two fragments, both made on tertiary flakes, two complete artifacts made on Sb flakes. One of the latter had its scraperbit prepared by flat ventral retouch. Four are single end and single side scrapers, all complete artifacts. One was made on a Sa flake, three on tertiary flakes.

Three tools are multiple scrapers, all made on Sb flakes. Two are complete tools, one is a fragment, and the latter is also notched on one edge.

Two scrapers are corescrapers, two others are microscrapers. Both of the latter were made on tertiary flakes, but one is a fragment only.

One fragment was unidentifiable.

Burins

Fourteen burins were collected from the site surface. Most (10) are angle burins. Nine of these are single angle burins on snap of which six were made on biface fragments. Two of these are very small tools. One was made on a Sa flake, two on Sb flakes. One double angle burin was made on a tertiary flake on opposed edges.

Three tools are dihedral burins. One was made on the axis of a Sb flake; the other two are dihedral angle burins, one a Sb flake also, the other one on a irregular biface fragment.

The last burin is a single transversal one made from the unaltered edge of a tertiary flake.

Truncations

Twenty-one tools are truncated pieces. Most of the tools are single distal truncations, 16 made by dorsal retouch, two by ventral retouch. The latter two and on the distal truncations are fragments. Most tools were made on tertiary flakes, five on Sb flakes. One of the latter was also partially backed. One artifact was made on a Sb blade, one on a tertiary blade; this last tool, and two others, have concave truncations. The others are straight to slightly convex. The two ventrally truncated artifacts were made on tertiary flakes.

Three other tools are proximal truncations. Two were made by dorsal retouch, one a concave truncation on a tertiary flake, the other one a straight truncation on a Sa flake. One proximal truncation was made by ventral retouch on a Sb flake.

Backed Pieces

A total of 20 backed pieces was collected from the surface. Nearly half of these are backed along one whole edge. Four tools have a straight to slightly convex backed edge, three by dorsal retouch, one by ventral retouch. All but one were made on tertiary flakes. The one exception was made on a Sb flake. One artifact, made on a Sb flake has a convex backed edged, dorsally retouched. Four artifacts are backed concave by dorsal retouch, two on tertiary, two on Sb flakes. One of the latter is a fragment only.

Five tools were backed only partially along one edge. Three were made by dorsal retouch, three complete and one fragment. One artifact was made on a tertiary fragment by ventral retouch.

Two pieces were double backed, both by alternate retouch. A complete tool was made on a Sb bladelet, the other one on a tertiary fragment.

Two artifacts were backed as well as truncated by dorsal retouch. Both are complete tools made on Sb flakes. One other tool was made on a biface fragment, which was very steeply backed after the fracture, along one edge. One tool was an unidentifiable fragment.

Denticulated pieces

One serrated and ten denticulated pieces were collected from the surface, all made on flakes. The serrated piece is fragmentary, and was made on a primary flake by careful dorsal retouch.

Three tools are simple denticulates, made on further unretouched flakes. One is a whole artifact made on a Sb flake, two were made on tertiary fragments. The other seven tools were made on flakes with some additional retouch. Only one is a fragment, made on a tertiary flake, the others are complete tools. The fragmentary tool is the only made by ventral retouch

of the complete tools, one was made on a tertiary flake, one on a Sb flake; the others on tertiary flakes. One of the latter was made by large and irregular retouch.

Notched pieces

Twenty six notched pieces were collected from the surface. Most tools are single notched flakes, five complete and 16 fragments. All but two of these were made on tertiary flakes. The two exemptions were made on Sb flakes. Several of these notched were made by ventral retouch. Three other tools are single notched pieces made on flakes with some more continuous additional retouch. Only one of these is a complete tool made on a tertiary flake. One fragment was made on a tertiary, the other one on a Sa flake.

One tool fragment, made on a tertiary flake, has multiple non-adjacent notches. Another tool fragment, also made on a tertiary fragment. has alternatingly retouched notches, on different edges. The last notched piece is an unclassifiable fragment, also made on a tertiary fragment.

Boring tools

Gravers. Most of the boring tools are gravers. One of these artifacts is a heavy graver made on the axis of a tertiary flake. The graverpoint of the tool has a strong triangular cross-section.

Most of the gravers are made on the flake's edge. Four of these are normal gravers made by dorsal retouch. But only one is a complete artifact; the others are fragments. The former is made on a Sb flake, the latter on tertiary flakes. There are also four so called "beaked" gravers, two whole and two fragments made on Sb and tertiary flakes. One of the whole tools, made on a Sb flake, has a graver point made by ventral retouch. The last graver is an oblique one formed by a small notch and a straight edge. This tool is complete.

Borers. Five boring tools are borers. One is a sharply pointed tool made on the edge of a tertiary flake. Another borer is an oblique one, made on a Sb flake. The other three are normal oblique borers, all fragmentary.

Drills. One broken drill was found; the tool was made on a winged point-base.

Other borers. This artifact is a heavy, roughly and irregularly retouched borer, made on a tertiary flake.

Composite Tools

Three composite tools were found on the surface. Two are burin-scraper combinations. One made on a Sb the other one on a tertiary flake. The third

artifact is a burin-graver combination made on a Sb flake.

Scaled pieces

Both tools are bifacially worked artifacts, with intensive scaled retouch along one edge. Both seem to have been made from exhausted cores.

Retouched pieces

A total of 75 retouched pieces were collected from the site surface. Thirty-two of those are unilaterally retouched:

--dorsal retouch, one whole edge; one whole flake, seven flake fragments and one blade fragment.
--dorsal retouch, less than ½ edge; two whole blades and three flake fragments.
--dorsal retouch, distal end; two whole and one flake fragment.
--ventral retouch, one whole edge; two whole flakes, two flake fragments and one bifacial thinning flake fragment.
--ventral retouch, less than ½ edge; one whole flake.
--ventral retouch, proximal end; one large flake fragment.
--bifacial retouch; one whole edge; two whole and one flake fragment.
--alternating retouch, one edge; one whole flake.
--alternating retouch, one end; one whole flake.
--mixed unifacial and bifacial retouch, one edge; one flake fragment.

There are 29 bilaterally retouched pieces:

--dorsal retouch, two whole edges; four flake fragments.
--dorsal retouch, one whole edge, one partially; one flake fragment and one blade fragment.
--dorsal retouch, both edges partially in equivalent loci; one flake fragment.
--dorsal retouch; one edge and one end, both completely; one whole flake and one fragment.
--ventral retouch; two whole edges; one flake fragment.
--ventral retouch, both edges partially in inequivalent loci; one flake fragment
--ventral retouch, one edge and one end, both partially; one whole blade
--bifacial retouch, 2 edges; one flake fragment.
--alternate retouch, two whole edges partially in equivalent loci; one whole flake and three fragments.
--alternate retouch, two edges partially in equivalent loci; one whole blade.
--alternate retouch, 2 edges partially in unequivalent loci; one whole flake.
--double alternate retouch; one whole flake.
--alternate retouch, one edge and one end; two whole flakes and one fragment.

--mixed unifacial and bifacial retouch, 2 whole edges: three whole flakes.
--mixed unifacial and bifacial retouch, one edge and one end; one whole flake.
--discontinuous retouch, two edges; one whole flake and one whole bladelet.

There are seven multifacially retouched pieces:

- dorsal retouch, two flake fragments.
--mixed unifacial and bifacial retouch, one whole flake and one fragment.
--mixed unifacial retouch, two whole flakes and one fragment.

Finally, there are also:

--one whole flake with retouch over the dorsal ridge towards the edge.
--one miscellaneous retouched piece.

Five pieces were further unidentifiable.

Cores

A total of 94 cores were collected from the surface. All sizes from very large to very small cores are present. Most cores are in the medium range, and there are about equal amounts of large and small cores.

Most cores are multiple platform cores (59). All are flake cores, except one very small core with one blade scar. Next most frequent are the double platform cores (31). There are 9 opposed platform cores, 5 on different and four on the same face. Seven are 90° cores, four on different and three on the same face. Four are diagonal cores, three on different, and one on the same face. One double platform core is amorphous. One of the 90° cores is of chalcedony.

There are 20 single platform cores, one of which is a blade core. There are also three wedge cores and 11 subdiscoidal cores.

Comments

Site 41WM360 was classified as a "burned rock scatter..." by the Texas A & M survey team (Patterson and Moore 1976:46). One burned rock midden was mentioned in this report. While the site certainly contains quantities of burned rock, it is probably a fairly intensively utilized campsite which was occupied throughout the range of the Archaic and Neo-American Periods. Many of the projectile points have been removed by collectors over the years and the present collections undoubtedly are biased to some degree.

Here as in the case of several other surface collected sites the transect method was utilized to insure that as representative a sample as possible would be collected in the limited time allowed for investigation. A glance at Tables 12.17-1, 2 shows that there is very little variation between the various sections of the site. Burned rock midden A contained as full a range of tools as the transect areas. Burned rock midden B and the general area around the burned rock middens (A + B on tool list) showed a slight drop in both quantity and type. It is of interest to note that midden A had a high percentage of biface fragments while midden B had many complete bifaces.

It is probable that the site is actually a series of encampments and that the range of tools and debitage reflect a diversity of activities related to subsistence, tool production and general maintainence. The main part of the site has been under cultivation for over forty years, an activity which undoubtedly spread and mixed any originally discrete artifact concentrations. The two small burned rock midden areas show some evidence of potting. The samples gathered during the present study are considered representative and no further work is recommended at this time.

Table 12.1[illegible] Debitage totals for selected areas at site 41WM360.

Debitage totals for site 41WM360 combined transects A, B, and C.

ITEM	TOTAL#	
Primary Flakes	[illegible]	[illegible]
Secondary Flakes	[illegible]	[illegible]
Tertiary Flakes	[illegible]	46
Secondary Blades	[illegible]	[illegible]
Tertiary Blades	[illegible]	[illegible]
Biface Thinning	[illegible]	[illegible]
Core Trimming	80	[illegible]
Core Fragments	70	[illegible]
Chunks	336	5.2
Burin Spalls		
Micro Flakes	171	2.6
Chips	1356	21
TOTAL		

Debitage totals for site 41WM360, burned rock midden A + B.

ITEM	TOTAL#	
Primary Flakes	63	3
Secondary Flakes	460	22
Tertiary Flakes	882	41
Secondary Blades	1	.05
Tertiary Blades	1	.05
Biface Thinning	[illegible]	[illegible]
Core Trimming	[illegible]	[illegible]
Core Fragments	[illegible]	[illegible]
Chunks	175	8.2
Burin Spalls		
Micro Flakes	66	3.1
Chips	433	20
TOTAL	2130	

Debitage totals for site 41WM360, area around burned rock midden.

ITEM	TOTAL#	%
Primary Flakes	4	2
Secondary Flakes	48	26
Tertiary Flakes	88	47
Secondary Blades		
Tertiary Blades		
Biface Thinning		
Core Trimming	14	7.5
Core Fragments	9	5
Chunks	12	6
Burin Spalls		
Micro Flakes	2	1
Chips	9	5
TOTAL	186	

12.18 Site 41WM368

Investigations

Site 41WM368 was located during January of 1978 although a totally accurate assessment at the time was difficult because the area was under an inch of snow. The site was considered worthy of testing since it was in the bottoms and was in close proximity to 41WM125, 126 and 158. It was hoped that testing would provide temporal data which when combined with the information gathered at 125 and 126 would allow the sequencing of this site cluster. It was also hoped that in-situ materials and features would be located since the site was subjected to periodic flooding.

When the site was returned to in the Fall of 1978 it was found that the terrace area had been burned-off and ground observation was much improved. It was further discovered that the site was considerably larger than previously thought. Surficial artifact distribution was noted in an area approximately 2800 meters E/W along the river and extending from it to the south some 660 meters (Fig. 12.18-1).Heavier artifact concentrations were noted on the eastern edge adjacent to site 41WM126 and since this was the area most effected by the construction of Taylor Park, investigations were focused there.

Work began with the staking out of several NE/SW transects running through the densest surface scatter (Fig. 12.18-2).These transects were spaced 10 meters apart and cultural materials from a 3 meter wide strip was collected along each one. No particular pattern of artifact distribution was noted (Table 12.18-1).

Following the transect collections a series of 17 shovel tests were placed throughout the eastern area of the site which appeared to be the least disturbed (Fig.12.18-2).A few tools were recovered from this operation and a 1 x 1 meter test unit was placed in the approximate geographic center of the artifact distribution.

Test unit T-1(Fig.12.18-2) was dug by arbitrary 10 cm levels to a depth of 80 cm. Table12.18-2lists the recovered tools and debitage. It is difficult if not impossible to interpret a site on the basis of such limited testing, especially when many of the records on the site and work are not available. It appears that the materials from levels 1-2 and possibly 3 are not in-situ since a fragment of salt glaze crockery was recovered in the latter. Since the site is adjacent to an upland slope, on the top of which sits site 41WM125, it is most likely that some of the materials recovered in these levels originated at 125, and has found its way down slope with the advent of modern agricultural practices.

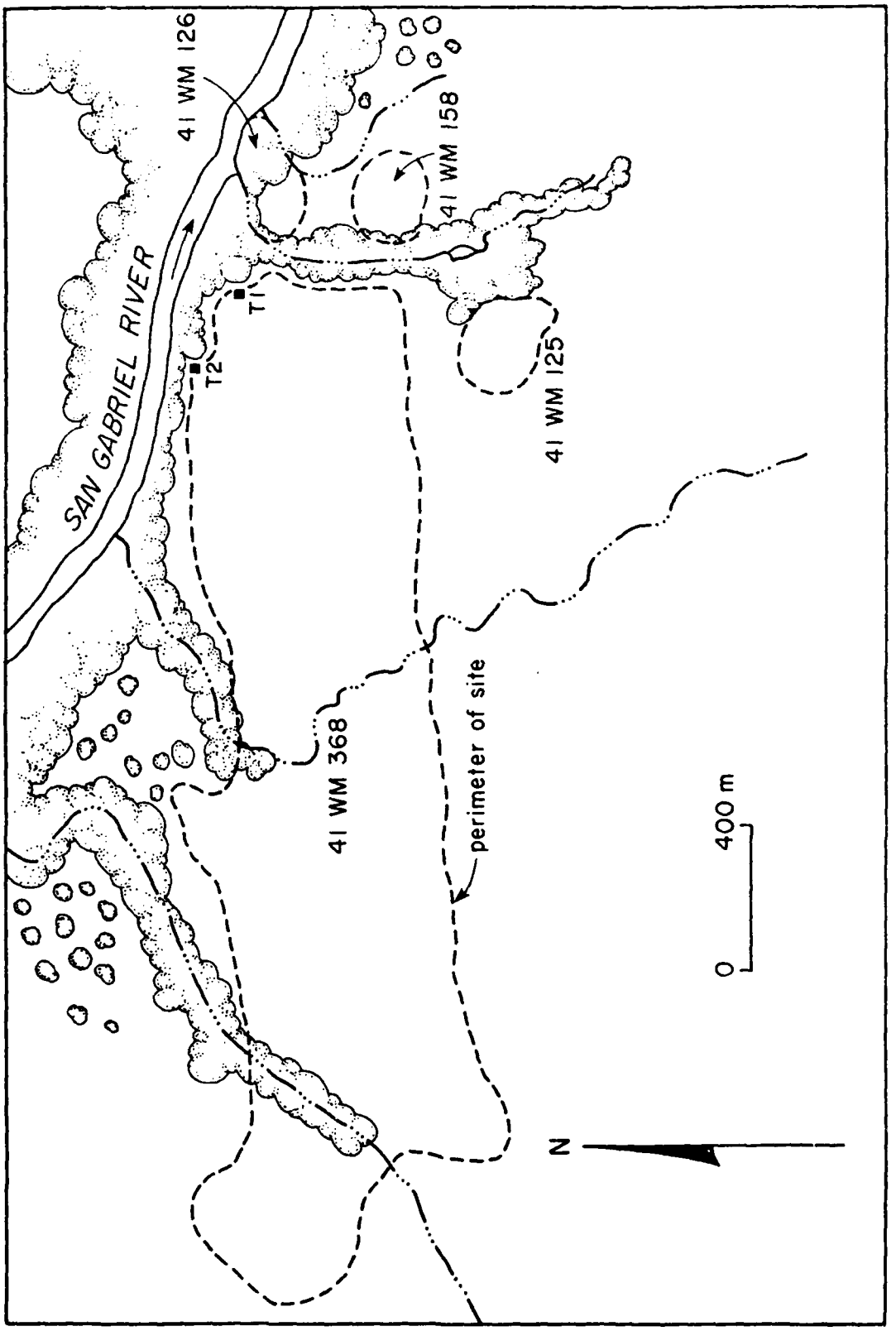


Figure 12.18-1

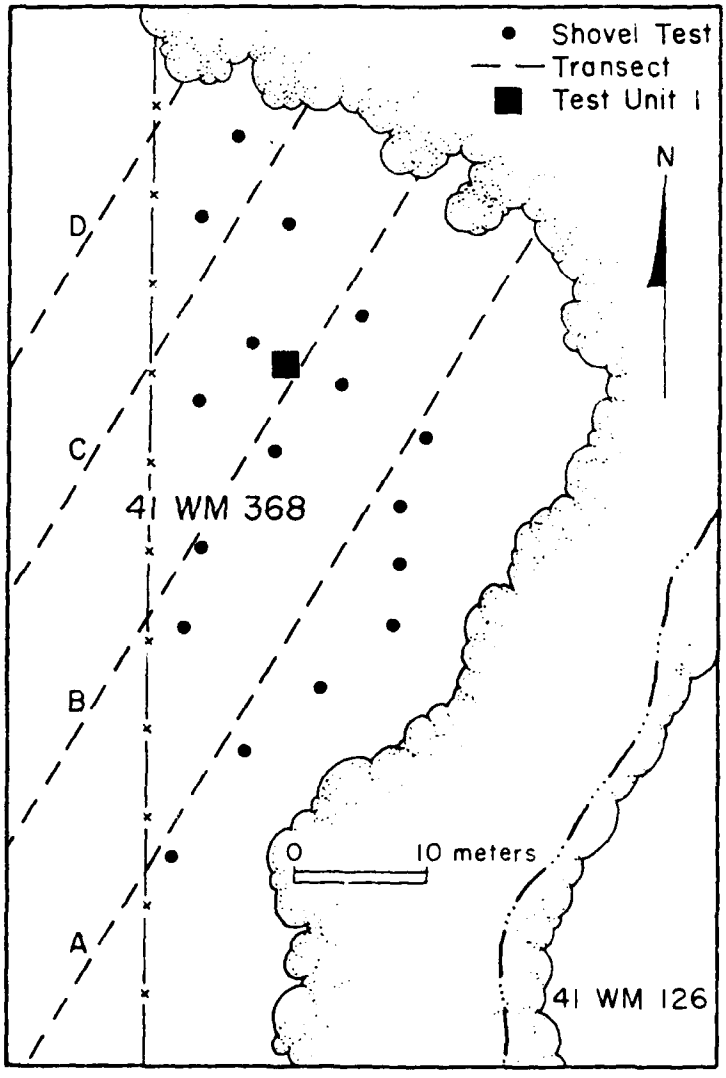


Figure 12.18-2

TABLE 12.18-1. Tools from 41 WM 368

TOOL LIST	TP#1	Surface	Transect A	Transect B	Transect C	Transect D	Total	%	B
Points	1						1	3	
Point Fragments							-		
Bifaces		1	1	2			3	9	
Biface Fragments	1	1	3	1			6	18	
Scrapers	1						1	3	
Burins	1		1				2	6	
Truncations			1				1	3	
Notches						1	1	3	
Gravers			1				1	3	
Axes			1				1	3	
Retouched Pieces	12	2	1	2			17	50	2
Total	16	4	9	4	-	1	34		
%	47	12	26	12		3		100	
Cores	2	2	6	8		6	24		1

TABLE 12.18-2 Artifact and debitage list for test unit #1 at 41 WM 368

ARTIFACT	1	2	3	4	5	6	7	8	Σ	%
Point							1		1	.1
Biface Fragment	1								1	.1
Scrapers	1								1	.1
Burins	1								1	.1
Retouched Pieces		1	1	1		5	2	2	12	1
Cores		1						1	2	.1
Primary Flakes	1		3		1	2	3	2	12	1
Secondary a Flakes	10	10	17	37	57	33	21	31	216	13
Tertiary Flakes		18	35	61	95		33	38	280	17
Micro Flakes	4	2	4	14	18	38	13	4	97	6
Micro Blade	1			1		1	1	1	5	.3
BFT Flakes			4	8	7	12	3	2	36	2.2
Chips	32	48	77	178	238	189	115	87	964	59
Σ / %	50/3	80/5	141/9	301/18	416/26	280/17	192/12	168/10	1628	

A rather dramatic increase in the artifact count occurs in level 4, rising again in level 5. In both levels 4 and 5 a concentration of small (3-5 cm dia.) unburned limestone cobbles were found in the southeast 25 cm square. They were in no particular pattern and are not thought to be a hearth.

A 3 cm wide filled fossil crack was found in level 6 running NE/SW across the western half of the unit. The majority of artifacts recovered in levels 608 seem to have come from throughout the unit, but they tended to be concentrated in or near the old crack line. All the materials recovered in the lower levels can not be accounted for as having sifted down from upper levels, but certainly the presence some of them can be attributed to redeposition.

It would appear that the major occupation in this section of the site is buried under approximately 50 cm of deposit. This corresponds well with the major occupation zone (C-1) and 41WM126 immediately to the east.

During the surface inspection of the site a concentration of limestone rock was found in the wall of an erosion gully to the northwest of Test Unit 1 (Fig. 12.18-2) Since the allocated time for work at the site was rapidly running out it was decided to remove the 1.41 m. of deposit over the rocks as a single unit rather than by arbitrary levels. The level containing the rocks was then uncovered and all the removed fill and directly below it carefully screened. Several of the rocks were burned but formed no pattern; and very few artifacts were recovered in association with them. It was concluded that the rocks may have once been part of a hearth but were no longer in context, in all probability having been redistributed by river flooding. No charcoal or other datable materials were recovered from either test unit and the site was backfilled.

Artifacts

Projectile points

1 unidentified point fragment from Test #1, Level 7.

Bifaces

Three complete bifaces were collected from this site, only one of which appears to be completely finished. This tool is small but elongated probably pointed, and slightly damaged at the tip.

The two other bifaces are not entirely finished; one has a convex base and a more or less pointed other end, bifacially retouched, a little more carefully at the pointed end. A little cortex is left on 1 face. The other one is a large suboval, roughly bifacially retouched tool. The retouch is completely covering both faces.

Biface fragments

Most of the biface fragments are medial fragments, a wide one and 3 medium wide fragments. There is one basal fragment with a more or less straight base. The edges are at obtuse angles to the base. The last is an edge fragment.

Scrapers

The only scraper was a whole single side scraper, made on a secondary b flake.

Burins

Both burins were made on secondary elements, a single oblique burin from a naturally steep, non-retouched edge was made on a flake; and a single dihedral burin was on a blade edge.

Truncations

A natural secondary b flake has a large notch or mega notch along one edge made by dorsal retouch.

'Boring' Tools

A normal oblique graver was made by dorsal retouch on a secondary b flake.

Axes

A slightly damaged axe was collected from the surface. The tool has a straight bit profile, primarily bifacially retouched, but secondary unifacially retouched. The rest of the tool is bifacially retouched. The butt is slightly damaged.

Retouched pieces

The retouched pieces from the largest tool category at this site. Most of them are unilaterally retouched flakes:

--dorsal retouch, 1 whole edge: 2 whole flakes and 1 fragment
--dorsal retouch, less than ½ edge: 1 whole secondary a flake
--dorsal retouch, proximal end: 2 whole flakes
--ventral retouch, 1 whole edge: 2 whole flakes and 2 fragments
--bifacial retouch, less than ½ edge: 1 whole secondary a flake
--Two whole secondary b flakes were retouched discontinuously along

1 edge and 1 end

A secondary b flake was retouched dorsally on both edges, one edge only partially. Another secondary b flake was retouched partially on both edges, in equivalent loci, also by dorsal retouch. A secondary a flake was retouched ventrally on both edges.

One secondary a flake was retouched discontinuously on 3 edges.

A large number of cores were also collected from this site. There are 10 single platform cores: 6 large, 2 small and 2 medium. Two of these cores are blade cores. There are also 8 multiple platform cores: 4 medium, 2 small and 2 large ones, 3 medium and 1 very large subdiscoidal and suboval cores, and one double platform core. The last one is a 90° core worked on different faces.

Groundstone

1 mano fragment of quartz, 7 x 6.5 x 3 cm, recovered from the surface.

Comments

It would appear that the main occupation of this site is linked with that at 41WM126 to the immediate east. Some contamination of the upper levels occurred as materials from 41WM125 were transported down slope from the southern upland edge. The rather large area covered by discontinuous lithic debris and artifacts running westward may be interpreted as having resulted from the procurement and initial processing of natural rock cobbles eroding out of the gravel formations forming the adjacent uplands.

That this site contains an occupation zone some 50 cm below the present surface is not in question. It is felt, however, that site 41WM126 represents a similar archaeological situation but with better contextual possibilities. Thus, no further work is recommended for site 41WM368 at this time.

12.19 Site 41WM402

Investigations

This site was located during the January 1978 survey of the proposed park areas surrounding North Fork Reservoir. In fact, the boundary of Cedar Breaks Park is far smaller than the site. Because of Corps of Engineers restrictions on surveying only within specific limits of the park areas, it is not possible to present an accurate estimate of the exact size of the site. This is of small import since the site appears to be the remnants of a series of lithic procurement activities which may have spanned prehistoric man's occupation of the San Gabriel River valley (Fig.12.19-1).

It was decided that the only meaningful fashion of sampling the site would be to isolate individual work (flint-knapping) areas and collect them as units. The park area is covered in a thick secondary growth of cedar which at times is almost impenetrable. This being the case, it was decided to run several transects along compass headings, collecting discontinuous "activity" areas as they were encountered. Unfortunately, this procedure proved unworkable because of the thickness of vegetation. The collecting party then simply followed a general magnetic azimuth from North to South through the center of the park area until the firebreak and fence property line was reached on the southern end of the park. The group then followed the same procedure beginning in the vicinity of 41WM403 and proceeding westward to the western extremity of the park area. During these operations artifacts and lithic debris were noted across the entire area, but only isolatable clusters of the same were collected. It was hypothesized that these represented discrete activity areas and as such might illustrate temporal and/or functional differences which could be related to either the temporal sequence in the area or to the manufacture of specific types of tools.

Unfortunately what were thought to be discrete activity areas appear amazingly homogenious in artifact type. Several small shovel tests were dug and it was discovered that the soil over most of the park area varied in depth from 3-20 cm with the undulating bedrock showing through at frequent intervals. What may have occurred is that the "isolated" artifact concentrations, in fact, correspond to the high points in the bedrock and do not represent actual activity areas.

During analysis of the collected materials it was decided to treat the site collection in a general fashion since no differences could be noted in the somewhat arbitrary field divisions.

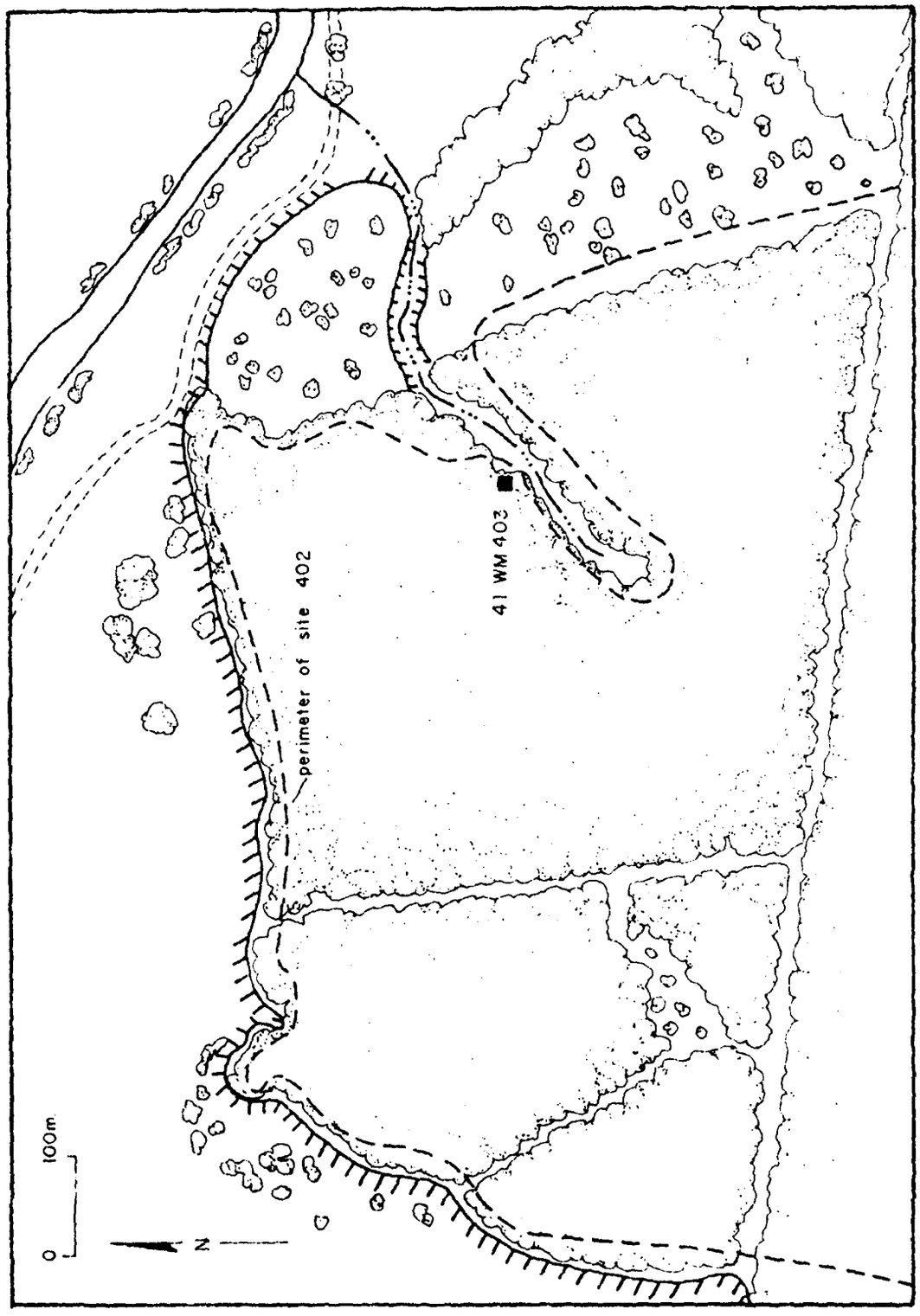


Figure 12.19-1

Artifacts

Projectile Points

The only projectile point recovered was a badly fragmented Ensor (Late Archaic Period, Twin Sisters Component). A large number of cores was also collected from this site, most of them single platform cores, ten large cores and 2 medium ones. A large number of these have no more than 1 or 2 flake scars. There are also 4 multiple platform cores, 1 medium and 3 large ones, 1 wedge core and 1 double platform core. The latter one is an opposed platform core, on 1 face.

Bifaces

Three complete bifaces, but no fragments were found at the site. One tool is a large, subtriangular biface, not very carefully bifacially retouched, neither end pointed. All retouch is centripetal and completely covering. The other finished tool is one of the sharply pointed tools, whereof the base is only roughly retouched, while the pointed working end, on the contrary, is finely secondary bifacially retouched, slightly accentuated by a narrowing of both edges.

One roughly bifacially retouched biface is probably an unfinished tool; both extremities are convex.

Scrapers

Both scrapers were made on natural secondary (sb) flakes, one of which is a denticulated tool. The other scraper is a small, somewhat doubtful specimen, with a slightly irregular convex scraper bit.

Truncations

One truncated tertiary flake was made in a coarse flint; the truncation occurred on the distal end by steep dorsal retouch.

Backed pieces

The edge of a secondary (sb) flake was backed by steep dorsal retouch, one end of the flake was also truncated. The tool has a deep patina.

Denticulates

One edge of a tertiary flake was denticulated by dorsal retouch.

Notches

Two tertiary flakes were notched by ventral retouch. One tool is a single notched piece, the other flake had additional continuous dorsal retouch.

'Boring' tools

The only 'boring' tool is a heavy borer, made on a secondary (sb) flake by irregular retouch. It is possible the retouch is accidental.

Retouched pieces

Six flakes were retouched unilateral:

--dorsal retouch, 1 whole edge: 1 whole tertiary flake
--dorsal retouch, less that ½ edge: 1 whole and 1 fragment
--dorsal retouch, distal end: 1 heavy fragment
--ventral retouch, 1 whole edge: 1 fragment
--ventral retouch, distal end: 1 whole flake

Three whole flakes were retouched bilateral, 1 dorsal and 1 ventral on an edge and an end, and one was retouched alternatingly on its edge.

Two tertiary flakes were retouched on more than 2 edges, one by mixed unifacial retouch, the other one by discontinuous retouch.

Comments

Although the sample from the site is relatively small, there is an interesting distribution of artifact types and debitage distribution (Tables 12.19-1, 2). The high percentage of cores (43.9%) is difficult to explain, as is the 1.28 tool/core ratio if one rules out the possibility of the area being utilized as a workshop area for the production of stone tools. That other activities took place there is indicated by the specialized tools such as backed pieces, notches, and scrapers. The relatively large number of retouched pieces may be misleading since some of these are probably the by-products of lithic reduction platform preparation. The high percentage of secondary flakes and chunks may reflect primary lithic reduction or blank manufacturing.

The upland areas adjacent to the San Gabriel River are capped with flint impregnated limestone, and although this site does not prove that these were favored locations for the acquisition of lithic material, it certainly does suggest that site 41WM402 provided raw materials for stone tool manufacture during the Late Archaic Period. Dense cedar growth and ground obscurity may, however, have biased the sample for making any more definitive statements.

Table 12.19-1. Tools, Site 41WM402

TOOL TYPES	SURFACE	%	BURNED
Points	1	4.35	
Point Fragments	-	-	
Bifaces	3	13.04	
Biface Fragments	-	-	
Scrapers	2	8.70	
Truncations	1	4.35	
Backed Pieces	1	4.35	
Denticulates	1	4.35	
Notches	2	8.70	
Borers	1	4.35	1
Retouched Pieces	11	47.83	
TOTAL	23	100.02	1
Cores	18		1
Tool/Core Ratio	1.28		

Table 12.19-2. Debitage totals for site 41WM402

ITEM	TOTAL	%
Primary Flakes	68	6
Secondary Flakes	251	24
Tertiary Flakes	116	11
Secondary Blades	1	.09
Tertiary Blades	1	.09
Biface Thinning		
Core Trimming	25	2.4
Core Fragments		
Chunks	518	49
Burin Spalls		
Micro Flakes	3	.3
Chips	76	7.2
TOTAL	1059	

12.20 Site 41WM404

(Brown Tick Rockshelter)

Investigations

The Brown Tick Rockshelter is located on the upland edge at the northern side of Northfork reservoir. It is at approximately 795' above mean sea level and 60' above river level. When located, it was obscured by brush accounting for its not being found on two previous surveys (Fig. 12.20-1).The shelter measures roughly 12 meters East/West by 6 meters North/South with the overhang providing only minimal protection from the elements. The extent of cultural deposit within the shelter measures 6 meters East/West by 5 meters North/South with a minimum depth of 20 cm and a maximum depth of 1 meter.

The archaeological team investigating site 41WM304 was first informed of the rockshelter by one of the COE supervisors who had been collecting artifacts at sites around the reservoir. The only other rockshelters known from the area was one covered by the dam and site 41WM332. The latter was tested by Texas A&M archaeologists and found to be 10-20 cm deep (Patterson and Moore 1976: 23,41). Unfortunately, no further information on the site has been published and a field inspection of the locale indicates that its utilization was ephemeral at best, especially considering that a small burned rock midden, site 41WM330, is located only several meters away. In other words, the Brown Tick Rockshelter is unique and an understanding of its utilization and function was necessary for an understanding of the settlement/subsistence patterns within the North Fork reservoir area.

Methodology

The site was first cleared of small brush and large rocks. Crew members attained a new appreciation of the principles of lever technology through its practical application in moving several sections of roof-fall weighing in excess of 1,000 lbs. Once these were removed, the area of the site was increased by approximately 25%.

A 1 x 1 m. grid system was placed over the floor of the shelter and two datums were established: one on a buckthorn root (see Fig. 12.20-2). and the second on the northwestern end of the shelter's back wall. Since the distances within the shelter were too short for the use of a transit of farmers level, string lines pulled from the datum points and line levels were used to keep vertical control. A North/South series of 1 x 1 m units was placed in the widest section of the shelter and these were taken down in 10 cm arbitrary levels after it had been determined that

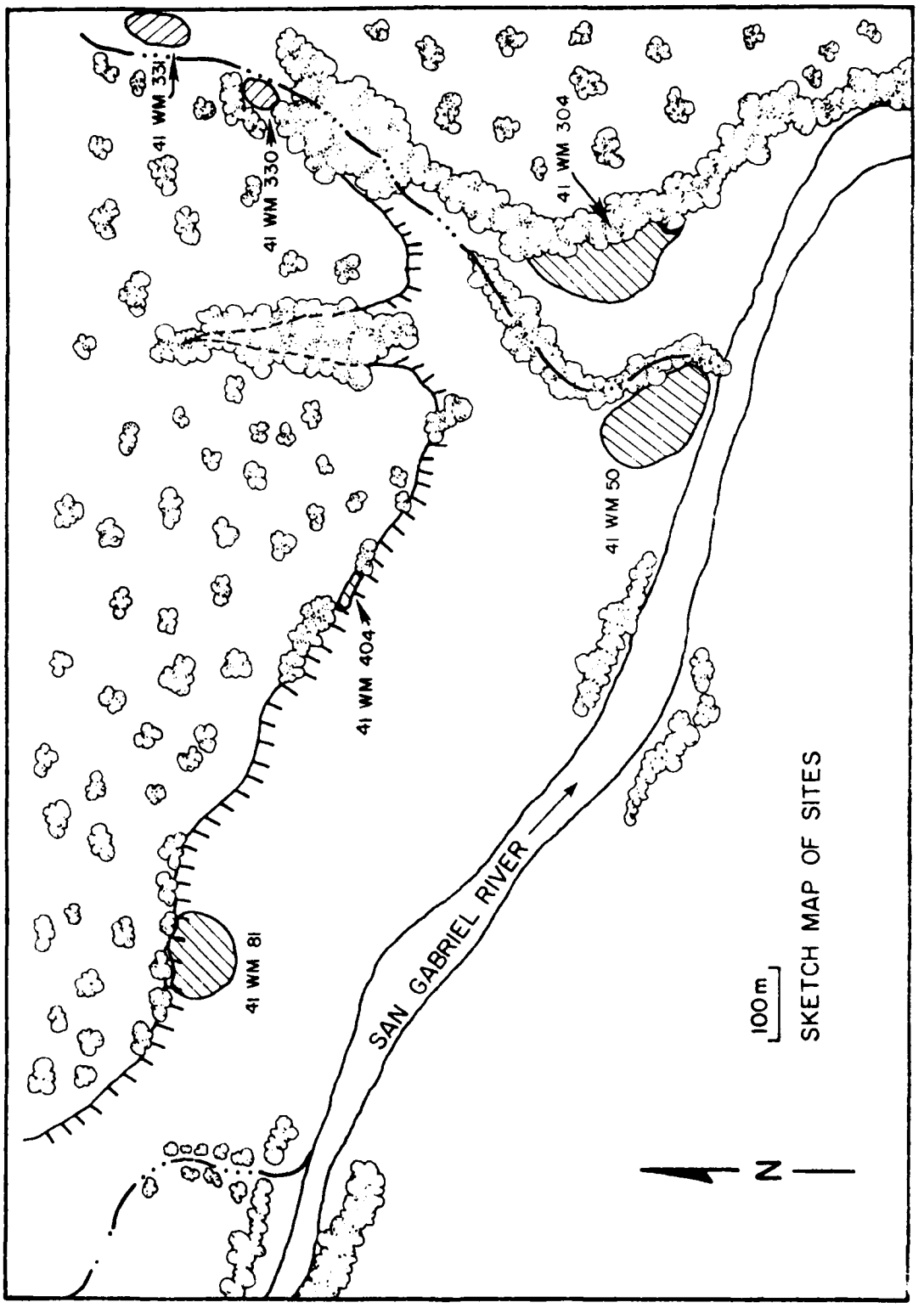


Figure 12.20-1

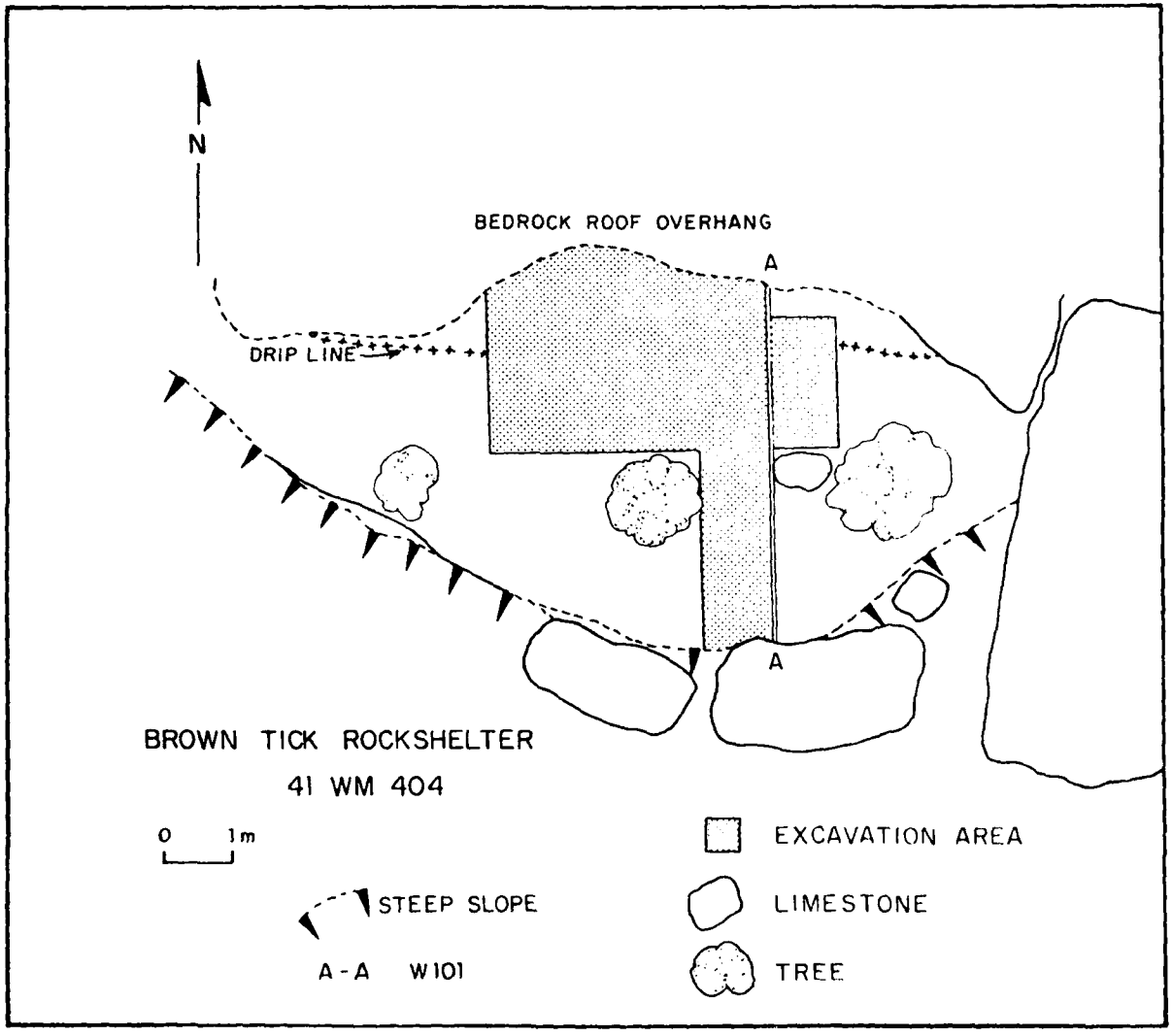


Figure 12.20-2

no cultural or natural stratigraphy could be discerned. Three natural divisions were noted and are discussed later in a section or stratigraphy. All unit fill was passed through ¼ inch hardware cloth except for soil, pollen, phytolith, flotation, and fine separation samples from each level within a given unit. This sample was returned to the storage facility at North Texas State University for processing at the convenience of the government. It is estimated that approximately 75% of the site was covered by the excavations.

Artifacts and rock debris was left in place for each level until they could be plotted and photographed. They were then removed, the bottom of the level cleaned and troweled and the next level begun. Any seeming concentration of artifacts and/or limestone cobbles was left in place until adjacent units could be opened to the same level to determine feature patterns. Unfortunately, there were no patterns, such as a hearth, which could be discerned. The explanation for this is that the site appears to have been mixed and churned to the degree necessary for the destruction of such patterning. The majority of the disruption probably followed each successive occupation of the site through the activities of scavengers. The location of the shelter places it well above the flood level of the river during man's occupation of the valley and only a thin mantle of soil exists above the site on the flat upland. In other words, soil build-up within the shelter may be attributed primarily to debris brought in by man, and secondarily to aeolian deposition, cave detritus, and colluvial soils from the upland edge over the shelter.

Stratigraphy

Three general divisions (Fig. 12.20-3) were noted. These are based on color, consistency, texture and inclusions. A description of each zone follows:

Zone 1 Dry, powdery, unconsolidated loamy silt with many roots and rootlets. Limestone spalls in this zone are small and few in number. This zone varies in thickness across the shelter from 2 cm to approximately 30 cm. It roughly corresponds to the Neo-American occupation of the site. Color--10YR3/1 dark grayish brown.

Zone 2 Medium compact silty clay loam (?) with numerous (50%+) limestone spalls and cobbles and many snail shells. Several large roots were noted running along the transition between this and Zone 1. This zone contains primarily Archaic Period materials and varies in thickness from 10 cm to 80 cm. Color--10YR4/2 grayish brown.

Zone 3 Soft decomposed limestone and cave flour (culturally sterile). Color--10YR7/4 pale tan/brown.

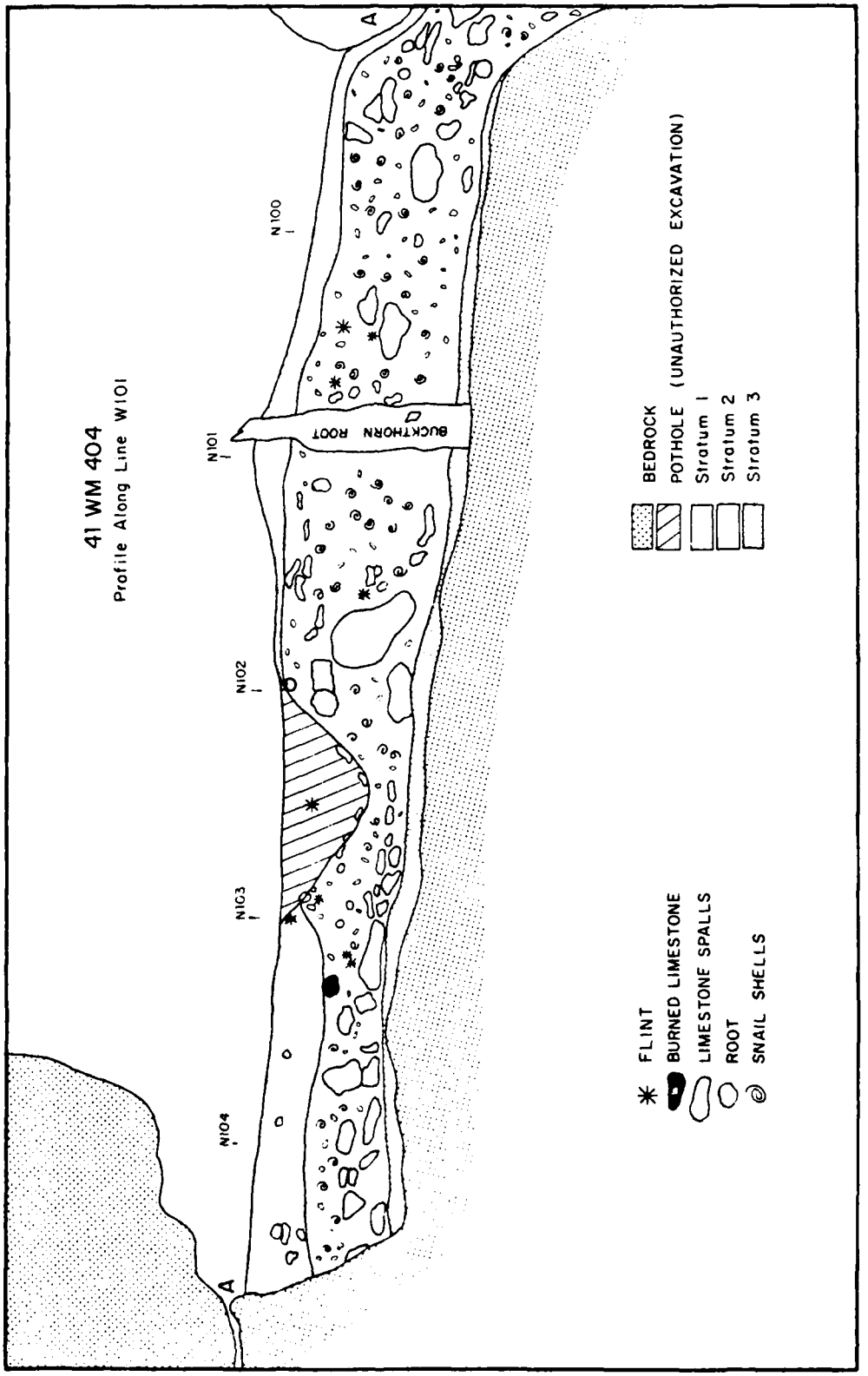


Figure 12.20-3

As already alluded to, there exists a division between the Neo-American, generally corresponding to levels 1-3 and Zone 1, and the Archaic from level 3 downward and Zone 2. Within these zones, however, there may be seen only a general pattern of cultural stratigraphy with moderate mixing of time-diagnostic artifacts. Because of this mixing it was thought best to view the site from a comparison of the Neo-American with the Archaic and then attempt to place the site itself in an areal settlement context (Table 12.20-1).

Artifacts

Projectile Points

A total of 55 identifiable projectile points were recovered during excavations. Of this number, 64% were from the Neo-American Period and 36% from the Archaic. Following is a listing of the point types within the various periods by component. It should be noted here that a Tortugas point was found in level 1 and is not counted here since the remainder of that unit is intact; and the presence of an Early Archaic point type mixed with the Neo-American materials is interpreted as an example of curation on the part of the later inhabitants of the shelter.

Neo-American			
	Toyah	Perdiz (n=8) w/in period = 23%	
	Austin	Scallorn (n=22) w/inperiod = 63% Scallorn Eddy (n=3) w/in period = 8% Edwards (n=2) w/in period = 6%	= 77%
Archaic			
	Twin Sisters	Ensor (n=3) w/in period - 5%	
	San Marcos	Montell (n=1) w/in period = 5% Marcos (n=1) w/in period = 5% Castroville (n=1) w/in period = 5% Marshall (n=1) w/in period = 5%	= 20%
	Round Rock	Marshall (n=1) w/in period = 5% Pedernales (n=7) w/in period = 35%	= 40%
	Clear Fork	Bulverde (n=3) w/in period = 14% Nolan (n=1) w/in period = 5%	= 19%
	San Geronimo	Martindale (n=1) w/in period - 5%	

It appears that the site was utilized fairly consistently throughout the prehistoric occupation of the river valley with the exception of the earliest times (Circleville component and Paleo-Indian Period). The heaviest occupation occured during the Austin component of the Neo-American Period, 650-1250 B.P.

Table 12.20-1
Tools, Site 41WM404.

TOOL TYPES	SURFACE	NEO-AMERICAN COMPONENT	(%)	MIDDLE & LATE ARCHAIC COMPONENT	(%)	TOTAL	%	BURNED
Points	4	50	(9)	19	(4)	73	7.20	-
Point Fragments	0	16	(3)	13	(3)	29	2.86	6
Bifaces	-	5	(1)	6	(1)	11	1.08	1
Biface Fragments	1	115	(21)	97	(21)	213	21.01	99
Scrapers	2	17	(3)	16	(3)	35	3.45	9
Burins	2	14	(3)	21	(5)	37	3.65	10
Truncations	-	5	(1)	3	(1)	8	.79	2
Backed Pieces	-	5	(1)	5	(1)	10	.99	2
Denticulates	-	23	(4)	14	(3)	37	3.65	11
Notches	-	44	(8)	41	(9)	85	8.38	27
Gravers	-	17	(3)	2	(.4)	19	1.87	7
Borers	-	2	(.4)	-	(0)	2	.20	1
Perforators	-	2	(.4)	1	(.2)	3	.30	-
Composite Tools	1	1	(.2)	1	(.2)	3	.30	-
Scaled Pieces	-	1	(.2)	-	(0)	1	.10	-
Retouched Pieces	1	225	(42)	222	(48)	448	44.18	151
TOTAL	11	542	100	461	99.80	1014	100.01	326
%	1.08	53.45		45.46				32.15
Cores	2	13		5		20		4
Tool/Core Ratio	5.50	41.69		92.20		50.70		

Bifaces

Six bifaces were recovered form the Neo-American levels, 7 from the middle and late Archaic component.

Three small, roughly triangular or subtriangular bifaces were all from the Neo-American component. One is a small triangular biface with a slightly concave base and a thin cross-section, and 2 others are small subtriangular bifaces with a strong convex base, and thin in cross-section also.

There are 2 medium to large triangular or subtriangular bifaces. One is large and carefully secondary bifacially retouched with a strongly convex base from the Neo-American, and a rather irregular subtriangular one from the Archaic component of the site.

Also from the Archaic component of the site comes a faintly stemmed biface, the stem of which is only a slight narrowing of the basal part of the biface towards a straight base.

One small elongated bifacial tool was recovered from the Neo-American levels of the site, and an almost round and thin biface comes from the Archaic levels. Three other bifaces are probably unfinished tools; all three were discovered in Archaic context, and range from an almost finished to a very crude and irregular tool.

Biface Fragments

a. Surface collection

One basal fragment was collected, with a more or less straight base, the edges at obtuse angles to the base.

b. Neo-American component

A total of 115 fragments were collected from these levels. Of these, 23 are basal fragments:

--1 fragment with a more or less straight base, the edges at right angles to the base.
--2 fragments with the edges at sharp angles to the base.
--5 fragments with the edges at obtuse angles to the base.
--7 fragments with a very convex basal outline.
--1 fragment is shouldered.
--7 fragments are roughly retouched at the base, and may be fragments of unfinished tools.

Forty-three are top fragments:

--sharp angled fragments: 28 large and 10 small fragments.
--obtuse angled fragments: 2 large fragments

--fragments with a 90° angle: 1 large and 1 small fragment.

There are 16 fragments, 8 of which are narrow, and 8 of which are medium wide. There are also 32 edge fragments and 1 unidentifiable fragment.

c. Archaic component

Ninety-seven biface fragments were recovered from the Archaic component of the site, of which 20 are basal fragments:

--1 fragment with a more or less straight base, the edges at right angles to the base.
--2 fragments with the edges at sharp angles to the base.
--4 fragments with the edges at obtuse angles to the base.
--2 fragments have the edges at mixed obtuse/sharp angles to the base.
--4 fragments have a strongly convex base.
--1 fragment has a slightly concave base.
--6 fragments have a very crude and irregularly retouched base, and could be parts of unfinished tools.

There are also 20 top fragments:

--sharp angled fragments: 12 large and 4 small fragments
--obtuse angled fragments: 1 large fragment.
--fragments with a 90° angle: 2 large and 2 small fragments.

There are also 15 medial fragments, 2 narrow and 13 medium wide ones.

There are 40 edge fragments, and 2 other pieces are further unidentifiable.

Scrapers

a. Surface collection

Two scrapers were collected from the surface, both single sidescrapers. One is a single sidescraper on a now-retouched flake, the other one is an inverse sidescraper on a flake.

b. Neo-American levels

Seventeen scrapers were recovered from the Neo-American component of the site, six of which are single endscrapers. Two are single endscrapers on a blade, one is an endscraper with notches and 2 are inverse endscrapers on flakes.

Four single sidescrapers were made on retouched flakes, and 1 is an inverse endscraper on flake. One scraper is an atypical, doubtful

specimen. There are 2 unidentifiable fragments and 3 scraper-bit renewal spalls.

c. Archaic levels

A total of 16 scrapers was collected from the Archaic levels of the site, only 1 of which was a single endscraper on a retouched secondary (Sb) flake. Three tools are single sidescrapers, 2 on non-retouched and 1 on a retouched flake. One of the former was made on a blade.

There are also 2 double sidescrapers, and 3 'giant' scrapers, a corescraper fragment, and a microscraper made on a small secondary (Sb) flake.

Three fragments are unidentifiable, and there are 3 scraperbit renewal spalls.

Burins

a. Surface collection

Two burins were found at the surface, 1 is a single angle burin on snap, made on a biface fragment, and 1 is a single transversal burin, made on the unprepared natural edge of a secondary (Sb) flake.

b. Neo-American levels

A total of 14 burins were found, the majority of them (8) single angle burins on snap, 4 of which were made on biface fragments. One double angle burin on 1 extremity and on opposed edges was made on a tertiary flake. Two dihedral burins were made on the edge of tertiary flakes, and 2 oblique burins were also made on tertiary flakes; one is a single oblique burin made from a steeply backed edge. The one single transversal burin was made from the natural unprepared edge of a secondary (Sb) flake.

c. Archaic levels

From the Archaic component of the site 21 burins were collected, 10 of which are single angle burins on snap; only 1 was made on a biface fragment, all the others were made on flakes. One double angle burin on snap was made on 1 extremity on opposed edges of a secondary (Sb) flake. There are 6 dihedral burins, 4 of which are single dihedral burins on angle, all made on secondary flakes, 1 single dihedral burin on the edge of a tertiary flake, and 1 'reversed' dihedral burin on a secondary (Sb) flake.

One oblique burin was made from the non-retouched but naturally steep edge of a tertiary flake.

The last 2 burins are both single transversal burins, made from non-retouched flake edge.

Truncations

a. Neo-American levels

Five truncated pieces were collected, 4 of which are distal truncations by dorsal retouch. All 4 were made on tertiary flakes, 1 is fragmentary. The fifth tool is a proximal dorsal truncation on a secondary (Sb) flake. All truncations are straight.

b. Archaic levels

All 3 truncated pieces are distal truncations made by steep dorsal retouch, 2 on secondary (Sb) flakes, 1 on a tertiary flake.

Backed pieces

a. Neo-American component

There are 5 backed pieces, 4 of which have 1 edge backed completely by steep dorsal retouch. The edges are straight or slightly convex. The fifth tool is a double backed secondary (Sa) flake, the edges also more or less straight.

b. Archaic component

There are also 5 backed pieces in this component, 2 of which were backed along 1 whole edge; one is a secondary (Sa) flake fragment with the preserved edge part backed straight, the other one with the preserved edge part backed concave, both by steep dorsal retouch. Two pieces have only partially backed edges, and both are complete tools. Both were made by dorsal retouch, one on secondary (Sb) flake, 1 on a secondary (Sb) blade. One fifth tool is an unidentifiable fragment.

Denticulates

a. Neo-American component

Twenty-three denticulated pieces were recovered from this component. Three are small serrated flake fragments, 2 on tertiary, 1 on a secondary (Sb) flake.

The majority of these tools are simple denticulated flakes, without any additional retouch; there are 8 whole and 7 fragmentary tools. Three of the denticulates made on flakes have additional continuous retouch elsewhere on the flake.

One piece was a small unidentifiable fragment.

b. Archaic component

Fourteen denticulated pieces were collected, the majority of them also simple denticulates on further unretouched flakes. Six are whole pieces and 4 are fragments.

There is also 1 small serrated flake fragment, 1 denticulated tertiary flake with additional continuous retouch, and 2 unidentifiable fragments.

Notches

a. Neo-American component

There are 44 notched pieces in the Neo-American component of the site, the majority of which are single notched flakes, without any additional retouch. There are 7 whole flakes, 6 made by unifacial retouch, one by bifacial retouch, and 15 flake fragments. There are 8 notched flakes that have additional continuous retouch, only 1 complete flake , and 7 fragments. There is 1 single notched bladelet.

Three flakes, 2 fragments, and 1 whole have multiple non-adjacent notches, 8 flakes with multiple occasionally adjacent notches, all fragments; 7 of the latter have additional retouch. One whole tertiary flake has 2 alternating adjacent notches.

The last piece is a fragment of a strangulated tertiary flake.

b. Archaic levels

A total of 41 notched pieces was collected from the Archaic component of the site, 28 of which are single notched flakes, mostly (22) fragments. One fragment has a bifacially retouched notch.

One secondary (Sb) flake fragment has a single notch with continuous additional retouch.

One blade, 1 bladelet and 1 bladelet fragment were also single notched.

Four flakes, 2 fragmentary, have multiple non-adjacent notches, and 5 flakes have multiple occasionally adjacent notches, 4 of which with additional continuous retouch.

Borer tools

Gravers.

a. Neo-American component

A total of 17 gravers was collected from the Neo-American component of the site. Six are gravers on flake axis, 5 sharply pointed normal gravers, 4 made by dorsal retouch, 1 by ventral retouch. One of the former has a long graver point. Only 1 dorsally retouched graver is still a complete tool. One 'beaked' graver was made on the axis of a tertiary flake.

Six gravers were made on flake edges, 2 are normal gravers made by dorsal retouch, 4 are fragmentary 'beaked' gravers, one of which is made by ventral retouch on previously steeply dorsally retouched edge.

Four gravers are oblique, 2 are normal, 2 are heavy gravers, triangular in cross-section at the point.

The last piece is an unidentifiable fragment.

b. Archaic component

In contrast to the large amount of gravers in the higher levels, only 2 were found in this component. They are both gravers on flake axis, 1 made by dorsal and 1 made by ventral retouch.

Borers.

Borers were collected from the Neo-American component only. One is a sharply pointed borer fragment of the axis of a tertiary flake, the other one is a oblique borer tool, triangular in cross-section at the bit.

Perforators.

a. Neo-American component

Two perforators were found, one is made on the axis of a tertiary flake, the other one is a fragment of a borer made on a flake edge.

b. Archaic component

One perforator was made on the tip of complete projectile point.

Composite tools

Two scraper-burin composite tools were found, 1 on the surface and 1 in the Neo-American component. One denticulated-backed piece combination was collected from the Archaic component.

Scaled pieces

One scaled piece was found in Neo-American content, and was made on a secondary (Sb) flake.

Retouched pieces

a. Surface collection

Only 1 retouched piece was collected from the surface, retouched multi-laterally by discontinuous retouch.

b. Neo-American levels

A total of 225 retouched pieces were collected from the Neo-American component. Of these, 146 were unilaterally retouched:

--dorsal retouch, 1 whole edge: 7 whole and 41 fragments of flakes, 2 microblades.
--dorsal retouch, less than ½ edge: 9 whole and 10 flake fragments.
--dorsal retouch, proximal end: 2 tertiary flake fragments.
--dorsal retouch, distal end: 4 whole and 9 flake fragments.
--ventral retouch, 1 whole edge: 8 whole and 18 flake fragments.
--ventral retouch, less than ½ edge: 2 whole and 6 flake fragments.
--ventral retouch, distal end: 1 tertiary microflake and 5 fragments.
--bifacial retouch, 1 whole edge: 10 flake fragments.
--bifacial retouch, proximal end: 1 tertiary flake fragment.
--alternating retouch, 1 edge: 1 secondary (Sb) blade and 3 flake fragments.
--mixed unifacial retouch, 1 edge: 3 fragments.
--discontinuing retouch: 3 whole and 3 flake fragments.

There are 61 bilaterally retouched pieces:

--dorsal retouch, 2 whole edges: 1 whole and 6 flake fragments.
--dorsal retouch, 1 whole and 1 partially: 1 whole and 1 flake fragment.
--dorsal retouch, both edges partially in unequivalent loci: 2 tertiary flake fragments.
--dorsal retouch, 1 edge and 1 end both partially: 1 whole secondary (Sb) flake.
--dorsal retouch, 1 edge and 1 end, both completely: 1 whole and 2 flake fragments.
--ventral retouch, 2 whole edges: 2 whole and 4 flake fragments.
--ventral retouch, both edges partially in unequivalent loci: 1 tertiary flake fragment.

--ventral retouch, 1 edge and 1 end, both partially: 1 microflake and 2 flake fragments.
--bifacial retouch, 1 edge and 1 end: 1 tertiary fragment.

--alternating retouch, 1 edge retouched alternatingly: 1 tertiary bladelet and 2 flake fragments.
--alternate retouch, 2 whole edges: 4 flake fragments.
--alternate retouch, 1 whole edge and 1 edge partially: 2 secondary (Sb) flake fragments.
--alternate retouch, both edges partially: 1 whole and 5 flake fragments.
--alternate retouch, 1 edge and 1 end: 2 whole and 1 flake fragment.
--mixed unifacial retouch, 2 whole edges: 3 secondary (Sb) fragments.
--mixed unifacial retouch, 1 edge and 1 end: 1 tertiary flake fragment.
--discontinuous retouch: 7 whole and 6 flake fragments.

There are 9 multilaterally retouched pieces:

--dorsal retouch: 2 whole and 2 flake fragments.
--bifacial retouch: 1 secondary (Sb) flake fragment.
--mixed bifacial and unifacial retouch: 1 secondary (Sb) flake.
--mixed unifacial retouch: 1 tertiary flake.
--discontinuous retouch: 2 whole and 2 flake fragments.

Finally, there are also:

--4 pointed flakes, 2 of which are fragmentary.
--1 piece with a triangular cross-section, with possibly use retouch along 1 edge.
--4 miscellaneous retouched pieces.

Five pieces were unidentifiable.

c. Archaic levels

A total of 222 retouched pieces was collected from the Archaic component of the site. One hundred and forty-four are unilaterally retouched pieces:

--dorsal retouch, 1 whole edge: 4 whole and 40 flake fragments.
--dorsal retouch, less than ½ edge: 8 whole and 13 flake fragments.
--dorsal retouch, distal end: 3 whole flakes and 1 secondary b bladelet, and 10 flake fragments.
--ventral retouch, proximal end: 1 tertiary flake.
--ventral retouch, distal end: 5 flake fragments.
--bifacial retouch, 1 whole edge: 2 flake fragments.
--bifacial retouch, distal end: 1 whole and 1 flake fragment.
--alternating retouch, 1 edge: 1 whole and 3 flake fragments.
--alternating retouch, 1 end: 2 whole flakes.
--mixed unifacial and bifacial retouch: 2 secondary (Sb) flake fragments.
--discontinuous retouch: 3 whole flakes and 2 blades, and 6 flake fragments.

Sixty pieces were retouched bilaterally:

--dorsal retouch, 2 whole edges: 5 flake fragments.
--dorsal retouch, both edges partially in equivalent loci: 2 tertiary flakes.
--dorsal retouch, both edges partially in unequivalent loci: 2 whole and 2 flake fragments.
--dorsal retouch, 1 edge and 1 end both partially: 3 whole flakes.
--dorsal retouch, 1 edge and 1 end: 3 flake fragments.
--ventral retouch, 2 whole edges: 2 tertiary flake fragments.
--ventral retouch, 1 edge and 1 end both partially: 1 tertiary flake fragment.
--alternating retouch, 1 edge retouch alternatingly: 1 tertiary blade fragment and 2 secondary (Sb) flake fragments.
--alternate retouch, both edges: 5 flake fragments.
--alternate retouch, 1 whole and 1 partial edge: 1 secondary (Sb) blade.
--alternate retouch, 2 edge partially in equivalent loci: 1 whole and 4 flake fragments.
--alternate retouch, 2 edges partially in unequivalent loci: 2 flake fragments.
--double alternate retouch: 1 tertiary flake fragment.
--alternate retouch, 1 edge and 1 end: 2 whole and 7 flake fragments.
--mixed bifacial and unifacial retouch: 2 whole flakes and 5 flake fragments.
--discontinuous retouch: 1 secondary (Sa) blade, 1 secondary (Sa) flake and 5 tertiary flake fragments.

There are 12 multilaterally retouched pieces:

--dorsal retouch: 3 flakes.
--mixed unifacial and bifacial retouch: 1 whole and 1 flake fragment.
--mixed unifacial retouch: 1 tertiary flake
--discontinuous retouch: 5 whole tertiary flakes and 1 secondary (Sb) flake fragment.

Finally, there are:

--3 whole pointed flakes
--1 tertiary flake fragment, triangular in cross-section, retouched from the prominent dorsal rib.
--1 miscellaneous piece.

One piece could not be identified.

Cores

Relatively few cores were found at the site, i. e. 20, 2 from the surface 13 from Neo-american context and 5 from Archaic context.

Table 12.20-2. Debitage totals for site 41WM404

ITEM	Archaic TOTAL#	%	Neo-American TOTAL#	%
Primary Flakes	109	.95	191	1.6
Secondary Flakes	1492	13	1480	13
Tertiary Flakes	4735	41	4173	36
Secondary Blades	5	.04	13	.11
Tertiary Blades	17	.15	20	.17
Biface Thinning	159	1.4	313	2.7
Core Trimming	12	.10	3	.03
Core Fragments	7	.06	3	.03
Chunks	480	4.18	443	4
Burin Spalls	10	.09	11	.10
Micro Flakes	1355	12	1359	12
Chips	3116	27	3473	30
TOTAL	11497		11482	

Both cores collected from the surface were double platform cores, medium large.

The cores recovered from the Neo-American levels are small and medium sized multiple platform cores. There are 3 single platform cores, 1 small and 2 large ones, and 1 of the latter has only 1 flakescar. The other cores are double platform cores, 1 large opposed platform core on different faces, two 90° cores, 1 on the same face, 1 on different faces, and 1 medium diagonal core, on different faces.

From the Archaic levels of the site came 1 small multiple platform core, 1 large single platform core and 3 double platform cores, 2 of which are 90° cores on 1 face, and 1 is a blade core with opposed platforms on different faces.

Ground Stone

1 Metate fragment of limestone measuring 14 x 13.5 x 7 cm (level 8, Archaic)
2 Anvils (?) of limestone from the surface of the shelter

Fauna

The faunal remains recovered from the site show the same dichotmy that may be seen in the tools (Table 12.20-3). Since there is some mixing at the site, it was decided to split the faunal remains along the same lines as the artifacts. In looking at the figures it is interesting to note that of the total identifiable bone recovered, 78% came from Zones 1 - 3, representing the Neo-American occupation at the site; while only 22% are associated with the Archaic levels.

Figure 12.20-4 is a cumulative frequency distribution of the non-intrusive species. A more detailed representation and discussion may be found under the faunal analysis section of this report. If one removes the rabbit from the Neo-American sample then it would appear that only slight differences exist in the faunal assemblages. In other words, the same animals were available and exploited through time with the exception of rabbit which enjoyed increased attention during the Neo-American Period.

The increased number of rabbit and the presence of bison (single animal) bone in the Neo-American and the lack of beaver in the Archaic are really the only differences, and may simply reflect cultural preference rather than resource availability. The bison is probably associated with the Toyah component, but this is uncertain since the Toyah and Austin components can not be separated.

The human bones (Table 12.20-3) are probably all neo-natal and surely represent the expedient disposal of at least two very young infants (still-born?).

Table 12.20-3. Number of Faunal Elements by Component for Brown Tick Shelter, 41WM404.

SPECIES	NEO-AMERICAN n	(T)*	(B)+	%	ARCHAIC n	(T)*	(B)+	%
Opossum	3	-	-	1	-	-	-	-
Armadillo	86	-	-	17	1	-	-	2
Rabbit	85	(1)	(3)	16	2	-	(2)	3
Jackrabbit	1	-	-	1	2	-	-	3
Fox Squirrel	7	(1)	-	2	1	-	(1)	2
Prairie Dog	2	-	-	1	-	-	-	-
Cotton Rat	3	-	(1)	1	-	-	-	-
Woodrat	21	-	(1)	4	-	-	-	-
Beaver	7	(5)	(2)	2	-	-	-	-
Raccoon	7	(4)	-	2	3	(1)	(1)	4
Skunk	2	-	-	1	-	-	-	-
Gray Fox	1	-	-	1	-	-	-	-
Dog/Coyote	7	(3)	(2)	2	3	(2)	-	4
Deer	169	(44)	(41)	32	37	(1)	(11)	44
Goat	13	(3)	-	3	4	(1)	-	5
Artiodactyla	4	-	-	1	2	-	-	3
Cow/Bison	9	(2)	(3)	2	-	-	-	-
Elements: rodent	1	-	-	1	-	-	-	-
-Small	3	-	(1)	1	1	-	-	2
-Medium	15	(2)	(4)	3	10	(7)	(2)	12
-Large	5	-	(1)	1	8	(4)	-	10
Bird sp. medium	2	-	-	1	-	-	-	-
Bird sp. large	4	-	-	1	-	-	-	-
Turkey	11	-	1	2	1	-	-	2
Vulture	3	-	-	1	-	-	-	-
Prairie Chicken	1	-	-	1	-	-	-	-
Bobwhite	2	-	-	1	-	-	-	-
Owl sp.	1	-	-	1	-	-	-	-
cf. Spoonbill	2	-	-	1	-	-	-	-
cf. Hawk	1	-	-	1	-	-	-	-
Snake sp.	3	-	-	1	-	-	-	-
Viper	23	-	-	5	1	-	-	2
Coluber	2	-	-	1	-	-	-	-
Turtle sp.	12	-	(4)	3	9	-	(9)	11
Pond Slider	4	-	(1)	1	-	-	-	-
Musk/Mud Turtle	3	-	(2)	1	-	-	-	-
Frog sp.	1	-	-	1	-	-	-	-
Bullfrog	3	-	-	1	-	-	-	-
cf. Human	1	-	(1)	-	37	-	(1)	-

* teeth

\+ burned

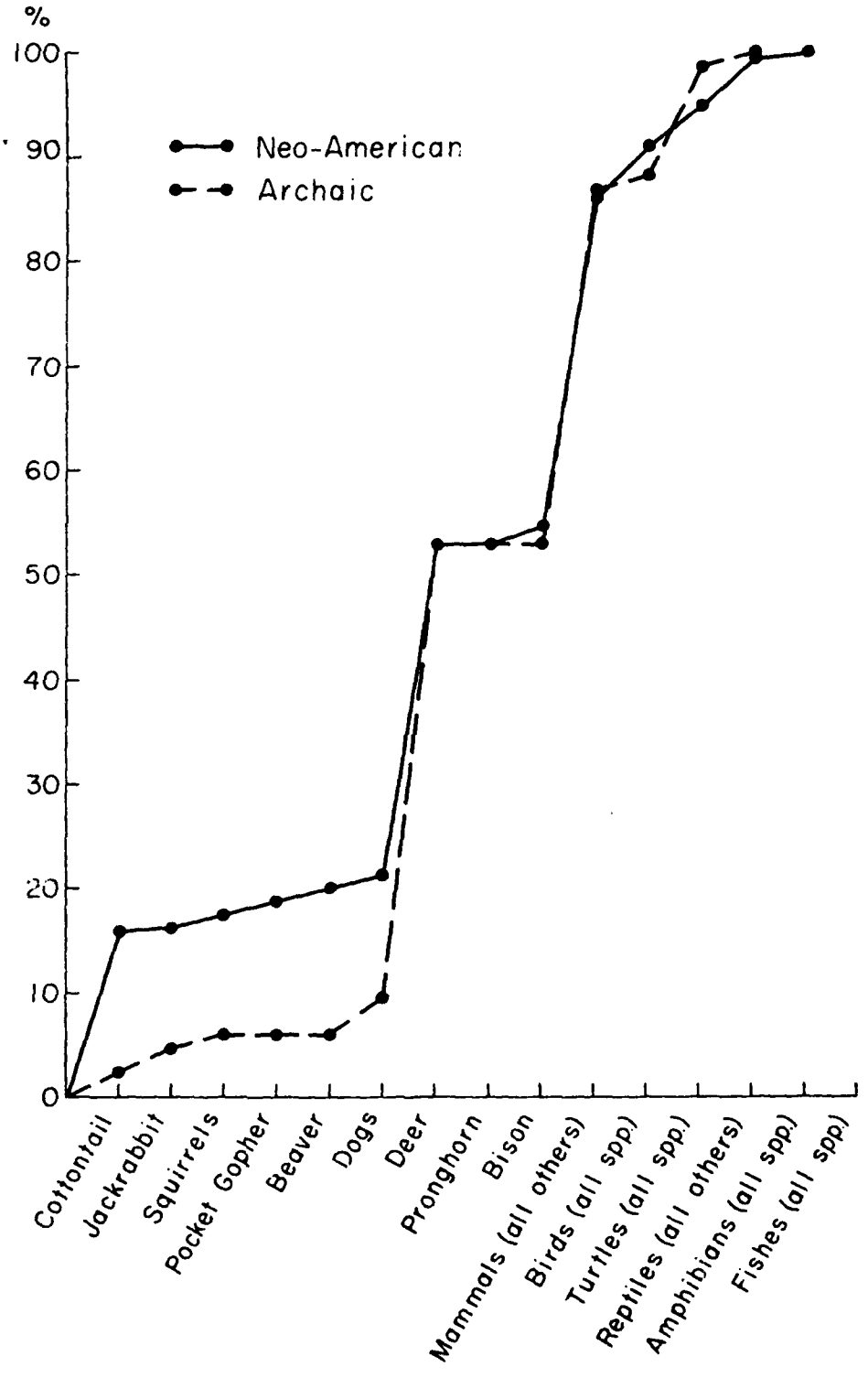


Figure 12.20-4. Cumulative Graph of Faunal Elements, 41WM404

Comments

Study of the tool and debitage tables indicates that there are no significant differences between the two components at the site. In fact, it appears that the only real difference between the various occupations of the Brown Tick Shelter was the increased utilization of rabbit during Neo-American times. This continuity of artifact type and distribution through time is most apparent when sample sizes are large and adequate from a given site or component. Differences between sites and components throughout Central Texas would, conversely, seem to be related to sample size or sampling technique. In other words, the smaller the sample and/or less representative (for whatever reason) the more pronounced the skew and the identification of artifical differences in artifact types and quantities.

The Brown Tick Shelter was occupied during the Middle and Late Archaic and during Neo-American times. The size of the shelter precluded large groups, and it probably functioned as a temporary campsite for a family unit or a hunting party. That both males and females were prewent is inferred from the presence of traditional hunting and food processing artifacts as well as the bones of very young, perhaps prenatal, humans.

The site would have offered protection from the elements, especially during the Winter months as it faces South. While ease of access to water would have been a problem, the site certainly provided an excellent view of the surrounding portions of the San Gabriel river valley, a plus for hunting parties. The diversity of faunal remains reflects both an exploitation of the uplands as well as the bottomland/aquatic environments.

There undoubtedly exist many such sites within the North Fork reservoir, and it is most unfortunate that the majority of them could not be located with standard visual and pedestrian survey techniques. Site 41WM404 is an exception and was simply missed by the A&M survey team. Other such sites are buried under talus and would be extremely costly and difficult to locate. The importance of such occurrences is illustrated by the fact that over 75% of the site area was excavated resulting in an adequate and representative sample from the site. This is the only archaeological manisfestation in either reservoir for which this statement may be made. Further studies on collected materials, such as pollen, soils, etc. will give future researchers a full data base from which to launch investigations of similar sites.

12.21 41WM419

(Crockett Gardens Site)

Introduction

The Crockett Gardens Site is located in North Fork Reservoir on the south side of the San Gabriel River, east of its confluence with a small spring-fed creek which originates approximately 1 km due south of the site (Fig. 12.21-1).

The site area may be characterized as an alluvial bottom abuting a high-bluff limestone terrace in the Edwards Plateau limestone hill country. Vegetataion, prior to recent disturbance, was improved pasture with walnut, hickory, pecan, hackberry, oak, and dogwood along the creek and river margins.

During the latter part of November, 1979, Borrow Pit I in North Fork reservoir was opened by construction personnel (Fig. 12.21-1). At this time, machine operators noticed and collected prehistoric Indian artifacts unearthed by the scrapers and bulldozers. One such worker became concerned that they might be destroying something of value and, after informing his supervisor, contacted one of the North Texas State University archaeological teams working at a nearby site. The potential of Borrow Pit I was immediately apparent since many of the artifacts recovered by construction personnel were diagnostic of the earliest known evidence for man in Central Texas.

The Fort Worth District C.O.E. archaeologist was notified immediately but destruction of the site continued and a team of archaeologists from NTSU was not allowed to begin investigations until January 29, 1979.

The purpose of the investigations was to:

1) Determine the nature and extent of the remaining portion of the site.

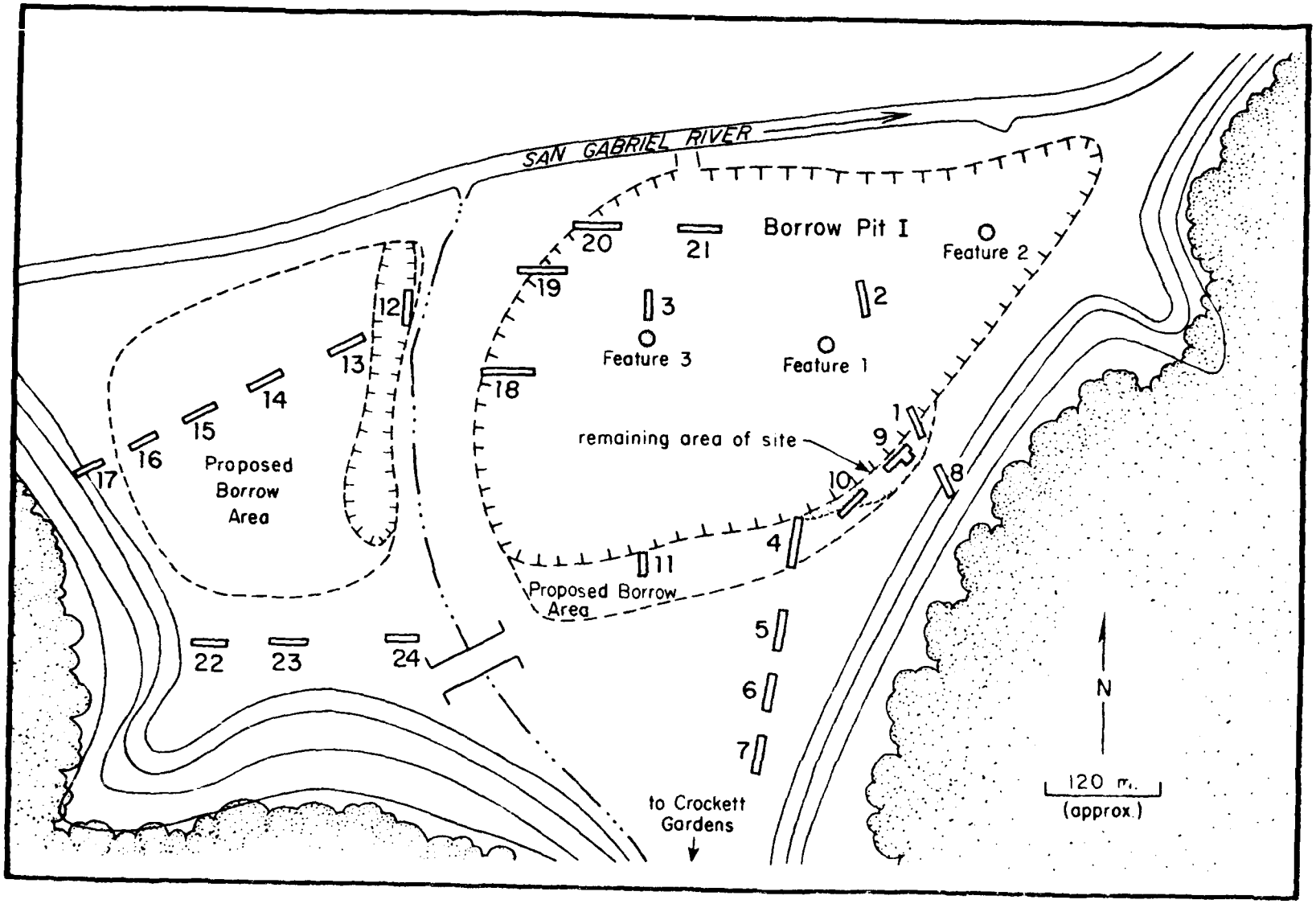
2) Determine the extent of construction-related damage.

3) Provide recommendations for archaeological mitigation, if applicable.

The cooperation of the weather and construction personnel allowed the accomplishment of these goals in a relatively expeditious fashion.

Figure 12.21-1

Map of Crockett Gardens Site (41WM419) showing general site topography and investigation units. Feature 4 and Test Unit 1 are in the SE extention of Trench 9.


SAN GABRIEL RIVER
Borrow Pit I
Feature 2
Feature 3
Feature 1
remaining area of site
Proposed Borrow Area
Proposed Borrow Area
to Crockett Gardens
N
120 m.
(approx.)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
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21
22
23
24

Methodology

Cursory inspection of the artifact distribution in Borrow Pit I revealed that the site was either extremely large or had suffered extensive redeposition during construction operations since artifacts were noted throughout the borrow area. Because of time and financial restraints, it was decided to sacrifice the usually desirable level of control provided by hand excavation for the time savings offered through the selective use of backhoe trenches (abbreviated: BHT). Both the operators and backhoe were provided by the Corps.

Trenches were used to define the extent and depth of cultural deposits both in the existing and proposed sections of Borrow Pit I (Fig. As trenching proceeded, differential soil zones were deposited separately as they were removed and then examined by the archaeologists. All cultural materials recovered from a given zone in this manner were placed in individual sacks and, as a further precaution, a small plastic bag of characteristic soil was placed in each artifact sack.

Upon completion of trenching, several 1 to 2 meter wide profiles were cleaned and drawn in each trench. Soil content, texture, and color (Munsell Soil Color Chart, 1975) were recorded. The resultant zones were coordinated with the previously collected artifact and soil samples. It is realized that this system fails to pinpoint the exact location of individual artifacts, but does offer investigators much more control than is usually afforded during backhoe work.

Horizontal and vertical control were maintained through the use of a permanent datum back reference. Soils removed in test unit 1 and feature 4 were passed (with difficulty) through a ¼" mesh screen. Soil and pollen samples were collected from the features, and one charcoal sample was taken from BHT 4.

Investigations

Prior to any excavations, cultural materials had been noted eroding out of the southeastern edge of the borrow pit at approximately 1.80 meters (6 ft.) below the ground surface. Some artifacts appeared at higher levels, but preliminary field analysis indicated that these dated from the Middle and Late Archaic Periods. The earlier, Paleo-Indian occupation of the site was thought to be contained within a lower mottled tan/orange clay; the very deposit, unfortunately, desired for construction operations.

A detailed discussion of each backhoe trench is considered redundant and only such discussion as is deemed relevant to site interpretation will be presented here.

Only a small portion of the original site was found to have been left in situ by the borrowing operations. The majority of this is along the southeastern rim of the borrow pit in the haul road area (Fig.12.21-1). Three possible hearth remnants were located in the central section of the pit (Features 1-3), but appear to have been in the very bottom of the deposits containing the Paleo-Indian materials. All of these were exposed and disturbed, to varying degrees, by construction operations.

Trenches 18, 19, and 20 contained cultural materials, but soils appeared to be water redeposited, and no clear artifact associations were possible. No cultural remains were recovered in Trenches 12 through 17 west of the creek originating at Crockett Gardens. Archaic remains were noted in the upper levels of Trenches 22 through 24 but no artifacts from earlier periods.

The area of Trenches 4 through 7 (Fig.12.21-1) has been subjected to intensive cutting and filling from both the San Gabriel River and the outflow from several springs located along the Crockett Gardens valley margin. Trench 4 and 5 contained decomposing travertine and tufa, as well as an unusual deposit of unconsolidated, silt-sized tufa flour (Fig.12.21-1) BHT 5, Zone 5). This stratum is a light gray/brown (10YR5/2) decomposed tufa-like material. The presence of spring-related deposits was not totally unexpected, as several springs are extant throughout the area today. Leaf and twig impressions were recovered in the travertine, and, while identification of species has not been made, they appear to resemble sycamore. It is interesting to note that the same floral incapsulation is presently going on around the Crockett Gardens spring and falls area at the head of the valley.

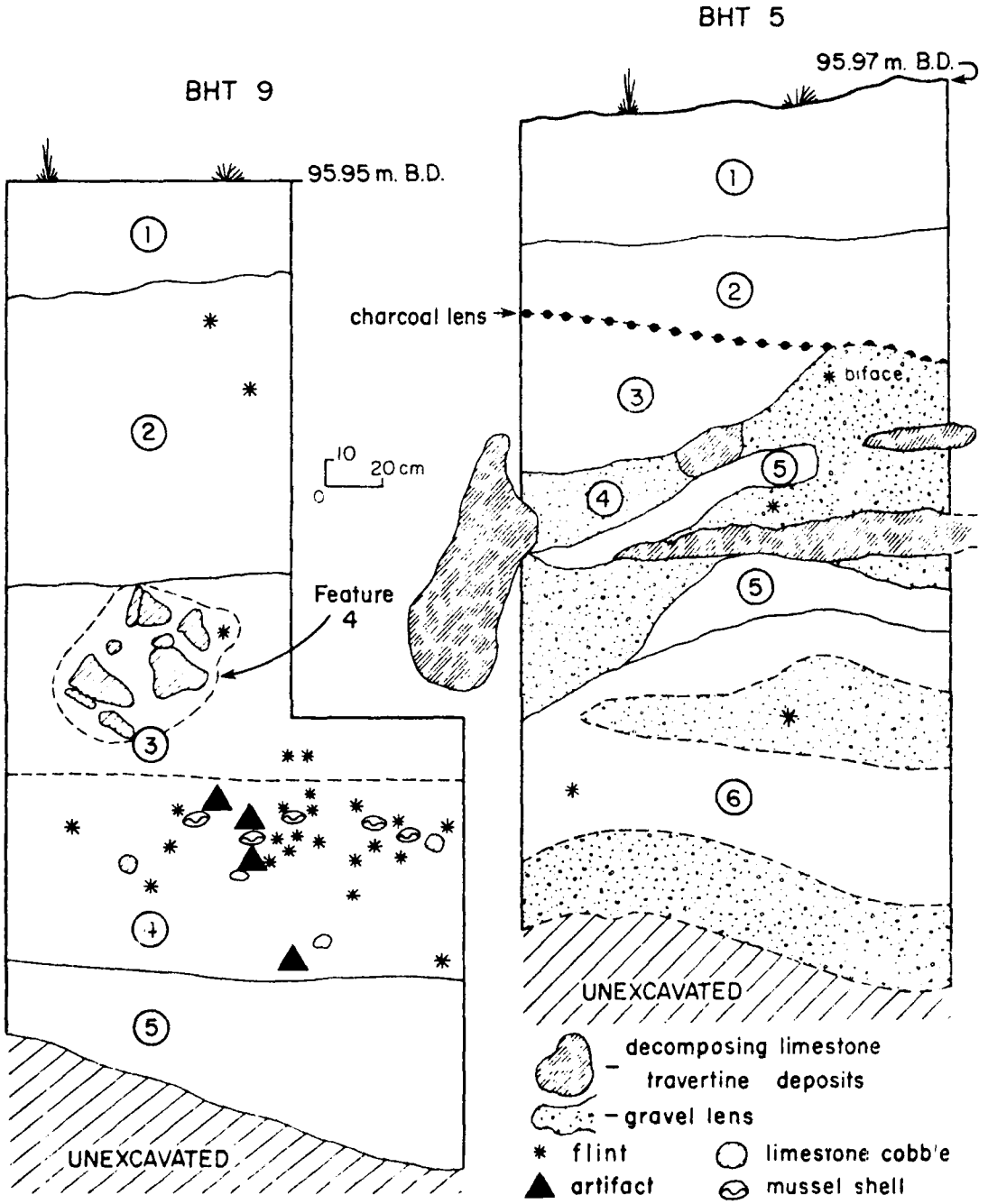
Cultural materials recovered in Trenches 4 through 7 came almost exclusively from gravel deposits and, as such, are not considered to be in primary context. Trench 5 (Fig.12.21-2) well illustrates this situation The first artifacts were encountered in the gravel deposits interfingering with Strata 3, 4, and 5 between 95.57 and 95.03 meters below the arbitrary datum. Diagnostic artifacts from this deposit include a fragment of a Pedernales type projectile point and a resharpened Ensor-like point. These types are associated respectively with the Round Rock and Twin Sisters phases of the Archaic Period. By most estimates, the deposits could have been laid down between 1,500 and 4,000 years ago.

Stratum 6 in BHT 5 also contained cultural debris, but unfortunately, no diagnostic or time-index stone tools. Artifacts were found in both the clays and the gravel deposit within the zone. No materials were recovered from the lowest gravel deposit, and trenching was stopped.

Of special interest were three well-made and obviously utilized prismatic blades recovered in Stratum 6 (Fig. 12.21-3 a,c,e). Similar blade forms were recovered in the surface collections, and at a Paleo-Indian rockshelter some 40 kilometers to the south. The similarity of form might be interpreted as a strong indication that they are not fortuitous.

Figure 12.21-2

Selected profiles from Backhoe Trenches 5 and 9.



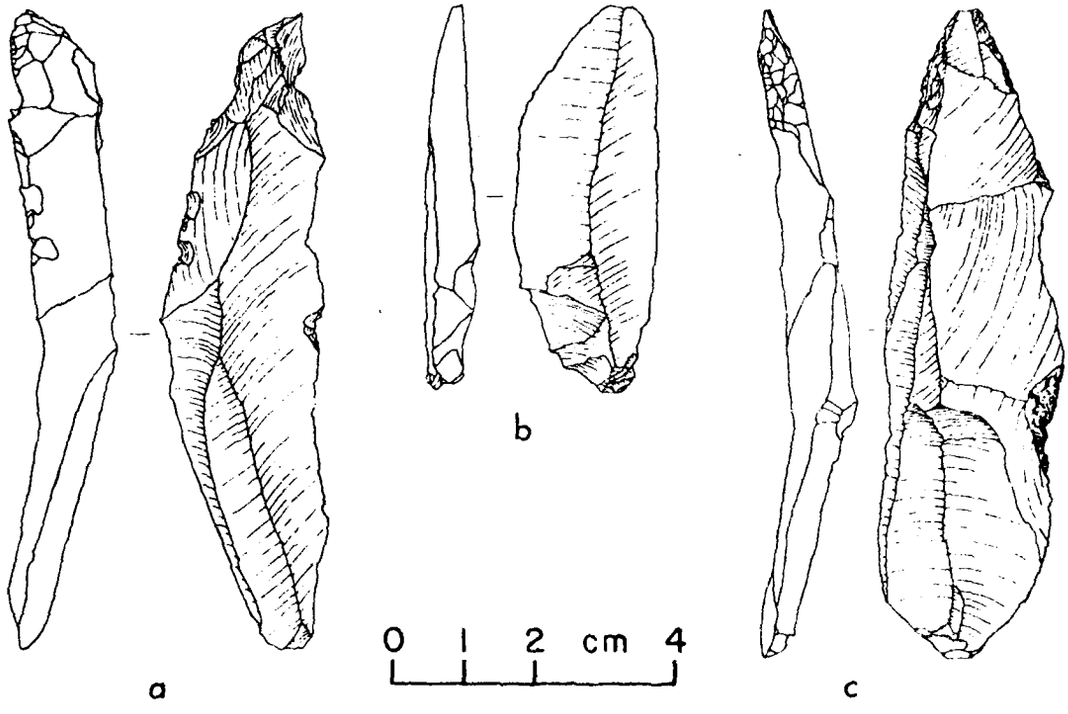
41 WM 419

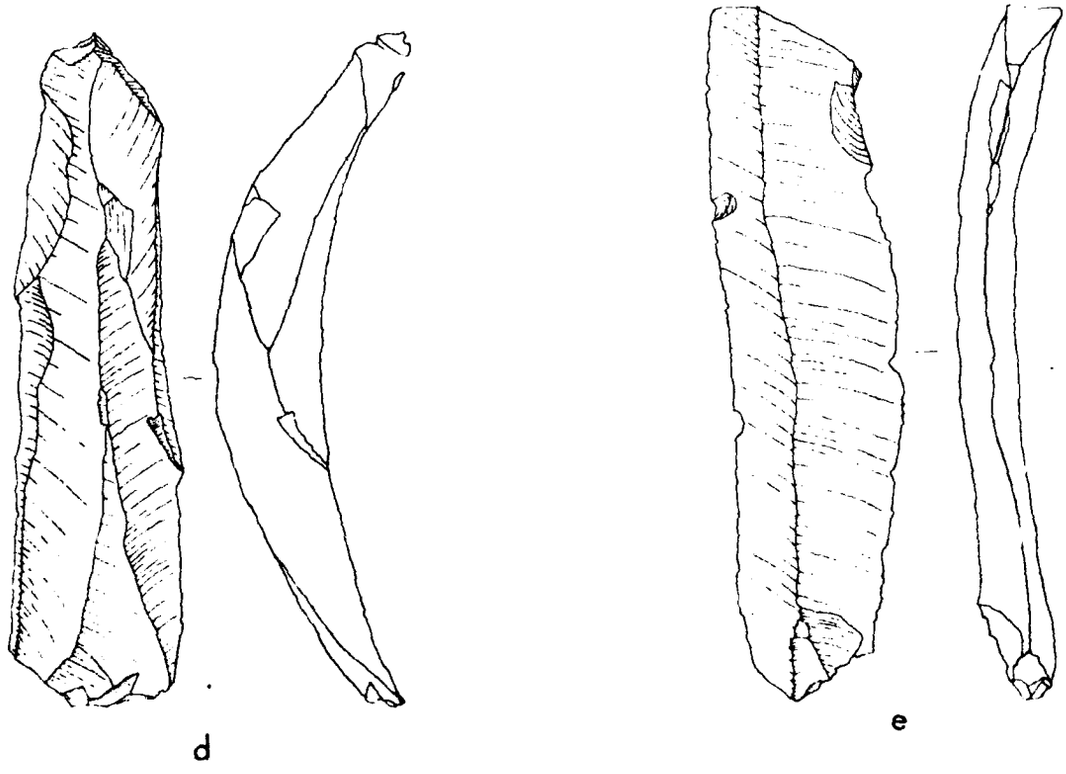
BACKHOE TRENCHES 9, 5

East Wall Section Profiles

Figure 12.21-3

Blades: (a, c, e) BHT 5, Stratum 6; (b, d) Borrow Pit General Collection.


a
b
c
0 1 2 cm 4


d
e

The decided lack of continuity between Trenches 4 through 7 mitigated against the continued expenditure of precious excavation time in this area.

Trench 8 was an attempt to find the base of the bluff and the extent of the cultural deposits in that direction. It was with some surprise that a cut and fill situation similar to that noted in Trenches 4 through 7 was encountered in Trench 8. Apparently, either the San Gabriel River or the creek from Crockett Garden cut northeast at the bluff edge. The riverine situation is favored because of the extent of the gravels and individual cobble size. An explanation, and one with some support, is that the river cut through near the bluff edge during Archaic times truncating the Paleo deposits. This is supported by the admixture of gravels and Archaic artifacts in Trenches 4 through 8.

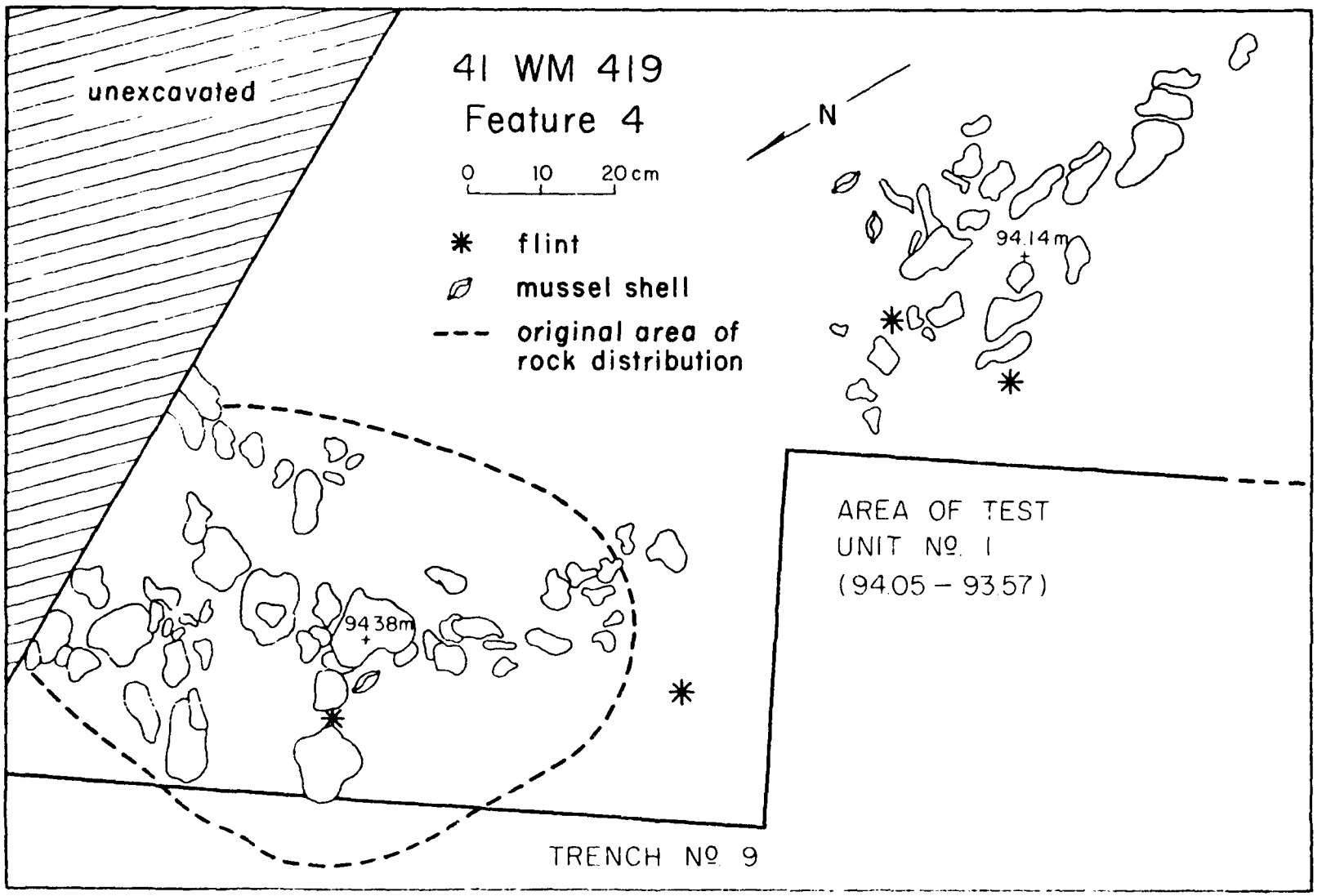
Trenching operations were continued around the periphery of Borrow Pit I and in the proposed borrow pit area to the west of Crockett Gardens Creek. No in situ cultural remains were found in the borrow pit, and only Middle and Late Archaic materials were recovered from the trenches west of the creek.

It appeared at this time that the only remains of the Paleo-Indian occupation lay in a small semi-circular area, some 35 m x 9 m, between Trench 1 and the eastern end of Trench 10 (Fig. 12.21-1) .

Only in Trench 9 was the lower compact tan/orangish silty clay noted that was thought to contain ghe Paleo-Indian material. Stratum 4 in Trench 9 contained concentrations of mussel shell, artifacts, and lithic debris(Fig.12.21-4)These artifacts, along with a possible hearth in Stratum 3, seemed to be the most likely location for determining if the site remnant contained old living surfaces and/or features such as the hearth remnants (Features 1-3) noted in the center of the borrow pit.

During the cleaning of the SE profile of BHT 9, a fragmentary and fire-spalled base of what is probably an Angostura projectile point was recovered from the bottom of Stratum 3(Fig.12.21-4).This discovery, along with Feature 4, prompted the selection of Strata 3 and 4 in BHT 9 for limited, but controlled investigation.

In order to expedite the work, the upper 1.90 meters of soil was removed down to Level 4 with the backhoe. The section around Feature 4 was only taken down 1.40 meters, and the rocks were cleaned. Unfortunately, the backhoe inadvertantly struck several of the rocks, dislocating them. Even with this disturbance, however, the similarity of pattern between Feature 1 through 3 and Feature 4 was apparent



12-145

Figure 12.21-4

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ARCHAEOLOGICAL INVESTIGATIONS AT THE SAN GABRIEL RESERVOIR DIST--ETC(U)
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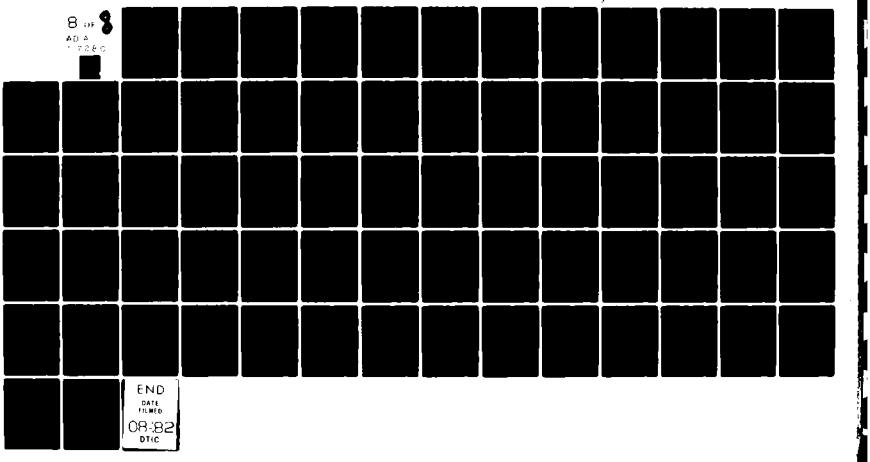

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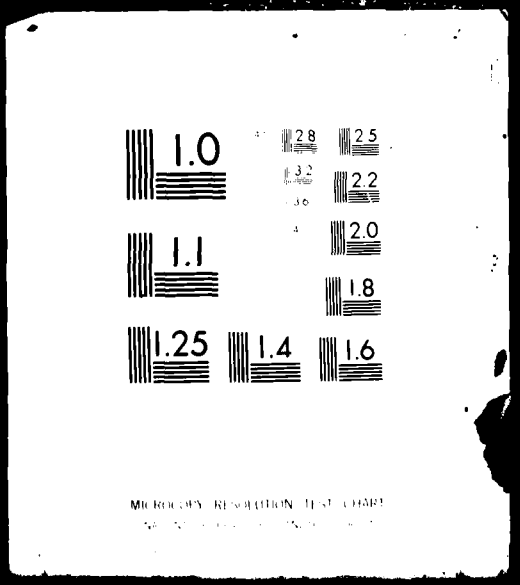


Backhoe Trench 9 Explanation (Fig.12.21-2)

Stratum 1 is a dark brown (10YR3/2) compacted clayey silt with rootlets. A few flakes were recovered during trenching from this zone, but basically it was sterile.

Stratum 2 is a tan/orange/brown (10YR3/3) compact clay containing quantities of decomposing limestone fragments. Several flakes and chips were noted within the zone, but no patterning or concentrations could be defined.

Stratum 3 is a tan/orange (10YR4/3) mottled, silty clay. The zone contained Feature 4, a possible hearth, several burned limestone fragments and, as in Strata 1 and 2, a small amount of randomly distributed lithic debris and artifacts which increased toward the bottom of the stratum.

Stratum 4 is a tan/orange (10YR4/3) clayey silt containing burned and unburned limestone fragments, freshwater mussel shell, snail shells, and concentrations of lithic debris and artifacts. Several of these concentrations seemed to be resting on compacted surfaces within the stratum. At first it was throught that they represented old living surfaces, but their discontinuous appearance at different levels seemed odd, and their exact nature and relationship to the artifacts was not resolved until the excavation of Feature 4 (see below).

Stratum 5 is a compact tan/yellow (7.5YR4/4) clay containing no cultural debris. BHT 9 was taken down 1.20 m lower than the section shown in Figure 4 with no noticeable change in Stratum 5. The gravels found in other trenches were not encountered, but this was to be expected based on the information obtained in BHT 2 and 3. These trenches began somewhere in Stratum 5 which continued down with no apparent change for approximately 3.65 m.

The following is a listing of the artifacts recovered during BHT 9 trenching operations.

Stratum 3 *(upper ½)*

Flakes and chips
Biface thinning flakes (1)
Projectile point tip (1)
Biface fragments
Bifaces, crude stream-polished (1)
Retouched flakes, unifacial/unilateral (2)
Notches (1)
Core fragments (2)

Stratum 3 *(bottom ½) and* 4	Projectile point base (1) Angostura?
	Flakes and chips
	Biface fragments (4)
	Blades, small (2)
	Core fragments (2)
	Drill, broken (1)
	Retouched flakes (11)
	Unifaces (1)
	Scrapers (2)
	Denticulates (2)
	Notches (1)
	Core/chopper (1)
	Perforators (1) (Figure 12.21-9)
	Hammerstone (1)
	Mussel shells
	Snail shells (Rabdotus sp.)

An exhaustive description of these artifacts is not presented here because their exact provenience and association is not known, and they represent a rather biased sample of each of the stratum. It does, however, serve to point out the utility of this type of rapid exploration for defining buried cultural deposits.

The backhoe was used to remove a 4 x 2 meter section adjacent to Feature 4 down to 94.05 m. in relationship to the arbitrary datum of 100.00 m. above sea level in order to expose the stratum containing the concentrations of artifacts. A 1 x 1 meter unit was cleared and taken down through arbitrary levels to a depth of 93.57 meters (Fig.12 .21-4)

Test Level 1 (94.05-93.93 m)	Flakes (9) P-1, S-0, 1-8
	Chips/chunks (17)
	Core fragments (3)
	Blade (1) distal fragment, no retouch
	Burin spall (1)
	Mussel shell fragments

Note - all lithic material coated with $CaCO_3$.

Test Level 2 (93.93-93.81 m)	Flakes (32) P-3, S-3, I-24, BFT-2
	Chips/chunks (32)
	Core fragments (2)
	Retouched flakes (2)
	Biface (1) proximal ½, stage 3

Note - flakes show meticulous platform preparation.

Test Level 3 (93,81-93.66 m)	Flakes (49) P-1, S-6, I-38, BFT-4 Chips/chunks (66) Core fragments (9) including 1 blade core fragment Retouched flakes (5) Biface (1) distal ½, stage 4 (Of 4 possible stages) Burin spalls (3) Scrapers (2) on flakes Notch (1) Projectile point (1) base section, burned, possibly Angostura type Mussel shell fragments Bone fragment (1) burned, rabbit-sized mammal
Test Level 4 (93.66-93.57 m)	Flakes (6) P-0, S-1, I-3, BFT-2 Chips/chunks (5) Biface (1) mid-section, stage 3

It is apparent that the majority of artifacts are concentrated in a 27 cm zone between 93.93 m and 93.66 m. A level "5" was excavated, but no artifacts were recovered, and the excavations were stopped. At the same time the testing was being accomplished, Feature 4 was being cleaned. It will be discussed here prior to the other features for continuity.

Feature 4 (Fig.12.21-4)

Feature 4 was first noted in trenching operations. Several of the rocks were hit by the backhoe, but it is felt that the majority were in situ following the trenching. Unfortunately, this was not the case following the removal of the 1.40 m of deposit overlaying Figure 4. Too late it was discovered that the rocks lay on a sloping surface (note elevations,Fig.12.21-2 and several were displaced before the machine could be stopped.Fig.12.21-4 shows the distribution pattern of the rocks and artifacts. All fill from below the very tops of the rocks to just beneath was screened, and the following materials were recovered.

Flakes (14) P-1, S-3, I-10

Chips and chunks (23) six of which are heat spalled an ed

Retouched flakes (4)

Bifaces (2) one fragment, one whole fire spalled (75.5 x 27.5 mm)

Gouge (1)

Projectile point (1), proximal, battered Gower-like

Scraper fragment (1) unilateral on a flake fragment

Scraper/denticulate (1)

Blade w/notch and burin (1)

Mussel shell fragments (3 valves)

The artifacts recovered from Feature 4 do not differ appreciably from those in the test unit except that tools represent 10% of recovered materials (Fig. 12.21-5). The stone distribution appears to have been roughly circular and contained both burned and unburned limestone cobbles. No charcoal or other organic matter was noted.

Of special interest was a peculiar soil formation found throughout Stratum 3 and the upper ½ of Stratum 4 which resembled a number of discontinuous slickenside surfaces. These were first noted in the cleaning of BHT 9 profiles and were thought to represent old ground surfaces. In reality, it is probable that they resulted from differential compaction, settling, and small block slippage of the deposits producing polished and fluted surfaces (Hall, 1979, personal communication).

It is concluded that Feature 4 was a hearth structure comprised of a single layer of limestone cobbles and chunks obtained from nearby talus slopes. Recovered artifacts could be interpreted to represent the following activities:

Tool Reworking - This is as opposed to tool manufacturing and is based on the high percentage of interior elements in relationship to primary and secondary ones in the flake and chip categories.

Flake Production - This is also seen in the numbers of interior flakes, as well as the core fragments and chips/chunks; and the particular attention given to platform preparation. Although a high number of utilized flakes were not found in this limited area, many were in the general collections. In addition, a flake may be used as a cutting tool without showing evidence of such use.

Cutting/Scraping - This type of activity is seen in the scrapers, blades and bifaces. The latter and the projectile point bases may be the remnants of rehafting since all were fragmentary.

Subsistence - This is a rather tenuous area since only one small animal bone was recovered (probably rabbit), and the river mussels may, admittedly, have been introduced by flooding.

Figure 12.21-5

Comparison of general artifact composition of Feature 4 and Test Levels 1-4 in Backhoe Trench 9.

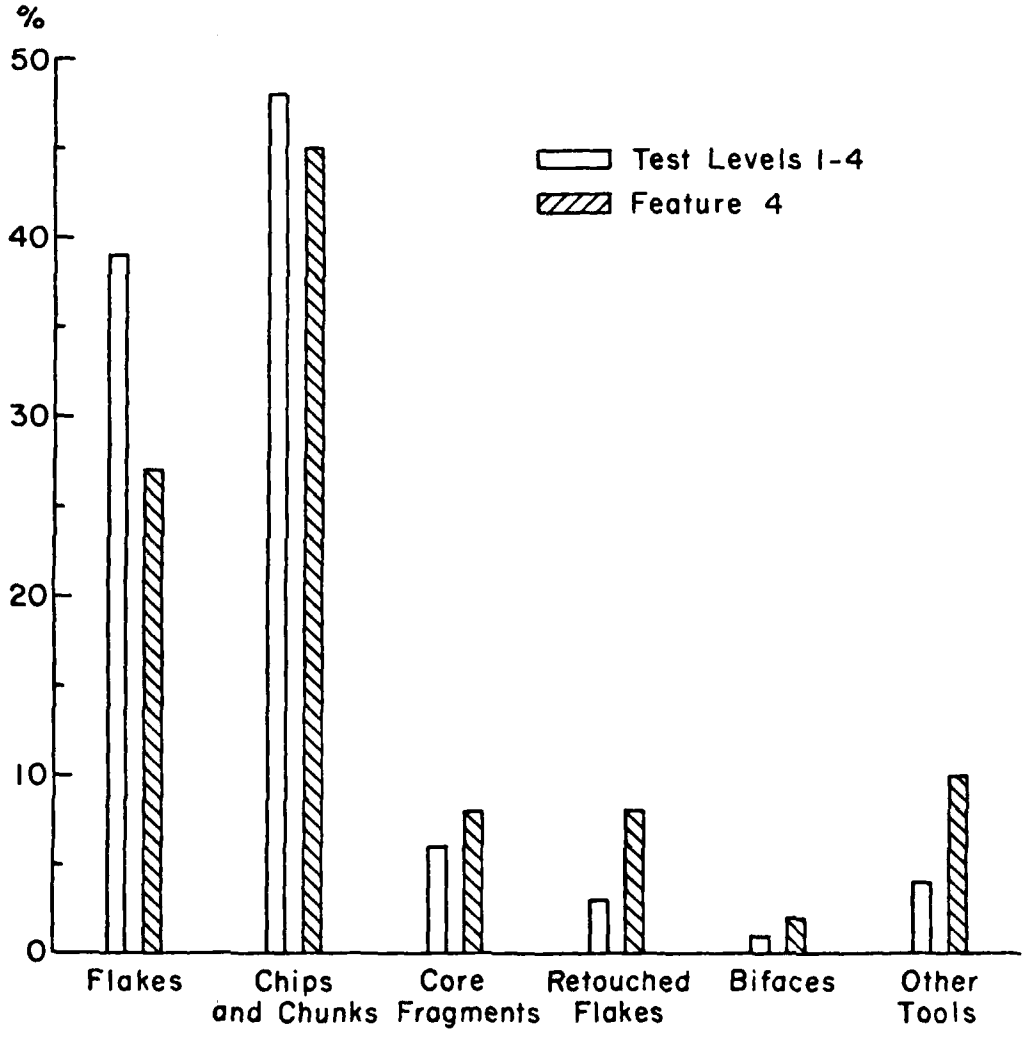


Figure 12.21-5

Utilization of the hearth may have been single-term, possibly as part of a transitory hunting encampment. Interestingly enough, Features 1 through 3 are almost identical to Feature 4 with the exception that none of them contained artifacts.

Feature 1 (Fig.12.21-6)

This feature was the most complete hearth found. It had just been clipped by heavy machinery, exposing a small cluster of fragmented limestone. Dimensions were 124 cm NE/SW by 90 cm NW/SE. As was the case with Feature 4, several of the rocks had been displaced by machinery, but the feature was basically intact.

A profile across the mid-section showed that the hearth was comprised of a single layer of limestone cobbles laying on a relatively flat surface. Mixed with the rocks were numerous snail shells, one mussel shell and two flakes, one of which was a biface thinning type. Numerous charcoal fragments were also scattered throughout the feature, but did not yield a large enough sample for radiocarbon dating.

The similarity to Feature 4 is quite striking. It is of further interest to note that the high point of the feature is less than one meter (.78 m) below that of Feature 4, while it is some 125 m linear distance N/NW. That would place the angle of slope at less than ½ of 1^{o} from the bluff edge towards the present channel of the San Gabriel River. This, of course, assumes that both features are contemporaneous, and that could not be verified.

Features 2 and 3

These two features are but remnants of hearths similar in nature to Feature 1 and 4. Unfortunately, they had been too badly disturbed by borrow operations for definition of their form. Neither contained any charcoal or artifacts. See Figure 2 for their relationship to Features 1 and 4. It should be noted here that many scattered burned limestone rocks were noted throughout the borrow pit area, and it is probable that these are remnants of other hearths destroyed by construction equipment.

General Collections

This section is saved until last because, while interesting, it is of limited value in interpreting cultural processes at the site. Not only is the exact provenience of the artifacts unknown, but materials from all levels of the site have been mixed together collapsing any temporal control.

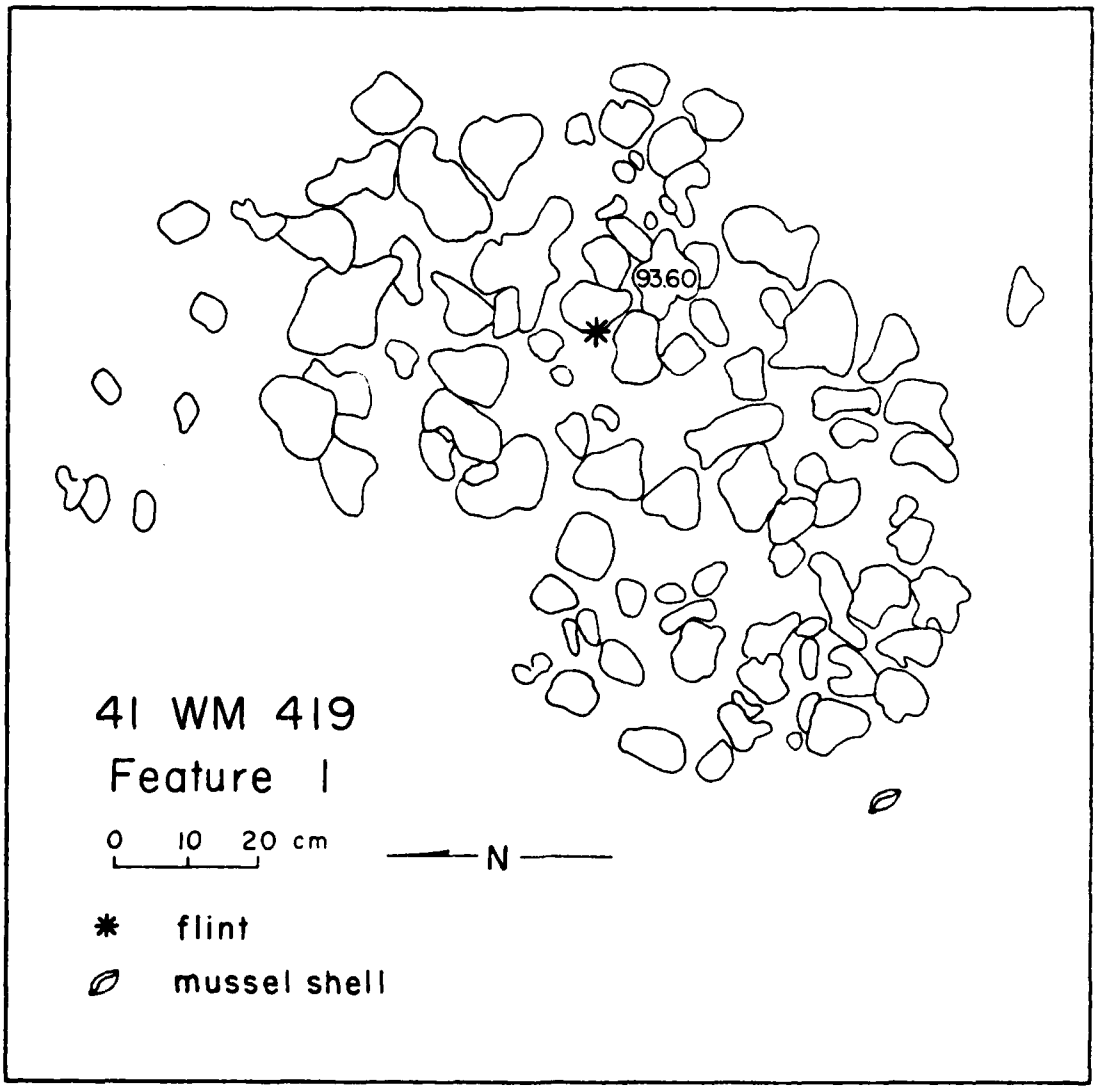
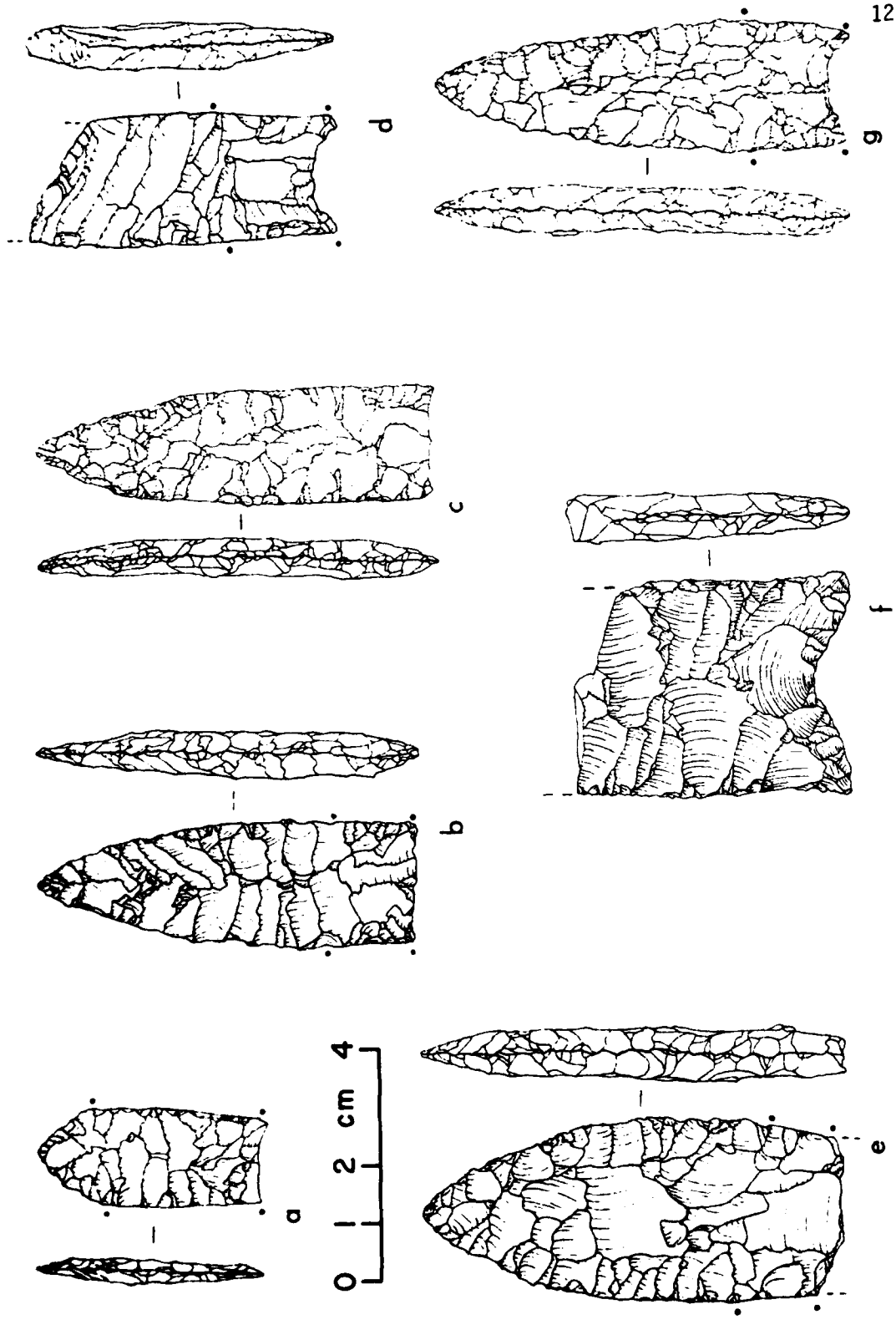


Figure 12.21-6

Figure 12.21-7

Projectile points: (a-d) Plainview; (e) Clovis; (f) Golondrina; (g) Meserve-like;

All illustrated specimens from general collection; dots indicate extent of edge grinding.


d
g
c
f
b
a
e
0 2 4 cm

Middle and Late Archaic materials were noted on the surface by NTSU survey personnel during January 1978, and again during an attempt to relocate 41WM66 in March, 1978. At present, it is extremely difficult to separate artifacts, other than projectile points, from the various time periods. Borrow Pit I slopes up at both the eastern and western ends so that these later materials could have been transported down into the bottom of the pit by both the scrapers and the bulldozers. Several discard piles from local artifact collectors and construction personnel were also noted in the pit. That this mixing happened is not only possible, but probable. Consequently, the surface collected artifacts are described qualitatively and not quantitatively.

Projectile Points (Fig.12.21-7):

Angostura (2)

Clovis (1)

Ensor-like (1)

Golondrina (1)

Hoxie (1)

Martindale (2)

Meserve (2)

Plainview (7)

Travis (1)

Flakes/chips/chunks - noted, but not collected

Bifaces - all of chert, range in size from 33 mm wide x 80 mm long to 60 mm wide x 170 mm long, all stages (1-4) of manufacture represented

Blades - similar to those from backhoe trenches and several small ones in the bladelette class

Cores - discus-shaped (Fig. 12.21-8)

175 mm diameter x 32 mm thick

107 mm diameter x 28 mm thick

83 mm diameter x 21.5 mm thick

Several angular, multi-platform core fragments were also recovered.

Retouched Pieces - these may be divided into three general types:

1) Large flakes with irregular and/or discontinuous unifacial retouch, usually along one edge only

2) Whole or fragmentary flakes with purposeful, regular, and usually circumferential unifacial retouch

3) Fragmentary blade or flake with steep, scraper retouch (unifacial) along one edge. Several of the blade types burins on a snap.

Scraper (Fig. 12.21-8,9)

Gouges - Clear Fork type (Fig.12.21-10)

Choppers - large fragments, or quartzitic material

Miscellaneous tools:

Bilateral uniface fragments

Notch on a retouched flake (Fig.12.21-9)

Retouched piece with both bifacial and unifacial retouch

Mano - white quartz

Mussel shell

Travertine nodules

As stated earlier, quantitative data are not provided because of the nature of the study. The projectile points are probably the most useful of the artifacts since they may be used as time diagnostics.

Discussion

Dating

There can exist no doubt concerning the occupation of 41WM419 during Late Paleo-Indian times (between 9,000 and 7,000 years ago). Angostura, Meserve, and Golondrina type projectile points are accepted index markers for the Circleville Phase of the Central Texas sequence. The presence of a Clovis-like point is not totally unexpected as Lerma-like points were found at the Devil's Mouth Site in association with Golondrina and Plainview types (Johnson 1964:46-58). More recently, a Folsom point in loose association with Plainview and Golondrina was noted at the St. Mary's Hall Site (Hester 1978:8) and with Plainview or Midland types at

Figure 12.21-8

Miscellaneous artifacts: (a, c) discoidal cores, general collection; (b) flake scraper, general collection

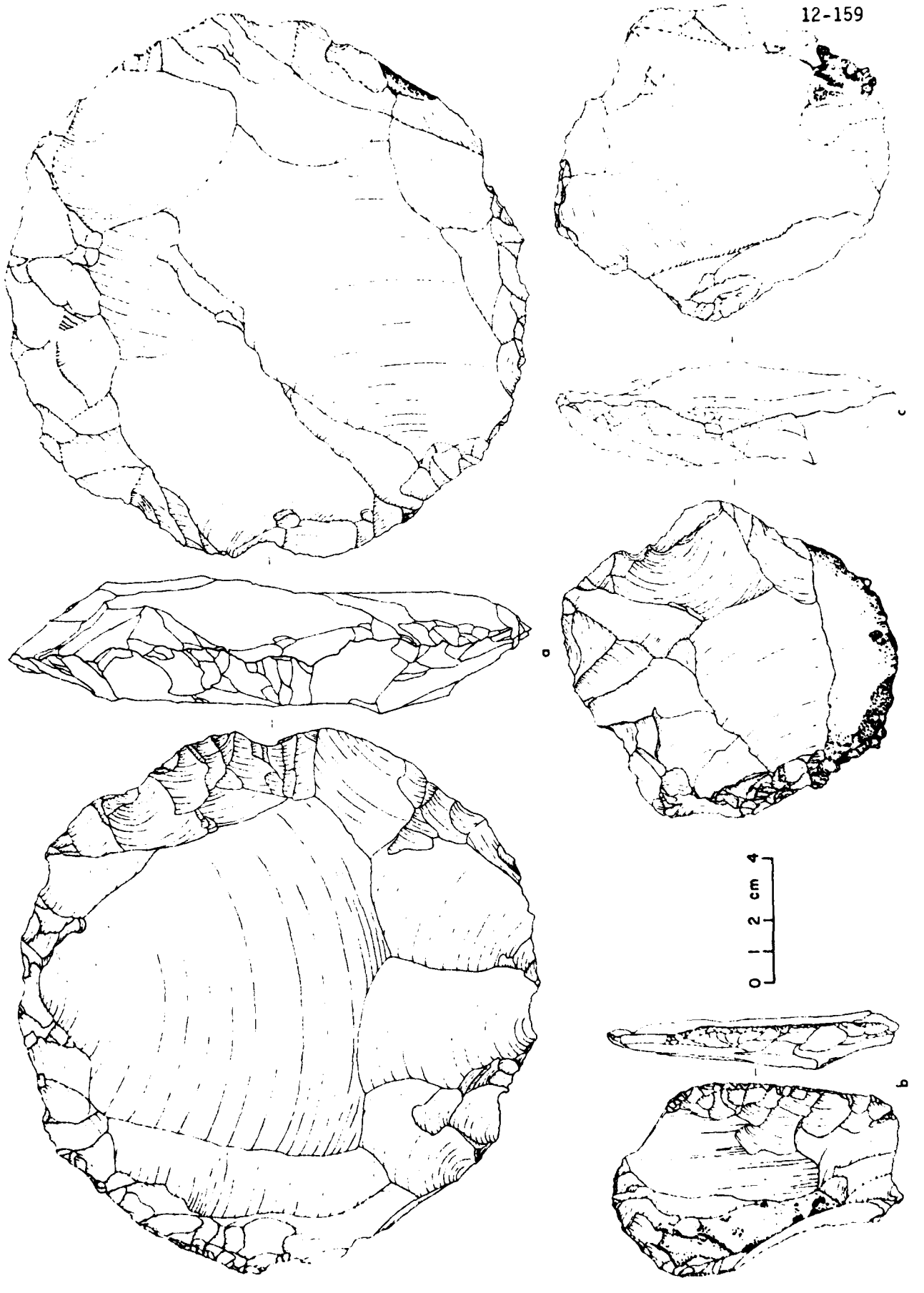
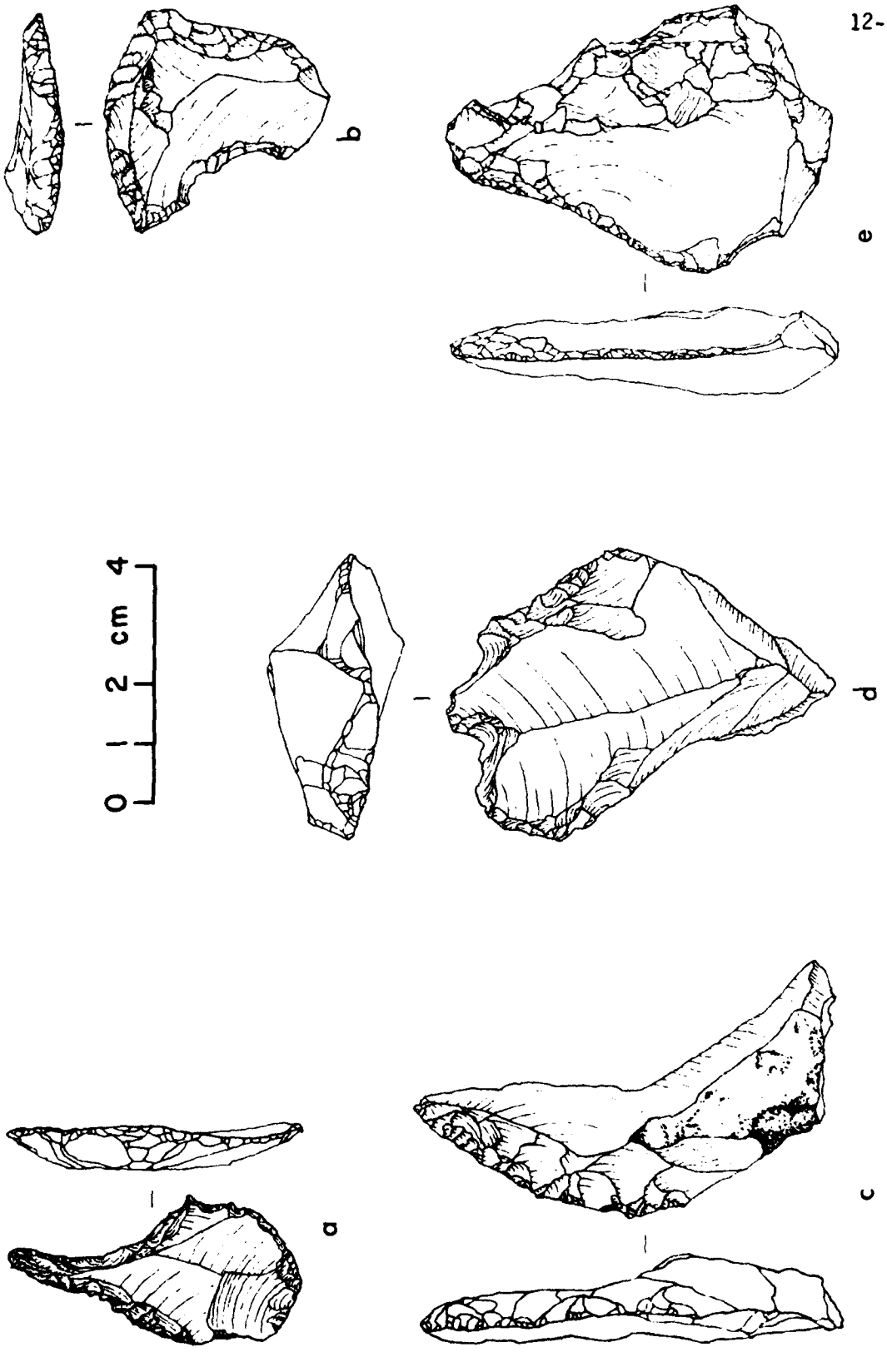

a
b
c
0 1 2 cm 4

Figure 12.21-9

Miscellaneous artifacts: (a) perforator with graver spur and scraper retouch, BHT 9, Zone 4; (b) circumferential scraper, general collection; (c) irregular scraper, general collection; (d) two notches and scraper retouch on a chunk, general collection; (e) flake scraper, general collection


0 1 2 cm 4
a
b
c
d
e

Bonfire Shelter (Dibble and Lorrain 1968). Closer to the Crockett Garden Site, the Levi Rockshelter near Austin produced a Clovis point which was stratigraphically lower than the Plainview and Angostura types (Alexander 1963:516). The presence of "classic" Paleo-Indian projectile points in association with typical Transitional assemblages in Central and South Texas is the rule rather than the exception.

A charcoal sample was obtained from the transition between Zone 3 and 4 in Backhoe Trench 4 where a remnant of these two zones existed in the pit-end of the trench. It was expected to date between 5,000 and 7,000 B.P. but the sample produced a corrected date of AD 1430 $\pm$ 180.

Radiocarbon dates for Golondrina and Plainview forms come from Baker Cave (Word and Douglas 1973:34; Hester 1978:4), Bonfire Shelter (Dibble and Lorrain 1967), and Devil's Mouth (Sorrow 1968). All dates seem to cluster, after calibration, around 8,000 B.P.

An additional site, the Horn Shelter near Waco, has produced an Angostura-like projectile point above Folsom and under Plainview bearing levels which has been dated at 9980 $\pm$ 370 B.P. (Frank Watt, personal communication, 1974).

Associative dating is always tenuous, but it appears that earliest occupation of the Crockett Garden Site should be around 8,000 years ago.

Lithic Artifacts

In addition to the projectile points(Fig.12.21-7)several examples of "Clear Fork" tools were found both by surface collection and with Feature 4, the hearth. The association between Clear Fork tools and Plainview/Golondrina points is still in the hypothetical stage, but does seem to have some support at several sites. Investigations at the Johnston-Heller Site (41VT15) in Victoria County on the South Texas Coast failed to produce an unequivocal relation, but did yield 37 Clear Fork tools in loose association with Angostura-like, Plainview, Golondrina, and Clovis-like projectile points (Hester and Birmingham 1976:18-20).

At the St. Mary's Hall Site in San Antonio, Hester (1978:9) found a large bifacial Clear Fork tool in a sealed context with Plainview points. An additional example of a Golondrina/Clear Fork tool association was mentioned in a footnote (Hester and Birmingham 1976:20) as having been found by Hester at Baker Cave (41VV213). A final report on this work has not been released to date.

The specimens from Crockett Garden are all bifacial (Fig.12.21-10) and are very similar to the ones found at the Johnston-Heller site and pictured in Figures 5 through 7 (Hester and Birmingham 1976:24-27). In a 1941 article, Cyrus Ray describes six types of Clear Fork Gouges.

His type 3 (Ray 1941:159, plate 28, Nos. 1, 2, 3, 4, and 6) appears to be the same variety found at 41WM419. Ray notes that many are incrusted with caliche and states:

> While Gouges (1) and (2) are also found in the same sites with thie Gouge (3) type, there are several indications that Gouge (3) may have been used at an earlier period than the others (Ray 1941:157).

No further mention of evidence for the earlier use of his Type (3) is made in the article. Ray also notes, however, that all of this types have been found in " . . . the same types of deposits as Folsom and Yuma points . . . have been found" (Ray 1941:161). This is mentioned simply to illustrate the fact that almost 40 years ago, the suggestion that a correlation between Clear Fork tools and known Paleo-Indian assemblages had been made.

Aside from the projectile points and gouges, several general observations may be offered based on the presence, and relative frequency absence, of certain tool types. *Retouched flakes* were found at Crockett Gardens in large numbers during the surface collecting, but composed only 33% of the tools (minus lithic debris) from controlled units in BHT 9. This compares favorably with 45% retouched flakes from the early levels at *Devil's Mouth* (*Johnson* 1964:82).

The *lithic debitage* from 41WM419 is heavily weighted towards the interior elements with 6% primary, 13% secondary, and 81% interior flakes. Admittedly, this is a small sample (N=102), but looks similar to the distribution at the Levi Rockshelter (Wilmsen, 1970:26).

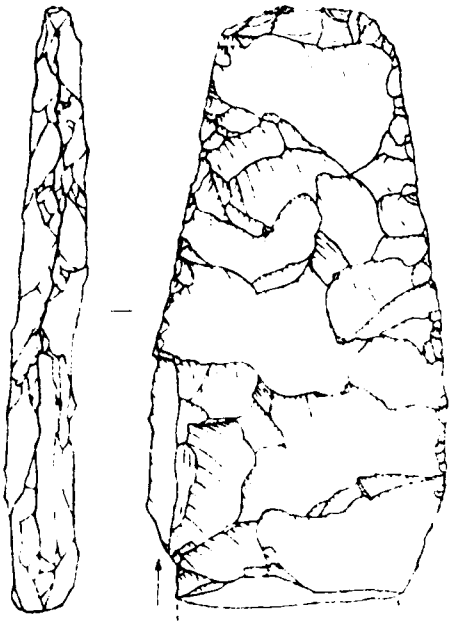
Blades (Fig. 12.21-3) are apparently not common artifacts in early tool assemblages. At Crockett Garden they comprise only 5% of the tools from controlled excavations. Similar, but smaller blades were found at the Levi Rockshelter (Alexander 1963:520). *Burins* and *burin spalls* seem to have a similar low frequency of occurrence.

The beautiful cores (Fig. 12.21-8) found in the borrow pit at 41WM419 indicate sophisticated flake production, as well as suggest that specialized activity areas existed within the site. *Bifaces* (Fig. 12.21-10) are not appreciably different from those noted at pure Archaic sites within the reservoir. Most of the finished ones (stage 4) have a slight contraction of the proximal one-third and a flat base with slightly rounded corners.

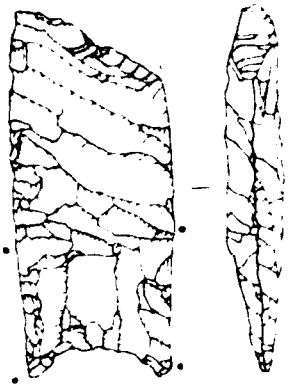
Although the samples from 41WM419 are relatively small, it is of interest to note the similarity to several well-known Paleo-Indian sites. The debitage to tool ratio at Crockett Garden (controlled units) is 1:1, while it is 1:1 at Blackwater Draw, 2:1 at Shoop, 2:1 at Quad, and 3:1 at Horner (Wilmsen 1970:65). One must not push analogies too far, especially when 98% of the presumed site area was destroyed before

Figure 12.21-10

Gouges: (a) reworked biface proximal fragment, general collection; (b) reworked Plainview proximal fragment, general collection; (c) Guadalupe-like BHT 9, Feature 4; (d) Clear Fork type, general collection.

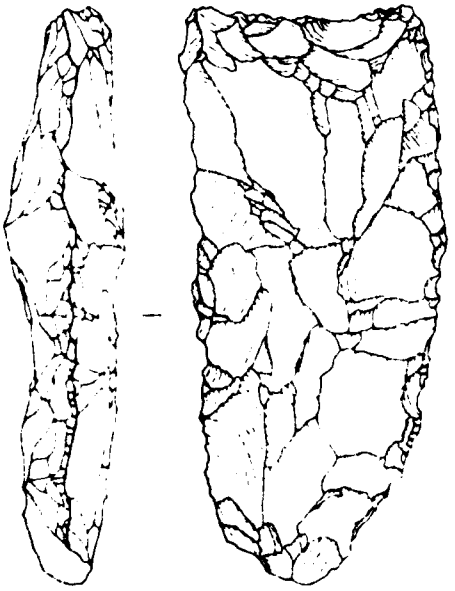


a

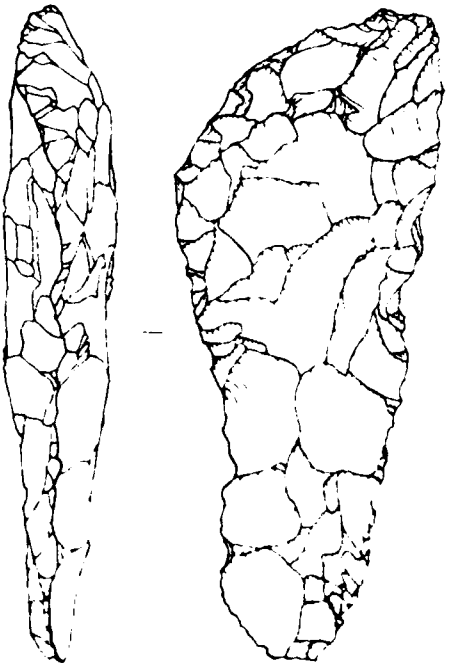


b

0 1 2 cm 4



c



d

investigation, but the similarities between geographically separated Paleo-Indian sites is intriguing.

As noted earlier, many of the artifacts were incrusted with caliche, some of them more heavily on one side than the other. According to Birkland (1974), $CaCO_3$ forms on the underside of inclusive rock materials in soils which have been saturated with ground waters laden with $CaCO_3$ derived from limestone parent materials on the surface. Although the incrustation is heavier on the earlier artifacts, it is present on the later Archaic ones also.

Comments

In summary, the Crockett Garden Site (41WM419) contained a buried Late Paleo-Indian component lying stratigraphically under and separated from a Middle Archaic utilization of the site. Collected artifacts may be interpreted to indicate a wide range of activities from tool manufacture to resource processing. The limited distributional data available could indicate that discrete activity areas existed, and that the site was periodically occupied by relatively small groups over many years, rather than a large group for a short period.

The site environment during the Paleo-Indian occupation was probably quite similar to that found today, minus the impact of modern man. Several small springs at the base of limestone bluffs provided fresh water, as did the nearby creek and river. Large flint nodules, eroding out of a limestone matrix capped the surrounding bluffs providing abundant raw materials for stone tool production. Hearth stones lay at hand in an apron of talus around each bluff, and firewood could be easily gathered along the creek and river banks.

The area around the Feature 4 hearth was used for artifact resharpening and/or finishing of tools. Primary lithic manufacturing took place elsewhere. The working of bone or wood may be indicated by the presence of gouges, scrapers, and a graver/perforator.

Other areas of the site may have functioned as butchering and processing areas as indicated by the bifaces, blades, and scrapers in the general collection. The large number of retouched flakes may also be a sign of processing both animal and plant resources. Fresh water mussels probably were part of the diet, as were small mammals such as rabbit.

13.0 Text Excavations at Historic Sites

by

Olin F. McCormick

13.1 Site 41WM399

Investigations

This site is the old Joseph Fish residence built during the late 1800's and was located in Russell Park on the north side of North Fork Reservoir at what will be the shoreline of the lake. It was initially found during the January 1978 park survey and re-checked by the historical survey that following Spring. During these brief assessments, artifacts diagnostic of the late 19th century were noted in an area of approximately 400 square meters (Fig. 12.0-1).

That Spring it was noticed that vegetation clearing had begun around what was to be the lake edge. NTSU archaeologists expressed concern to Corps personnel that sites such as 41WM399 had been recommended for further work and would need some sort of protection. As a consequence, the Corps personnel at the project office and the clearing contractor were provided with a list and map of the sites which fell within the area to be cleared. As an additional precaution, the perimeters of the sites were flagged with plastic tape and these were then shown to the clearing contractor foreman and Corps liasion officer in charge of clearing.

When 41WM399 and the other sites so marked were returned to for investigation during October, 1978, it was discovered that all the precautions had failed to protect the sites and that they had been bulldozed and destroyed. No surface collection of artifacts was accomplished at 399 and the extent and degree of disturbance made any testing of dubious value.

Artifacts

The artifact assemblage observed at this site is characteristic of a turn of the century farmstead. This includes cut nails, stone and earthenware, coffee grinder parts, and an oil lamp wick holder.

Comments

The fate of this site strongly points out the need for accomplishment of archaeological investigations during the planning rather than the construction phase of reservoir development. Furthermore, once the decision has been made to investigate a resource it must be protected until such work is consumated.

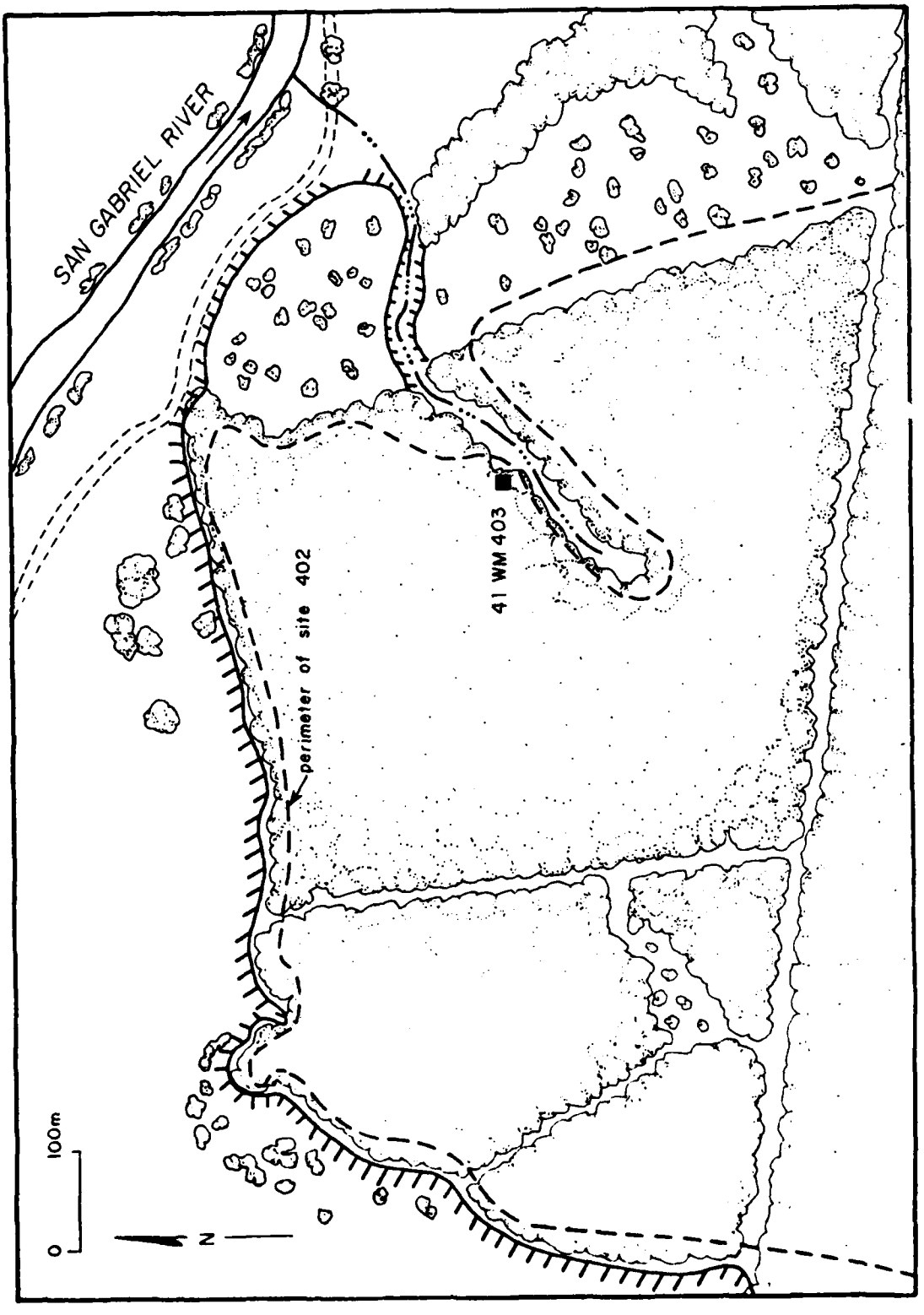


Figure 13.2-1. Location Map of Site 41WM403.

13.2 Site 41WM403

Investigations

This site is a small (5.50m x 4.70m) single room historic rock structure (Fig.13.2-1) located on the southern upland edge of the river valley in the middle of prehistoric site 41WM402.

When first located the site was a jumble of natural limestone blocks with the north and south walls only partially visable. The chimney area and remaining walls became apparent when the obviously out-of-place rocks were cleared away and soil which had piled up around and in the structure was cleared out (Figs. 13.2-2, 3).

The exterior walls were placed directly on bedrock and a small amount of mortar was placed between. The mortar was made of powdered limestone, sand and wood ash. Thin flat limestone blocks were also found adjacent to the exterior of the western wall. These may have served as a porch or flagged entrance for the structure. No formal doorway was noted but it probably was adjacent to the "porch". No evidence of pier and beam or raised flooring was noted and it is probable that the structure had a dirt floor. Several pieces of window glass were found indicating that the structure had at least one window.

Twenty centemeter wide trenches were taken down to bedrock along the interior and exterior of the northern and western walls and along the interior of the southern wall, and the exterior of the eastern wall. In addition the fireplace area was cleaned to bedrock and a 1 x 1 meter test unit was placed in the northwestern interior corner and taken down to bedrock (20cm.). A similar unit was placed in the southeastern interior corner and a third 1 x 1 m. unit was placed adjacent to the northwestern units southern side. These controlled units as well as the trenches were excavated in order to provide a sample of the artifacts associated with the structure. All removed fill was passed through a ¼" screen. Unfortunately, here as in the case of several other sites the crew chief disappeared with site records before the analysis and write-up could be accomplished. In an attempt to gather some of the removed data, Ms. Nancy Reese and Mr. James Thomson of the Institute of Applied Sciences returned to Georgetown and conducted a deed and records search (Table 13.2-1).

The first record on the area in question is a deed to a Joseph M. Fish for 350 acres on the 11th of February 1846 from the Republic of Texas. It passed through a number of individuals including one of the early Anglo settlers of Williamson County, Ezekiel M. Rhea, in 1867. None of the records indicate the structure in question, but in 1874 an eight acre block surrounding the site was separated from the original 350 acre tract. It is purely speculative but the stone house may have been built shortly

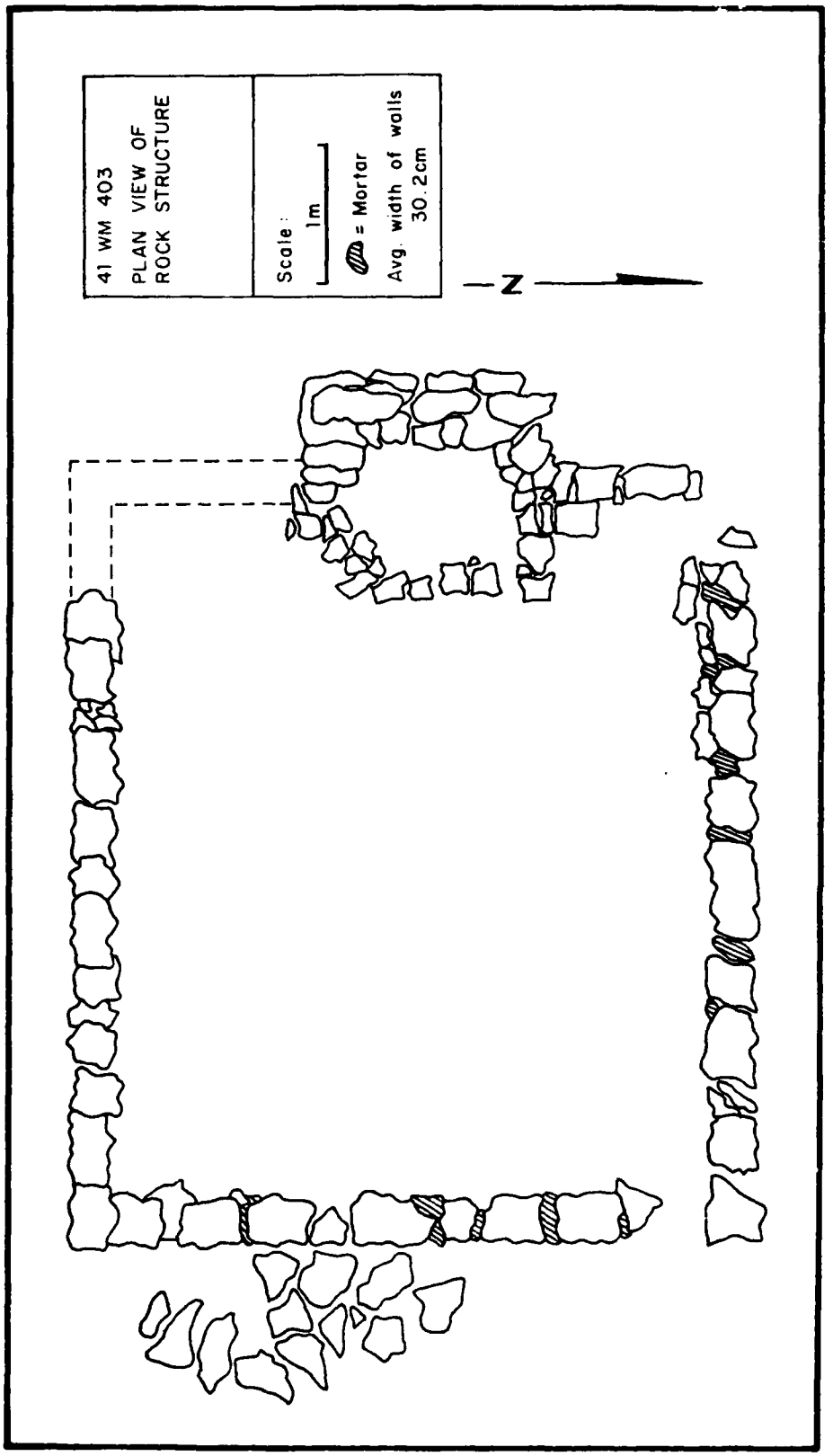
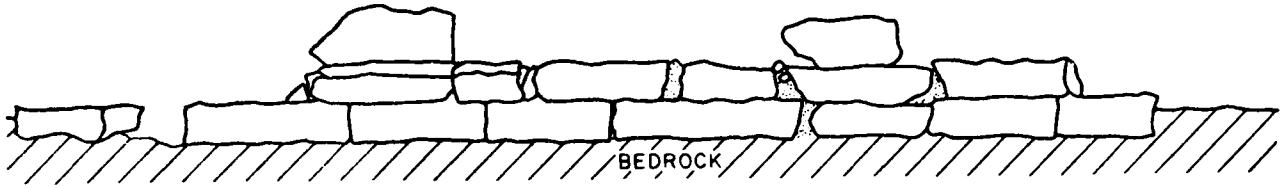
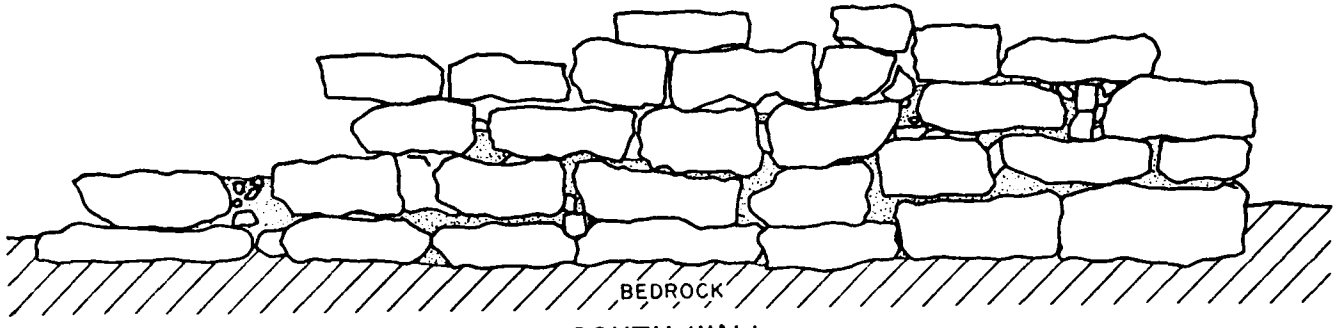

41 WM 403
PLAN VIEW OF
ROCK STRUCTURE
Scale:
1m
= Mortar
Avg. width of walls
30.2cm
N

Figure 13.2-2.



NORTH WALL

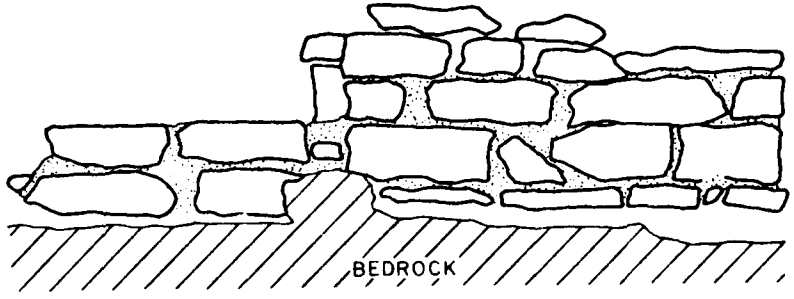


SOUTH WALL

Limestone

Mortar

0 50 cm



WEST WALL, FIREPLACE

41 WM 403

EXTERIOR WALL FACES

Figure 13.2-3.

Table 13.2-1. Ownership history for Joseph Fish Survey A-232 Tract 200-1 which contains site 41WM403

Owner/Buyer	Acreage	Amount	Date
Republic of Texas to Joseph M. Fish	350 acres	Patent	11 Feb. 1846
J. M. Fish to Elbert Dresser	"	$1	6 Aug. 1855
E. Dresser to L. S. Robertson	"	$300	25 Jan. 1866
L. S. Robertson to George L. Bagwell	"	"	1 Dec. 1866
G. L. Bagwell to Ezekiel M. Rhea	"	$450	14 Nov. 1867
E. M. Rhea to W. R. Piper	"	$400	17 Jan. 1870
W. R. Piper to Charley Norvell and Green Thomas	8 acres	$35	2 Oct. 1874
Green Thomas to Peter Norvell	"	$10	9 Aug. 1879
Peter Norvell to George West	"	---	17 Dec. 1901
Fannie Norvell to George West	"	$248	6 Dec. 1902
George West to Wayne A. Adams	"	---	10 Feb. 1915
Wayne D. Adams to Austin Adams	"	$1	17 May 1938
Austin Adams to J. E. Peck	"	$2367	19 May 1938
J. E. Peck to Roy F. Gunn	"	$30325	26 July 1946
R. F. Gunn to U. S. Govt.	553 acres	$176930	4 March 1971

after this time since the only identifiable artifact recovered at the site was a fragment of semi-porcelain with the mark of the Edward Clarke Company of Tunstall, England, a type which was not manufactured by the company until 1877.

Artifacts

Table 13.2-2 is a listing of the artifacts recovered from the testing of site 41WM403. Several of the categories, such as nails, have been condensed for presentation. The datable materials all fall within a period between A.D. 1850-1890.

Table 13.2-2. Artifacts recovered at site 41WM403

#	ITEM	#	ITEM
18	Clear Bottle Glass Frags.	1	Grey Paste Stoneware
55	Brown Bottle Glass Frags.	12	Beige Paste Mortar Frags.
8	Olive Green Glass Frags.	2	Milk Glass 4-hole Button
44	Purple Glass Frags.	1	Fence Staple
6	Dark Green Glass Frags.	63	Cut Nails
78	Green Tint Plate Glass Frags.	2	Wood Screws
7	Clear Plate Glass Frags.	15	Misc. Metal Frags.
37	Aqua Tint Glass Frags.	1	Horseshoe
28	Green Tint Glass frags.	1	Brass Lamp Vent
4	Clear Glass Lamp Chimney Frags.	4	"Griddle Stone" Frags.
34	Fine White Paste Earthenware	2	Slate Frags.
1	Semi-porcelain Frag.	1	Wooden Dowel, Cedar
9	Fine White Paste Stoneware		

Fauna

Species	# of elements
Fox Squirrel	3
Goat	1
Cow/Bison	18
Pig	10
Medium Mammal	1
Large Mammal	11
Prairie Chicken	1
Turkey	1
	46

Comments

Since the majority of the information gathered on this site was perloined by the individual in charge of the investigations, much more data than is presented here is available on this site. With in-hand data, however, it appears that site 41WM403 represents one of the earlier settlements in the North Fork reservoir area dating from the mid to late 19th century. The structural remains are of a single room rock house.

It is strongly recommended that the remaining structure be stabilized and preserved for park visitors as an example of early architecture in this section of Texas.

13.3 41WM408

(Fisher House)

Investigations

Little may be said concerning the Fisher house and farm at this time the records on the site and investigations were taken by the crew chief before they could be analyzed and written up. The site was recommended for investigation by the NTSU Historical Survey in March of 1978. Here, as elsewhere, researchers found that the site had been extensively bulldozed following the survey and recommendation but before such investigations could be initiated.

A subsequent records search indicates that the house may have been built by Moses Fisher in 1860; although a T. P. Fisher took control of the property in 1912 and it is more likely that it was constructed at that time (Table 13.3-1). Fortunately the present author had prepared a plan map of the site before turning the investigations over to one of the crew chiefs and this is Figure 13.3-1a. The identifiable remains at the site consisted of a house area, two wells and two septic tanks.

The older of the two wells was hand dug and rock lined (Fig. 13-3-1b). It is similar in construction to the well discussed at site 41WM409, the Tyalor House. The older of the two septic tanks was hand dug and covered over with timber. The more modern one is of precast cement; and the modern well has a metal casement.

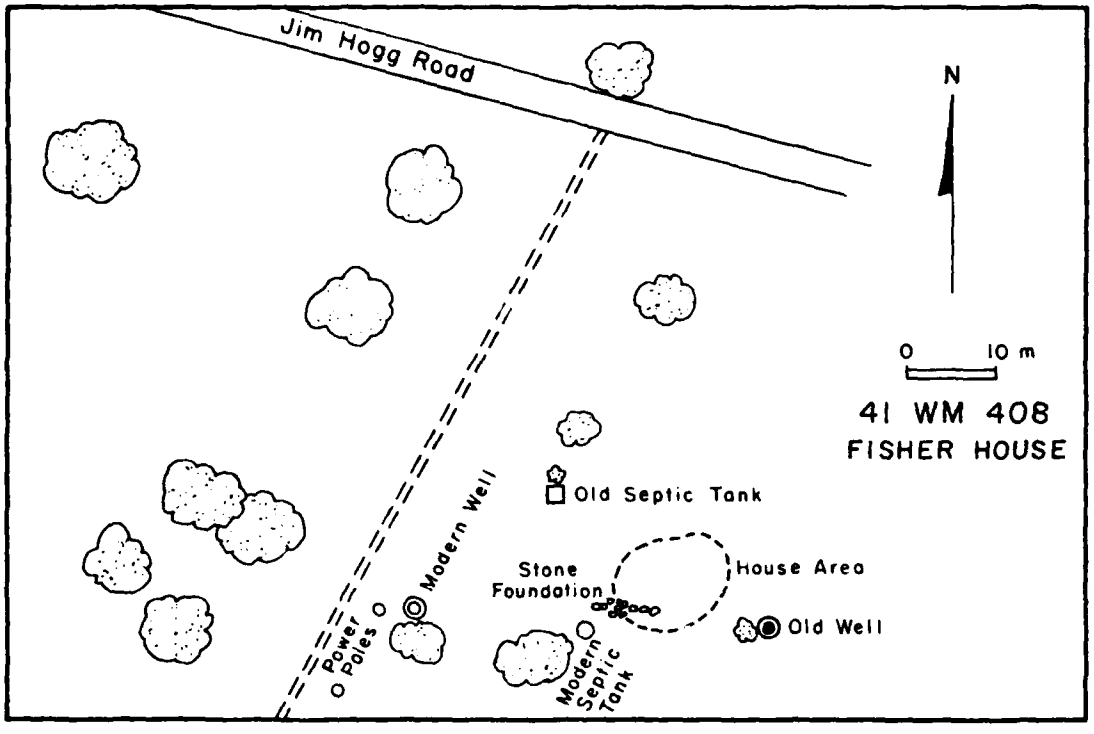
Comment

Little more can be said about this site at this time since much of the site was destroyed by clearing operations and what little data that was collected is presently not available.

Table 13.3-1. Ownership history for the Warren G. Wilkinson Survey A-670 Tract 305 which contains site 41WM408, The Fisher House

Owner/Buyer	Acreage	Amount	Date
Republic of Texas to Warren G. Wilkinson	160 acres	Patent	12 Oct. 1846
Moses Fisher (for Wilkinson) to Alson McCaleb	"	Traded 320 ac.	12 Oct. 1846
Alson McCaleb to Nicholas S. Crunk	"	---	29 March 1849
N. S. Crunk to Benjamin R. Thompson	"	---	27 July 1850
B.R.Thompson to James A. Graves	"	---	6 Aug. 1855
J. A. Graves to Thomas P. Hughes	"	---	3 July 1856
T.P. Hughes to Moses Fisher	"	---	10 Aug. 1860
Republic of Texas/General Land Office	"	---	17 Oct. 1862
Republic of Texas to W.G. Wilkinson	"	Patent	24 Sept. 1864

W. A. Jenkins to T.P. Fisher	108 acres	$1500	5 March 1912
T.P. Fisher to Texas Vet. Land Board	156 acres	$4900	6 April 1951
Texas Vet. Land Board to Kenneth E. Spielman	"	"	27 March 1951
K. E. Spielman to D.C. Mott	"	$17160	6 April 1961
D. C. Mott & J. M. Mott to U.S.Govt.	212 acres	$93050	-- March 1971


Jim Hogg Road
N
0 10 m
41 WM 408
FISHER HOUSE
Old Septic Tank
Modern Well
Stone Foundation
House Area
Old Well
Power Poles
Modern Septic Tank

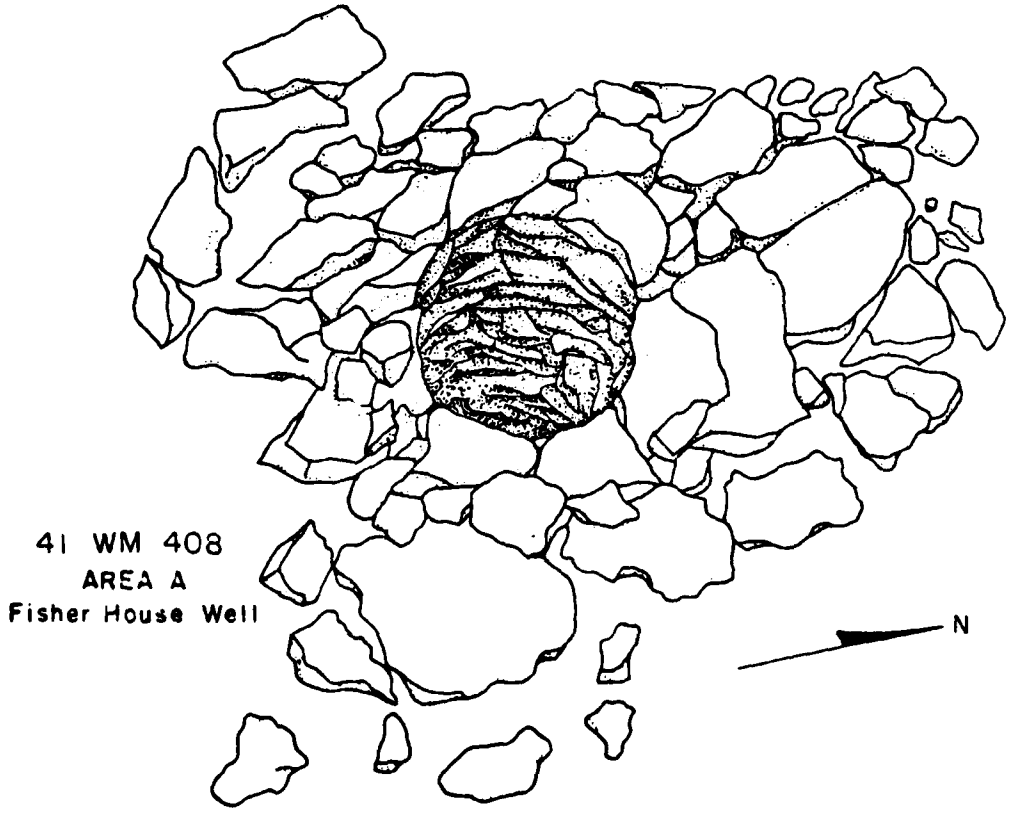

41 WM 408
AREA A
Fisher House Well
N

Figure 13.3-1

13.4 41WM409

(Taylor House)

Investigations

The Taylor house and farm was first recorded during the 1978 NTSU Historical survey of North Fork Reservoir. At this time the main house had been taken down but the chimney remained as well as two wells and clear evidence for several outbuildings. Surface artifacts also indicated that a cotton gin had been in operation some place on the property. When the site was returned to for investigation it was found that it had been bulldozed. The exact locations of the outbuildings could not be identified and all that remained of the main house was the footing for the fireplace which was slightly below ground level and had thus escaped the blade. Both wells were located and it was decided to sample the hand dug one for period artifacts. At the same time the area around the fireplace footing was cleaned, photographed and drawn; and a general collection of the surrounding area was made.

Since the well was located adjacent to a slope it was decided to cut a backhoe trench into the side of the well from the slope. This was accomplished and a column of rock was removed down one side of the well as it was excavated in arbitrary 10 to 20cm levels. This technique allowed excavations to have easy access to the interior and greatly increased the safety factor for crew members (Figures 13.4-1, 2).

Table 13.4-1 presents the ownership record of the site as nearly as could be reconstructed from records from Williamson County. Unfortunately here, as elsewhere, the crew chief removed many of the records and notes on the site. This theft of government property makes further detailing of work at this site difficult.

Table 13.4-1. Ownership history for the John Sutherland Survey A-554 Tract 300 which contains site 41WM409, The Taylor House

Owner/Buyer	Acreage	Amount	Date
Republic of Texas to John Sutherland	432 acres	Patent	5 Dec. 1856
John Ray to S. F. Vickers	375 acres	Will Deed	3 July 1883 (?)
S. F. Vickers to W. T. Ray	"	$200	12 June 1887
W. T. Ray to Isabella Piety/Effie E. Watson	432 acres	---	14 May 1938

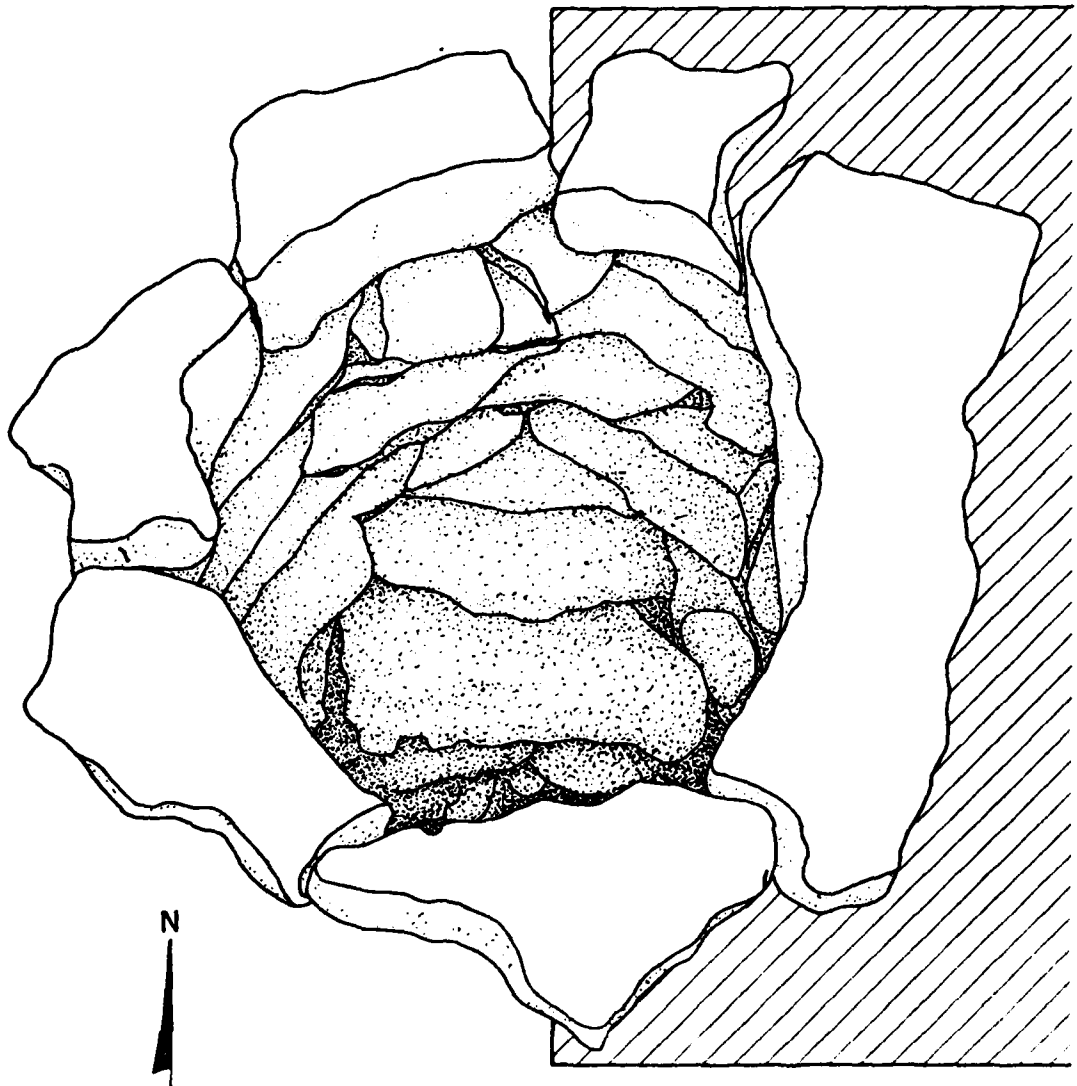
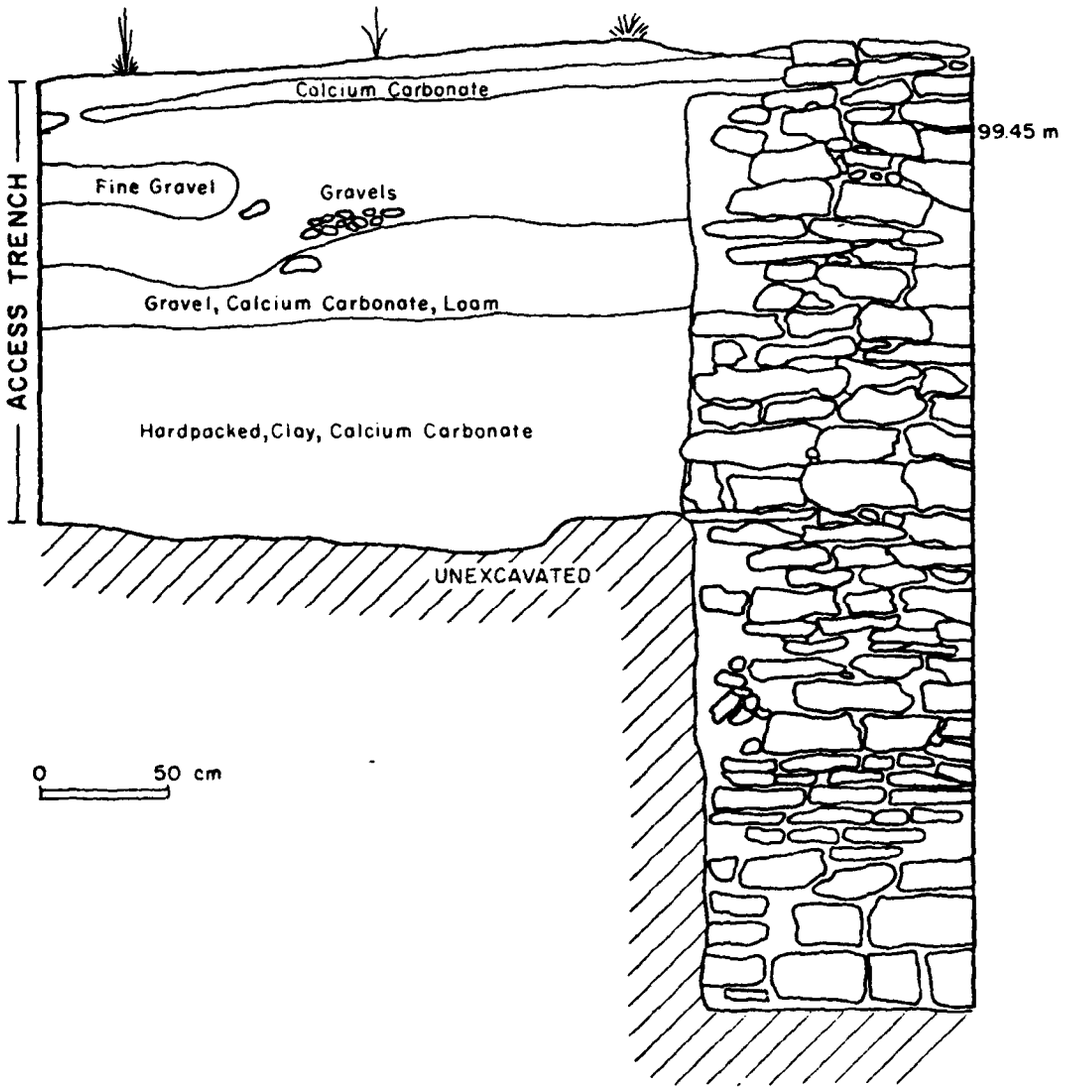


Figure 13.4-1.



41 WM 409
BACKHOE TRENCH 1/TAYLOR WELL
South Wall Profile

Figure 13.4-2.

I. Piety/E. E. Watson to Edward Jenkins	432 acres	$3000	22 June 1938
E. Jenkins to Willie Jenkins Adams	592 acres	Gift Deed	20 March 1964
W. J. Adams to A. S. & L. B. Wade	"	$34000	1 March 1965
Agnes S. & Louis B. Wade to U.S. Govt.	"	$105130	9 March 1971

Artifacts

A total of13,222 items were recovered from investigations at this site. Of this number some 12832 came from the cleaning out of the well. Table 13.4-2 shows the distribution of the materials from the general collection of the site and the excavation of the fireplace area. Datable items came only from the general collection and the well and are detailed in Table 13.4-3 .

Table 13.4-2. Distribution of artifacts recovered through general collection and limited excavations of the fireplace location.

ITEM	GENERAL	FIREPLACE
Bottle glass	117	4
Plate glass	18	7
Earthenware	89	0
Stoneware	10	0
Brick	15	14
Household	9	0
toy	3	0
agricultural	11	1
milling (Gin)	11	0
nails	21	5
misc. metal	43	0
horse related	3	0
transportation	1	0

Table 13.4-3. Datable items from the well and general collection.

General Collection
Medicine bottle, "LYRIC" 1916-1929
" " (2), 1905-1917
Ball jar 1920-1964
green glass jar "GOLDE" 1860-1915
brown glass jar "HALE" 1860-1915
metal well wheel (Sears) 1897
Texas license plate 1935

Well
dark green medicine bottle (level 1) 1815-1885
dark purple " " (levels 1 & 4) 1880-1925
brown screw top bottle (level 1) 1929-1954
" glass bottle, "S B. & G. Co. (level 1 ?) 1881-1905
aqua tint panel bottle (level 1) 1860-1915
4-hole tin covered wooden button (level 1) pre 1900
fine white paste earthenware sherd (level 13) "Arthur J. Wilkinson" 1896

The only other items of note from the well were a number of metal addressograph plates from levels 4-10 with names and addresses in the general area and premium amounts. These are thought to have been from an insurance company, and judging from the amounts (eg. $6 annually) they probably date from just after the turn of the century.

Fauna

The faunal elements recovered from the well are listed in Table 13.4-4. Obviously several of the species are fortuitious, such as the armadillo, frogs, squirrel and cat. These either fell or were thrown into the well for disposal. The remaining, excluding the rats, probably were food species utilized by the sites inhabitants.

Table 13.4-4. Fauna recovered from well area

SPECIES	# ELEMENTS
armadillo	78 nearly complete individual
cottontail rabbit	1
fox squirrel	20 nearly complete individual
cotton rat	9
black rat	4
domestic cat/kitten	82 nearly complete individual
whitetail deer	1
cow/bison	1
pig	13
large mammal	13
frog sp.	21
	243

As mentioned earlier many of the records on this site are presently not available; but it seems likely that it was first occupied some time after 1883. The majority of datable materials both from the general collection and the well excavations date from no earlier than the 1880's (Table13.4-3). This fits well with the deed record for the site in that the longest ownership following the original patent was a W. T. Ray from 1883 to 1938.

Quite obviously the earliest manufacturing date possible on a given cultural item has relatively little to do with its disposal date. This is illustrated by the medicine bottle found in the top portion of the well which has a manufacturing date of between 1815 and 1885; while metal addressograph plates dating from the early part of the 20th century were found in the middle (level 6) area of the well fill.

It appears quite likely that the well was used only as a refuse pit after about 1925. The similarity of construct on technique and fact the well at site 41WM408 is on the same aquifer may mean that they both went dry about the same time. Both sites have more modern drilled and cased wells which were in use until abandonment following government purchase of the property.

Comments

It is difficult to understand why this site is called the Taylor house when the deed record does not show anyone named Taylor being an owner. It is possible that someone named Taylor rented or leased the property, but without the stolen records this is speculation.

From what evidence is available it appears that the Taylor site

was settled during the latter part of the 19th century. It was added on to and changed until by the time of government acquisition it consisted of a dwelling, two wells, several outbuildings and a cotton gin. The location of the latter was never firmly established. Clearing of the structural remains at the site and the theft of documentary data on the site have irreparably damaged interpretation of this site.

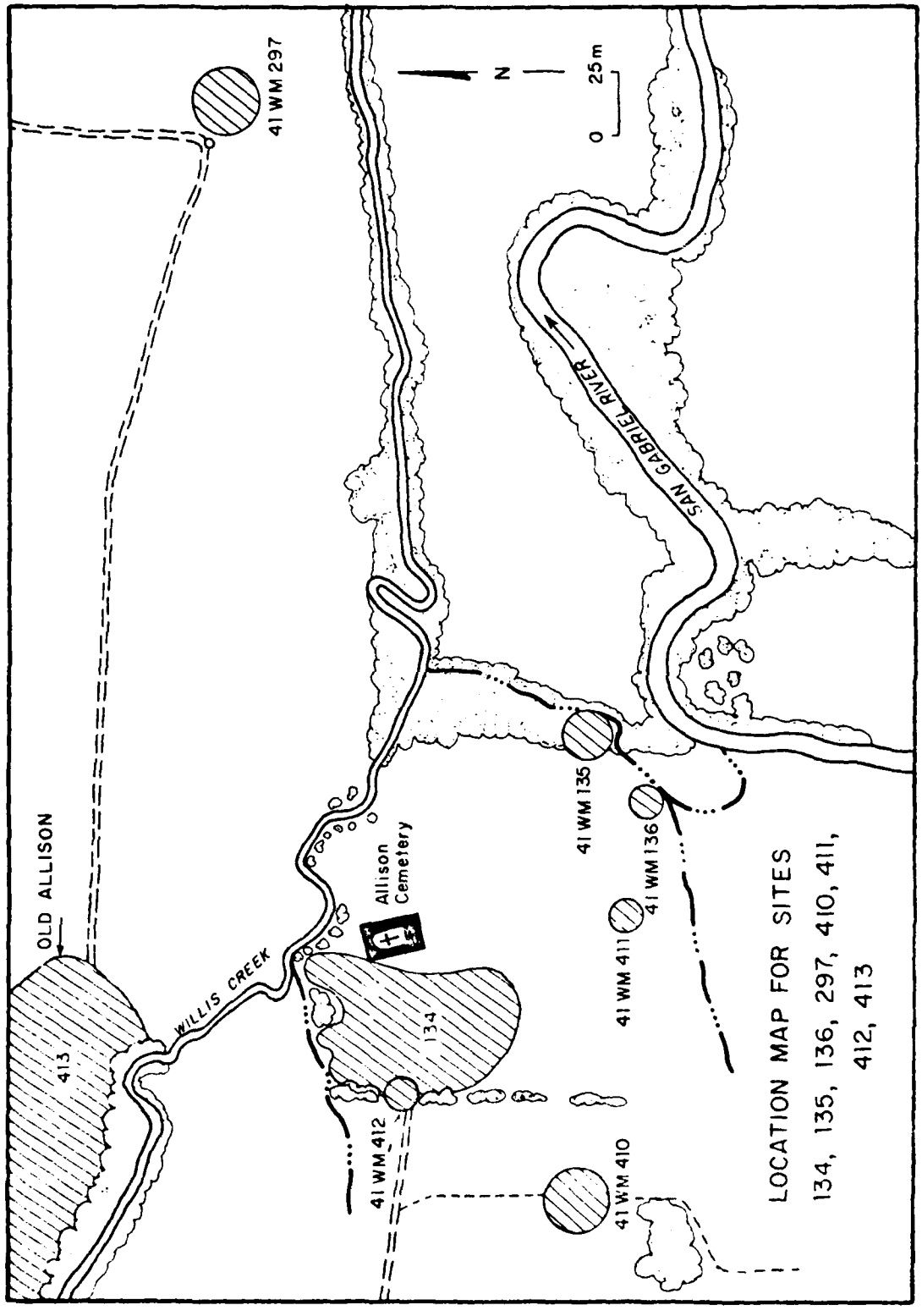

41 WM 297
N
0 25m
SAN GABRIEL RIVER
OLD ALLISON
413
WILLIS CREEK
Allison Cemetery
134
41 WM 135
41 WM 136
41 WM 411
41 WM 412
41 WM 410
LOCATION MAP FOR SITES
134, 135, 136, 297, 410, 411,
412, 413

Figure 13.5-1.

13.5

41WM410

(Bartosh Cellar)

Investigations

This site is the remains of a filled-in cellar which was profiled by a recent gravel pit between the San Gabriel River and Willis Creek in Granger reservoir (Fig. 13.5-1). The site was first noted in the wall of the gravel pit during the historical survey; and it was determined at this time that it was originally associated with the Bartosh house, the remains of which had been obliterated by the graveling operations. In addition to the cellar, the site contained a hand-dug, brick-cased well to the north (upslope) of the house location (Fig. 13.5-2).

The gravel pit was first cleaned and profiled in order to determine the exact shape of the cellar remains. This was then drawn and photographed. A contour map of the entire site area was made and a 1 x 1.5 m test unit was placed in the top center of the feature. This test unit was taken down in arbitrary levels until the earliest (late 1800-early 1900's) materials were encountered (Fig.13.5-3Zone A). The fill above this point contained beer cans and artifacts of modern origin and was removed as a unit. Cultural Zone A was excavated stratigraphically and was segregated from Zone B. Excavations were continued until the bottom of the cellar was reached. At this point cultural materials became very sparse and the only thing of note on the original floor of the cellar were several charred logs, possibly associated with either the ceiling or wall support for the structure. One arbitrary 10 cm level was placed below the floor of the cellar, but this proved to be sterile.

Artifacts

Table 13.5-1 lists the artifacts recovered during excavations and only those which can be dated will be discussed here.

Surface and General

clear glass "OXIDINE" bottle, ca. 1900+
purple glass lamp shade frag., ca. 1880-1925
Western Stoneware Co. "Old Sleepy Eye" pitcher, ca. 1906+
"Mrs. Stewarts Bluing" bottle, ca. 1916-1929
aluminum dressing comb w/floral design (Sears), ca. 1908+
clear glass medicine bottle w/"Penslar" name, ca. 1900+

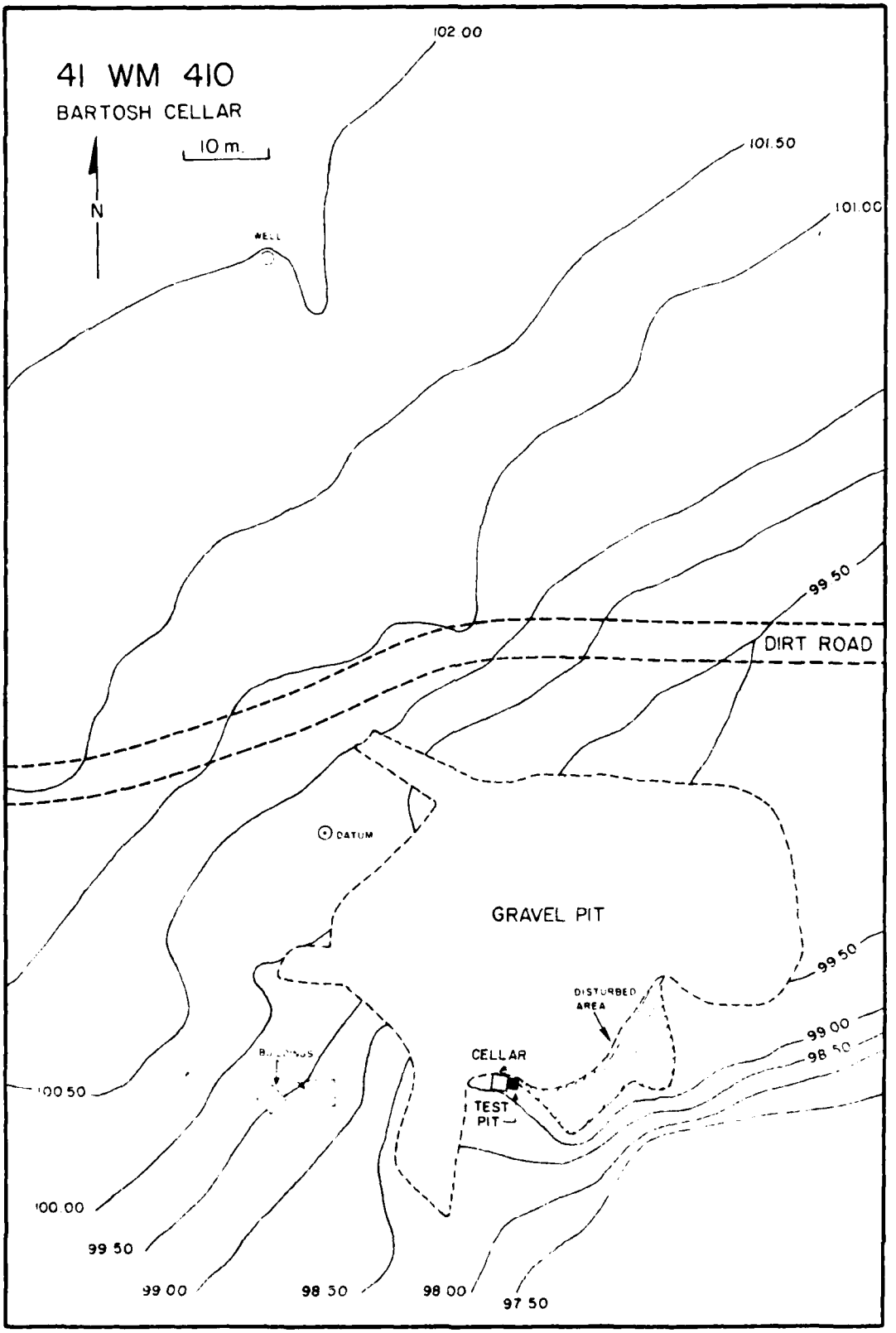

41 WM 410
BARTOSH CELLAR
10 m.
N
WELL
102.00
101.50
101.00
99.50
DIRT ROAD
DATUM
GRAVEL PIT
DISTURBED AREA
CELLAR
TEST PIT
99.50
99.00
98.50
100.50
100.00
99.50
99.00
98.50
98.00
97.50

Figure 13.5-2.

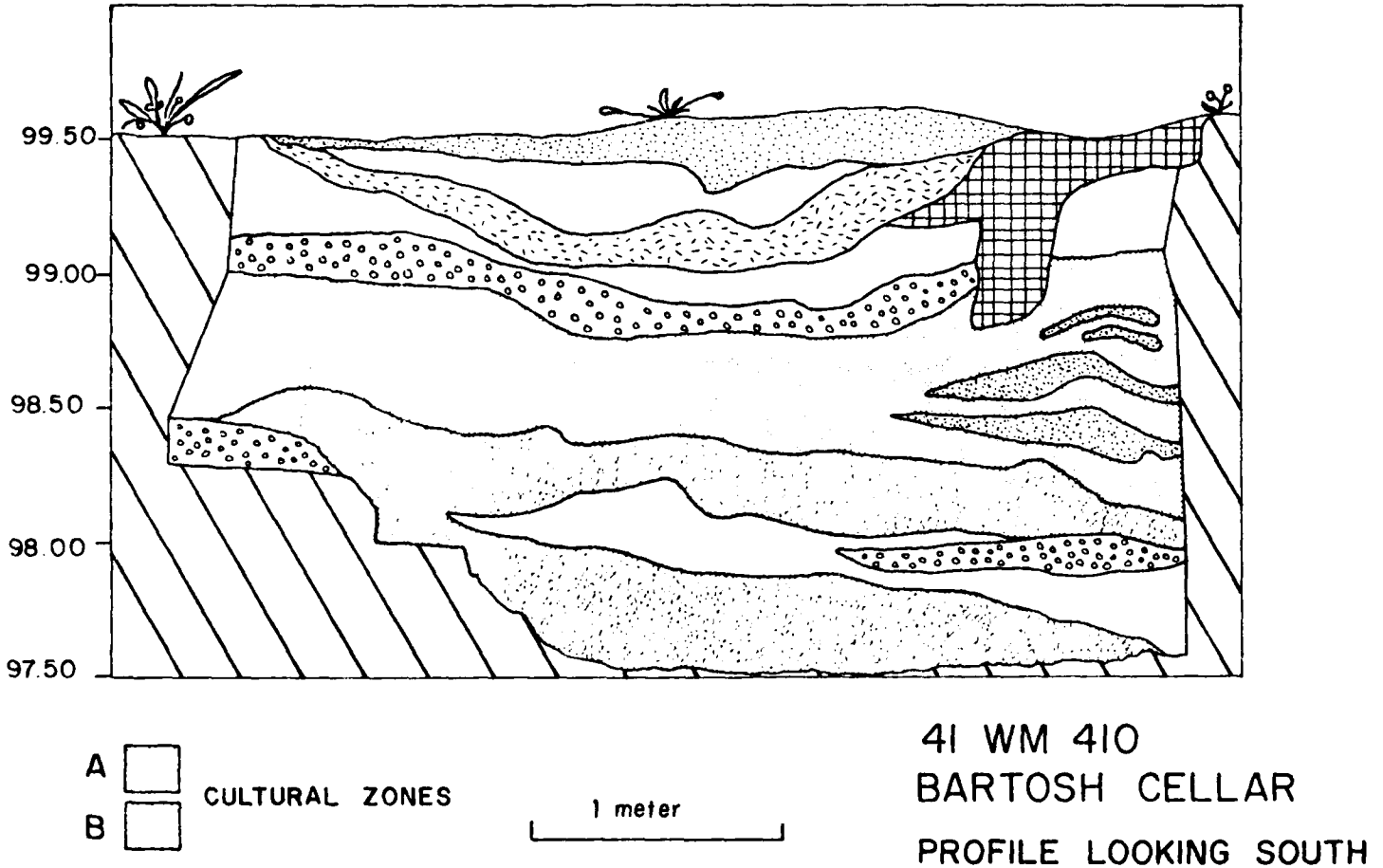

99.50
99.00
98.50
98.00
97.50
A
B
CULTURAL ZONES
1 meter
41 WM 410
BARTOSH CELLAR
PROFILE LOOKING SOUTH

Figure 13.5-3.

Table 13.5-1. Artifacts from Bartosh Cellar (41WM410)

RECOVERY AREA / MATERIAL	Clear Glass	Colored Glass	Plate Glass	Fine White Paste Earthenware-Undecor.	Fine White Paste Earthenware-Decorated	Fine White Paste Stoneware-Undecorated	Fine White Paste Stoneware-Decorated	Coarse paste Earthenware	Coarse Paste Stoneware	Brick	Mortar, Cement	Household Related	Stove Fragments	Clothing Related	Toys & Entertainment	Gun Related	Wagon Parts & Horse	Agriculture Related	Fence & Net Staples	Cut Nails	Wire Nails	Screws, etc.	Wire	Springs	Sheet Metal, "Tin" Can Fragments	Wood Fragments	Bone Fragments	Charcoal Fragments	Identifiable Metal	Unidentifiable Metal	Metal Mesh Screen	TOTAL
Surface - From dump & pit profile	11	10		1	3			7	3																							35
Recovered from recent wall slump	8	4	2	2	4	1		3	1			9					1						2		23		10	1				71
Surface clearing	10	6		2	2		3	2				1					1			2		2	1		22				2	2		58
Surface to 98.65 cm BD (Level 1)	38	17		6	1	9	5	7				5		1			2			2	17		21		93					10		234
Test #1 Level 2 98.65-98.40/98.03, Zone A	884	384	4	48	46	3	17	4	33		9	33	27	154	1	3	14	7	1	3	53	1	301	1	888			10		1	35	29[illegible]
Level 3 98.40-97.93, Zone B	9	6		1										1									3		24							44
Level 4 97.93-97.78, Zone B	7																				1				9	82						99
Level 5 97.78-97.50, Zone B	9	27		9		1	6			1	1			8				1		4	21		8		15	257						368
Floor of Cellar (Level 6)																	1															1
North Face Profile	4	2							1	1													1						1			10
Wall Wash Out				4	1		1																									6
TOTAL	980	456	6	68	57	14	32	23	37	1	10	49	28	164	1	3	18	9	1	11	93	3	337	1	1074	339	10	11	2	14	35	3892
%	25.00	12.00	.15	1.75	1.46	.36	.82	.59	.95	.026	.26	1.26	.72	4.21	.026	.077	.46	.23	.026	.28	2.52	.077	8.66	.026	27.62	8.70	.26	.28	.051	.36	.90	

Level 1 (99.50-98.65)

purple glass bottle frag. w/"Garrett & Co. Est. 1835", ca. 1880-1915

Level 2 (98.65-98.40 and 98.03 on w. end) Zone A

clear glass bottle frag. w/"W.F. Severa, Cedar Rapids, Iowa", ca. 1860-1915
purple glass frags., ca. 1880-1915
clear glass bottle frag. base w/"OXIDINE", ca. 1900+
purple glass frag. w/"SANFORDS 43", ca. 1880-1925
fine white paste stoneware w/pink transfer underglaze, ca. 1800-1870
purple glass frag. w/"S" (Swindell Bros.) ca. 1880-1925
brown glass bottle frag. w/"JOS. TRINER CHICAGO" ca. 1900+
clear glass bottle w/"Watkins", ca. 1860-1917
clear medicine bottle w/"LYRIC", ca. 1916-1929
purple whiskey bottle frag. (Frieberg & Kahn Old 92 Whiskey) ca. 1880-1915
fine white paste saucer w/"Viterous, F. Owin Knowles China Co. 18__"
decorative caste iron stove grill (Sears), ca. 1895+

Level 3,4,5 (98.40-97.50) Zone B

purple glass bottle screw type neck, ca. 1900-1925

Many other items, such as hand-made hoe blades and much of the ceramic sample may be generally dated when all of these are computed along with the items listed above and an average is calculated for the major occupation of the site it comes out to be A.D. 1898. The range is from A.D. 1860 to A.D. 1925. Since it is known that the site has been more recently occupied, these dates only apply to the utilization of the cellar and its subsequent filling-in in 1925. The very recent material found in level 1 is attributed to additional disturbance caused by graveling operations some time in the late 1950's.

Fauna

The following animal bones were recovered during testing operations and are reported here simply as an indication of both the domestic and intrusive species found at most historic sites. The large mammal, pig and cow/bison (most probably cow) all exhibit butchering marks made with a saw. The rats, lizards and frogs are obviously intrusive either in the fill pushed into the abandoned cellar or as an example of attrition within the species natural habitat.

cotton rat	1
black rat	1
cow/bison	7
pig	59

large mammal	9	
lizard sp.	3	capsules (over 200 vertebrae)
frog sp.	18	
bullfrog	1	
	103	

Comments

Unfortunately little more can be said concerning this site since the field notes and some of the collected data were stolen by the Crew Chief. If these are ever recovered the analysis may be completed.

13.6 Site 41WM411

Investigations

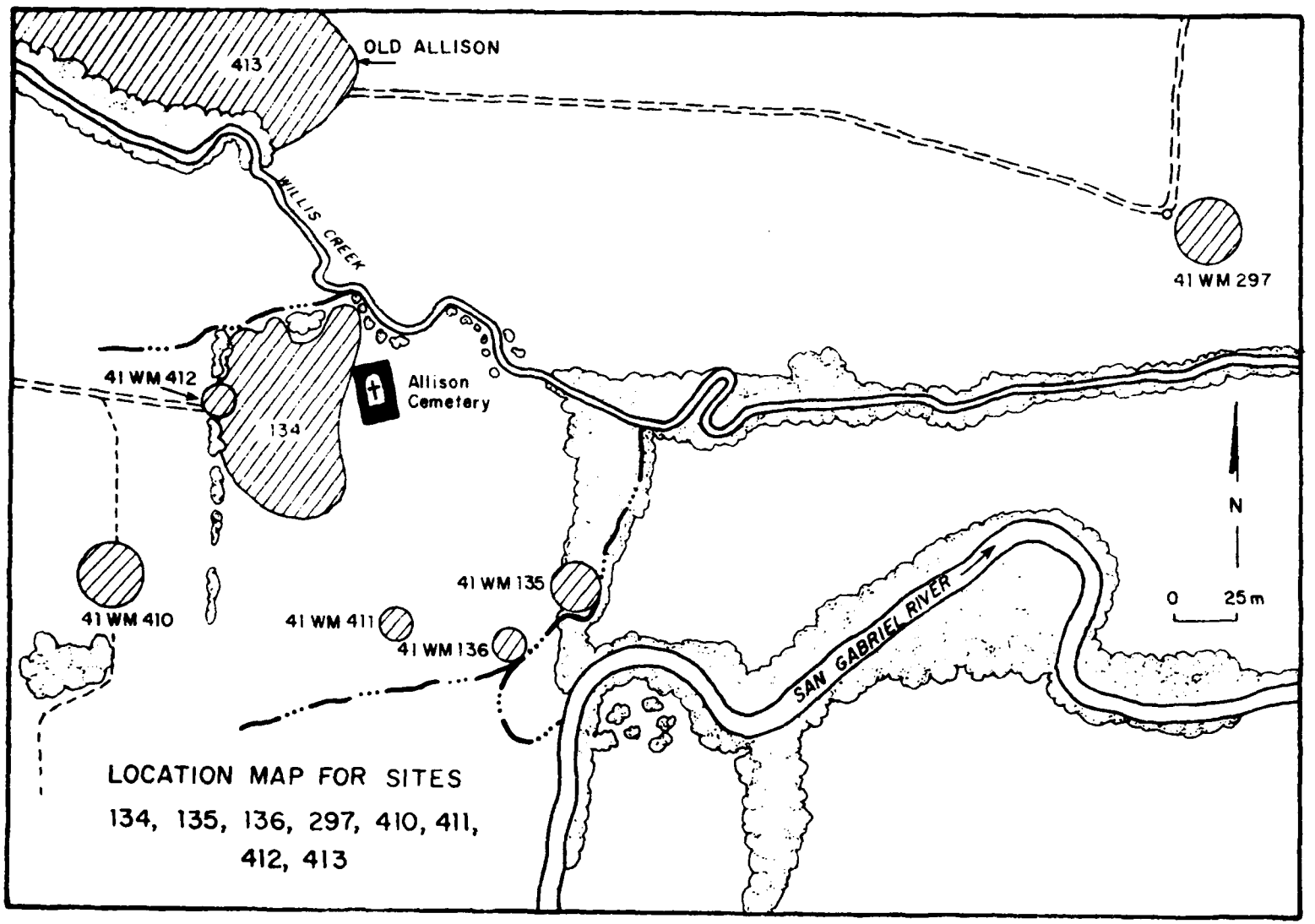
This historic house site was probably part of the Hoxie Ranch dating from the late 19th and early 20th century. It is also most probable that the structure was removed or damaged beyond repair by the 1921 flood. When first located during the historical survey, a small portion of the site had been further destroyed by small gravel pit operations along the terrace face (similar to the one at 41WM410). When it was revisited for testing, it was discovered that a clearing and grubbing operation had totally disturbed the surface area making any speculation on the exact location of the structure difficult. In addition, prehistoric cultural debris from sites 41WM135 and 136 was spread across the entire area. Distinguishing the historic from the prehistoric materials was not a problem. It is mentioned here simply to illustrate the extent of transportation and mixing created by clearing operations (Fig. 13.6-1).

The area of historic artifact scatter was approximately 1225 square m. Across this area a series of 22 shovel tests were placed. Each test was some 50 cm deep by 50 cm wide, going through the culture bearing zone. In only two of these tests were any artifacts noted and these only some bottle glass. The site was then surface collected in order to recover period artifacts, but this, too, proved to be somewhat less than successful. It was concluded that whatever was left of the site following the 1921 flood had been effectively destroyed by reservoir clearing operations.

Comments

No conclusions based on the meager artifact collection is warrented here. It is possible that documentation, in the form of historical records, exists for this site; and a records search could be accomplished even after reservoir construction.

Figure 13.6-1


OLD ALLISON
413
WILLIS CREEK
41 WM 297
41 WM 412
Allison Cemetery
134
41 WM 135
41 WM 410
41 WM 411
41 WM 136
SAN GABRIEL RIVER
N
0 25 m
LOCATION MAP FOR SITES
134, 135, 136, 297, 410, 411,
412, 413

13.7 Site 41WM412

Investigations

This site was thought to be a tenant farmstead of the Hoxie Ranch complex dating from the late 1800's to the early 1900's. Aside from the general historic artifact scatter, the single distinguishing feature of the site was a circular depression which was thought to be a filled-in well (Fig. 13.7-1).

The site was first carefully surveyed to define artifact concentrations and then mapped (Fig.13.7-2). Since the entire area with the exception of the road had been under cultivation for some years, a surface collection was made by concentration areas. Area 1 could be broken into two distinct artifact scatters although clearing activities and spoil piles from the nearby gravel pit may have artificially created this separation. The cultural materials in this section of the site appeared to be slightly older than found in Areas 2 and 3.

Debris in Area 2 and the shape of the area are interpreted as being related to a house; while artifacts from Area 3 are what one might expect from a barn or outbuildings. Several 1 x 1 meter test units were placed in Area 1 where artifact densities were the highest and in Area 2 adjacent to an old fence line where the amount of previous disturbance was thought to be minimal. An additional excavation unit was placed over the western half of the "well".

"Well" Following the careful excavation of the western half of this feature a number of plastic amonium nitrate bags were found in the fill resting on the floor of the original excavation. These bags were marked as poisonous and a further caution against burning or disposing openingly was printed on the bags. It can only be supposed that whatever function the circular/stepped (see Fig.13.7-2) excavation served, its most recent usage was a disposal pit for very recent fertilizer bags. Zone 1 is recent humus containing beer glass, aluminum pull-tabs and cigarette filters. Zone 2 is a sandy grey/brown soil with Ca Co_3 nodules throughout. Zone 3 is the same as 2 but is more tan and compact; and Zone 4 is a compact tan/brown mottled sandy clay heavy in small gravels. None of the cultural materials recovered from the "well" dated from the earlier occupation period at the site, and it is considered likely that both the origin and use of the feature are recent.

Artifacts

General This collection came from areas outside those designated such as the road, and can not be directly linked to the other

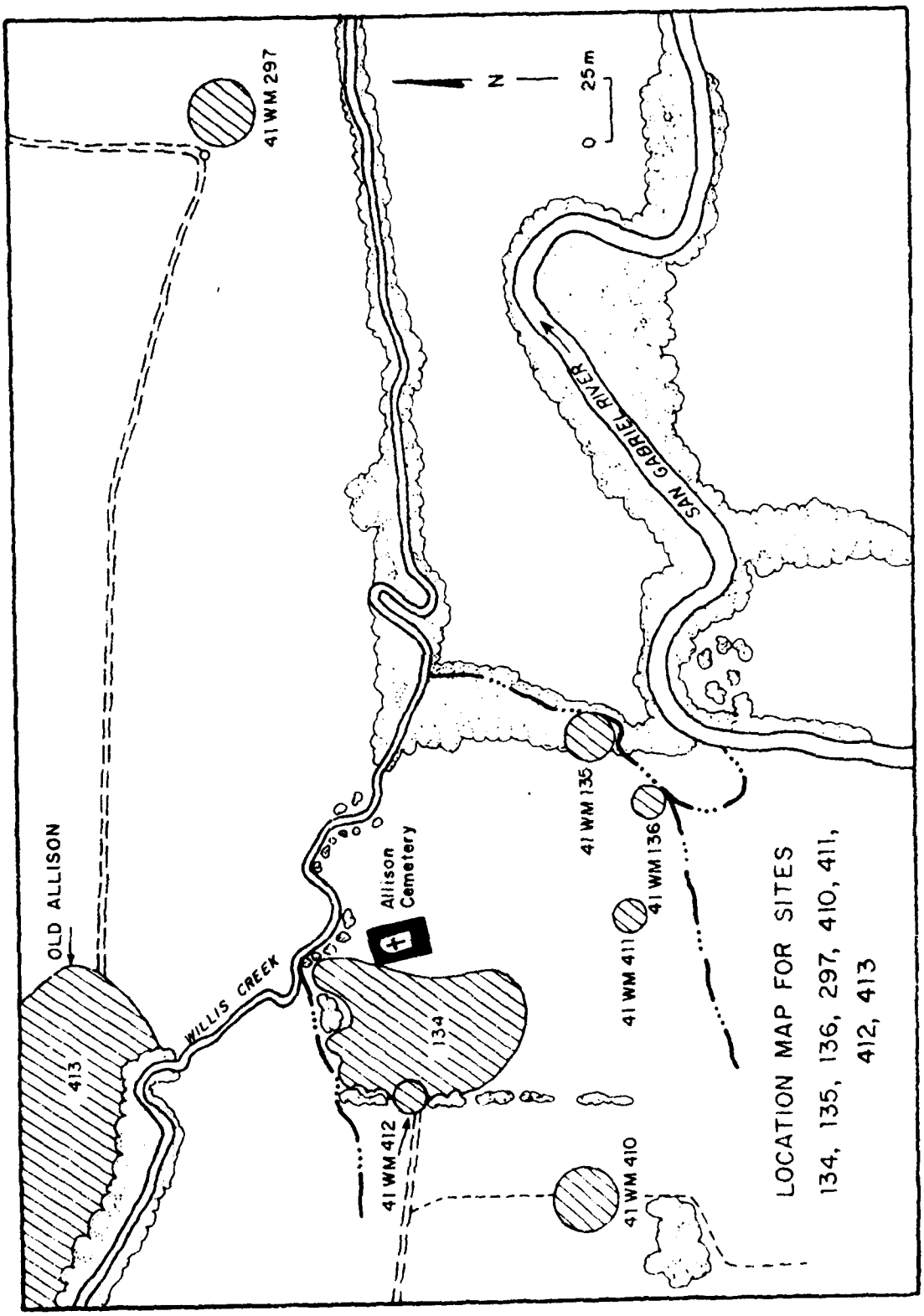

41 WM 297
N
0 25 m
SAN GABRIEL RIVER
41 WM 135
41 WM 136
41 WM 411
OLD ALLISON
413
WILLIS CREEK
Allison Cemetery
134
41 WM 412
41 WM 410
LOCATION MAP FOR SITES
134, 135, 136, 297, 410, 411,
412, 413

Figure 13.7-1

41 WM 412

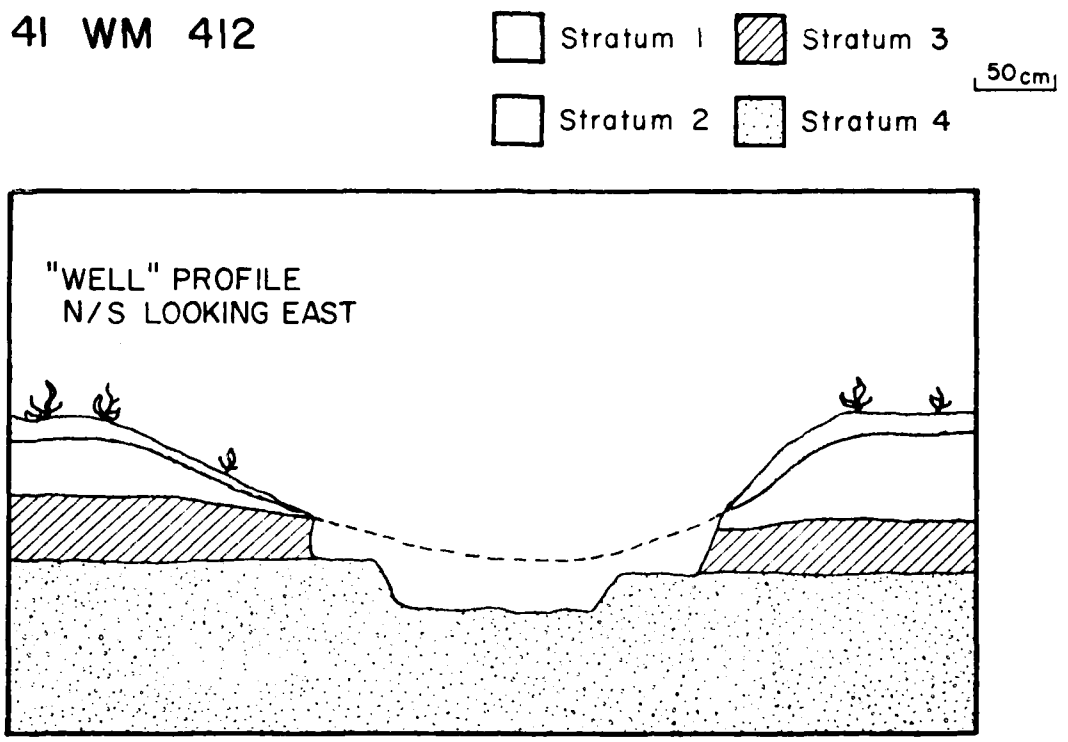


Figure 13.7-2.

concentration.

purple bottle molded bases and neck, ca. 1860-80
milk bowl fragment, ca. 1875+
undated stone and earthenware
cut and wire nail
assorted (color and type) glass fragments
handmade iron barn spike
blade fragment off of a "spreader"

Area 1

milk glass jar w/screw type mouth, ca. 1920-1964
brown glass base w/owen's ring, ca. 1903+
snap case, ca. 1855-1913
green tint glass frag. w/"MARG" raised mark, ca. 1860-1915
purple medicine bottle w/molded neck, ca. 1880-1925
purple glass base frag., ca. 180-1925
purple glass frag. w/molded ridges, ca. 180-1925
purple glass ink bottle base frag. w/"CARTER No. 5 MADE IN. . .", ca. 1880-1925
clear glass base w/a #1 inside of a diamond (Illinois Glass Co.) ca 1916-29
clear glass frag. w/raised "R", ca. 1860-1915
clear glass frag. w/"SKERRGLA" & "P. . ." & "AU", ca. 1915+
clear glass bottle base frag. w/"A" & "K-5862", ca. 1920-1964
4-hole concave center pot metal button, n.d.
Kerr Glass Co. self-sealing Toulouse fruitjar, ca. 1915-1919
clear glass bottle base w/"KERR GLASS MFG CO" & "SAND SPRINGS OKLA" & "PAT AUG 31 1915", ca. 1915-1919
purple glass frag. w/"_BIT_", ca. 1880-1915
brown glass bottle neck frag. w/mold marks, ca. 1900+
fine white paste stone w/"WARREN. . ." and a partial cross, ca. 1870+
fine white paste dolls arm, n.d.
purple glass medicine bottle neck, ca. 1860-80
purple glass frag. w/"A", ca. 1860-1915
green medicine bottle neck w/crown top and ring, ca. 1860-80
clear glass Owen's ring bottle base w/"52" & "3", ca. 1903+
metal fragment from a "BEACON" flashlight

Area 2

metal button w/"HAWK BRAND" and bird effigy
copper "Indian Head" penny, 1898
metal single tree end clips
metal screw-on radiator cap, ca. 1900-1919
caste iron stove fragments
various glass bottle fragments, ca. 1880-1915
misc. earthen and stoneware, n.d.
misc. brick fragments (along fence line)
harness ring

Area 3

green glass snap case, ca. 1855-1913
aqua tint bottle neck w/wide collar 7 dropped ring, ca. 1860-80
mold-blown purple bottle base, ca. 1880-1925
3-piece molded clear medicine bottle, ca. 1810-1890
fine white paste earthenware w/green sponged underglaze decoration, ca. 1820-60
metal wagon parts
metal horse bit fragment
misc. stone and earthenware frags.

Test Pits

No materials not recovered in the general or controlled surface collections were found in the three test pits. All cultural evidence disappeared between 12 and 20 cm.

"Well"

Materials recovered from the excavation fill were mixed with modern materials throughout. One brown glass bottle base dating between 1810 and 1870 and one purple bottle fragment dating between 1880 and 1925 were the only relics of note found in cleaning out ½ of the fill. Fig. 13.7-2 is the profile for this feature.

Fauna

The following list of faunal materials were recovered from the test excavations. Unfortunately the disturbed nature of the site precludes their assignment to a specific occupation period. It is most probable that they are all fairly recent and the assemblage is what one would expect at a farmstead.

goat	1
pig	37
large mammal	1
domestic chicken	1
bullfrog	2
	42

Comments

As mentioned earlier, the entire listing of all the artifacts recovered is not presented here, simply those which can be dated at least to a general period or those thought to be significant for interpreting a certain locale.

It is most likely that the site was occupied as a farmstead from around 1860-1880 and was abandoned in the early 20th century, most probably after the 1921 flood. The mean ($\bar{x}$) date for all the collected materials at the site is A.D. 1899.94 which would round off to A.D. 1900. The more recent trash in the area is a result of modern lease-farming and recent gravel pit operations around the site.

Of note is the fact that Allison Cemetery was located just to the northeast of Area 3 (Fig. 13.7-1). While some of the cemetery was removed, many gravestones remain, several of which were turned up during land clearing operations. There is, however, no clear connection between the farmstead and the cemetery. Area 1 and 2 both exhibit artifacts commensurate with general house debris. Area 3 also appears to have similar debris except for the wagon parts and the horse bit. It must be remembered that the site has experienced moderate to heavy mixing of surface materials through cultivation, and this may account for some of the similarities in area assemblages.

13.8

41WM413

Allison
(Old Friendship)

Investigations

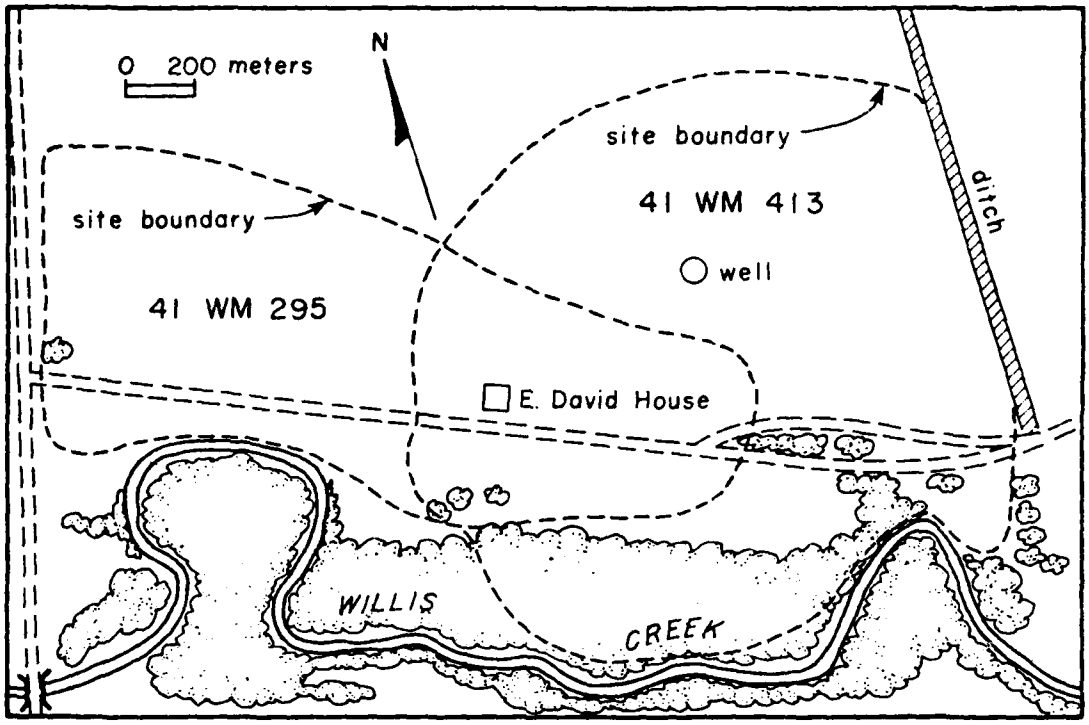
The late 1840's town site of Allison located adjacent to Willis Creek (Fig.13.8-1) was first recorded during the 1978 historical survey of the Granger reservoir area by North Texas State University. At that time the community well and man descrete artifact scatters were noted and it was decided that the site offered researchers an excellent opportunity to define middle and late 19th century Anglo community settlement patterns as well as providing period diagnostic artifacts from a town setting for comparison with those collected at semi-isolated farms.

As mentioned earlier the site was severly damaged by land clearing operations before permission to conduct preservation research was granted. The research design for collecting useful information at the site was hastily revised when investigators arrived at the site and found that the situation recorded during the survey no longer existed. The first order of business was to assess the exact nature and extent of the observed damage. This was accomplished through an intensive pedestrian inspection of the site surface, the banks of Willis Creek and several growing erosion gullies cutting from the creek northward into the site.

This inspection documented that the clearing and grubbing operation had moved and mixed much of the surficial remains of the town site especially on its eastern end. In addition much material had been pushed over the creek bank and gully edges. The community well had been bulldozed and filled-in and the adjacent concrete platform had been removed. It was felt, however, that several isolatable artifact concentrations still existed and that it would be fruitful to concentrate efforts on surface collecting these.

Each of these artifact scatters had its limits flagged and the site was intensively collected, the artifacts so recovered kept separate from all others. Historic accounts of the site mention residences, a gin, blacksmith shop, church, school and a lodge (Scarbrough 1976: 414). Some of these structures were removed by the 1921 flood and several others were canabalized following the flood and subsequently moved to the nearby community of Friendship. However, the scant records that exist indicate that occupation of the general area of the settlement continued until acquisition by the U. S. Government in 1971. Utilization of the area for stock grazing was allowed until 1978.

Attention was next turned to the area of the community well. Wells, particularly abandoned ones, often attract quantities of artifacts representative of the period of active use. These are generally in stratified context, becoming more recent as the top is approached. With the hope of


0 200 meters
N
site boundary
site boundary
41 WM 413
41 WM 295
well
ditch
E. David House
WILLIS
CREEK

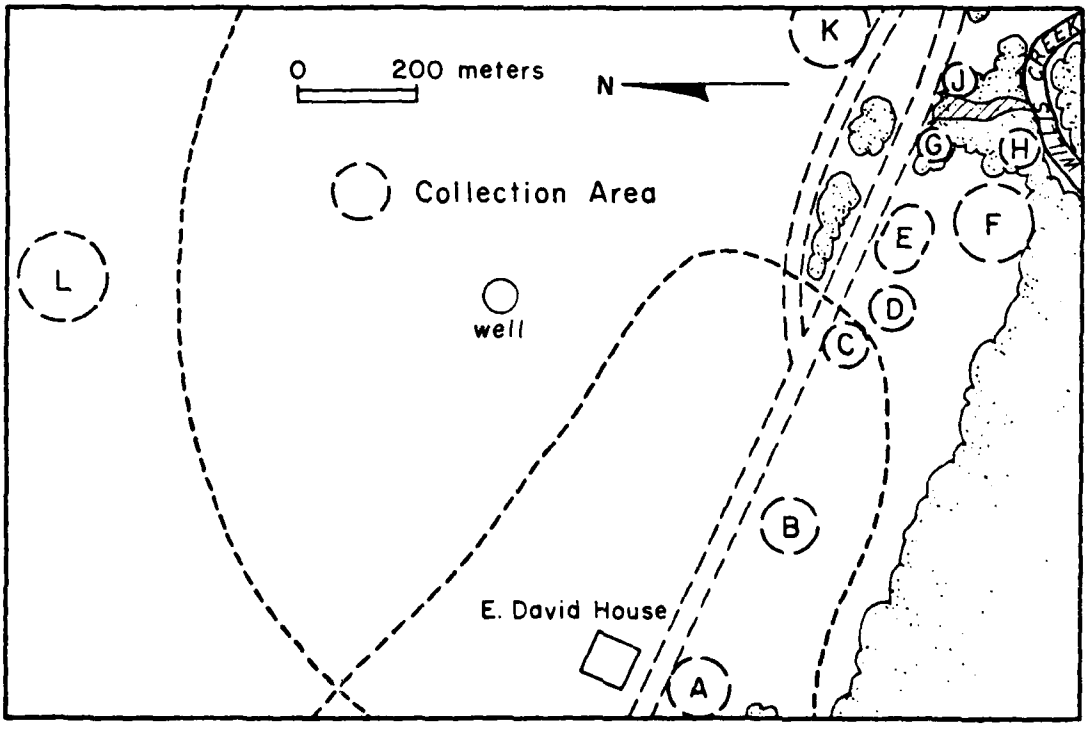

0 200 meters
N
Collection Area
well
E. David House
A
B
C
D
E
F
G
H
J
K
L

Figure 13.8-1.

recovering period diagnostic artifacts and documenting construction techniques a backhoe trench was run across the area thought to contain the well. Bricks were encounted at approximately 1 meter below the surface. Undoubtedly the upper wall sections of the well had been destroyed by recent bulldozing during clearing operations. Approximately 6 courses of brick were cleared, drawn and photographed. The removed soils were checked for artifacts, but only materials pushed in from the surface were encountered. The well is better than 7 feet (Fig.13.8-1) in diameter and it was decided to utilize the remaining allocated time at the site in investigation of the area surface artifacts indicated might be the blacksmithy.

Prior inspection of this area showed that it had been disturbed by landclearing and that several holes had been dug by treasure hunters, probably using a metal detector. The area was first surface collected and then blade-scraped to just below the present surface in order to determine if any structural remains could be defined. Careful scrutiny failed to reveal any and a shallow backhoe trench was then placed through the artifact concentration center to determine if flooding might have silted over and protected some remains. Unfortunately, this operation proved fruitless and it was concluded that such remains as existed following the 1921 flood had been obliterated by the recent land clearing.

Tables below illustrate a representative sample of the artifacts recovered in the various concentration areas. Mean dates are derived from averaging all datable materials from a given area. The location of the blacksmithy seems certain based on the recovered artifacts in Table 13.8-1. The location of the school and gin are less certain, especially since the artifacts were recovered in one of the most highly disturbed sections of the site. Area "I" (Fig.13.8-1) was probably a residential structure (Table13.8-4) as was Area "L" (Fig.13.8-1, Table 13.8-5). The latter is included to illustrate the differences in surficial recovery of artifacts when the area, unlike area "I", has not been extensively disturbed. Presumably all the structural areas along the creek could have produced similar collections had they not been mixed and disturbed.

Artifacts

Rather than listing all the artifacts recovered at the site, several tables have been prepared on the various areas of the site which are discussed in the text and evidence some cultural integrity.

Comments

Allison, originally settled by Elihu Crosswell Allison in 1847 and abandoned as a community in 1921, offered researchers an opportunity to document and study a 75 year period for a small farming community in this section of the San Gabriel River valley. The only other such situation existed at Friendship, just northeast of Allison. Unfortunately, the remains of this community now lie under the government buildings and parking

Table 13.8-1. List of selected items recovered at site 41 WM 413, area F, probable site of blacksmith shop. $\bar{X}$ site = 1886.

#	Item
35	Common horseshoe nails
1	Common wire nails
42	Cut nails
3	Iron kettle fragments
11	Iron carriage bolts
6	Square bolts
3	Iron flat washers
2	Iron nuts
12	Metal screws
7	Horse shoes
6	Horse shoe trimming fragments
2	Metal files
1	Metal butt hinge
2	Hay mower teeth
3	Metal singletree center clips
9	Metal pins
45	Metal fragments with cold chisel marks
249	Misc. metal fragments
2	Light chisels (homemade)
1	Tapered metal punch (homemade)
14	Iron stove fragments
1	Pocket knife blade fragment
1	Iron lock
1	Metal anvil fragment
1	Metal ring snaffle bit
1	Metal gearwheel off seeder

Table 13.8-2. List of selected items recovered at 41 WM 413, area G, possible site of school. $\bar{X}$ date = 1893.

#	Item
3	Caste iron school desk side support fragments
1	Caste iron school desk seat brace
1	Caste iron school desk foot with screw holes
1	Copper pencil eraser holder

Table 13.8-3. List of selected items recovered at 41 WM 413, area H, Possible gin. $\bar{X}$ date = 1882.

#	Item
2	Circular rip saw blade fragments
3	Large metal chain links, 1 hoisted, 2 flat
1	Caste iron wheel with 1 flat side and center hole
1	Metal hinge with rotational piveot
1	Metal crank fragment

Table 13.8-4. Listing of items recovered at site 41 WM 413, Area I, probable residential structure. $\bar{X}$ date = 1886

#	Item
1	Dark blue glass fragment
1	Brown glass fragment
3	Milk glass fragments (1 Mason jar lid)
9	Clear glass fragments (1 glass electric insulator cap frag.)
19	Aqua tint glass frags. (1 glass electrical insulator cap frag.)
4	Green tint glass frags. (2 bottle necks, ring top with short collar under-1 after 1990, 1-1860-1880)
32	Purple glass frags. (1 crown top neck 1860-80, 2 bottle base with owens ring 1903+, 3 oil lamp chimney frags, 1 pitcher frag. 1880-1925)
8	Earthenware, fine white paste (Rim sherds, 1 with raised dots around rim)
8	Earthenware, fine white paste (5 body, 2 base, 1 serving platter frag.)
2	Earthenware, fine white paste (with yellow glaze and floral transfer overglaze)
1	Earthenware, coarse beige paste - bristol glaze interior and exterior
4	Stoneware, fine white paste (2 body, 1 cup handle, 1 rim)
1	Stoneware, coarse tan paste (tan glaze ext., brown glaze int.)
1	Stoneware, coarse beige paste - (grey beige glaze ext., brown glaze int.)
3	Stoneware, medium beige paste - (grey beige glaze ext, brown albany glaze int.)
1	Course beige paste brick frag.
1	Unidt. metal frags.
4	Metal sheet belt frags.
5	Metal sheet frags. (tin cans?)
1	Metal link chain
1	Metal sheet with wire handle holder
1	Metal flatware handle
1	Metal flat head wood screw
1	Metal cut nail spike with rosehead
9	Metal wire nails
1	Iron eye hook
1	Circular saw blade
2	Carriage bolt with nut
1	Metal bar with hole (wagon part)
1	Large slip type buckle
1	Iron pipe joiner
1	Metal slag fragment
2	Coal fragments

Table 13.8-5. Listing of items recovered at site 41 WM 413, area "L", probable early residential structure. $\bar{X}$ date = 1879

#	Item
192	Purple tint glass fragments (1880-1925)
13	Purple tine glass panel bottle fragments
20	Purple tint glass bottle necks (1840-1880)
7	Purple tint pressed glass fragments
3	Purple tint pressed glass pitcher fragments
41	Green tint glass fragments (12 plate glass frags., 1850-1870)
9	Light olive tint glass fragments (2 bases with kick-up, 1840-1880)
270	Aqua tint glass fragments
14	Aqua tint glass bottle necks (1840-1880)
12	Aqua tint glass bottle bases
7	Aqua tint glass panel bottles
49	Aqua-green tint glass fragments
5	Milk glass fragments (1 mason jar cap liner)
86	Brown glass fragments (6 snuff bottle trays, 1 wide neck 1840-1870)
1	Amber glass fragment, mold blown with diamond motif
1	Light yellow/brown pressed glass fragment with woods scene
22	Clear glass fragments (1 with molded shell ridge design)
176	Fine white paste earthenware
12	Beige paste earthenware (1 milk bottle
9	Tan paste earthenware
4	Grey paste earthenware
6	Orange paste earthenware
3	Peach paste earthenware
44	Fine white paste stoneware
2	Fine white paste stoneware doll head, arms, legs
10	Beige/tan paste stoneware
2	Grey paste stoneware
3	Fine white paste porcelain
1	White glass 4 hole button
3	Course grey paste brick fragments
29	Course red/brown paste brick frags.
7	Course orange paste brick frags.
4	Course beige paste brick fragments
27	Metal cut nails (common, masonry, rose head box)
1	Metal wire nails
33	Misc. sheet metal fragments (cans, etc.)
76	Misc. caste iron frags. (stove, plow, wagon, kettle frags.)
1	Jorged metal alloy steel crescent and wrench
1	Metal corn knife blade (circa 1897)
1	Metal phillips head screwdriver (modern)
1	Metal caste iron pipe frag. (10 cm+ diameter)
1	Tin snuff can "Quality snuff-American-since 1782"
1	Brass keroscene lamp frag.
1	Bone handle pocket knife
1	Homemade metal rod stock punch
1	Large metal screw fragment
2	Slate fragments

lots at the Granger dam site. It is equally unfortunate that investigations could not have been carried out before vegetation clearing of the reservoir basin.

More data, in the form of field observations and background documentation, was collected than is reflected in this brief report. It, however, was taken by the crew chief and is presently unavailable for incorporation in this report.

13.9 Site 41WM414

Investigations

This site is located on the northwestern section of Willis Creek Park in the Granger Reservoir area, and a section of it overlaps with prehistoric site 41WM120 (Fig.). Initial survey of the cultural materials on the surface indicated that it was a house site dating from the period from the late 1850's to the 1890's.

The area of the site is in the process of reverting to nature and visual inspection of the ground surface was impossible. A series of shovel tests were placed at 5 meter intervals across the suspected area and site limits were determined in this manner. During the testing operation, one area of artifact concentration was noted and a 1 x 1 meter test pit was placed in its center. Unfortunately both the shovel tests and the test pit revealed nothing below the modern plow zone (approx. 18-20 cm)(Fig. 13.9-2).

Some fifty meters to the east of the suspected house site a large erosion gully was noted which had been filled with "trash". Some fairly early materials were noted eroding out of the bottom of the northern end of the deposit, but their depth (in excess of 2.5 meters) and the limited amount of time allocated for investigation at this site precluded the gathering of systematic samples from the trash dump. It was decided that preservation was preferable to grab samples. No wells or other structural remains were located and the site was considered of only very limited value for future research.

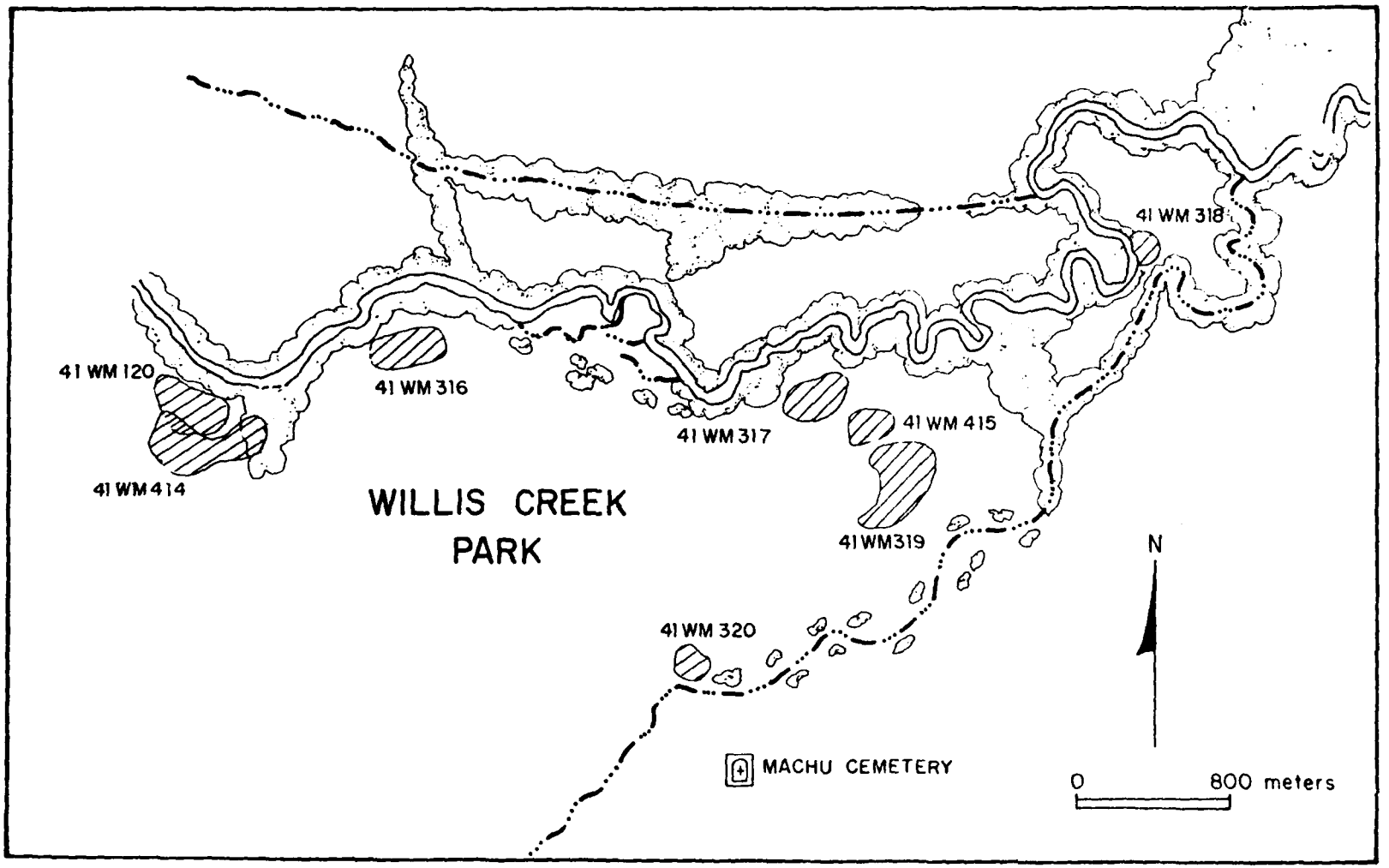
Artifacts

The artifacts recovered at 41WM414 are typical of a late 19th century farm house. Table 13.9-1is a condensed listing and shows nothing remarkable. Sixteen bottle fragments were datable, ranging in age from 1815 to 1902 with a $\overline{X}$ date of 1896. It is suspected that the structure was occupied at least up until the 1921 flood, and the dump east of the site proper may have been used which might account for the lack of artifacts dating from 1890's to 1920. It should be noted here that a modern concrete slab structure (ca. 1940-1970) had been recently removed from an area some 50 meters east/southeast of the site. The majority of the trash noted in the dump most probably had its origin at this site.

Comments

It appears that site 41WM414 is a small farmstead, possibly part of the Hoxie ranch complex which was abandoned early in the 20th century. Its main occupation may have been between A.D. 1850 and 1880, although such an assignment is tentative.

Figure 13.9-1


41 WM 318
41 WM 120
41 WM 316
41 WM 317
41 WM 415
41 WM 414
WILLIS CREEK
PARK
41 WM 319
41 WM 320
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MACHU CEMETERY
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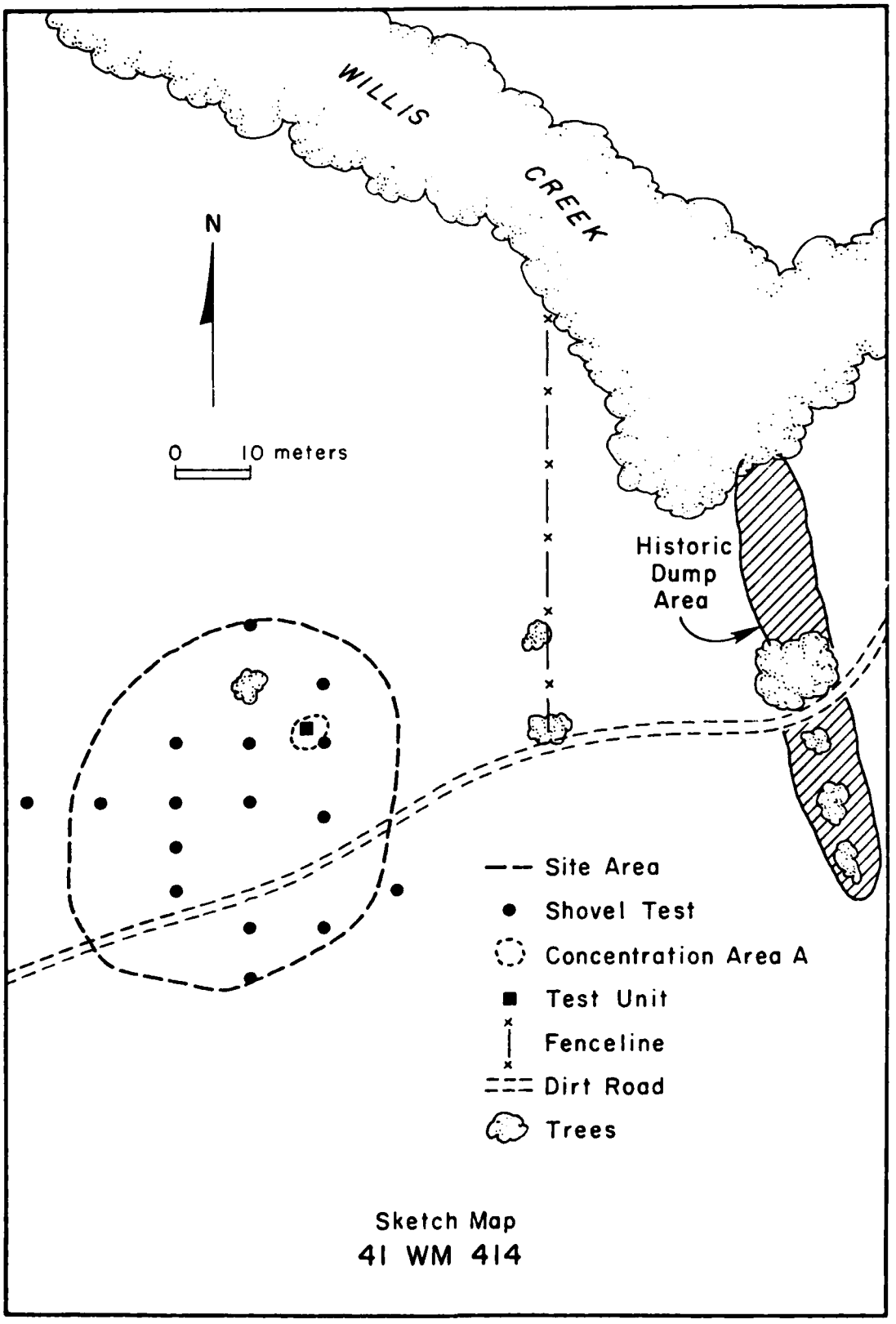

WILLIS
CREEK
N
0 10 meters
Historic
Dump
Area
Site Area
Shovel Test
Concentration Area A
Test Unit
Fenceline
Dirt Road
Trees
Sketch Map
41 WM 414

Figure 13.9-2

Table 13.9-1. Artifacts recovered through surface collection and limited shovel testing at site 41 WM 414.

#	Item
20	Clear glass fragments
207	Colored glass fragments
5	Plate glass fragments
135	Fine white paste earthenware
24	Course paste earthenware
34	Fine white paste stoneware
38	Course paste stoneware
2	Brick fragments
3	Porcelain doll fragments
1	Clay pipe fragment
5	Caste iron stove fragments
11	Tin can fragments
13	Cut nails
1	Wire nail
7	Metal wagon hardware fragments
6	Metal gun part fragments
2	Slate fragments (roofing?)

While the site itself has suffered extensive disturbance through the agency of agriculture, the dump area may contain a number of whole artifacts from the site in its lower levels. Subsequent dumping of more recent trash has sealed these lower units and at the same time protected them. It is suggested that any further work at the site, occassioned by park improvements, concentrate on the trash dump area to the east of the house site.

13.10 Site 41WM415

Investigations

Historical site 41WM415 is located in the east-central section of Willis Creek Park in Granger Reservoir between prehistoric sites 41WM317 and 41WM319. The area has been plowed and terraced, but it was hoped that some structural remains such as a cellar, well, or outhouse might be located and that these could provide diagnostic period artifacts from the late 1800's. The house structure itself was probably removed by the 1921 flood and abandoned. A careful surface collection of the site was accomplished in order to isolate any concentrations of cultural debris. A heavy ground cover of improved pasture and many years of intensive agriculture either obscured or blended any such occurrence.

Following this operation a series of shovel tests were executed through what appeared to be the center of the artifact distribution. The latter operation demonstrated that the cultural deposits were surficial in nature, and since no indications or subsurface features were found, further testing was not accomplished (Fig.13.10-1).

Artifacts

The artifacts recovered from this site are exceedingly small and fragmentary. This is undoubtedly a product of the area being subjected to many years of intensive cultivation. Only one artifact from the site could be assigned a date and that was a large brown glass bottle base from the Fairmont Glass Works, ca. 1898-1930. The remainder of the materials duplicate those recovered at 41WM414 and a listing will not be repeated here.

Comments

It appears that 41WM414 and 41WM415 are similar in terms of artifactual content. Both probably represent small farmsteads or tenant houses for the Hoxie ranch. In any event, it is unlikely that sufficient in-situ occupational features and materials remain at either site to warrent further investigation.

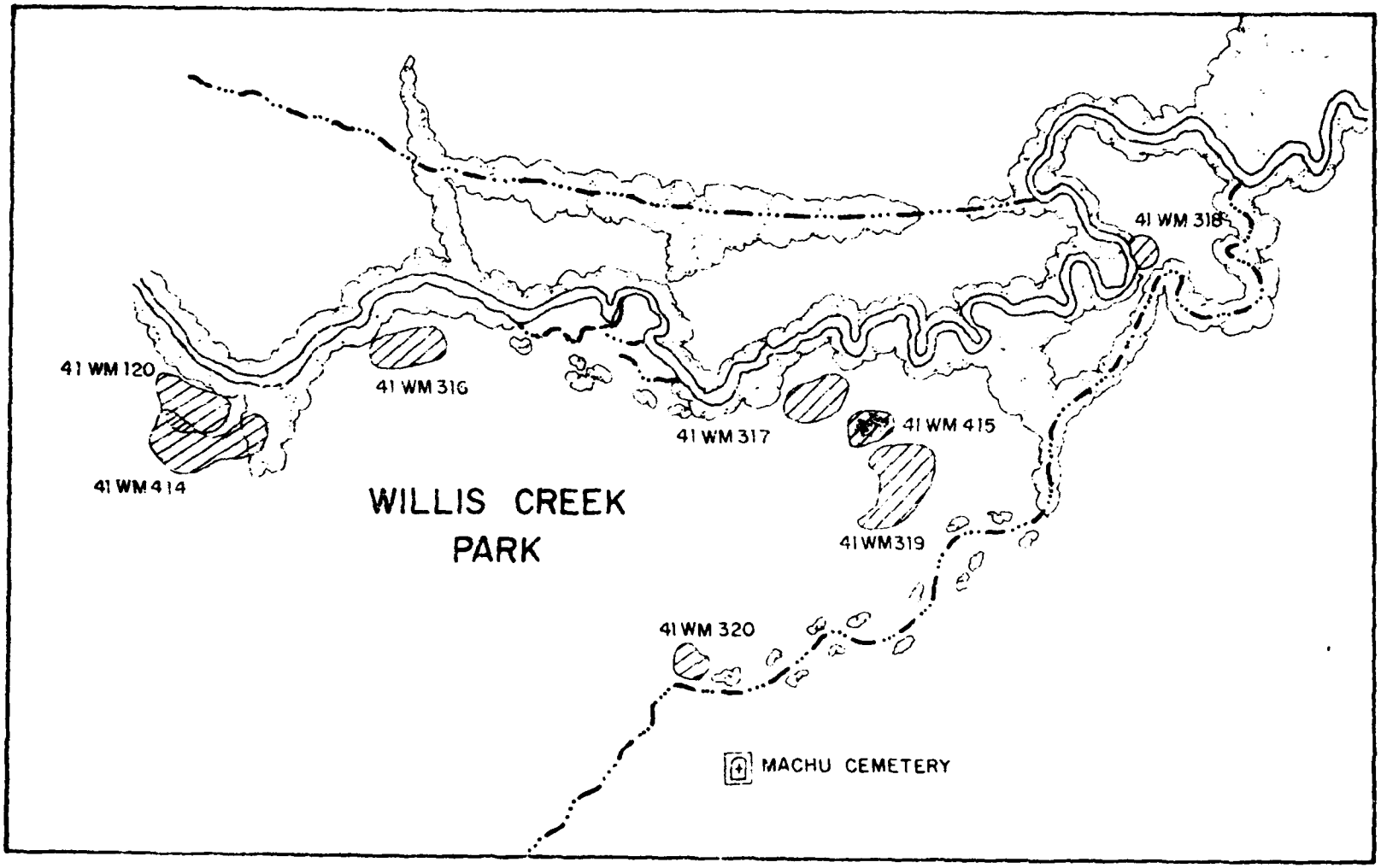


Figure 13.10-1

13.11 Site 41WM416

When originally noted during the historical survey, the site consisted of a house site with a cut limestone block fireplace, concrete columns, a cistern and the remains of several outbuildings. When revisited for the purposes of limited testing, it was discovered that clearing operations had disturbed the site to such an extent that further investigations were deemed a waste of time and energy (see Fig. 10.2-1).

13.12 Site 41WM417

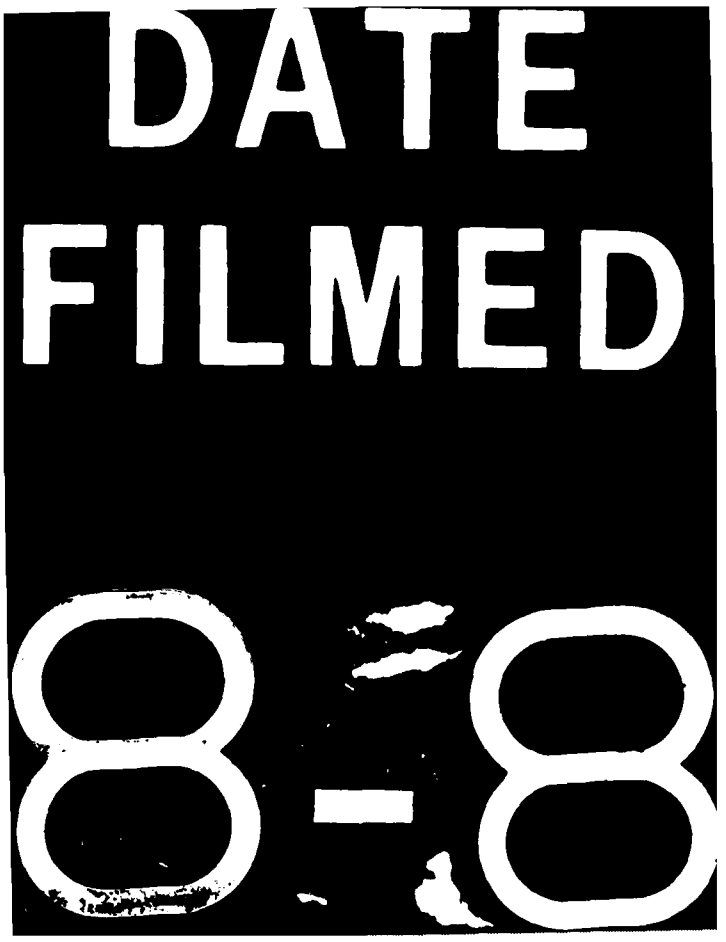
When first noted, this pre-1925 house and outbuildings were still standing structures. One of the barns was a log cabin which was most probably originally a living structure. Unfortunately, both the house and the log structure had been removed when researchers returned. The area had been bulldozed and disturbed to such an extent that relocation of the log structure site proved to be impossible and further work at the site was considered ludicrous (see Fig. 10.2-1).

13.13 Site 41WM418

The Rubel Place, located in Wilson Fox Park on Granger Reservoir, originally consisted of a house, barn and storm cellar. When first noted during the 1978 historical survey, the house and barn had already been demolished in-place and were partly overgrown with weeds and blackberry vines. The house site was of particular interest since it appeared that the piers supporting the superstructure were made of cut and faced stone. Since the "Walker" cemetery, from which most of the grave markers are missing, is only about 50 meters to the east, it was thought that this might be the origin of the pier stones.

Subsequent investigation of the house area revealed that it was the origin of the majority of scorpions in Central Texas and that the stone blocks were not grave markers. The latter were made of limestone, measured approximately 1' square and 6" deep, and were dressed on one face. The smoothed side was facing up; and the blocks were buried up to 3/4 their depth in the ground. A cedar pier was placed in the center of each block and then the house beams run across these and were toed-in.

The limestone blocks may have originally been part of another structure such as a fireplace base or paving (sidewalk ?) of some sort. One of the blocks and the matching pier were collected and the others photographed. The structure apparently was constructed after 1925 and was still occupied in 1963. No cultural debris was noted which dated any earlier than the mid-20th century and no collections were made. In a search of the areas several pieces of grave markers from the Walker Cemetery were found and these were turned over to Mrs. Scarborough of the Williamson County Historical Survey Committee for safekeeping (see Fig. 10.2-1).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