# A CULTURAL RESOURCES INVENTORY OF

# TEXAS - MISSOURI - EVACUATION CREEKS, COLORADO

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Victoria E. Keen
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BUREAU OF
LAND MANAGEMENT
COLORADO

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# A CULTURAL RESOURCES INVENTORY OF THE TEXAS-MISSOURI-EVACUATION CREEKS STUDY AREA, RIO BLANCO COUNTY, COLORADO

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DENVER, COLORADO

1983

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This document is printed in conjunction with the White River Resource Area and Piceance Basin Resource Management Plans/Environmental Impact Statements. It serves as support for both RMP/EISs, plus oil and gas leasing. In addition, this work is integral to the Craig District Cultural Resource Management Plan.

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## FOREWORD

This publication is outstanding for two reasons. First, it is a commendable effort under sometimes difficult situations and the final product reflects professional pride and effort by Gordon and Kranzush. Their willingness to provide the Bureau of Land Management with solid, well reasoned baseline information is greatly appreciated. Second, this report represents the Bureau's commitment to energy development and cooperation with those engaged in the oil and gas industry. This inventory was conducted at a savings to the Bureau and the public through the large block acreage approach.

I am proud to make this report available to the public and I know that its contents will be useful for a long period to come.

George C. Francis
State Director
Bureau of Land Management
Colorado

## DEDICATION

This volume is dedicated to Prill Mecham. Her dedication to the cultural resources of this region, and her support of those individuals who share a similar love, contributed to the quality of this document. Her insistence upon a totally professional effort and her unflagging enthusiasm will be evident in archaeological records for a long time to come.

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ACKNOWLEDGEMENTS

A project of the size and scope of the Class III cultural resources inventory of the Texas-Missouri-Evacuation Creeks study area necessarily requires the full commitments and energies of all involved parties. The startling resource density encountered during this inventory (a total of 368 resources are now documented for the surveyed zones) presented an even bigger challenge to the participants in this contract than could ever have been predicted from the previous work in the region. It is therefore with special thanks and sincere admiration that we laud the following individuals and staffs.

Our gratitude goes to Joe Ben Wheat and Calvin Jennings for their kind contributions of time and assistance in artifact identification; to Priscilla Ellwood for preparing the ceramic analyses that appear in Appendix A of this report; to Josef Muennig for his excellent artifact photography; to Nicaela Branham and Ellen Kimler for the drafting of seemingly endless maps, charts, and figures; and to David Barker for the typing of the report text. We would also like to thank the BLM Craig and Meeker personnel for their assistance, cooperation, understanding, and patience during this project.

On a more personal note, the field crews want to express their gratitude to and affection for the Allen Gentrys of Vernal, Utah/Windella Ranch, Colorado. Mr. and Mrs. Gentry generously provided Gordon & Kranzush, Inc. with their Whiskey Creek Ranch for use as a field base during the inventory, and offered their warmth, goodwill, and friendship throughout that long 1980 field season. Their sharing of experiences, knowledge, advice, and company helped make the field experience one we will all remember fondly.

And finally, Gordon & Kranzush, Inc. wishes to take this opportunity to memorialize the incredible, and at times superhuman, efforts of the four field crew members who saw the pedestrian survey of nearly 12,000 acres through from start to finish, and survived the heat, the gnats, the snakes, and the infamous White Face Butte: Nikki Branham, Elaine Jordan, Vicky Keen, and Erin Olshan. While we are grateful to the other crew members, Craig Engleman, Galacia O'Rourke, and Sandy Shea, whose help was invaluable during the field season, we feel that the four key crew members listed above deserve special tribute. So to N, V, and the Es, G&K salutes you!

The Principals
Gordon & Kranzush, Inc.
August, 1981

## ABSTRACT

Between May and November 1980, a Class III intensive cultural inventory of the approximately 11,700-acre Texas-Missouri-Evacuation Creeks study area was undertaken by Gordon & Kranzush, Inc. under Contract Number YA-512-CT9-252 for the Craig District of the Bureau of Land Management. The study area, located in southwestern Rio Blanco County, Colorado, is the scene of increasing energy minerals development, and was selected by the BLM for investigation in order to facilitate this development while protecting the cultural resource base.

A total of 356 prehistoric and historic resources were recorded during the 100% pedestrian survey of the study area, including 173 sites, 67 localities, and 116 isolated finds. Aboriginal resources reflect steadily increasing activity from Paleoindian (pre-5000 BC) through Proto-historic (AD 1880) times, though Fremont period (AD 400-1250) manifestations are widely divergent in this area from those recorded in surrounding regions. Resource types include lithic scatters, quarries, rock art, campsites, wickiups, and a sweatlodge. The 15 historic resources reflect Euroamerican transportation, stock raising, homesteading, mineral exploration, survey, and hunting activities during the years from AD 1880 through 1930.

Five prehistoric sites are considered eligible for nomination to the National Register of Historic Places, and 39 others may be eligible, but more data is required for final determinations. In addition, two potentially eligible districts, containing a total of 22 resources, have been identified as archaeologically significant zones. Avoidance and protection of these resources are recommended. Also, two previously recorded resources in the study area qualify for National Register listing: Collage Shelter is listed on the Register, and the route of the Uintah Railway has been found eligible for nomination.

# INTRODUCTION

## Contract Data

In September of 1979, Gordon & Kranzush, Inc. (G&K) was contracted by the Bureau of Land Management (BLM) to conduct a Class III intensive inventory of approximately 16,000 acres of BLM-administered lands in the Texas-Missouri-Evacuation Creeks (T-M-E) drainages of southwestern Rio Blanco County, Colorado. The work was conducted under Contract Number YA-512-CT9-252 to provide cultural resource management data for the study area in order to facilitate increasing energy minerals exploration, development, and transportation, while at the same time protecting the fragile cultural resources by isolating areas of particular cultural value. The study area was defined by the BLM in response to accelerating development pressures and the unusual resource diversity and density documented for a portion of the study block by 1978 energy-related cultural resource investigations (Gordon, Kranzush and Knox 1979),

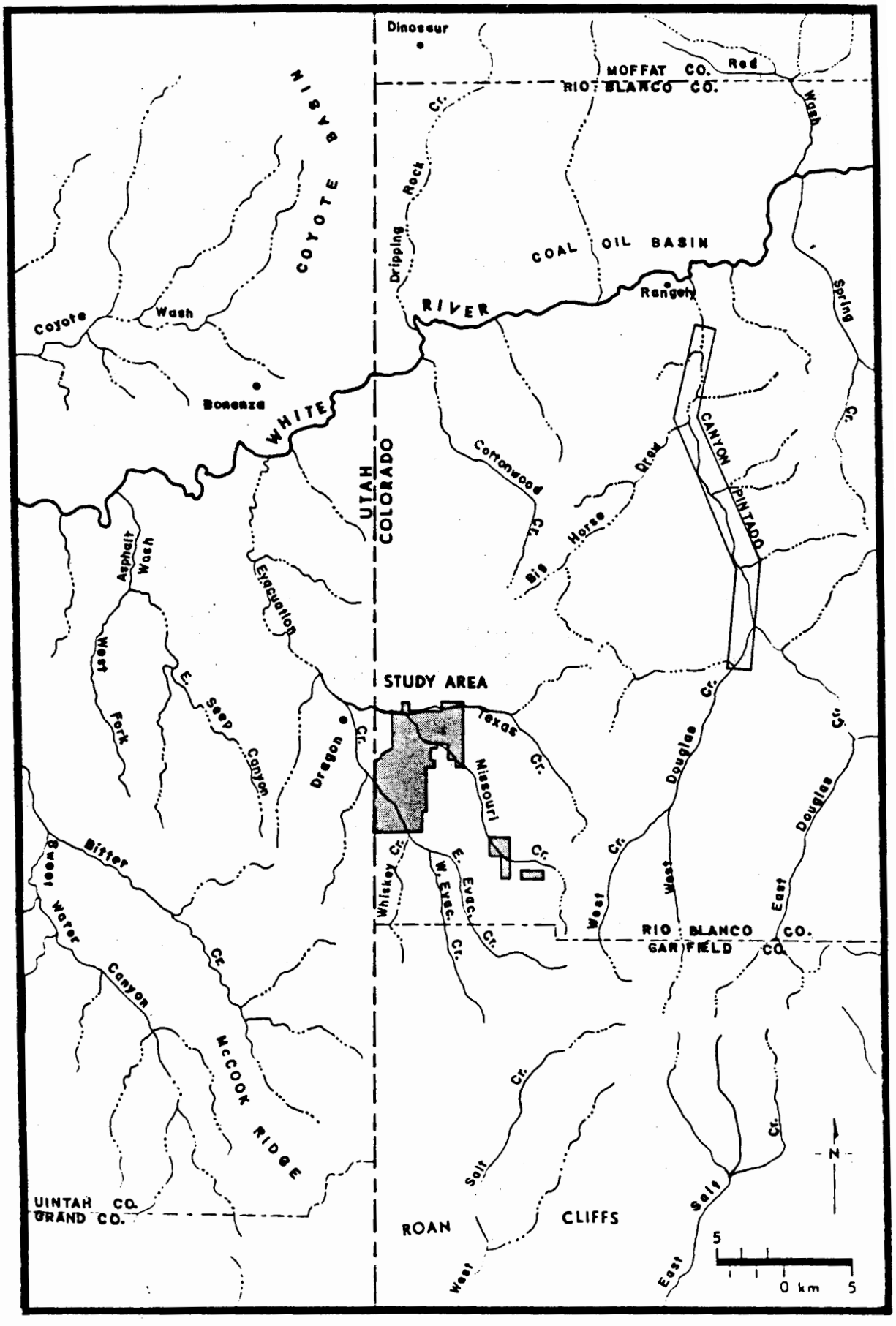
A series of unforeseen events and circumstances led the BLM to reduce the study area to a total of 11,692.5 acres (a 27% reduction), and also forced abbreviation or deletion of certain contract and research efforts (see below). The study area covered by the Class III inventory, shown in Figure 1, includes three discrete parcels of land along portions of lower Texas Creek, upper and lower Missouri Creek, and lower Evacuation Creek. These parcels have the following legal descriptions:

| Township | Range | | Section | Acreage |
|---|---|---|---|---|
| 3S | 103W | S½ | 7 | 320 |
| | | | 8 | 640 |
| | | | 17 | 640 |
| | | W½, NE¼, N½SE¼, N½S½SE¼, W½SW¼SE¼ | 18 | 595 |
| | | E½, E½NW¼ | 19 | 400 |

FIGURE 1

**STUDY AREA**

**TEXAS-MISSOURI-EVACUATION CREEKS**



| | | | | |
|---|---|---|---|---|
| | | NW¼, NE¼, SE¼ | 20 | 480 |
| 3S | 104W | E½SE¼, E½E½W½SE¼ | 11 | 100 |
| | | S½, E½NW¼, E½W½NW¼ | 12 | 440 |
| | | | 13 | 640 |
| | | E½E½, E½E½W½ | 14 | 200 |
| | | E½SE¼, E½E½W½SE¼, S½SE¼SE¼NE¼, NE¼SE¼SE¼NE¼, SE¼SW¼SE¼NE¼ | 22 | 110 |
| 3S | 104W | S½, E½NE¼, SW¼NE¼, S½NW¼NE¼, E½NE¼NW¼NE¼, NW¼NW¼, S½SW¼NW¼, S½N½SW¼NW¼, SE¼SW¼SE¼NE¼, NE¼NE¼SW¼SW¼, S½SE¼NE¼NW¼, NE¼SE¼NE¼NW¼ | 23 | 547.5 |
| | | | 24 | 640 |
| | | | 25 | 640 |
| | | | 26 | 640 |
| | | E½E½, E½E½W½ | 27 | 200 |
| | | E½E½, E½E½W½ | 34 | 200 |
| | | | 35 | 640 |
| | | | 36 | 640 |
| 4S | 103W | | 15 | 640 |
| | | E½ | 22 | 320 |
| | | SE¼ | 23 | 160 |
| | | SW¼ | 24 | 160 |
| 4S | 104W | S½S½ | 1 | 160 |
| | | S½S½ | 2 | 160 |
| | | E½SE¼SE¼ | 3 | 20 |
| | | E½E½E½ | 10 | 80 |
| | | | 11 | 640 |
| | | | 12 | 640 |

The research and project planning took place during the winter of 1979-1980. The field inventory of these areas was undertaken from May through October 1980, under the direction of the Principal Investigators, E.K. Gordon and K.J. Kranzush. The following individuals served on the field crews: N. Branham, C. Engleman, E. Jordan, V. Keen, E. Olshan, G. O'Rourke, and S. Shea. Data analysis and preparation of the deliverables were undertaken from November 1980 through July 1981.

## Contract Goals and Research Orientation

The series of contract goals originally proposed by G&K included the following:

A - Location, recordation and significance assessment of all surface prehistoric and historic (pre-AD 1931) cultural resources within the 16,000 acre study area,

B - Determination of the level of accuracy possible in utilizing historic documents to predict or interpret historic archaeological resources,

C - Clarification and refinement of the cultural/temporal sequence for the study area,

D - Consideration of similarities and diversities in subsistence and settlement patterns, as reflected by shifts in resource and artifact type ratios, both within the study area, and between the study area and the Douglas Creek drainage to the east,

E - Testing of an hypothesis of impromptu small-game butchering functions for small, aboriginal activity loci, and

F - Testing of cultural and environmental constraints on aboriginal settlement patterns proposed for northwestern Colorado.

As mentioned above, a series of problems beyond the control of the contractor (e.g. inflation, unavailability of government funds for completion of the contract under cost-reimbursible terms, unexpectedly high resource density, and environmental factors) resulted in the abbreviation of research and field inventory efforts. Goal A above was accomplished for only about 11,700 (plan-view) acres, rather than the 16,000 acres originally proposed. Goals E and F were deleted from the analysis due to lack of funds and time, though the necessary raw data were collected and are available for use in addressing these research questions at a later date. Goals B, C, and D are addressed in the following report for the areas covered in the Class III pedestrian survey.

Other aspects of the originally proposed approach to this study that were altered or deleted during the course of contract efforts include methodological changes involving a shift from tabulation of 100% of cultural debris at resource areas to partial tallying, abandonment (at the direction

of the COAR) of collection of ancillary data samples, and deletion of detailed stereoscopic micro-wear analysis of collected artifacts.

Despite the curtailing of the methodological and research strategies and goals, the primary purpose of this Class III inventory--to provide the BLM with cultural resource data that will facilitate both cultural and natural resources management in the general Texas-Missouri-Evacuation Creeks study area - has been accomplished. For the acreage investigated under this contract, all non-recent surface cultural resources have been identified, recorded, and evaluated individually, and in some cases collectively, for their eligibility for nomination to the National Register of Historic Places (Goal A). A total of 356 such cultural resources have been recorded under this contract, bringing the total resource count for the areas investigated to 368, or one cultural resource per approximately 32 acres (20 resources per section). This density nearly doubles that recorded for the Canyon Pintado Historic District (one resource per 62 acres) and points up the unfortunate tendency for well-known and thoroughly investigated areas to overshadow the signifance of adjacent regions about which little is known, but which may be potentially more significant. The following discussions will hopefully eliminate some of the bias toward emphasizing Canyon Pintado as the major archaeological zone in this portion of northwestern Colorado by revealing the Texas-Missouri-Evacuation Creeks study area as a district of intensive aboriginal activity in its own right.

# METHODOLOGY

## Research Methodology

Prior to initiation of TME fieldwork, extensive historic period research was conducted to allow the accuracy of historic documentation to be assessed in terms of its ability to predict historic site location. Data concerning the history of the specific study area is derived primarily from five sources: the Colorado Preservation Office site files, which list previously recorded cultural resources; the Colorado Land Office Master Title and Use Plats, which provide land ownership and use information; the Historical Index, a chronological narrative of all past and present actions affecting the use of or title to public lands and resources; the Land Office Tract Books, which are the records of actual filings made by individuals for tracts of land offered by the Government; and early General Land Office Geographic Land Survey Maps, which established township, range and section lines, and today, along with surveyors' field notes from these early surveys, provide information concerning the use and settlement of, as well as the geographic picture of the land at various times in the past. The latter four information sources are available from the Bureau of Land Management Colorado State Office.

From historic research data, potential historic site locations were predicted. It was hoped that this predictive scheme would aid in crew ability to distinguish between historic and recent cultural debris during fieldwork, thereby maximizing efficiency in terms of time spent in the recordation of Euroamerican cultural remains. In addition, the accuracy of historic documents as site location predictors could be checked.

Following completion of fieldwork, historic research was concentrated in the areas of artifact identification and the identification and understanding of historic resources which had not been predicted on the basis of

pre-reconnaissance research. Reports of historic site excavations and materials available from the Denver and Boulder Public Libraries, Norlin Library at the University of Colorado at Boulder, and the Colorado Preservation Office were accessed in an attempt to fill the gaps in the historic record as previously established. An attempt was made to verify findings and hypotheses regarding historic use of the area through an areal resident, Mr. Allen Gentry.

Prior to and during the initial phases of T-M-E fieldwork, research regarding the prehistoric period in Northwest Colorado consisted of the acquisition of and familiarization with research and cultural resource management documents for the region. Broad cultural, temporal, locational and functional patterns in aboriginal regional exploitation were studied to aid in resource recognition and comprehension during the field reconnaissance of the project. In addition, reports concerning previous examination of areas within and adjacent to the study area were scrutinized to ensure that previously recorded resources would not be re-recorded and that any informational deficiencies of previous surveys in the area could be rectified during T-M-E fieldwork.

The Colorado Preservation Office and the BLM Craig District Office (CDO) and White River Resource Area (WRRA) records were consulted in determining site/survey area locations. In addition, CDO and WRRA information regarding vegetation and wildlife in the study area was examined.

Following completion of field reconnaissance, research into specific site and artifact types was conducted. This research included comparative analyses and solicitation of expert opinions regarding cultural and temporal affiliations of collected diagnostic artifacts, additional examination of site type categories and their indicators, a comparative survey of regional

rock art motifs, and examination of existing literature for functional, morphological and locational correlates of the observed T-M-E study area with those presented for surrounding regions.

## Definitions and Systems of Classification

To assist in achieving these objectives, a series of definitions and classification systems were devised by the Prinicipal Investigators prior to the initiation of pedestrian reconnaissance within the study area. Crew members were instructed in and familiarized with the organizational methods adopted for the study, and were encouraged to take part in numerous small projects in the general vicinity of the Texas-Missouri-Evacuation Creeks area to insure a working knowledge of the systems prior to project commencement. Classifications of cultural remains, site and artifact types, and lithic materials will be briefly described below.

For the purposes of this study, all cultural remains are classified as prehistoric, historic or recent in terms of manufacture and use. Prehistoric remains consist of those items of material culture which in all probability were manufactured and used prior to ca. 1880. The broad term "prehistoric" includes the Proto-historic period for the purposes of this study. Historic manifestations consist of the cultural remains which can with reasonable assurance be dated to the ca. 1880-1930 period. Recent cultural manifestations are those which postdate 1930 in manufacture and use.

Prehistoric cultural manifestations are, by necessity, of aboriginal manufacture as well. However, those items classified as historic in nature might be of either aboriginal or Euroamerican manufacture and/ or use. Although it is unlikely that a prehistoric artifact could be mistakenly classified as historic, it is quite possible that certain cultural remains

of historic manufacture and use are classified as prehistoric manifestations. For example, certain lithic tools, particularly those types known to predominate in the Proto-historic period could possibly have been manufactured and used in the years following initial European settlement of the region. However, due to the fact that such items represent the continuance of a prehistoric technology and exhibit no characteristics upon which to postulate a post-contact manufacture, they are most frequently considered to be of prehistoric temporal affiliation. Theoretically, the majority of non-diagnostic aboriginal remains could fall into this class, and therefore, in most cases, cultural resources are described as aboriginal or Euroamerican in origin.

The following cultural periods, defined on the basis of data from previous studies conducted of Northwest Colorado and Northeastern Utah, were adopted for the purposes of this study: Paleoindian/Early Desert Archaic (pre-dating 5000 BC); Early Archaic (5000-3000 BC); Middle Archaic (3000-1000 BC); Late Archaic (1000 BC-AD 400); Fremont (AD 400-1250); Proto-historic (AD 1250-1880); and Historic (AD 1880-1930).

Cultural resources can be further classified as sites, localities and isolated finds. The working definitions for these resource classifications as presented below were developed by G&K for use in this area (Gordon, Kranzush and Knox 1979:36).

> Prehistoric site -activity locus consisting of structural remains, features and/or six or more artifacts, including lithic debitage, contained within a radius of 15 m.
>
> Prehistoric locality (LOC) -activity locus lacking structural or feature remains and containing two to five artifacts, including debitage, within a 15 m. radius.
>
> Prehistoric isolated find (IF)-a single artifact that cannot be demonstrated to occur within close enough proximity to a prehistoric site or locality to allow cultural or temporal associations to be reasonably hypothesized.

Historic site -activity locus consisting of structural remains and/or a concentration of historic debris (e.g., a midden not associated with a structure may, if large and varied enough or if multi-component, be considered a site) reflective of extended or repeated periods of use.

Historic locality -activity locus consisting of structural remains and/or a containing a few scattered items, usually reflective of a single type of limited activity or of a single, brief period of use (e.g., the remains of a wagon, lodging or shepherd's camp debris); a cultural manifestatation of dubious or questionable historic status may also be designated a locality.

Historic isolated find -a single historic artifact that cannot be demonstrated to be within sufficient proximity to an historic site or locality to allow associations to be reasonably hypothesized.

To aid in the maintenance of these distinctions, resource types will be distinguished by the following system: "5 RB" refers to a site; "5 Rb" refers to a locality; and "5 rb" refers to an isolated find. This system was devised to avoid confusion in discussing the resources and to aid in the presentation of interpretations of the data collected.

Aboriginal and Euroamerican sites were further classified in terms of the types of physical cultural manifestations and the activities represented by the recorded cultural debris. In devising typed categories, an attempt was made to combine and equate the components of the two major site typologies currently in use in northwest Colorado.

The Canyon Pintado classification system (Creasman 1979:III-6-8) consists of seven broad, generally morphologically defined site categories that may apply to either aboriginal or Euroamerican remains. In addition to "Petrograph Sites" and "Open Lithic Scatters", campsites and architectural sites are further divided into "Open" and "Sheltered" categories. The seventh site type, "Sheltered Storage Sites", refers to non-arhcitectural food storage locations. One advantage in utilizing the Canyon Pintado system is that morphologically, as opposed to functionally, defined site types can be consistently utilized whether or not site function is apparent

from surface indications. In addition, the creation of a few broad, mutually-exclusive site types allows for the grouping of larger numbers of sites for comparative purposes. There are problems in employing this type of classification system, however, and depending upon the research goals of a particular study, the applicability of the system can be limited. Morphologically defined types tend to obscure the behavioral data that are available from historic and prehistoric cultural remains. For example, the isometric location of a prehistoric campsite and historic homestead may imply that an identical set of site selection criteria were utilized in selecting the activity area, but may just as possibly indicate that a certain zone was equally as desirable in terms of the performance of vastly different behaviors. Such a realization could be lost if functional data were not taken into account for the purpose of site grouping.

The site typology utilized in the Green River-Hams Fork Draft EIS for Coal Areas (BLM 1980:123-124) attempts a more functionally-defined system of site definitions, resulting in the creation of eleven aboriginal site types and fourteen historical site types. Functional categories (e.g. campsite, quarry, kill site, burial) are combined with morphologically defined categories (e.g. lithic scatter, tipi ring, rock wall) resulting in a series of concisely defined, highly descriptive site types. The advantage of this type of classification system is that type names instantly convey a wealth of descriptive information about member sites, even when individual site descriptions are not available. One disadvantage in utilizing this sort of system, however, is that it results in inherent difficulties in site classification due to the fact that categories are not mutually exclusive (i.e. a campsite may contain a quarry area, or tipi rings; extensive lithic scatters may co-occur with rock art or rock walls, etc.). A site

may be accurately described by combining multiple categories (e.g. campsite/ rock art) but this carries the probability of resulting in an unwieldy number of categories. An additional disadvantage is the apparent inclusion of historic rock art within the archaeological site type in a system which, for all other purposes, separates aboriginal and Euroamerican cultural remains.

For the purposes of this report, site types will be defined as depicted on Table 1. To clarify definitions, and to widen the applicability of the system, the G&K categories are equated to both the Canyon Pintado and Green River-Hams Fork systems. Historical resources (Table 8), discussed separately in this report, are classified where possible according to the Green River-Hams Fork typology as defined in Table 3-19 of the Draft EIS (BLM 1980:124).

Lithic tool material types, as categorized on the lithic artifact tally sheets used for the project, were anticipated on the basis of previous experience in the project area. Since there appears to be considerable confusion/disagreement among archaeologists regarding the classification of material types, the definitions utilized in establishing lithic categories are presented below.

A number of rock types were utilized by aboriginal groups in the Texas-Missouri-Evacuation Creeks study area. The most commonly used material was siltstone, which occurs throughout the study region, most often in the form of nodules and occasionally in tabular and angular to subangular fragments. Colors range from black to grey, dark to light brown, and orange, and include several varieties of banded siltstones. This clastic sedimentary rock, composed of fine grains of quartz and clay material (grains not visible to the naked eye), is often laminated, as is evident in the fairly common occurrence of banded siltstones in the project area (Hamblin

TABLE 1
TEXAS-MISSOURI-EVACUATION SITE TYPES AND EQUIVALENTS
(Aboriginal Sites)

| G&K Site Type | Canyon Pintado Equiv. | Green River-Hams Fork Equiv. |
|---|---|---|
| Lithic Scatters | Open Lithic Scatters | Lithic Scatters<br>(Certain) Kill Sites |
| Definition: Concentration of lithic or lithic and faunal remains lacking structures or features such as hearths, stone rings, or rock art panels. | | |
| Campsites | Open camps<br>Sheltered Camps<br>(Certain) Open Architecture<br>(Certain) Sheltered Architecture | Rockshelters<br>Tipi Rings<br>Wickiups<br><br>Campsites |
| Definition: Concentration of lithic and/or faunal and/or ceramic remains co-occuring with features or structures such as hearths, natural or man-made shelters, etc; also the occurrence of structural or featural remains in the absence of lithic,ceramic, or bone artifacts. Certain artifacts (e.g., groundstone, ceramics) indicate campsite function in the absence of structures or features. | | |
| Quarries | (Certain) Open Lithic Scatters | Quarries |
| Definition: A naturally-occurring source of lithic materials suitable for making tools in association with the products of lithic tool manufacture. | | |
| Rock Art | Petrograph Site | Rock Art |
| Definition: Painted, incised, or pecked figures on a rock surface; motifs generally include anthropomorphic, zoomorphic, abstract, floral, or geometric design. | | |
| Masonry Architecture | (Certain) Open Architecture<br>(Certain) Sheltered Architecture | Granary<br><br>Rock Walls |
| Definition: Mud-mortared or dry-laid stone masonry structures or alignments that cannot be classified as components of aboriginal campsites. | | |

Site types lacking equivalents in G&K system:
Canyon Pintado: Sheltered Storage Sites
Green River-Hams Fork: Burial

and Howard 1970:39). One particularly densely concentrated occurrence of a generally poor quality banded or marled tan and orange siltstone is located on the east-facing slopes of White Face Butte. Siltstone is typically interstratified with sandstones and shales, and does not generally occur in thick bedded deposits (Ibid.:39). No large outcrops of the material were noted within the study boundaries. Most of the study tract is characterized by lithics of the upper members of the Cretaceous Mesa Verde Group, consisting of interbedded sandstones and shales, and siltstones are frequently interstratified in this formation.

Cryptocrystalline silicate artifacts were also abundant in the study area, although not nearly as common as siltstone items. The cryptocrystalline silicates were broken into two categories for recordation purposes. Cherts, as defined for analysis, include all opaque cryptocrystallines, regardless of luster, texture, color, or appearance. This includes a type of chert known as "tiger chert", a banded chert of generally dark brown-greyish color, often of high quality for tool manufacturing, and thought to be imported from known source areas to the north in the Sand Wash and Powder Wash Basins (Walton, personal communication). Cherts range in color from black to brown to red, grey, yellow, orange, purple, and blue, are waxy to grainy to uniform in luster texture, and items occasionally contain crystal inclusions. Chalcedony is translucent, and may appear almost glassy, although it still has a somewhat grainy appearance. A light pigmentation often gives chalcedony a reddish, yellow, orange or white tint, depending on the presence of certain mineral particles within the rock.

Some small chert pebbles and cobbles occur within the study boundaries, located on slopes above floodplains, but it is not known how much, if any, of this material was utilized by aboriginal groups. No

naturally occurring chalcedony was noted within the study zone.

Quartzite is also a commonly noted artifact material within the study boundaries. This silicate is composed principally of macroscopic grains of quartz in a silica-cemented state. Orthoquartzite, a sedimentary occurrence, results when newly formed quartz grains attach to existing sand grains, while metaquartzite is formed by heat and compression, acting upon a quartzose sandstone, deforming and fusing grains of quartz and filling the pore spaces between sand grains with newly formed quartz. Quartzite occurs naturally within the study tract as small concentrations of angular to sub-angular fragment and as rounded cobbles (mostly occurring in and around drainage channels), and colors range from grey to brown to red. For the purposes of recordination, quartzites were also classified according to graininess. Finer grained quartzites have a high matrix-to-grain ratio, and the coarser grained quartzites have a low matrix-to-grain ratio.

Occasionally, aboriginal occupants of the study area flaked a piece of sandstone or quartz crystal. Quartz, a silica mineral, occurs in crystals that range from transparent to translucent to milky, and may be colorless to brown, grey, black, rose, or purple, depending on trace minerals or inclusions within the crystals. It generally does not form a good flaking surface and due to its hardness, is not generally easily worked, but several quartz flakes were noted during field investigations within the study boundaries. Sandstone, a clastic sedimentary rock composed primarily of medium sized grains of quartz and a silica cement, is also ordinarily not a good material for tool manufacture, as the fracture line follows the silica cement between the sand grains, making it generally too friable for use. However, an occasional flake knapped from locally occurring, fine-grained sandstone was encountered in the study area.

Finally, the igneous rock obsidian was utilized by aboriginal groups in the study area. Obsidian is a glass (containing no crystalline structure, but skeletal crystals or crystallites) formed by rapid cooling of volcanic magma. It is most often jet black, due to inclusions of particles of ferromagnesium minerals, but specimens were also noted in the study area that have a somewhat waxy luster and greenish tint due to the presence of greater concentrations of certain ferromagnesium minerals. Many of the obsidian items observed also contain visible flow lines, giving the rock a banded appearance (opaque black and glassy/smoky transparent bands).

Obsidian sources do not occur naturally within project boundaries, although several specimens were found, particularly in the Evacuation Creek region. Nelson and Holms (1979) sampled and analyzed 16 geologic sources of obsidian in western Utah, Nevada and southern Idaho, and traced approximate routes of transport to archaeological sites in western and central Utah. According to their findings, the five areas which have "implement grade" obsidian are: Modena, Mineral Mountains, Black Rock Desert and Topa Mountains in Utah; and Malad, Idaho. Large deposits of high quality obsidian are also obtainable near Flagstaff, Arizona (Ibid.). Of these sources, the closest to the study area is the Black Rock Desert. This type of analysis is, of course, beyond the scope of this report, but it is not altogether unlikely that obsidian found within the study area was transported from one of the identified obsidian source areas. Additionally, the absence of cores or large fragments of obsidian within the study region suggests that the material source was far removed, and the material may have been transported to the area through trade. At this time, it is unknown whether obsidian sources exist in eastern Utah.

Fossils of various types are abundant within the study boundaries.

Petrified wood, formed by replacement over time of woody fibers and cellulose with silica, has been noted in the study area, and a few flakes and cores of petrified wood have been recorded. Some of this material may be of high flaking quality, and may even resemble chert in composition. Other petrified wood fragments are more grainy, and are of poorer tool-manufacturing quality. In addition, one bead was discovered in the project area that had been formed from a portion of a partially-silicified reptilian bone, possibly that of a turtle.

Lithic debitage was categorized in terms of the stage of reduction of the parent material that it represents. Primary decortication flakes are those exhibiting in excess of fifty percent cortex material on the dorsal flake face where it does not appear that previous flaking resulted in dorsal cortex removal. Secondary decortication flakes exhibit less than fifty percent dorsal cortex and most frequently bear the recognizable scars of previous flake removal. Interior flakes consist of flakes with no dorsal cortex, presumably struck from the source rock following cortex removal. Fragments are pieces of lithic material lacking the attributes of flakes or cores which may or may not have been utilized without modification. The term "retouch" refers to intentional edge or facial modification either for the purposes of tool manufacture or rejuvenation. Lithic materials tally sheets, attached to the Colorado Site Inventory forms submitted to the BLM, were utilized in recording the attributes of certain lithic specimens encountered within aboriginal sites (see also the discussions of collection strategy and artifact tally strategies discussed below).

For the purposes of site recordation and analysis, the following topographic contexts were identified in the T-M-E study area:

Floodplain - the generally level and often open plain flanking a drainage channel

Terrace - a generally low, narrow, level-topped alluvial feature which slopes, often quite steeply to an adjacent floodplain or drainage channel. Vegetation may or may not resemble that present on the adjacent floodplain.

Rock face - cliff wall or exposed surface of a large, free-standing boulder.

Upland feature- large, generally level-topped mesas, buttes, etc., e.g., White Face Butte, some major interfluvial ridges, etc.

Ridge slope - the lateral margins of a narrow, level to gently sloping interfluvial ridge.

Ridge fingers - low, level to sloping protrusions from a high ridge feature. Ridge fingers often extend downward to a floodplain from the leading edge of a ridge or protrude at right angles to its slopes.

Ledge/overhang/shelter - protected area or indentation in or at the base of a cliff wall.

Bench - high, level, platform-like feature usually occurring on the slopes of a steep-sided ridge or upland feature, usually bounded on the front and back by cliff walls or very steep slopes.

Where possible or appropriate, additional information regarding a resource's position on a specific topographic feature was recorded. The "Key to Table B-1" in Appendix B indicates the final topographic categories identified for the study area.

## Field Methods

The objectives of the fieldwork conducted for this investigation were to:

- locate, record and assess the significance of all surface prehistoric and historic cultural resources in the study block, and to
- verify or negate the accuracy of historic documents regarding the location and nature of historic resource areas.

Field reconnaissance in the Texas-Missouri-Evacuation Creeks study area was conducted between May 10 and November 21, 1980 with one major inter-

ruption occurring between July 1 and August 14, 1980. Fieldwork was officially terminated on October 31, 1980 due to a limitation of available funds, and only one brief period of reconnaissance, conducted at G&K expense, was undertaken thereafter to verify conflicting locational data. During periods of pedestrian inventory, between two and three crews of two to six persons were employed in ground coverage. Crew members included E.K. Gordon, K.J. Kranzush, V.E. Keen, E.C. Jordan, E.K. Olshan, A.M. Shea, N. Branham, G.L. O' Rourke and C.A. Engleman.

Ground surface was examined by topographic unit (e.g. floodplain south of drainage, ridge crest and slopes, etc.) and crew members walked zig-zag transects from 10 to 30 m in width as determined by the crew leader on the basis of terrain, vegetation density, and ground surface visibility. Several methods were employed to assist in the maintenance of even, orderly crew progress and to prevent either gaps between or overlaps of the survey corridors. Crew members were instructed to meet adjacent personnel on each oblique pass through their assigned transect. In this manner the crew leader could widen or narrow the angles of the "zig-zags" within the transects while assuring that crew members progressed on an even line. Maintenance of a chain of voice contact in areas of dense vegetation helped assure that crew members would not become separated during resource recordation.

Cultural resources were sought in the forms of surface debris, structural remains, unnatural environmental disturbances and as cultural materials eroding from road-cuts, banks, slopes, or arroyo walls. When a cultural resource was encountered, survey transects were abandoned and the immediate vicinity of the find was intensively examined to determine the nature and extent of the cultural remains. If an isolated find or locality had been encountered, one or two crew members triangulated the resource area, described

and/or sketched the artifact(s) and recorded the environmental characteristics of the surrounding area. If the encountered resource met site classification criteria, two to four people took part in recordation. In addition to the above mentioned information recorded for IF's and localities, sites were photographed and surface artifacts were either completely or partially tallied. A permanent datum consisting of an eighteen inch length of concrete reinforcing bar to which was attached a washer bearing the Smithsonian trinomial site designation and a yellow plastic G&K survey cap was erected at virtually all sites. Rebar data were generally sunk eight to twelve inches into the ground, but in cases where shallow soils prevented this, data are most commonly supported by a rock cairn. In a limited number of cases, site identification washers were wired to trees. In a very few cases, no permanent indication of the site datum was left either due to environmental constraints against datum placement or lack of datum marking materials at the time of site discovery. The Colorado Site Inventory Record forms submitted to the BLM indicate datum position and placement for each site.

At the inception of this investigation, the intent was to completely tally the surface component of each recorded site. With few exceptions, previous investigations in the area had indicated that the majority of the sites in the area were small and could be easily recorded in this manner. However, it became obvious shortly after the commencement of the study that complete tallies would be impossible (and of questionable value) due to the observed site size and artifact density. Therefore, tally transects were placed randomly in all but the smallest of sites, and only surface artifacts within these areas were examined. Tally transects generally were oriented so as to join opposite site boundaries and pass through the site datum. Transects were of fairly consistent width and were generally broken into

four to five meter segments. While imprecise orientation, measurement and layout prevent direct comparison of tally transect content between the sites, the method nonetheless allowed a rough estimate of the percentages of site components for each site while significantly decreasing site recordation time. In addition, an indication of some lateral changes in artifact density within each site is available from tally transect data.

Site mapping was generally accomplished in the following manner. After establishment of site boundaries by marking the extent of artifactual distribution with pin flags, one crew member was stationed at the site datum to triangulate site location and to locate boundary points by means of a Brunton Pocket Transit. One or two people assisted by pacing the distances from the boundary points to the datum. Features, artifacts that were to be collected, and the tally transect, if the site was not completely tallied, were located in the same manner. Site slopes were measured and topographic and vegetation patterns were mapped.

The following artifact collection strategy was employed for all aboriginal sites, localities and isolated finds recorded within the study area. Culturally or temporally diagnostic aboriginal artifacts (primarily projectile points, ceramics, and beads) were collected unless the artifact was too fragmentary to be of diagnostic value. Other finished tools were collected at the discretion of the crew leader if it was thought that pertinent functional inferences could be drawn through further artifact analysis, if a tool appeared to belong to a type that could be of broad comparative value (e.g. end scrapers, certain knives), or if site location indicated a distinct possibility that tools would be lost due to site vandalism or erosion. In addition, crew members were instructed to collect unique or unusual artifacts of uncertain function, origin or material. Except for one item that qualified

for collection under the latter criteria, no groundstone artifacts were collected. For historic resources, industrial artifacts were generally described *in situ*. Only one historic bottle was collected. All collected materials are discussed in Appendix A.

In order to address research concerns regarding the functions of localities, 100% collection of recorded localities was undertaken during alternate field sessions in the study area. A total of 32 localities (51% of the total number recorded) were collected in this manner. Additional collections from localities followed collection policies outlined above for sites, localities and isolated finds.

The Project Inspector met with field personnel for part of the day on June 17, 1980. One site, 5 RB956, was visited.

Each crew member maintained a journal of field observations, in addition to any supportive documentation (tally sheets, photographic records, etc.) that was completed during pedestrian reconnaissance. Field notes and original photographs, photographic records, site forms, maps and tally sheets will remain on file at Gordon & Kranzush, Inc., Boulder, Colorado. A set of original photographs and photographic negatives have been filed with the BLM Craig District Office, Craig, Colorado. All collected artifacts will be curated by the University of Colorado Museum, Boulder, Colorado.

## Problems and Problem Resolution

The Texas-Missouri-Evacuation Creeks study imposed several problems in terms of orderly and thorough project completion, not the least of which was the nature of the terrain to be examined. Although this difficulty was anticipated, it nonetheless reduced field efficiency and therefore contributed to a slowdown in survey coverage. Arroyo crossings and seemingly

inaccessible cliff ledges were the most persistent logistic problems encountered. Both situations often necessitated extended detours before ground coverage could progress. In particular, the multiple, vertical-walled cliff levels flanking Missouri Creek caused slow ground coverage, since access points to and from the levels were limited, and since frequently, benches bifurcate, necessitating crew reorganization to assure thorough coverage. At times, portions of a crew were dispatched to cover these features while the remainder of the crew continued through more manageable terrain. An alternate method involved the entire crew working back and forth up or down a section of cliff. Neither method was more efficient in terms of coverage.

Certain vegetation communities necessitated alterations in field methods as well. Floodplains supporting extremely dense sage/greasewood/saltbush communities are virtually impassable in certain areas. Since ground surface visibility generally drops to zero in such locations, survey coverage was most frequently decreased, and crew members were instructed to make a single pass through the floodplain to a point where vegetation density decreased.

Heavily wooded uplands contributed to crew disorganization since visual and verbal contact was limited. Where terrain permitted, compass orientations were employed to maintain parallel spacing. At other times, individual crew members were assigned survey areas as defined by topographic features. An insurmountable problem with these methods was that individual crew members were slowed by resource recordation and often the crew was forced to stop and wait for one or more of the team to "catch up".

Difficult climatic/environmental conditions imposed other sorts of problems. Rain and snow slowed survey progress immensely due to the dif-

ficulty of walking or driving through the muddy clay soil. Unfortunately, the only resolution to this problem was to await drier conditions. Fortunately, this rarely involved a delay of more than a few hours.

Summer heat and diurnal temperature changes caused numerous problems. During the hottest part of the summer, survey began at daybreak to allow a full day to be completed by 3:00 p.m., thus avoiding the hotter hours of the day. Such a methodology was necessitated by crew fatigue, heat stress and an inability to carry sufficient individual water reserves to efficiently work through extremely hot periods.

In the early and late phases of fieldwork, large diurnal temperature changes imposed clothing needs that greatly increased the pack weight of crew members, thus at least minimally slowing survey progress. As a solution, a defined feature would often be examined during the early morning hours, after which the crew would return to the truck to deposit outer clothing before continuing reconnaissance.

The gnat or black fly infestation of the study area proved to be an insurmountable difficulty. Despite attempts to split the day into very early morning and late evening survey sessions and despite trying the full range of commercial and homemade insect repellents, the majority of the crew members suffered some level of toxic reaction to gnat bites. The psychological effect of working under these conditions was equally as damaging. Therefore, field operations were suspended from July 1 to August 14, 1980 to allow the infestation to complete its cycle. By mid-August, field work was resumed with no further problems.

The high aboriginal resource density encountered in the study area imposed certain problems in resource recognition and recordation. In areas of extremely high resource density, it was frequently difficult to accurately

delimit resource boundaries on the basis of horizontal breaks in artifact occurrence. Utilizing physical distribution as a means of establishing boundaries (see resource classifications, pages 9-10, above) will have the tendency to obliterate functional, cultural or temporal distinctions between closely grouped artifacts or artifact concentrations. In short, when site size is large and resource density is high, it becomes increasingly difficult to recognize the horizontal stratigraphy of components of the resource base that have been devised for analytical purposes. Any number of culturally or temporally distinct sites, localities or isolated finds may be erroneously grouped as a single resource. In spite of this problem, it was decided to continue defining sites on the basis of horizontal artifact distribution. Where sufficient data exists to separate culturally or temporally distinct manifestations, analysis should identify or at least suggest the existence of multiple site components.

Exhaustive recordation of site descriptions and contents constituted a survey problem in a certain sense of the word. Due to high resource density, detailed data recordation served to slow the progress of pedestrian reconnaissance. While ultimately, slow ground coverage resulted in the termination of fieldwork prior to completion of the 16,000 acre tract, it was decided to continue detailed site recordation for several reasons. With developmental pressures increasing for the area and in light of the evidence of previous site vandalism (obvious evidence of historic/recent disturbance was recorded for 72 (20%) of the 356 resources and disturbance is strongly suggested for an additional 49 (14%) of the resources), it was apparent to the Principal Investigators that a delay in data recordation would result in a reduced data base for the area. Therefore, we endeavored to recover the maximum amount of available data in an attempt to "freeze" the data base for

the purposes of future research. In addition, were site recordation procedures abbreviated in an attempt to accelerate survey progress, many of the sites that we can now classify as warranting no further work would have required additional fieldwork for the purposes of evaluation and/or impact mitigation. Therefore, aside from eliminating the expense of additional fieldwork for these purposes, we feel that resource evaluation has in this study been based upon more complete data than will in many cases be available in the future.

Project cost overruns caused BLM to terminate fieldwork for the T-M-E study on October 31, 1980.

## Laboratory Methods

Laboratory analysis and data recordation were divided between the office and the field base of operations. During the evenings of the field sessions, each crew member completed preliminary forms, summary evaluations and maps for each recorded resource, in addition to preliminary artifact identifications for each collected specimen. A comprehensive resource provenience base map was also updated each evening.

Concurrently, office personnel were engaged in the washing, stabilizing, numbering and cataloguing of collected artifacts. At certain times during the field season, these people also conducted spot checks for crew accuracy in terms of site location and mapping, UTM grid coordinate identification, site descriptions and preliminary significance assessments.

Following the termination of field work, all collected artifacts were examined and sorted by morphological/functional categories (represented are projectile points, knives, scrapers, drills, gravers, beads, ceramics, miscellaneous or unusual tools and groundstone). Expert opinions were sought

regarding projectile point, bead and ceramic identification. All relatively complete projectile points, drills, gravers, beads, groundstone and unusual artifacts were professionally photographed. Extensive comparative analysis for the purposes of projectile point and ceramic identification was undertaken. Collected Euroamerican artifacts (four beads, one bottle) were also researched in terms of type and origin. See Appendix A for artifact analysis results.

Values for a series of 25 variables were measured for all recorded resources and variable values were entered in the University of Colorado computer and the results of contingency analyses are presented in Appendix B.

## STUDY AREA DESCRIPTION

### Study Area Boundaries and Locations

The Texas-Missouri-Evacuation Creeks study area is located within the White River drainage system in the arid, southwestern portion of Rio Blanco County, Colorado. The region is located south of Rangely, west of Douglas Creek and north of Baxter Pass, with the Colorado/Utah border forming the western boundary (Figure 1). The survey tracts are located within the Colorado Plateau physiographic province along the eastern Tavaputs Plateau (a geomorphic subdivision of the Uintah Basin), which extends west to the canyons of the Green River in Utah (Sabatka 1965:30, 37). The largest of the study area survey units (26.2 square kilometers) roughly encompasses the area from Park Mountain south to the confluence of Evacuation and Big Bluejay Creeks, and from an unnamed, north-flowing tributary of Texas Creek west to the Utah/Colorado border. The smaller survey tracts (3.2 square kilometers, collectively) are located southeast of the larger unit and include the upper reaches of Missouri Creek and northern extensions of West End, Timber and Calf Canyons.

Topographically, the area is characterized by deep, arroyo-cut bottomlands, low floodplain terraces, broad interfluvial ridges, flat-topped buttes, and cuestas. Slope percentages range from near 0 percent along drainage bottoms to 10-15% along floodplain terraces, and up to 80% on ridge slopes; at cliff edges slopes are nearly vertical.

The most prominent topographic feature within the study area is White Face Butte (elevation 2134 meters/7003 feet), which forms a natural boundary separating the Texas-Missouri and Evacuation Creek watersheds. It can be seen from almost any point within the larger survey tract. Other conspicuous landmarks include Displacement Point (elevation 2157 meters/7080 feet), a

rocky pinnacle located just west of the study area in Utah, and Park Mountain (elevation 2194 meters/7200 feet) located north of study area boundaries. Rugged, convoluted, north/south-trending ridge systems, which include Oil Spring and Texas Mountains, separate the study area from the Douglas Creek drainage region and the Canyon Pintado Historic District to the east.

For the purposes of this report, three physiographic/topographic regions are delineated from the two survey units described above (Figure 2).

The Texas-Lower Missouri Creeks region is located within the northern portion of the large survey tract, and encompasses Texas and Missouri Creeks and their tributaries, as well as the rugged northwestern talus slopes and ridge fingers of White Face Butte. Terrain is characterized by large, flat-topped buttes and steep talus slopes separated by broad expanses of floodplain. The rims of the buttes are frequently faced with nearly vertical sandstone walls. Other features include steep, interfluvial ridges, cuestas and free-standing sandstone pinnacles and spires produced by differential weathering. Other areas are characterized by broad, relatively flat-lying regions of sandstone bedrock outcroppings and large boulders interspersed with sandy, aeolian and/or alluvial deposits dissected by small drainages. Elevations range from 5905 feet/1799 meters to 6800 feet/2072 meters above mean sea level.

The Evacuation Creek region encompasses the southern portion of the larger survey unit and includes Evacuation Creek and its tributaries. A divide running generally southeastward from the northwestern-most extension of White Face Butte along the crests of a series of upland features forms a natural boundary separating this area from the Texas-Lower Missouri region (Figure 2). Topographically, this area is characterized by the rugged lower ridges southwest and south of White Face Butte, by flat-topped buttes rimmed with sandstone, and by the large, interfluvial escarpments of Davis Canyon, separated by

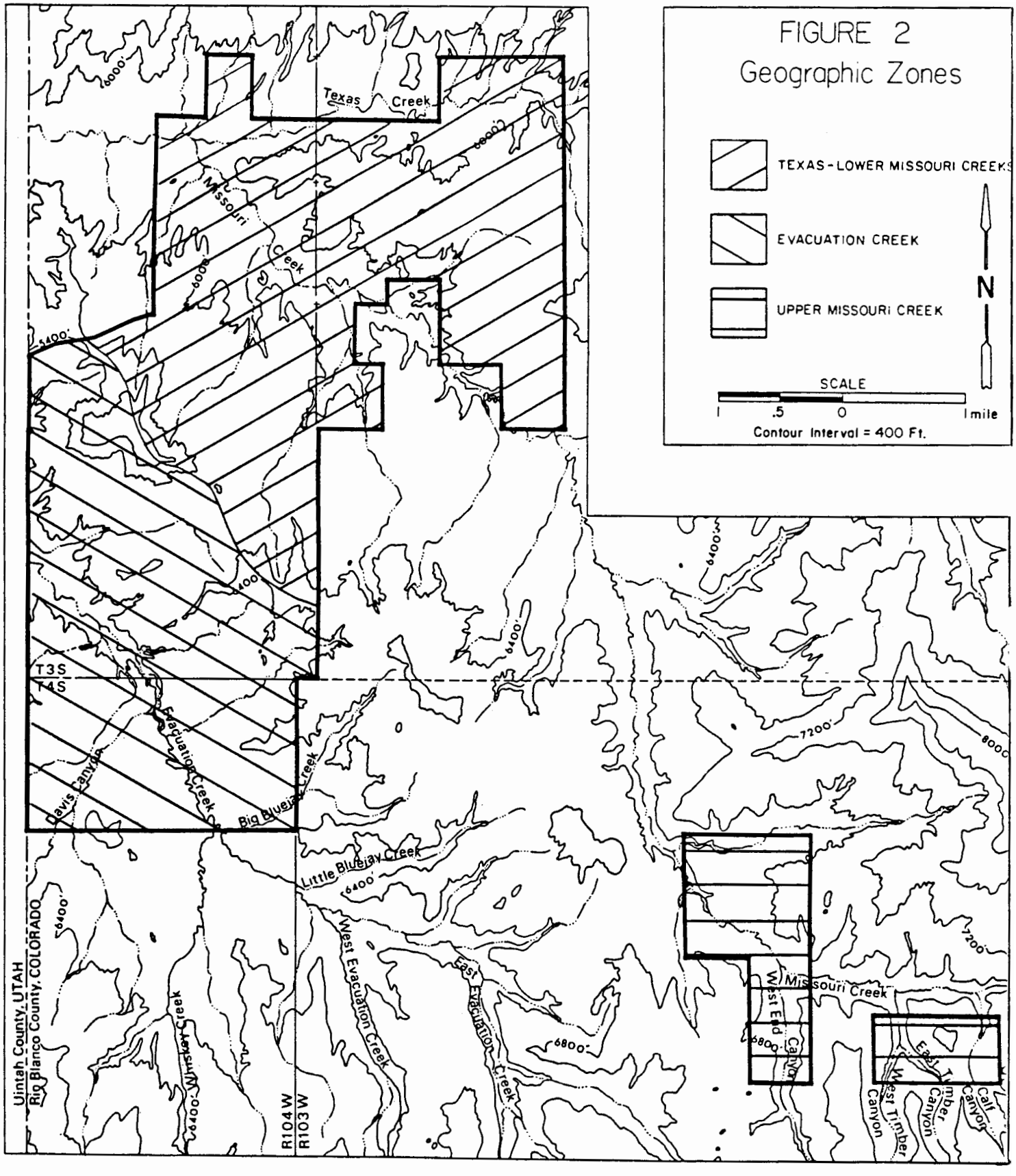


FIGURE 2
Geographic Zones
TEXAS-LOWER MISSOURI CREEKS
EVACUATION CREEK
UPPER MISSOURI CREEK
N
SCALE
1 .5 0 1 mile
Contour Interval = 400 Ft.
Texas Creek
Missouri Creek
Davis Canyon
Evacuation Creek
Big Bluejay Creek
Little Bluejay Creek
West Evacuation Creek
East Evacuation Creek
Missouri Creek
West Timber Canyon
East Timber Canyon
Calf Canyon
Uintah County, UTAH
Rio Blanco County, COLORADO
R104W
R103W
T3S
T4S
6000'
6400'
6800'
7200'
8000'

broad expanses of floodplain. Elevations range from 5960 feet/1816 meters to 7003 feet/2134 meters above mean sea level.

The third area, or Upper Missouri Creek region, encompasses the two smaller survey units located southeast of the larger survey unit. This region is encompassed under a separate category because of its distance from the larger survey unit and distinctive topographic relief and vegetation. This area includes portions of the upper reaches of Missouri Creek and northern extensions of West End, Timber and Calf Canyons. The higher elevations in this area, ranging from 6440 feet/1962 meters to 7294 feet/2223 meters, support diverse plant communities, and vegetation is generally dense. West End and Timber Canyons are characterized by mixed mountain shrubs and steep, interfluvial ridges with multi-level terraces frequently faced with nearly vertical sandstone walls and large boulders. In Calf Canyon, alpine vegetation is more prevalent and terrain is more mountainous.

All vantages and degrees of exposure exist within the study area. Generally, exposure is greater in the floodplain, and butte and ridge tops provide the best vantage.

## Geology and Soils

Geomorphologically, surface formations within the survey tracts are composed of sandstone, shale, claystone and marlstone belonging to the Mesa Verde, Wasatch and Green River Formations. The eastern Tavaputs Plateau is cut on the Green River formation, forming discontinuous cuestas upheld by local sandstones and indurated by limey and siliceous zones (Sabatka 1965: 30, 37). These particular sandstone formations are subject to differential weathering, which produces rock shelters, caves and overhangs suitable for human occupation. Sandstone deposits also provide material suitable for the

manufacture of milling implements, and vertical sandstone rock faces provide smooth surfaces for petrograph panels.

Native lithics suitable for the manufacture of flaked tools rarely occur as outcrops within the study area, and are more frequently found in the form of nodules, tabular and angular to subangular fragments, or smooth cobbles and pebbles.

Siltstone is the most abundant naturally-occuring toolstone within the study area boundaries. This clastic sedimentary rock usually occurs in nodules or fragments, and colors range from black to grey, dark to light brown and orange. Rough-grained, low quality, laminated tan and orange banded siltstone is particularly abundant, primarily along the crest and east-facing slopes of White Face Butte. The density of this material was such that it was often difficult to discriminate between culturally and naturally modified materials. Fine-grained, tan/brown siltstone fragments of higher quality were also found in the vicinity of White Face Butte.

Chert and quartzite are the second most abundant native toolstones found within study area boundaries. They usually occur in the form of rounded cobbles along drainage beds or small pebbles eroding from graded bedding. Quartzites range in color from grey to tan to red. Cherts occur in a variety of colors, including oolitic and "tiger" chert specimens. Angular to subangular fragments of grey, fine-grained quartzite were noted southeast of the study area along Little Blue Jay Creek just south of its confluence with Texas Creek (Gordon, Kranzush and Knox 1979:18). Pebbles of chert eroding out of graded gravel beds are particularly plentiful in the western one half of Section 19 in the Texas-Lower Missouri region. Cryptocrystalline pebbles were also noted along the crests of upland features. However, it is difficult to determine how much, if any, of this material was utilized

for tool manufacture.

Fossilized materials are also found within the study area. Naturally occurring petrified wood is largely confined to rough, large-grained fragments of petrified pinon occurring primarily in the Texas-Lower Missouri region. The platy formation of the cleavage plane is such that this material is probably ill-suited for the manufacture of flaked tools. No naturally occurring, high-quality petrified wood fragments were noted, although cores and flakes of this material were recorded, particularly in the Evacuation Creek region. Fossilized reptilian and (mammal?) bones and gastropods are also abundant, and occur in eroding shale exposures primarily in the uplands.

Chalcedony, "tiger chert", and obsidian were not found to occur naturally within the study area, although a variety of artifacts recorded during survey were manufactured from these materials (see "Methodology" section for a discussion of potential sources of these materials located outside the study area).

Little information is available concerning representative soil series in the study area. Overall, significant topographic relief largely inhibits the development of stable soils of notable depth (Hurlbett 1976:9).

Soils along ridgetops and elevated areas in the Texas-Lower Missouri and Evacuation Creek regions are generally thin (1-5 cm), light brown and sandy, and are produced by the mechanical weathering of bedrock formations. These soils are often underlain by a rocky layer of decaying sandstone fragments. Upland soils containing a significant amount of shale usually exhibit a more clayey consistency, and colors range from a brownish-grey to greyish-green. Aeolian deposits of fine, powdery loess have accumulated in a few upland areas, and are somewhat greater in depth (3-19 cm). Pockets of fine, aeolian sands also occur. Overall, texture is usually loamy with medium to high

permeability.

Soils are more developed in the higher altitudes of the Upper Missouri Creek region, and have a greater organic content. These soils generally fit the podzol category and are somewhat more acidic. Greater soil depth is also evident, specifically in the upper mountainous zones of Timber and Calf Canyons.

Soils in floodplain regions and semi-arid basins at lower elevations consist of thick, alluvial deposits (1.5-6 meters) with medium to high salinity and alkalinity. Terrace soils located above the floodplain are usually less alkaline and saline. Agricultural productivity in the area is limited by insufficient moisture and excessively alkaline or saline soils of low organic content. On-going down-cutting and trenching in floodplain areas, which frequently produces arroyos as much as 3-6 meters deep, further diminishes the amount of arable land in the region.

Historically, few homesteaders attempted any large-scale agricultural endeavors in the area. Private land use was largely confined to stock raising, and agricultural activities were limited to the cultivation of forage crops (see "History" section for more information regarding historical land use).

It is uncertain whether these soil conditions, or the climatic phenomena that influenced these conditions existed during the prehistoric period. These and other paleoenvironmental investigations are beyond the scope of this project. The cyclical process of floodplain soil deposition/depletion, however, is of archaeological interest for several reasons. Depositional periods produce a higher water table and consequently more abundant vegetation and higher faunal populations, all of which are factors which influenced prehistoric/historic site location. A post-depositional period

would also favor horticultural activities, while an erosional period would make such endeavors less feasible, if not impossible (Weber, et al 1977:7).

Although chronological stratigraphic sequences have not yet been established for northern Colorado, historic accounts lend credence to the concept of deposition/erosion cycles. The Dominguez-Escalante expedition, which made its way down Douglas Creek in September, 1776, recorded only a single "bad stretch" which required traversing a deep arroyo (Ibid.:5). Later residents of the area reported that around 1882, the Douglas Creek valley was covered with thick grass and lacked the thick secondary scrub vegetation and deep arroyos that are evident today (Ibid.)

It is believed that the present cycle of severe arroyo cutting taking place in northeastern Colorado began sometime during the late 1880's (Ibid.). Exact causal factors for these cycles have not been precisely delineated, although determinants such as overgrazing, drought and shifts in seasonal precipitation patterns may trigger erosional cycles (Ibid.:6).

## Climate

Specific climatic data for the Texas-Missouri-Evacuation Creeks region is unavailable. The 1978 update of the Unit Resource Analysis for the Rangely Planning Unit, however, provides "blanket" information for the unit as a whole (BLM 1978).

Generally, it can be said that the study area is typical of a middle latitude arid steppe region with an abundance of sunshine during all seasons and low annual precipitation. Moisture-laden air from the Gulf and Pacific coasts is prevented from reaching the area by the Sierra Nevada and Rocky Mountains. The Wasatch Mountains that border the Uintah basin on the west produce a rain shadow effect and also thwart major storms (Sabatka 1965:30). Winds are usually out of the west-northwest (BLM 1978).

Meteorological data collected for the Rangely Planning Unit (BLM 1978) records an average of 9.5-11 inches of annual precipitation for the area, and temperatures range from over 100°F during July and August to -40°F in January and February. Winter snowfall accounts for the majority of the annual precipitation. Snow accumulation is often heavy, especially during the month of December and thereafter (Ibid.). The average frost-free period in lower elevations is about 140 days (Fowler, personal communication).

During the period of field investigations (May 10-June 30, August 13-October 31, 1980) field personnel experienced a wide range of seasonal climatic conditions. May temperatures were very comfortable (usually around 65-70°F) and skies were clear. Diurnal temperatures increased from June through August and frequently, temperatures in excess of 100°F were experienced by late morning/early afternoon. Field personnel witnessed only one sudden summer cloudburst around August 15th; otherwise, skies were mostly clear.

Allen Gentry, a long-time resident of the area, maintains that precipitation during the summer is usually scanty, and that more regular rainfall does not occur until after August 30th (personal communication). At least for the 1980 field season, this information was confirmed. Towards the end of August and around the first of September, cloudy, windy days became more frequent, and temperatures stayed within the 75-90°F range. By mid-October survey personnel experienced several successive overcast, rainy days in which diurnal temperatures ranged between 30-55°F. After several days of wet drizzle and low cloudiness, the first snowstorm occurred on October 15th, 1980. These few days of steady precipitation produced excessive run-off down ridge slopes, which often washed out portions of roads. An acceleration of back and downcutting was observed in the unstable arroyo

walls along the floodplain, especially in eroded areas adjacent to slopes. These observations attest to the propensity for flash flooding in the area.

Again, it is uncertain whether present climatic conditions in the Texas-Missouri-Evacuation Creek region were substantially similar to prehistoric conditions. Investigations conducted primarily in the Southwest, however, suggest that Holocene environments have changed very little since the end of the Pleistocene (Hurlbett 1976:8). Although the analysis of trends in paleo-environmental variations have yielded somewhat conflicting results, the following general patterns have been extracted, principally for the Southwest.

Briefly, moist conditions prevailed for a period following the pluvial intensity of the last glaciation. This was followed by the Altithermal, an arid, warm period as postulated by Antevs which lasted roughly from 6000-2000 BC (Jennings 1968:59; Weber et al 1977:17). According to Antevs, these dry conditions led to the loss of binding vegetation and triggered erosion leading to extensive sedimentation. Martin, however, believes that this period was warm and moist, lasting from 5500-4000 BC, and that environmental changes from gentle winter precipitation to a summer pattern of sudden, violent rainstorms were responsible for rapid erosion and sedimentation, despite normal ground cover (Ibid.:60; Weber et al 1977:17). Jennings sees more fluctuations during this period at Sudden Shelter in eastern Utah, and noted a drought period from 4500-2500 BC (Weber et al 1977:17).

According to Antev's interpretations of the Altithermal, arid conditions persisted until around 2000-1000 BC when atmospheric shifts brought more moisture into the area. These moist conditions continued until around AD 1200 when weather patterns again shifted and summer rainfall decreased. Arid conditions were again prevalent until the Neo Boreal Period (AD 1550-1850), a postulated global cooling trend which increased precipitation in the area

(Ibid.).

Budget considerations did not permit any full-scale paleoenvironmental investigations in the Texas-Missouri-Evacuation Creeks study area. Fortunately, pollen analysis undertaken for the Canyon Pintado project provides a general overview of paleoclimatic variations for the nearby Douglas Creek area. Although environmental variables differ, it is felt that the two environments are similar enough to provide broad structural parameters for tentative correlation.

From around AD 250 to approximately AD 1000 moisture conditions were relatively stable to slightly dry (Creasman 1979:VI-30). Douglas Creek apparently maintained a higher water table until around AD 800 and precipitation increased slightly around AD 850. This period corresponds roughly to the inception of Fremont horticultural subsistence patterns in Douglas Creek, which began around AD 375 and continued until about AD 1210 (Ibid.:VI-5). A combination of increasingly arid conditions and a shift from winter precipitation to less frequent, torrential summer rainfall, triggered a decrease in the Douglas Creek water table around AD 1000. This pattern reached its peak around AD 1225, and the ensuing drought lasted from AD 1225-1300. Fremont occupation of Dripping Brow Cave in Canyon Pintado ceased during this period (Ibid.:VI-9). Following the drought, precipitation patterns again shifted to a preponderance of winter storm activity which lasted until just after AD 1550. Increased density and a real expansion of pinon/juniper groves is also evident during this span, but the water table level of Douglas Creek remained low. Evidence points to re-occupation of the Dripping Brow Cave site, possibly by Numic speakers, during this period. After AD 1550, the climatic conditions appear to have been substantially similar to present conditions (Ibid.:VI-31).

## Hydrology

Availability of local water has often been demonstrated to be a prime factor influencing both prehistoric and historic site location. For the most part, several studies have indicated that there is an inverse correlation between site location and distance to water.

All drainages located within the project area are part of the greater White River drainage system. The northern portion of the project area, or Texas-Lower Missouri region, is drained to the north by Texas Creek and to the south by Missouri Creek. Both streams are secondary, seasonal tributaries of Evacuation Creek, which is a primary branch of the White River.

Texas Creek was dry during field investigations; numerous earthen dams and small stock reservoirs in the vicinity suggest that the water supply is probably seasonal. Missouri Creek contained at least small amounts of water during the survey period, and substantially similar conditions existed during a 1978 survey undertaken in the area (Gordon, Kranzush and Knox 1979).

The Evacuation Creek region is drained by north-flowing Evacuation Creek, an intermittent stream with permanent sections, and by seasonal Big Blue Jay Creek located in the southern part of the region. Permanent sections of Evacuation Creek, which carried considerable water during field investigations, are located east of Davis Canyon. A tributary of Evacuation Creek running through Davis Canyon contained a trickle of water in late October of 1980.

The upper portions of Missouri Creek drain the more mountainous survey tracts which comprise the Upper Missouri Creek region. Here,

Missouri Creek is fed by numerous small, ephemeral north-flowing drainages flanked by long, interfluvial ridges. During field investigations, a small amount of water was observed in Calf Canyon, which is probably fed by a spring located farther upstream.

Whiskey and East Evacuation Creeks, both of which are located outside project area boundaries, contained at least small amounts of water during summer and fall of 1980. West Evacuation Creek flowed less consistently, which may be partly attributed to water control structures and devices associated with McAndrews Lake and the Gentry ranch located south of the project area. Little Blue Jay Creek, located just outside the southern boundary of the larger survey tract, was also dry during field investigations.

Modern perennial springs, another potential water source in the region, are all located outside study area boundaries. These include Mud Spring, situated in Davis Canyon above its confluence with Side Canyon in Utah, another spring located near the head of Calf Canyon and south of Oil Spring Mountain. Shallow, concave depressions in sandstone bedrock exposures collect water after sudden cloudbursts, and probably were exploited aboriginally (and historically) as auxillary water sources.

## Vegetation

Hurlbett's (1976) vegetation classification system used in settlement pattern predictability studies in Northwestern Colorado is used for delineating specific vegetation zones within the study area. Although the system was created for the Piceance Basin, it is used herein for purely descriptive purposes. The categories and their characteristics are listed on Table 2. Please consult the original source for a complete listing of subspecies, etc., associated with each category.

TABLE 2
VEGETATION CATEGORIES
(After Hurlbett - 1976)

| Category | Characteristics |
|---|---|
| BOTTOMLANDS | |
| Big sagebrush shrubland | alluvial soils of low salinity |
| Greasewood shrubland | alluvial soils of high salinity or alkalinity |
| UPLANDS | |
| Shad-scale shrubland | dry steep hillsides |
| Hillside fringed sage and grassland | steep hillsides with unstable sandysoil |
| Low elevation big sagebrush shrubland | below 2000 m /6500 ft. |
| Mid elevation big sagebrush shrubland | 2000-2300 m /6500-7500 ft. |
| High elevation big sagebrush shrubland | above 2285 m /7500 ft. |
| Big sagebrush shrubland on cliffs and rocky breaks | deep, relatively moist soils |
| Mixed mountain shrubland | 2100-2400 m /7000-8000 ft.; Gambel's oak, serviceberry with chokecherry, snowberry, big sagebrush, mountain mahogany |
| Oakbrush shrubland | oakbrush dominant |
| Serviceberry shrubland | north-facing hillsides at mid and upper slope positions |
| Low elevation pinon-juniper woodland | below 2100 m /7000 ft. |
| High elevation pinon-juniper woodland | above 2100 m /7000 ft. |
| Pinon-juniper woodland on cliffs and rocky breaks | juniper dominant in shale; pinon dominant in sandstone |
| High elevation grassland | shallow rocky soils, 2330-2750 m./ 8000-9000 ft. |
| Douglas fir forest | 2400-2500 m /7500-8000 ft., on north-facing slopes and in drainages |
| Aspen forest | 2400-2500 m /7500-8000 ft., on sheltered north-facing slopes |

## Fauna

The Texas-Missouri-Evacuation Creeks region hosts a variety of wildlife that could have been exploited by prehistoric/historic inhabitants of the area.

The study area falls within the winter range of the mule deer, which is probably the most important wild mammal in the region (BLM 1978). At lower elevations they browse on sagebrush, bitterbrush, mountain mahogany and pinon.

During the summer, herds are found at higher elevations and along the rims of basin areas. The critical range of the mule deer is located north and east of the project area, and their winter migration route is 3-4 miles to the northeast.

During the summer months, the study area was virtually devoid of any mule deer (a single animal was sighted in late June). In fact, only rabbits, birds, and reptiles were sighted, probably due in part to an infestation of particularly voracious biting gnats, which overtake the region annually from mid-June through the end of July. It is not known whether this infestation occurred during prehistoric/historic times, but it undoubtedly would have had an effect on seasonal habitation of the area.

The snowshoe hare inhabits the dense undergrowth usually associated with conifer stands in mountainous areas, while the white-tailed jackrabbit prefers open areas and sagebrush parks (Ibid.). The desert cottontail inhabits open plains, foothills and low valleys below 1981-2133 m/6500-7000 feet with grass, sagebursh and scattered pinon and juniper. The habitat of the mountain cottontail overlaps with that of the desert cottontail, although the former prefers elevations above 1828 meters/6000 feet.

Other mammals observed or inferred in the area include various other type of rodents, coyotes and wild horses. Lizards and snakes are also abundant. Birds observed in the area include chukar partridge, geese, ducks, mourning doves, magpies, crows, scrub jays, Stellar's jays, chickadees, woodpeckers, hummingbirds, starlings and several species of raptors.

Overall, prehistoric and historic inhabitants of the T-M-E region had access to a variety of environmental zones capable of supplying a myriad of vegetal, faunal and lithic resources. Wood resources for fuel and shelter are plentiful, and the local availability

of water, at least in some areas, is presently dependable enough to allow for reasonably long-term periods of occupation. The diverse topographic relief in the area provides a number of habitation zones. Prominent features such as White Face Butte and Displacement Point may have served as locational reference points and might have indirectly influenced site location. Elevated buttes and ridges provided protection, as well as excellent vantage for observing the movements of game.

## PREHISTORY

### Background

Much of the information available concerning prehistoric occupation of this region of northwest Colorado has come from intensive investigations of the Canyon Pintado Historic District, undertaken since 1976 by the Laboratory of Public Archaeology (CSU). This District, located approximately 20km northeast of the Texas-Missouri-Evacuation Creeks study area, comprises a corridor approximately 17 miles long and one mile wide along the Douglas Creek drainage system, and covers a total area of approximately 13,000 acres (Creasman 1979:I-3). Investigations within the District have resulted in the identification of 157 sites (a density of one site per 82.8 acres), from which a number of patterns of prehistoric use of the region may be derived (Ibid.:III-118).

A primary accomplishment of the LOPA work was the identification of a cultural-temporal sequence of occupation. Investigations within the District did not reveal any evidence of Paleoindian (pre-5000 BC) or Early Desert Archaic occupation of the area. It is assumed that such evidence, if it exists at all, is deeply buried under floodplain alluvium or is located at high elevations (Ibid.:VI-2).

Late Desert Archaic occupation of the Canyon Pintado area apparently began approximately 4700 years ago (2750 BC). Archaic McKean and Pinto projectile point types indicate that both Great Basin and Great Plains influences characterized at least the material culture of Archaic inhabitants of the Douglas Creek area. Occupation by Archaic groups ended sometime before AD 695, and it is hypothesized that the end of the Late Archaic period may have been approximately AD 375 (Ibid.:VI-4). Archaic activity in the Douglas Creek area was apparently most intensive between AD 150-375, at

least in floodplain areas. Sites in floodplain areas are generally open campsites; sheltered campsites occur on the floodplain edges; and open lithic sites are noted in the uplands (Ibid.:VI-4).

The next cultural period noted coincides with the most intensive prehistoric utilization of the Canyon Pintado District. This period, extending from AD 375-1210, is marked by occupation by Fremont peoples and evidence of some maize horticulture. Precise definitions of the Fremont culture have escaped formulation by archaeologists dealing with the subject, and yet there seems to be an underlying "understanding" of a general cultural pattern identifiable as "Fremont". This cultural pattern generally includes existence of maize horticulture (sometimes supplemented by planting of beans and squash) in addition to hunting and gathering of faunal and vegetal resources, extensive rock art, rock-and-mud structures (including protected or semi-protected granaries), distinctive pottery, and woven juniper bark artifacts. A sedentary or semi-sedentary lifeway is indicated by such attributes, and in some Fremont areas (most notably in Utah) small villages of wood/thatch houses have been recorded. With increasing research and survey in Fremont areas, a tendency toward strong regionalism, reflected by distinctive local variations of the Fremont attribute set, is becoming apparent for this cultural manifestation. This local variation has been interpreted as an indication that many of the Fremont period groups developed in situ from preceding Archaic groups. Horticulture in the Douglas Creek area, undertaken along the margins of alluvial fans, was apparently never extensive, and a broad-based hunting/gathering subsistence strategy was also employed by Fremont peoples. This fact, along with the facts that sites with Archaic components were also utilized by Fremont peoples, and that no temporal hiatus was observed between Archaic and Fremont occupations,

suggests that the Douglas Creek Fremont may have developed in situ from existing Archaic populations (Ibid.:VI-7). Development of horticulture may have occurred due to a shifting of precipitation patterns, resulting in increased summer rainfall necessary for growth of maize (Ibid.:VI-8, 9).

The Douglas Creek Fremont culture is characterized by the existence of numerous petrographs of triangular and trapezoidal anthropomorphs and zoomorphs which, although exhibiting similarities to the San Rafael Fremont variant of southern Utah, appear to also include distinct stylistic developments. A wide variety of features are also associated with the Douglas Creek Fremont, including beehive-shaped masonry and adobe storage structures (free-standing structures located near overhang walls), curvilinear and rectangular promontory habitation structures, wattle and daub structures, stone alignments, bedrock mortars, and firepits. It is suggested by Creasman (1979:VI-8) that the existence of masonry structures may indicate that conflict perhaps occurred in this area, possibly as a result of contact with Numic-speaking peoples. A limited amount of Emery Gray and Uinta Gray ceramics were found in Fremont-age sites, and additionally some sherds of trade wares, originating in the Southwest, were also recovered (Ibid.:III-55-64).

The end of the Fremont occupation in the Douglas Creek region may be tied to another shift in climatic conditions, this time a drying period extending from AD 1100 to AD 1300. It is suggested that the period from AD 1225-1300 may have been a time of intensive drought, leading to the end of the Fremont lifeway in the Douglas Creek region (Ibid.:VI-9).

Evidence from the Canyon Pintado District suggests that the area was re-occupied immediately after the drought by Proto-historic groups, possibly Numic-speaking peoples (Ibid.:VI-9). By AD 1550, Ute-Shoshoni groups are known to have occupied the area. Subsistence strategies employed by these

nomadic groups were once again broadly based on hunting-gathering activities, and there is some evidence of increased exploitation of the pinon-juniper zone (Ibid.:VI-10). In fact, Proto-historic sites tended to be open camps located on benches along cliff walls, immediately accessible to the pinon-juniper zone.

Utilization of the Douglas creek area by Proto-historic peoples appears to have been less intensive than the preceding Fremont utilization. Proto-historic cultures are identified in Canyon Pintado by a limited number of equestrian petroglyphs, as well as bison hunting scenes. In addition, a few sherds of Intermountain ware (Shoshoni, Ute or Paiute manufacture) ceramics were recovered. Apparently (at least at Dripping Brow Cave, 5 RB699), the region was utilized until the removal of the Utes in the 1880's (Ibid.: IV-92).

A fairly continuous time span of occupation of the Douglas Creek region is therefore indicated, beginning 4700 years ago and continuing through Proto-historic times (up to the 1880's). Apparently widely recognized culture patterns (i.e. Archaic, Fremont, Proto-historic) were developed locally in response to existing physiographic and climatic conditions in the Canyon Pintado District.

Evidence gathered from other project areas in this northwest Colorado region may be used to supplement the general cultural chronology framework established in the Canyon Pintado area. No evidence of Paleoindian occupation of the general study area had been recovered prior to the Texas-Missouri-Evacuation Creeks inventory, although projectile points of Paleoindian age have been found farther north in Dinosaur National Monument (Breternitz 1970), and across the state border to the west in Utah (Chandler and Nickens 1979a). The Moon Lakes Project area north of Rangely includes

three sites containing projectile points similar to those from regional sites with levels containing Archaic dates (Ibid.:99). Such limited evidence of Archaic occupation in the general study area may be attributed at least in part to the suggestions proposed by Creasman (1979:VI-2) that sites containing such early evidence may be deeply buried. A large site just south of the study area, 5 RB1181, also contains points thought to be of Archaic affiliation co-occurring with numerous manos (Knox 1981). Evidence of Fremont cultural occupation of the region abounds. Previous G&K investigations within the Texas-Missouri Creeks region (Gordon, Kranzush, and Knox 1979) have resulted in the recordation of three sites containing Fremont indicators. One site, 5 RB817, contained a hearth that produced a radiocarbon sample dated at c. AD 1245± 60, which would place occupation of the site right at the termination of Fremont occupation of the Canyon Pintado area. Another site, 5 RB888, contains numerous petrographs resembling those of Fremont origin, and the remaining site, 5 RB820, is listed on the National Register of Historic Places under the name Collage Shelter. This rock art/shelter site contains petrographs similar to those from both Uintah (pre-AD 1000) and Vernal (AD 1000-1200) Fremont styles, and floral designs suggestive of grain, indicating the possibility that at least limited horticulture was practiced in the vicinity (Gordon, Kranzush, and Knox 1979:122-130). Also a Fremont period projectile point (Rose Springs Series) was recovered from Davis Canyon in 1980 (Knox 1981). Other regional studies, including surveys of the Moon Lake project areas (Chandler and Nickens 1979a and 1979b; Anderson and Henss n.d.), have resulted in the identification of sites with prehistoric components suggesting Fremont cultural affiliations. Evidence of Fremont occupation includes diagnostic projectile points and two petrographs sites.

In addition to the sites described above, two other regional sites with Fremont affiliations are currently listed on the National Register of Historic Places. The Carrot Men Campsite, 5 RB106, includes petrograph panels containing "carrot-shaped" anthropomorphs, as well as an associated utilized rockshelter. The Fremont Lookout Fortification Site, 5 RB344, a dry-laid masonry structure in a defensible ridgetop context, was possibly used as a refuge for Fremont groups.

While evidence of Proto-historic/Historic occupation of the region is not as abundant as that for the preceding Fremont period (e.g. Creasman 1979: VI-9), several sites containing Proto-historic components have been recorded. Four sites within the T-M-E study area recorded by Gordon & Kranzush, Inc. in 1978 have possible Proto-historic/Historic components (Gordon, Kranzush, and Knox 1979:124-132). Three of these sites, 5 RB820, 888, and 915, consist of Proto-historic petrograph motifs, and two of these, 5 RB820 and 888, also contain Fremont-style petrographs. Petrographs at 5 RB820 are of a horse with rider superimposed over a Fremont-style anthropomorph, those at 5 RB888 include an historic aboriginal figure, and those at 5 RB 915 include a bison surrounded by four mounted horsemen (one of the horse petrographs is possibly of recent origin). These all represent post-Southwest Spanish contact (AD 1500) equestrian aboriginal groups, and although specific cultural affiliations are not known, it is thought that Ute-Shoshoni groups may have been responsible for the petrographs. It has been suggested that, due to its proximity to 5 RB915, 5 RB817 also contains a Proto-historic/Historic component (Ibid.:123).

Other regional sites containing Proto-historic/Historic components include 5 RB236, composed of Ute trapezoidal figure petrographs, 5 RB239, a lithic scatter containing probable Ute artifacts, and 5 RB635, an open camp/

petroglyph site containing petroglyphs of three horselike figures (one with rider) attributed to Ute or Shoshonian horse cultures. In addition, surveys of the Moon Lake Project areas north and west of Rangely have recovered evidence of Ute-Shoshoni occupations in the form of ceramics, diagnostic projectile points, and horse petroglyphs (Anderson and Henss n.d.; Chandler and Nickens 1979a).

In addition to establishing a cultural/temporal chronology for the Canyon Pintado area, some analysis of settlement patterns was also undertaken (Creasman 1979:VI-23-30). It was found that a narrow elevation range along the Douglas Creek canyon comprised the primary utilization zone in this area. Sites were generally spread out over this narrow band, and were located at an average of 23 m above a drainage. It is thought that location well above a drainage may have been selected for greater visibility of the floodplain and surroundings. Such a location also provides immediate access to the canyon wall vegetation community, containing a wide variety of vegetal and faunal resources, as well as easy access to the canyon wall/floor vegetation community interface. Sites, particularly sheltered camps, tend to have a southerly aspect, although open campsites are characterized by a broader range of orientation (Ibid.:IV-27, 28).

Sites in the Canyon Pintado study area additionally tend to cluster around drainage mouths. Sites in this location also generally contain petrograph components. According to Creasman (1979:I-4-5), a study undertaken in 1974 by Jennings of several tributaries of Douglas Creek also resulted in the discovery that site densities are highest at the mouths of tributary canyons. Several of the Canyon Pintado drainage mouth sites are extensive habitation sites on the Douglas Creek floodplain, at the confluence of Douglas Creek and fairly large tributary drainages (Ibid.:III-8). All of

these floodplain sites have Late Archaic-Fremont cultural affiliations, which may indicate that a change in subsistence strategy to include horticultural activities resulted in selection for floodplain location (Ibid.:VI-29). Overall, the dominant site type/component in the Canyon Pintado area is the petrograph site, followed by open camps, sheltered camps, open lithic and architectural sites (including two historic architectural sites).

While previous investigations within the Texas-Missouri Creeks area have not been as comprehensive as those undertaken in the Canyon Pintado area, a number of trends in site location have been identified by Gordon & Kranzush, Inc. (Gordon, Kranzush, and Knox 1979:135-139). These include tendency for sites to cluster in the pinon-juniper zone and along tributaries of major drainages, as well as a tendency to cluster in confluence situations. These trends are similar to those reported above for the Canyon Pintado area. One additional trend noted in the Texas-Missouri Creek area is that of resource aspect. Orientation of sites in the Texas-Missouri Creeks area showed no differences between north and south aspects, whereas the Canyon Pintado sites tended to have a southerly aspect (Ibid.). With the completion of more comprehensive investigations of the Texas-Missouri-Evacuation Creeks survey area, the results of which follow, much more specific comparisons may be made between data collected in the Canyon Pintado area and the smaller drainages located to the southwest (see "General Conclusions"). From these comparisons, a more complete regional synthesis of aboriginal settlement may hopefully be formulated.

## Inventory Results and Interpretations

During this investigation, 114 isolated finds, 62 localities and 171 sites with components of aboriginal origin were recorded. Of the sites, 30

are classified as campsites (one of which contains a rock art component), five are classified as quarry areas, one consists solely of rock art panels, and 135 have been classified as lithic scatters. Isolated finds, localities and sites are discussed separately below. Within the discussion of aboriginal sites, each site type is discussed as a group. A summary of all recorded sites and general observations applicable to the aboriginal resource base as a whole are presented in the section of this report entitled "General Conclusions".

Isolated Finds

A total of 116 isolated finds ( 33% of the total number of resources recorded during survey) are located within the study area. Two of the isolated finds (IFs) are classified as historic (5 rb1495, 5 rb1691) and are discussed separately under the "History" section of this report. Table 3 lists legal description, elevation, type of find and material for each isolated find recorded.

Ninety-three (82%) of the prehistoric IFs are categorized as debitage, 59 (63%) of which exhibit edge modification. (For the purposes of this discussion, modification refers to intentional human alteration of the flake in the form of edge retouch or macroscopic use wear, or shear retouch which may result from either human utilization of the object or natural wear processes.) Six projectile points or point fragments constitute 5% of the total, and other finished tools (15) encompass the remaining 13%. Abberant items deviating from the three types of finds mentioned above indlude a fine-grained quartzite pipe bowl (or shaman's sucking tube?) and a tan siltstone interior percussion flake found in the vicinity of a network of four low, sandstone cairns. In order to keep the number of artifact categories to a minimum, these items are respectively included in the finished tools

TABLE 3: Prehistoric Isolated Finds

| No. | Elev.(m) | Debitage | Finished Tool | Projectile Point | Material Type | Collected |
|---|---|---|---|---|---|---|
| 1494 | 1850 | | TME-29 Flake knife | | chert | X |
| 1496 | 1817 | X-Modified | | | siltstone | |
| 1497 | 1851 | X-Modified | | | chalcedony | |
| 1498 | 1841 | X-Modified | | | siltstone | |
| 1499 | 1835 | X-Modified | | | chalcedony | |
| 1500 | 1841 | X | | | chert | |
| 1501 | 1828 | X-Modified | | | quartzite | |
| 1502 | 1834 | X | | | chert | |
| 1503 | 1834 | | Biface | | chert | |
| 1504 | 1847 | X-Modified | | | siltstone | |
| 1506 | 1877 | X-Modified | | | chalcedony | |
| 1507 | 1890 | X-Modified | | | siltstone | |
| 1508 | 1817 | X | | | siltstone | |
| 1509 | 1792 | X-Modified | | | chert | |
| 1510 | 1817 | X-Modified | | | chert | |
| 1511 | 1877 | X-Modified | | | chert | |

TABLE 3 cont.

| No. | Elev.(m) | Debitage | Finished Tool | Projectile Point | Material Type | Collected |
|---|---|---|---|---|---|---|
| 1512 | 1868 | | | Fragment | chert | X |
| 1513 | 1853 | X-Modified | | | siltstone | |
| 1514 | 1859 | | TME-33 Pipe?? | | quartzite | X |
| 1523 | 1878 | X-Modified | | | siltstone | |
| 1524 | 1877 | X | | | siltstone | |
| 1551 | 1807 | X | | | siltstone | |
| 1574 | 1999 | X | | | chert | |
| 1575 | 2023 | X-Modified | | | quartzite | |
| 1632 | 1780 | X-Modified | | | siltstone | |
| 1633 | 2024 | X-Modified | | | siltstone | |
| 1634 | 1841 | X-Modified | | | chert | |
| 1635 | 1835 | X-Modified | | | siltstone | |
| 1636 | 1817 | X-Modified | | | siltstone | |
| 1637 | 1826 | X-Modified | | | siltstone | |
| 1638 | 1914 | X-Modified | | | chert | |
| 1639 | 1945 | X-Modified | | | siltstone | |
| 1640 | 1835 | X-Modified | | | siltstone | |

TABLE 3 cont.

| No. | Elev.(m) | Debitage | Finished Tool | Projectile Point | Material Type | Collected |
|---|---|---|---|---|---|---|
| 1641 | 1853 | X-Modified | | | siltstone | |
| 1642 | 1795 | | | TME-15 | chert | X |
| 1643 | 1829 | X | | | siltstone | |
| 1644 | 1823 | X | | | siltstone | |
| 1645 | 1841 | X | | | quartzite | |
| 1646 | 1939 | X-Modified | | | siltstone | |
| 1647 | 1804 | | Biface | | siltstone | |
| 1648 | 1817 | X-Modified | | | chert | |
| 1649 | 2036 | X | | | quartzite | |
| 1650 | 1908 | | | Fragment | chert | X |
| 1651 | 1911 | Core | | | quartzite | |
| 1652 | 1902 | X | | | siltstone | |
| 1653 | 1920 | X | | | siltstone | |
| 1654 | 1847 | X | | | siltstone | |
| 1655 | 1923 | X-Modified | | | siltstone | |
| 1656 | 1835 | X | | | siltstone | |
| 1657 | 18645 | X | | | siltstone | |

TABLE 3 cont.

| No. | Elev.(m) | Debitage | Finished Tool | Projectile Point | Material Type | Collected |
|---|---|---|---|---|---|---|
| 1658 | 1835 | X-Modified | | | siltstone | |
| 1659 | 1841 | | TME-25 Preform | | chalcedony | X |
| 1660 | 1847 | | | TME-16 | chalcedony | X |
| 1661 | 1847 | X-Modified | | | siltstone | |
| 1662 | 1816 | X-Modified | | | siltstone | |
| 1663 | 1847 | X | | | siltstone | |
| 1667 | 1878 | | | TME-17 | siltstone | X |
| 1669 | 1841 | X | | | siltstone | |
| 1670 | 1896 | X-Modified | | | siltstone | |
| 1671 | 1841 | X-Modified | | | siltstone | |
| 1672 | 1865 | | Biface | | siltstone | |
| 1673 | 1853 | X-Modified | | | siltstone | |
| 1674 | 1853 | | | Fragment | chalcedony | X |
| 1678 | 1871 | X-Modified | | | siltstone | |
| 1679 | 1816 | X-Modified | | | siltstone | |
| 1680 | 1865 | X | | | siltstone | |
| 681 | 1926 | | Biface | | siltstone | X |

TABLE 3 cont.

| No. | Elev.(m) | Debitage | Finished Tool | Projectile Point | Material Type | Collected |
|---|---|---|---|---|---|---|
| 1682 | 1841 | X-Modified | | | siltstone | |
| 1684 | 1834 | X-Modified | | | siltstone | |
| 1685 | 1890 | X | | | siltstone | |
| 1686 | 1890 | X-Modified | | | siltstone | |
| 1687 | 1865 | X-Modified | | | siltstone | |
| 1688 | 1938 | X-Modified | | | siltstone | |
| 1689 | 1926 | X-Modified | | | chalcedony | |
| 1694 | 1878 | X-Modified | | | siltstone | |
| 1695 | 1926 | X | | | siltstone | |
| 1697 | 1878 | | TME-26 Flake knife | | chert | X |
| 1698 | 1874 | | TME-26 Blade | | chert | X |
| 1701 | 1865 | X-Modified | | | chert | |
| 1704 | 1900 | X | | | siltstone | |
| 1705 | 1877 | X-Modified | | | quartzite | |
| 1706 | 1877 | X-Modified | | | siltstone | |
| 1707 | 1822 | X | | | siltstone | |
| 1708 | 1890 | X-Modified | | | chert | |

TABLE 3 cont.

| No. | Elev.(m) | Debitage | Finished Tool | Projectile Point | Material Type | Collected |
|---|---|---|---|---|---|---|
| 1710 | 1889 | X | | | siltstone | |
| 1712 | 1865 | X | | | siltstone | |
| 1794 | 1820 | X | | | siltstone | |
| 1795 | 1847 | X-Modified | | | siltstone | |
| 1809 | 1867 | | Biface | | siltstone | |
| 1810 | 1841 | | Mano/Hammerstone | | quartzite | |
| 1811 | 1817 | Core | | | siltstone | |
| 1813 | 1905 | X-Modified | | | siltstone | |
| 1814 | 1896 | X-Modified | | | siltstone | |
| 1823 | 1902 | X | | | siltstone | |
| 1824 | 1963 | X-Modified | | | siltstone | |
| 1825 | 1890 | X-Modified | | | siltstone | |
| 1827 | 1908 | X-Modified | | | siltstone | |
| 1829 | 1841 | X-Modified | | | siltstone | |
| 1830 | 1859 | X-Modified | | | chert | |
| 1831 | 1878 | | Biface | | siltstone | |
| 1832 | 1847 | X | | | siltstone | |

TABLE 3 cont.

| No. | Elev.(m) | Debitage | Finished Tool | Projectile Point | Material Type | Collected |
|---|---|---|---|---|---|---|
| 1834 | 1841 | X-w/cairns | | | siltstone | |
| 1835 | 1841 | | TME-28b Triang. biface | | siltstone | X |
| 1840 | 1847 | X-Modified | | | quartzite | |
| 1841 | 1853 | X-Modified | | | quartzite | |
| 1842 | 1865 | X-Modified | | | quartzite | |
| 1843 | 1847 | X | | | chert | |
| 1848 | 2091 | X | | | siltstone | |
| 1864 | 1914 | X-Modified | | | siltstone | |
| 1865 | 1884 | | Biface | | quartzite | |
| 1866 | 1899 | X | | | chert | |
| 1867 | 1893 | X-Modified | | | siltstone | |
| 1868 | 1902 | X | | | siltstone | |
| 1870 | 1881 | | TME-21a End-scraper | | chert | X |
| | | | Historic Isolated Finds | | | |
| 1495 | 1834 | | Bottle neck | | purple glass | |
| 1691 | 1902 | | Bottle neck | | purple glass | |

and debitage categories.

Siltstone is the dominant lithic material and accounts for 73 (64%) of the prehistoric IFs located during survey. This is followed by chert (22 items; 19%), quartzite (12 items; 11%), and chalcedony (seven items; 6%). Projectile points and point fragments are manufactured from chert (three items; 50%), chalcedony (two items; 33%) and siltstone (one item; 17%). Other finished tool materials include six items of siltstone (40%), five chert artifacts (33%), three quartzite items (20%) and one artifact of chacedony (7%).

Fourteen of the projectile points and/or other finished tools were believed to be of functional, cultural or temporal diagnostic value and were collected for further analysis. These items are designated in Table 3. A more detailed discussion of these collected artifacts, as well as photographic illustrations of selected items, are found in Appendix A of this report.

According to computerized data tabulations given in Appendix B, there appears to be a relationship between the locations of IFs within the study area and several environmental variables. Significant trends in IF locations are summarized below. Although most environmental variables are self-explanatory, the Key to Table B-1 in Appendix B provides a complete list of vegetational zones and topographic features. Vegetation zones and their characteristics are more thoroughly discussed under the section entitled "Study Area Description" on page 41 of this report.

Eighty-three (73%) of the 114 prehistoric isolated finds found during survey clearly occur in upland contexts, while 13 (11%) occur along the floodplains or floodplain terraces. Eighteen (16%) of the IFs are located on slopes.

In terms of vegetation, low elevation pinon/juniper woodland is over-

whelmingly favored (87 items; 76%). Only five items (4%) were found in greasewood shrubland communities, six (5%) in shad-scale shrubland and hillside fringed sage and grassland zones, ten (9%) in low elevation big sagebrush shrubland, five (4%) in big sagebursh or pinon/juniper on cliffs/breaks and one item (1%) in the high elevation pinon/juniper woodland zone. The mean elevation of IFs is 1869.95 meters (S=50.10, V=2510.39) with a range of 1780-2024 meters.

Most IFs (66 items; 58%) are located in the Missouri Creek drainage area, followed by Evacuation Creek and its tributaries where 29 items (25%) were found. Seventeen (15%) IFs are located in the vicinity of Texas Creek and only two (2%) were found in the Davis Canyon drainage area, which is a major tributary of Evacuation Creek.

The majority of IFs are located nearest a seasonal, intermittent water source (103 items; 90%), which is ordinarily a primary (60 items; 52%) or secondary tributary (37 items; 32%) of a major drainage. Only 11 items (10%) have a major drainage as the nearest water source, and six (5%) are closest to another type of water.

A total of 72 (63%) of the IFs are located within .81 km of either a drainage head or a confluence of two drainages, although the confluence situation is favored (49 items; 43%). Thirty-two items (28%) are positioned within .81 km of both a drainage head and a confluence.

The average slope to the nearest drainage (vertical distance divided by horizontal distance) is .00862. The mean direct linear distance ("C" value) to the nearest water source for IFs is 203.03 meters. (The "C" value is an expression of the direct linear distance from a resource to its nearest water source, and its comptuation can best be explained by means of a right triangle. The vertical distance from the resource to its nearest drainage

forms the vertical axis of the triangle, while the horizontal distance to water forms the horizontal axis. The "C" value, then, is that value which corresponds to the hypotenuse of the right triangle.)

Overall, the locational patterns of isolated finds closely parallel those of the total cultural resource base within the study area. More IFs than sites or localities are found on slopes, but generally upland topographic contexts are consistently favored. In addition, more IFs than other resources were found within the lower elevation vegetation zones. Other inter-resource differences appear to be relatively minor.

Finally, consideration was given to the possible relationship between isolated finds and other aboriginal cultural resources located during survey. A total of 54 (55%) IFs have a site as the nearest neighbor, 32 (33%) are located nearest another IF and 12 (12%) are located nearest a locality. Historic IFs and those which were located nearer a project area boundary than the nearest resource were excluded from the analysis. The mean distance from each IF to its nearest site is 139.67 m (s=117.62 m) with a range of 46-640 meters. Appendix B contains a complete list of computer tabulations concerning IFs.

The analysis of isolated finds may yield valuable information regarding aboriginal presence in an area, despite the fact that specific cultures or temporal periods pertaining to those artifacts can rarely be affirmed.

Behaviorally, most IFs are thought to represent single episodes of non-intensive resource exploitation or activities associated with tool manufacture/rejuvenation. Possible aboriginal behaviors leading to the deposition of an

isolated, single artifact include discard due to exhaustion or greadage, abondonment upon completion of a particular task, or loss during transport or procurement activities. The original aboriginal context of artifact deposition is often indiscernible to the archaeologist, however, due to external influences such as ground surface disturbance, deposition/erosion and other environmental stimuli.

Morphological characteristics of collected artifacts provide some clues regarding function or possible circumstances surrounding artifact discard, and sometimes provide temporal parameters for the period of artifact deposition. Collected artifacts are designated in Table 3. To aid in cross-referencing collected isolated finds with the more thorough discussion of artifact types provided in Appendix A, artifact types (designated with the "TME" prefix) are provided for each IF.

Most collected isolated projectile points either do not sufficiently resemble other previously recorded types or are too fragmentary to allow classification. Only one collected isolated projectile point may be tentatively assigned to a specific temporal period. 5 rb1660 (TME-16), a chalcedony triangular projectile point with deep, U-shaped corner/basal notches and slight basal grinding, cannot be positively classified, but resembles possible Archaic specimens found in other regions. 5 rb1667, (TME-17) a siltstone basally notched specimen, does not resemble any previously recorded types encountered during research, but certain characteristics resemble specimens of Archaic/Fremont affiliation. The remaining isolated projectile points (5 rb1512, 5 rb1650, 5 rb1674) are too fragmentary to allow for classification.

It is possibly significant that all isolated projectile points located within the study areas are fragmentary -- no complete specimens were found.

Accordingly, it is probable that these specimens were discarded due to breakage or lost during hunting forays, although in some cases, breakage may have occurred through post-depositional disturbance.

Stylistic variations among utilitarian objects such as knives, scrapers, etc., are less dramatic through time and can rarely be assigned to a particular temporal or cultural period. These collected finds include 5 rb1494 (TME-29), a chert flake knife with scalar flaking along the right lateral edge; 5 rb1659 (TME-25), a chalcedony projectile point preform with a broken tip and snap fracture at the distal edge; 5 rb1681, a crude siltstone biface fragment; 5 rb1697 (TME-29), a chert, parallel-sided blade; 5 rb1835 (TME-28b) a siltstone medium triangular-elliptical biface, and 5 rb1870 (TME-21a) a chert endscraper with a pointed bit.

5 rb1494 and 5 rb1697 are thought to be tools that were opportunistically manufactured and used for a variety of purposes. Lack of resharpening suggests that they were used for short periods and then discarded after the task was completed. 5 rb1835 is classified in a category of tools that may have been used for cutting or scraping of resistant materials (hides?) and 5 rb1870 was probably utilized as a gouge or creaser. (Both may have been unintentionally lost, or discarded upon completion of a specific project.) 5 rb1659 and 5 rb1698 are both fragmentary tool blanks or preforms which may have been discarded due to breakage. 5 rb1681 is too fragmentary and poorly worked to determine its intended use or function.

The remaining collected IF, 5 rb1514 (TME-33), is a hollow, conical piece of quartzite 55 mm in length which is highly smoothed and polished on all exterior and interior surfaces. Drilling is off-center and sandstone cortex is evident around the opening at the cone base. The function of the cone is somewhat questionable but it may be a pipe bowl or a shaman's sucking

tube (Wheat, personal communication). Because the item is so finely worked and so unusual, it is doubtful that it was intentionally discarded. The item was probably recorded out of its aboriginal context, and may have been lost during transport or migration.

The remaining isolated finished tools were not collected, so little can be said regarding their intended function or the circumstances surrounding their deposition. These items included: 5 rb1503, a chert biface fragment; 5 rb1647, a siltstone bifacially retouched secondary decortication flake with evidence of pot-lidding; 5 rb1672, a silstone biface midsection with proximal and distal snap fractures; 5 rb1809, a grey patinated siltstone biface fragment; 5 rb1810, a pink quartzite mano/hammerstone with two slightly ground facets and pecking on one end; 5 rb1831, a tan siltstone biface or core fragment; and 5 rb1865, a pink quartzite cobble fragment with crude unifacial edge reduction.

Debitage representing various stages of lithic manufacture makes up the remaining 93 non-collected isolated finds. Fifty-nine (63%) of these items exhibit some edge modification, be it obvious, intentional retouch or use wear, or modification by natural forces. These finds may represent one-time, opportunistic, impromptu utilization of a lithic item for a specific task. The exceptions to this are 5 rb1651 and 5 rb1811, which are both isolated core fragments that were possibly reduced on the spot in order to produce flakes for performing an immediate task or for providing tool blanks, but evidence of the reduction sequence (the flakes) is lacking.

One piece of debitage deserves special mention because of its proximity to a series of unusual structural features. This tan siltstone interior percussion flake is located on the southern edge of an east-facing ridge

protuberance in the midst of four low, sandstone cairns (about 20 cm tall). The cairns are situated approximately 90-120 m apart and generally follow the contours around the northern and eastern edges of the ridge. The vertical drop along the eastern edge of the feature is considerable. It is unlikely that the cairns served as prehistoric/historic locational reference points because they do not appear to be aligned with any prominent topographic feature, and they are too low to be seen from a distance. It is also doubtful that they served as an historic/recent property line or stock enclosure. The cairns may possibly represent the remnants of a game drive used to channel animals over the precipice on the eastern edge of the ridge feature. Because the cairns are so low, they may possibly have been used as foundations to support a brush enclosure or structure. It is impossible to determine whether there is any association between the cairn network and the siltstone flake, although the flake, merely by virtue of its presence, lends some credence to an aboriginal origin for the cairn network.

Environmental data compiled for IFs indicates that they tend to occur within specific environmental contexts, which generally reflect the locational patterns noted for the entire resource base (see Appendix B). Generally, it appears that upland pinon/juniper ecosystems were more consistently exploited in terms of short-term, limited activities as represented by isolated finds. Seasonal, primary tributaries of major water sources in the Missouri Creek drainage area were also heavily favored, and IFs are consistently located within .81km of a confluence and/or head of a drainage.
The lower frequency of IFs in floodplain or higher elevation vegetational zones may be partially skewed by limited ground surface visibility and heavier vegetation in these areas, and/or higher sediment aggradation rates in the lowlands.

Next to sites, IFs are the second-most frequently discovered resource type within the study area (approximately one per 100 acres examined). Although numerous external stimuli such as ground surface visibility, private collection, or deposition/erosional forces undoubtedly influence the frequency of IFs, explanations for the relatively high frequency of this resource type may be advanced.

In the first place, the abundance of locally available toolstone in the study area may indirectly encourage a higher frequency of isolated finds. It seems reasonable to assume that, in an area where lithic raw materials are plentiful, there would be little reason to retain items of marginal or impaired utility, particularly debitage of limited use or function. This hypothesis may account for the relatively high frequency of IFs manufactured from siltstone as opposed to other lithic materials, since siltstone is the most commonly found lithic material in the T-M-E study area. Therefore, if relatively little energy need be expended in obtaining more material, and if that material is readily available for performing impromptu tasks, it seems that there would be little need for retaining these flakes of marginal utility. Most other lithic materials found within the study area are thought to occur locally (in the form of cobbles or pebbles), if not regionally in the form of exploitable outcrops or quarry areas.

Secondly, any analysis of the distribution or frequency of isolated finds in an area must address their relationship to the overall resource base. In the study area as a whole, the Archaic lifeway seems to be the most pervasive, regardless of the time period or culture in question. It is conceivable that the high frequency and wide distribution of IFs in the study area reflects this generalized Archaic subsistence strategy, characterized by the exploitation of a wide range of natural resources. It is more likely that a combination of influences such as abundance of lithic materials, exploita-

tion of a broad resource base, and extensive areal exploitation all contributed to the high frequency of IFs noted within the study area.

In determining the relationship between IFs and the total resource base, an important consideration is the analysis of the proximity of an IF to other cultural resources within the study area. Ideally, this would include the isolation of particular resource clusters, which would allow the analysis of inter-associations between resource types within an objectively delineated cluster. Unfortunately, financial constraints prevented the undertaking of this type of analysis. Nonetheless, certain tentative relationships between IFs and other cultural resources may be formulated.

Out of the total number of IFs recorded, 30 (26%) are located within 100 m of a site, four of which (13%) are located nearest a campsite. Forty-seven IFs occur within 150 m of a site, and ten (21%) are closest to a campsite. These values were chosen arbitrarily as reasonable distances within which association between resource types might be expected.

The Chi-square statistic was used in order to determine whether there is a significant difference between the observed and expected frequencies of IFs located within 100 m of a site and those which do not occur within 100 m. The same test was performed substituting the value of 150 m. Historic resources and resources closer to the study area boundary than their nearest neighbor were excluded from the analysis, resulting in a total "N" of 98. For the 100 m value, an $x^2$ value of 16.32 was obtained, which is associated with a probability of $p<.001$. When substituting the value of 150 m, an $x^2$ value of 0.36 was obtained, which is not significant ($p \geq 0.5$). The test indicates that IFs do not occur as frequently within 100 m of a site. Assuming that this distance is a fair measure of association, it is possible that IFs more frequently represent isolated activity rather than peripheral site activity. However, it is likely that a test used to determine association between all

resource types within an objectively delineated resource cluster might indicate that, in terms of specific regions of intense utilization, few resources can be considered truly isolated.

Another method of testing the association between IFs and other resources is by means of a contingency table enumerating the number of times an IF has a site as its nearest neighbor, etc. (Hodder and Orton 1976:204-207). This test has the advantage of using raw frequencies rather than arbitrary measure of distance, and therefore may be more sensitive to resource clustering. According to Hodder and Orton, the test is sensitive to small-scale patterning if only first nearest neighbors are used (Ibid.:204, 205). Again, 18 resources were excluded from the analysis resulting in a total "N" of 98. The resultant coefficient of segregation between resource types ("S") varies from +1, which indicates the complete segregation of a distribution, to -1, where resource types occur in isolated pairs, to 0, which indicates a more random intermingling of resource types (Ibid.:205).

In testing for the degree of association of segregation between IFs and sites and IFs and localities, an S value of 0.05 was obtained for both tests. These values approach 0, indicating that there is very little association between IFs and those resource types, and the distributions are more randomly intermingled. No significant difference between the distributions was found upon testing the values for significance with the $x^2$ statistic.

None of the Texas-Missouri-Evacuation Creeks isolated finds are considered individually eligible for nomination to the National Register of Historic Places, although several IFs may be eligible by virtue of association with unique resource clusters which are potentially eligible as archaeological districts or areas (see Table 10, in Section entitled "Management Summary"). Within the West End Canyon Cluster, these IFs include 5 rb1574 and 5 rb1575;

IFs within the boundaries of the Davis Confluence Cluster include 5 rb1809 and 5 rb1870. The remaining assemblage of IFs is not considered archaeologically significant and it is believed that full recordation and/or collection of isolated finds during the T-M-E pedestrian reconnaissance constitutes adequate retrieval of all pertinent data regarding these resources.

In summary, locational and morphological trends exhibited by IFs located within the study area provide a number of clues to prehistoric/Proto-historic aboriginal behavior. Only one collected isolated find may be tentatively assigned to the Archaic/Fremont period, although it is recognized that the overall spatial distribution and frequency of IFs may reflect the Archaic subsistence pattern of widespread areal resource procurement. The relatively high frequency of IFs may also be explained by the abundance of locally occurring lithic materials for replacing items that were lost or discarded. Overall, the upland pinon/juniper vegetal/topographic zones seem to be consistently favored for the short-term tasks represented by IFs. Lastly, there is a low probability of encountering an IF within 100-150 m of a site, and IFs were found to be randomly intermingled with other sites and localities encountered in the T-M-E study area.

## Localities

A total of 67 localities (19% of the total number of cultural resources recorded during survey) were located during pedestrian reconnaissance of the study area. Five of these are classified as historic (5 Rb1490, 5 Rb1555, 5 Rb1699, 5 Rb1700, 5 Rb1847) and are discussed separately under "History: Results". Two others, 5 Rb1625 and 5 Rb1630, were considered to be localities for recordation purposes, but do not conform to the locality definition (see page 9). 5 Rb1625 contains seven items and 5 Rb1630, a shattered cobble,

TABLE 4: Prehistoric Localities

| No. | Elev.(m) | Size($m^2$) | # of items | debi-tage | ret./ util. | finished tools | % col-lected | # of lithic materials | Veg. | Topo. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1485 | 1822 | 0.5 | 5 | 5 | 0 | 0 | 100% | 3 | 13 | 5 |
| 1486 | 1810 | 65 | 4 | 0 | 4 potsherds | | 100% | NA | 2 | 1 |
| 1487 | 1834 | 2 | 4 | 4 | 0 | 0 | 100% | 3 | 13 | 5 |
| 1488 | 1822 | 6 | 3 | 2 | 1 | 0 | 100% | 2 | 13 | 2 |
| 1489 | 1833 | 44 | 5 | 4 | 1 | 0 | 100% | 3 | 13 | 6 |
| 1491 | 1847 | 0.1 | 2 | 0 | 0 | 1 (in 2 pieces) | 100% | 1 | 13 | 5 |
| 1492 | 1841 | 2 | 2 | 2 | 0 | 0 | 0% | 2 | 6 | 5 |
| 1493 | 1865 | 0.5 | 3 | 2 | 1 | 0 | 100% | 2 | 13 | 4 |
| 1505 | 1795 | 0.1 | 2 | 2 | 0 | 0 | 0% | 1 | 6 | 6 |
| 1525 | 1835 | 2 | 5 | 4 | 1 | 0 | 100% | 2 | 13 | 4 |
| 1526 | 1835 | 48 | 5 | 1 | 3 | 1 | 20% | 1 | 13 | 7 |
| 1527 | 1823 | 18 | 4 | 4 | 0 | 0 | 0% | 1 | 13 | 4 |
| 1528 | 1804 | 2 | 4 | 4 | 0 | 0 | 0% | 1 | 13 | 7 |
| 1529 | 1822 | 0.005 | 2 | 2 | 0 | 0 | 0% | 1 | 13 | 7 |
| 1530 | 1792 | 2 | 2 | 1 | 1 | 0 | 0% | 1 | 6 | 5 |

TABLE 4 cont.

| No. | Elev.(m) | Size($m^2$) | # of items | debi-tage | ret./util. | finished tools | % col-lected | # of lithic materials | Veg. | Topo. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1531 | 1804 | 1 | 5 | 3 | 2 | 0 | 0% | 2 | 13 | 5 |
| 1532 | 1868 | 18 | 2 | 2 | 0 | 0 | 0% | 1 | 13 | 5 |
| 1533 | 1908 | 1 | 3 | 0 | 3 | 0 | 0% | 1 | 13 | 4 |
| 1534 | 1853 | 9 | 2 | 0 | 1 | 1 | 100% | 1 | 13 | 5 |
| 1535 | 1817 | 2 | 2 | 0 | 2 | 0 | 0% | 1 | 6 | 5 |
| 1536 | 1828 | 17 | 2 | 1 | 1 | 0 | 0% | 2 | 6 | 5 |
| 1573 | 1999 | 156 | 4 | 3 | 0 | 1 | 25% | 2 | 13 | 9 |
| 1576 | 1804 | 15 | 2 | 1 | 1 | 0 | 0% | 2 | 13 | 9 |
| 1621 | 1804 | 30 | 3 | 2 | 1 | 0 | 100% | 1 | 13 | 7 |
| 1622 | 1817 | 128 | 4 | 3 | 1 | 0 | 100% | 1 | 13 | 9 |
| 1623 | 1804 | 5 | 2 | 0 | 2 | 0 | 100% | 1 | 13 | 9 |
| 1624 | 1841 | 30 | 4 | 3 | 0 | 1 | 100% | 2 | 6 | 5 |
| 1625 | 1841 | 29 | 7 | 4 | 3 | 0 | 100% | 1 | 13 | 5 |
| 1626 | 1792 | 87 | 2 | 0 | 2 | 0 | 100% | 1 | 6 | 5 |
| 1627 | 1993 | 69 | 5 | 0 | 3 | 2 | 100% | 3 | 13 | 2 |
| 1628 | 1890 | 210 | 5 | 3 | 2 | 0 | 100% | 2 | 123 | 7 |

TABLE 4 cont.

| No. | Elev.(m) | Size($m^2$) | # of items | debi-tage | ret./util. | finished tools | % col-lected | # of lithic materials | Veg. | Topo. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1629 | 1835 | 3 | 2 | 1 | 1 | 0 | 100% | 2 | 13 | 6 |
| 1630 | 1841 | 0.1 | 15 | fragments (cobble) | | 0 | 0% | 1 | 13 | 7 |
| 1631 | 1853 | 7 | 2 | 2 | 0 | 0 | 0% | 2 | 13 | 7 |
| 1665 | 2072 | 3 | 2 | 1 | 1 | 0 | 100% | 1 | 13 | 5 |
| 1666 | 2085 | 812 | 4 | 0 | 3 | 1 | 75% | 2 | 13 | 4 |
| 1675 | 1841 | 4 | 2 | 0 | 2 | 0 | 100% | 1 | 13 | 9 |
| 1676 | 1835 | 2 | 2 | 0 | 1 | 1 | 100% | 2 | 13 | 4 |
| 1677 | 1828 | 150 | 4 | 1 | 3 | 0 | 100% | 1 | 13 | 4 |
| 1683 | 1905 | 39 | 3 | 3 | 0 | 0 | 0% | 1 | 13 | 6 |
| 1690 | 1865 | 5 | 3 | 3 | 0 | 0 | 0% | 1 | 13 | 2 |
| 1692 | 1853 | 3 | 3 | 0 | 3 | 0 | 0% | 1 | 13 | 7 |
| 1693 | 1884 | 10 | 4 | 3 | 0 | 1 | 100% | 1 | 13 | 5 |
| 1696 | 1853 | 14 | 2 | 0 | 1 | 1 | 100% | 1 | 13 | 5 |
| 1703 | 1853 | 12 | 2 | 1 | 1 | 0 | 100% | 1 | 13 | 7 |
| 1709 | 1890 | 126 | 2 | 2 | 0 | 0 | 100% | 2 | 13 | 7 |
| 1711 | 1908 | 1 | 2 | 2 | 0 | 0 | 100% | 2 | 13 | 5 |

TABLE 4 cont.

| No. | Elev.(m) | Size($m^2$) | # of items | debi-tage | ret./ util. | finished tools | % col-lected | # of lithic materials | Veg. | Topo. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1793 | 1823 | 1 | 2 | 1 | 1 | 0 | 0% | 1 | 15 | 2 |
| 1807 | 1884 | 57 | 3 | 0 | 3 | 0 | 100% | 3 | 13 | 7 |
| 1812 | 1878 | 112 | 4 | 0 | 4 | 0 | 0% | 1 | 13 | 7 |
| 1822 | 1890 | 1380 | 3 | 0 | 3 | 0 | 0% | 1 | 13 | 7 |
| 1826 | 1872 | 32 | 4 | 0 | 4 | 0 | 0% | 1 | 6 | 6 |
| 1828 | 1878 | 160 | 3 | 2 | 1 | 0 | 0% | 1 | 13 | 7 |
| 1833 | 1853 | 80 | 2 | 1 | 1 | 0 | 0% | 1 | 6 | 5 |
| 1836 | 1847 | 0.4 | 4 | 0 | 4 | 0 | 0% | 2 | 13 | 5 |
| 1837 | 1872 | 3 | 2 | 1 | potsherd | 1 | 100% | 1 | 15 | 9 |
| 1838 | 1884 | 17 | 3 | 2 | 1 | 0 | 0% | 2 | 15 | 9 |
| 1839 | 1838 | 3 | 2 | 2 | 0 | 0 | 100% | 1 | 13 | 7 |
| 1844 | 1835 | 697 | 4 | 4 | 0 | 0 | 75% | 1 | 13 | 2 |
| 1845 | 1850 | 6 | 2 | 0 | 2 | 0 | 100% | 1 | 13 | 2 |
| 1846 | 2109 | 8 | 3 | 1 | 2 | 0 | 100% | 1 | 14 | 5 |
| 1869 | 1893 | 72 | 4 | 3 | 0 | 1 | 25% | 2 | 13 | 4 |

TABLE 4 cont.

| No. | Elev.(m) | Size($m^2$) | # of items | debi-tage | ret./ util. | finished tools | % col-lected | # of lithic materials | Veg. | Topo. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Historic Localities | | | | | |
| 1490 | 1853 | 7 | corral | | | | | | 13 | 5 |
| 1555 | 1841 | 0.75 | rock cairn | | | | | | 13 | 7 |
| 1699 | 1883 | 5 | historic cans | | | | | | 13 | 6 |
| 1700 | 1878 | 59 | temporary historic camp | | | | | | 13 | 9 |
| 1847 | 2121 | 0.75 | rock cairn | | | | | | 14 | 5 |

consists of 15 items. These resources shall be discussed as localities, but are excluded from all numerical and statistical analyses because of their aberrant nature. All numerical computations in this section concerning prehistoric localities, then, are based upon a total of 60 resources.

Localities were collected for further analysis during every alternate field session in order to provide a representative sample of localities within the study area. Table 4 lists all pertinent information concerning localities, including percent of collection. A more detailed discussion of items collected from localities, as well as photographic plates of specific collected items are found in Appendix A of this report.

A total of 15 prehistoric localities contain four items, seven contain five artifacts and the remaining 38 are composed of two or three items. The average number of items for a locality is 3.02 Thirty-five (58%) contain only one lithic material, 18 (30%) are composed of two material types, five (8%) contain three lithic materials, and two (3%) contain ceramics.

Fifteen of the prehistoric localities (25%) consist of lithic debitage without retouch or utilization, nine of which are manufactured from a single lithic material, and six in which more than one material is present. Thirty-one localities (52%) contain a mixture of unmodified debitage and retouched/utilized flakes. Twenty of these contain a single lithic material and 11 are composed of items manufactured from more than one material. Twelve of these 31 localities (39%) consist entirely of retouched/utilized debitage. Twelve localities (20%) consist of a mixture of unmodified debitage, retouched/utilized flakes, finished tools or projectile points ranging in relative frequency from 1:3 or 1:1 (one tool per three pieces of debitage to one tool per one piece of debitage). Five consist of a single lithic material, and seven contain several different materials. Finally, two lo-

calities contain ceramics: 5 Rb1486 is composed of four potsherds representing types of black-on-white/grey trade ware, and 5 Rb1837 contains one potsherd of grey corrugated trade ware and an endscraper.

Prehistoric localities average 79.85 $m^2$ in size, but the standard deviation and variance are quite large (s=220.55, v=47835.336). In fact, only 12 localities are larger than the mean, and only half the localities (30) are larger than 10 $m^2$ in area.

Localities range in elevation from 1792-2109 m and average 1963 m. majority of localities (46-76%) were recorded in areas characterized by low elevation big sagebrush shrubland, three (5%) in pinon/juniper vegetation on cliffs/breaks, one (2%) is located in big sagebrush shrubland, and the remaining locality (2%) is located in high elevation pinon/juniper. This locational pattern (in terms of vegetation zones) very closely parallels that of the total cultural resource base within the study area.

Localities are distributed over a fairly wide range of topographic features, although the upland context (48, or 80%) is consistently favored. Other topographic features include floodplain (1, or 2%), floodplain terrace (6, or 10%), and ridge slope (5, or 8%). Generally, topographic distribution of localities is also quite similar to that of the total resource base, with the exception that proportionally fewer localities are situated on the tops or edges of ridge fingers and the edges/rims of upland features when compared to the total resource distribution, and a proportionately greater number of localities are situated in the interior of upland features. However, the differences do not appear to be major ones.

Most prehistoric localities (31, or 52%) are associated with the Missouri Creek system; 16 (26%) are associated with the Texas Creek system; 12 (20%) are located near Evacuation Creek and its tributaries; and one (2%) is associated with the Davis Canyon drainage network. This distribution generally

conforms to the overall resource patterning, with the exception that proportionally more localities are associated with Texas Creek and proportionally fewer are associated with Evacuation Creek, but again, differences appear to be minor.

The majority of localities (58, or 97%) are situated nearest an intermittent, seasonal water source, which is more frequently a primary (33, or 55%) or secondary (17, or 28%) tributary of a major drainage. Three localities (5%) are located nearest another type of water source and seven (12%) are nearest a major drainage.

A total of 35 (58%) of the localities are located either within .81 km of a drainage, or within .81 km of the confluence of two drainages, although the confluence situation is favored (21 localities, 35%). Twenty-one (35%) localities are situated within .81km of both a drainage head and a confluence. The average slope to the nearest drainage is .02%, and the mean direct lineal distance ("C" value) from a locality to its nearest water source is 185.30 m (s=110.33).

Finally, consideration was given to the spatial orientation of localities in relation to other resources within the study area. The average distance from a locality to the nearest site is 126.9 m (s=117.42). A total of 15 (32%) localities have an IF as their nearest neighbor, seven (15%) are located nearest another locality, and 25 (53%) are nearest a site. Thirteen localities were excluded from the analysis because they are located nearer a study area boundary than the nearest resource. A complete list of computer tabulations concerning localities is found in Appendix B.

Resources designated as prehistoric localities may presumably represent a distinct activity or set of activities distinguishable from sites. Such resources are thought to represent activity by one, or at most a few, indi-

viduals for very limited purposes. It is uncertain, however, whether the spatial aggregation or dispersion of these resources is directly related to aboriginal behavior, or is more the result of post-depositional disturbance. It is possible that a number of localities may actually be remnant sites in which only a few items (i.e. less than six) remain in an area where a greater concentration of artifacts indicative of more varied and/or intensive activity once existed. Because portions of the study area have been utilized through recent times, it is likely that a great deal of artifact collection and/or relocation has taken place. Natural forces such as erosion or deposition may have separated items from a site and relocated the artifacts as a locality, or transported items from different activity areas resulting in an unrelated collection of artifacts forming a locality. It is also possible that artifact clusters recorded as localities may actually be preliminary or remnant surface exposures of buried cultural strata. Finally, it must be kept in mind that the locality definition itself and the number of items constituting a locality is arbitrary. All of these factors deserve consideration as attempts are made to interpret specific localities and their functions, since they may tend to blur distinctions between localities and sites.

It was hoped that localities which were 100% collected for functional analysis might provide supportive data for several hypotheses outlined in the original Texas-Missouri-Evacuation Creeks research design (see "Introduction"). Wear analysis was conducted on selected finished tools collected from localities, but unfortunately, financial and time constraints prevented detailed analysis of retouched/utilized items and debitage. Consequently, some interpretations of locality function and/or behavioral correlates are addressed, but these must be regarded as tentative due to partial analysis of collected locality remains.

Fifteen of the 60 prehistoric localities consist of lithic debitage without retouch or utilization, nine of which consist of items manufactured from a single lithic material. Four of these nine localities (5 Rb 1527, 1528, 1529, and 1532) contain siltstone items exclusively and occur in areas where siltstone is the dominant material for sites and IFs as well. The same tendency was observed for 5 Rb1844, which contains all quartzite items and is located in an area where quartzite items are predominant. It is possible that these localities consisting entirely of flaking detritus of a single lithic material may represent small-scale tool manufacturing evidenced by the presence of unretouched, unutilized flakes and cores and the absence of tools.

The remaining six localities in this category contain unmodified debitage of more than one lithic material. Two of these resources (5 Rb1485, 1487) may also represent minor tool-making loci because at least three of the flakes in each locality are of a single lithic material. (In the case of 5 Rb1487, all flakes are chert, but each is a different color). The remaining localities in this group (5 Rb1492, 5 Rb1631, 5 Rb1709, 5 Rb1711) consist of only two items each, making it difficult to infer specific activities. It is possible that these localities may actually represent remnant sites, or possibly items that have been relocated from existing sites. For example, 5 Rb1631 is located 45 m from site 5 Rb 1618, which may either signify peripheral site activity or disarticulation of the items from recorded site boundaries by natural post-depositional forces.

Thirty-one of the 60 prehistoric localities consist of a mixture of debitage and retouched/utilized flakes. Twenty of these consist of items manufactured from a single lithic material (ten of which consist entirely of modified flakes) and more than one lithic material is present at 11 localities

(two of which consist entirely of retouched/utilized flakes). Twelve of the single-material localities (11 entirely of siltstone, one exclusively quartzite) again occur in areas where siltstone or quartzite artifacts are dominant. It is impossible to determine the functional capacity of these localities without use wear analysis, but it may be safe to say that the behaviors represented are clearly more task-oriented (game butchering/processing? - tool manufacture/finishing?) than the localities that consist entirely of unmodified debitage.

Twelve localities consist of a mixture of unmodified debitage, retouched/utilized flakes, finished tools or projectile points; five of which contain items of a single lithic material, and seven in which more than one lithic material is present. Several of these localities contain tool kits extremely suggestive of activities associated with game kills and/or butchering/processing of animal carcasses. Six localities (5 Rb1534, 1693, 1696, 1624, 1666, 1627) contain projectile points or point fragments which occur with finished tools, retouched/utilized flakes or unmodified debitage. 5 Rb1627, for example, contains a chalcedony point midsection, a siltstone biface fragment, and three utilized chert flakes. The remaining five localities usually consist of a single tool with modified or unmodified debitage.

Wear patterns exhibited by finished tools from these localities lend credence to the hypothesis that they represent butchering/processing activities. For example, 5 Rb1676 consists of a single retouched flake and a unifacial tapered endscraper (TME-21c) which was most likely straight-hafted and utilized in a unidirectional scraping or adze-like chopping motion against a moderately resistant surface. The wear pattern suggests utilization for the latter stages of hide processing or perhaps the dismemberment of an animal carcass. The item was not resharpened; in fact, it may have been misused

as indicated by a large flake removed from the bit.

5 Rb1491 (TME-20b), which consists of a unifacial, double-bitted side-scraper (found in two pieces and later glued together) may have been used both for scraping and/or smoothing projectile shafts. Wear patterns indicate possible utilization for moderate to light-duty scraping of pliant to somewhat resistant materials. Two worked concavities on either side of the tool may have served a "spokeshave" function.

5 Rb1869 consists of a small, parallel-sided blade and three pieces of unmodified debitage. The blade exhibits a transverse impact fracture on the proximal edge, and may have been a projectile point that was later used for cutting or scraping. This locality, as well as others which contain finished tools and unmodified debitage,may still represent butchering/processing loci, although this functional assignation is more speculative. However, it must be kept in mind regarding these localities that "flakes or tools utilized in butchering small game may or may not exhibit obvious characteristics of utilization due to brevity of use" (Kranzush, et al 1979:98).

The remaining locality in this category (5 Rb1573) does not appear to be associated with butchering/processing activity and may represent a specific tool manufacturing area. In addition to fragments and one flake, the locality contains a small, triangular-elliptical biface fragment (TME-28a) which exhibits heavy utilization along a small portion of one of its lateral edges. Wear analysis suggests a possible burnishing function performed in the manufacture and/or finishing of a perishable tool.

Two localities containing pottery sherds were also recorded. Locality 5 Rb1486 consists of four sherds of black-on-grey/white trade ware (TME-44), possibly representing four different pottery types. The four potsherds may be Kayenta or Mesa Verde wares from Pueblo II (AD 1050-1150) or Pueblo III

(AD 1150-1250) times, placing them within the Fremont Period of influence in the study area (see Appendix A). Due to the extremely unlikely probability that such a distribution could result from chance forces of nature (e.g. washing together or exposure of four sherds of four different types), it appears that the most likely explanation for the existence of this locality is that it represents loss of the sherds during transport, either by aboriginal groups or possibly by recent collectors.

The remaining locality containing pottery (5 Rb1837) consists of one sherd of grey corrugated pottery (TME-43) and an endscraper (TME-21c). The potsherd is apparently a trade ware (Tusayan Corrugated?) of Anasazi manufacture (ca. AD 950-1300), and the endscraper appears to have been briefly utilized against a resistant material. Unintentional loss of items during transit is a possible explanation for the existence of this locality as well, although other unknown factors may also have resulted in such a distribution. It should be noted that the entire area in which the locality was situated has been heavily vandalized in recent times, and it is possible that these items may have been lost or discarded by collectors.

Finally, two resources (5 Rb1625, 5 Rb1630) were considered to be localities for recordation purposes, but do not conform to the locality definition. 5 Rb1630 consists of 15 unmodified medium-grained, grey quartzite cobble fragments, possibly representing the initial stages of lithic reduction, and 5 Rb1625 is composed of seven siltstone flakes, three of which exhibit retouch/utilization. 5 Rb1625 may represent game butchering/processing or tool manufacturing/finishing activities, although this interpretation is impossible to confirm without use wear analysis. These two abberrant localities were excluded from all numerical tallies given in the foregoing discussions.

Diagnostic projectile points collected from localities establish para-

meters for a time range of activity from Early Archaic (ca. 5000 BC) through Proto-historic times (ca. AD 1880). A projectile point from 5 Rb1534 (TME-4) does not resemble any other specimens found in the literature, but it may be of Early Archaic age (5000-3000 BC ) (Wheat, personal communication). Points from 5 Rb1696 (TME-12) and 5 Rb1624 (TME-11) are tentatively assigned to the Archaic and Late Archaic periods, respectively (5000 BC-AD 400), and points from 5 Rb1666 (TME-16) and 5 Rb1693 (TME-6) may be associated with Late Archaic-Fremont and Late Fremont-Proto-historic (Numic?) cultures (1000 BC-AD 1880). 5 Rb1627 is too fragmentary to allow for identification.

Since all specimens are fragmentary, it is believed that they were discarded due to breakage. Only one specimen (from 5 Rb1696) exhibits evidence of resharpening; the remaining artifacts exhibit either minimal breakage, or such extensive damage that, if it occurred prior to discard, rejuvenation would have been impractical, if not impossible.

Although the evidence is not conclusive, it is possible that the majority of localities represent utilization of the area during the Archaic Period, or at least reflect the generalized Archaic lifeway which was practiced by a number of different aboriginal groups. Extensive-area resource procurement, which charaterized the generalized Archaic subsistence pattern, may very well have resulted in the deposition of artifacts consistent with the small artifact clusters defined by G&K as localities.

As exhibited in the locational analysis of isolated finds, prehistoric localities appear to occur within specific environmental contexts which generally follow patterns apparent for the entire resource base. Again, the upland pinon/juniper environmental context was apparently most consistently favored for limited activities as represented by localities. Seasonal, primary or secondary water sources, particularly in the Missouri Creek

drainage area are also heavily favored. As for IFs and sites, localities are more frequently located wihtin .81 km of a drainage head or confluence, or often both.

In terms of the possible relationship between localities and prehistoric sites within the study area, it was found that 14 localities occur within 100m of a site (two of which are nearest a campsite). Aberrant localities, historic resources and those localities which are closer to a study area boundary than the nearest site were all excluded from the analysis. As for isolated finds, the chi-square test was used to determine whether there is a significant difference between observed and expected frequencies of localities located within 100 m or 150 m of a site. For the 100 m distance, an $x^2$ value of 7.68 was obtained, which is significant at $p \leq .01$. The chi-square value derived from substitution of the 150 m value is not significant ($p > .05$). The test indicates that there is a relatively low probabitity of encountering a locality within 100 m of a site, and localities may therefore represent more isolated than peripheral site activities. It is interesting to note that at 150 m, the probability of encountering a locality increases to approximately 50%. The distance of 150 m appears to act as sort of a "threshold" value in which the number of localities within 150 m and those not within 150 m (23 and 24 respectively), in the study area are almost equally distributed.

The contingency table "nearest neighbor" test (see page 69 for an explanation of this test) was also employed for localities in order to determine the degree of aggregation or dispersion between localities and other resources within the study area. Historic localities (5), abberant localities (2), and localities which are closer to a study area boundary than their nearest neighbor (13) were excluded from the analysis. In testing for the degree of spatial association or segregation between localities and IFs, a co-efficient

of segregation, or S value, of 0.04 was obtained. Since the value is closer to 0 than 1 or -1, it is apparent that IFs and localities are more randomly intermingled, indicating minimal association between these resource types. Localities and sites, however, appear to be more strongly associated, as indicated by the resultant S value of -0.94. This S value approaches -1, indicating that these resources occur more frequently in isolated pairs. A chi-square test for significance, however, indicated that these results are not significant (p=.05).

None of the Texas-Missouri-Evacuation Creeks localities is believed to be individually eligible for nomination to the National Register of Historic Places. However, one locality (5 Rb1573) may be eligible by virtue of its inclusion within the West End Canyon Resource Cluster, an area which is potentially eligible as an archaeological district or area. Although the locality was 25% collected, it is recommended that the remaining artifacts be left undisturbed until a final determination of eligibility for the entire resource cluster is made. Another locality, 5 Rb1627, also falls within the West End Canyon Cluster boundaries, but 100% collection has successfully mitigated any potential adverse effect to this resource.

The 31 localities which were 100% surface collected as well as the 29 localities left _in situ_ or only partially surface collected are also considered to be ineligible for nomination to the National Register. While it is possible that limited shallow subsurface cultural deposits may exist in these locality areas, it is generally felt that minimal soil depth and frequent disturbance precludes the possibility of encountering significant subsurface cultural remains. Furthermore, it is believed that all pertinent data concerning these resources was gathered during field recordation and/or collection.

In summary, localities recorded within the study area represent a number

of activities undertaken by aboriginal groups, including impromptu small game kill/butchering and limited tool manufacturing activities. It must be kept in mind, however, that some of these interpretations are somewhat speculative, due to the influence of post-depositional factors and incomplete analysis of all collected items from localities. Diagnostic artifacts collected from localities indicate a prospective time range of activity from Early Archaic to historic times (5000 BC-AD 1880). It is possible that the patterns of small resource clusters which characterize localities may be a reflection of the generalized Archaic subsistence mode which was practiced by several groups during this period. Environmentally, localities are consistently located in upland pinon/juniper zones. In terms of spatial distribution, there is a low probability of encountering a locality within 100 m of a site, and localities and sites tend to occur more frequently in isolated pairs. Isolated finds and localities tend to be more randomly intermingled.

## Sites

A total of 171 aboriginal sites were recorded in the 11,692-acre T-M-E survey area. The sites consist of 30 campsites, five quarry areas, one rock art site and 135 lithic scatters. Each site type will be discussed separately below in terms of group composition and location (see Table 5).

### Campsites

Table 6 lists the 30 campsites recorded during the T-M-E survey. As is clear from the table, the presence of certain features, specifically hearths, most often resulted in the classification of a site as a campsite. Of the 30 campsites, 20 meet only one of the defined criteria for membership within the category. The ten remaining sites contain two or three of the five identi-

fying characteristics. It is most common (four cases) for structural remains to occur in conjunction with features such as hearths, depressions, or rock alignments.

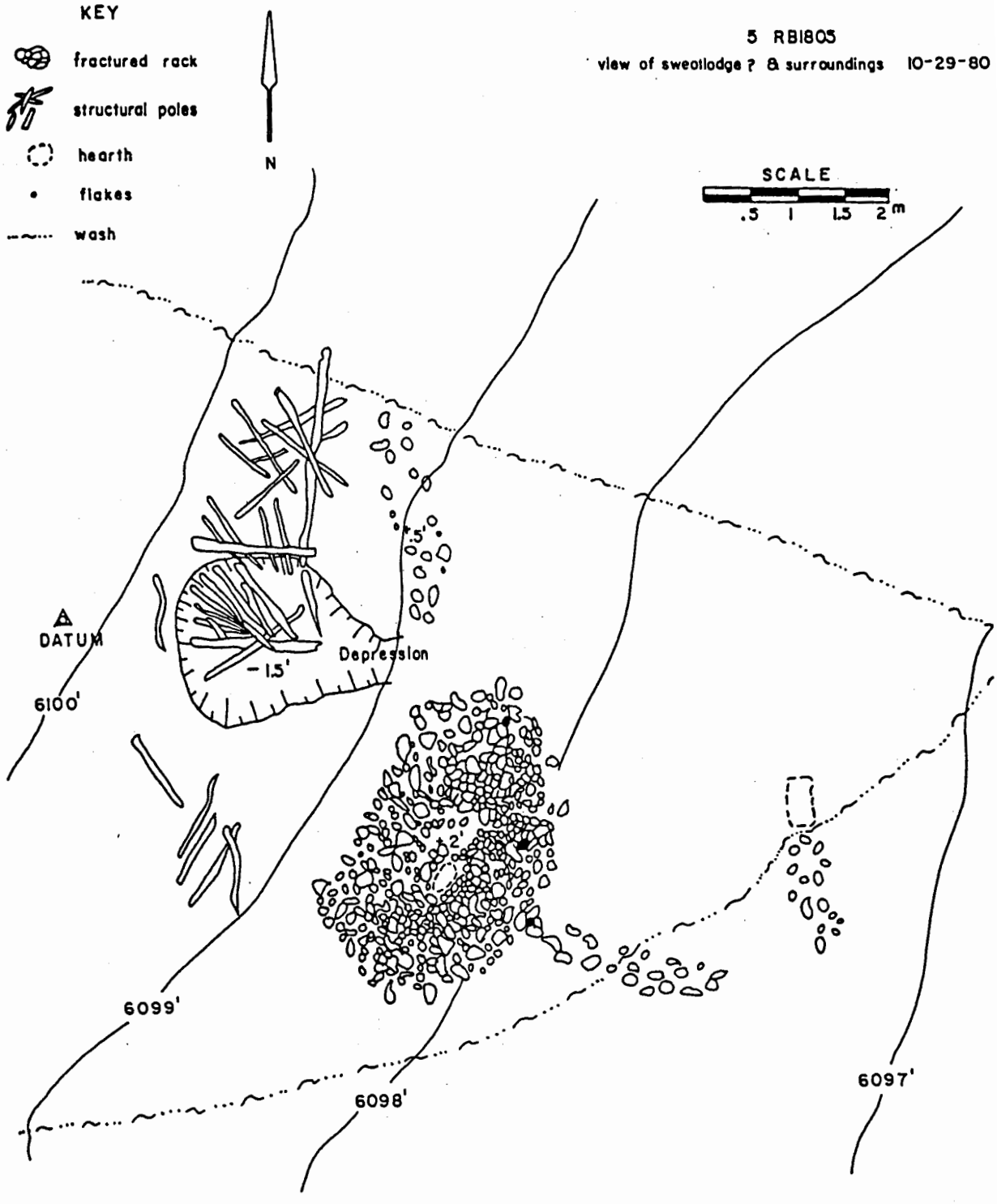
The five sites in which structural remains were recorded are 5 RB1570, 1797, 1805, 1806, and 1808 (Plates IV-V). All structural indications consist of partially collapsed juniper pole structures containing (at present) between two and 15 poles. 5 RB1570 consists of a generally linear alignment of juniper poles laid into living juniper trees. Pole ends are buried 15 to 30 cm in the loose topsoil, and several disarticulated poles are scattered adjacent to the erect portion of the structure. The methods used to cut the poles was not obvious, although several of the disarticulated poles more resembled deadfall than cut logs.

Structural indications associated with the remaining four sites consist of roughly conical arrangements of juniper poles. 5 RB1797 and 1806 contain somewhat disarticulated circular arrangements of poles laid into living junipers, whereas 5 RB1805 and 1808 contain the remains of what seem to have been free-standing structures. The 5 RB1805 structure, due to its small size (Figure 3) and association with hearths and fire-cracked rock, is believed to be the remains of a sweatlodge. (Firebaugh; Jennings, personal communications). The remaining structures most probably represent the remains of wickiup-like constructions, although poor preservation (Plate V.b) and/or small size and unusual form (Plate V.5) may indicate that 5 RB1806 and 1808 served alternate functions as lean-tos and/or game drying racks. The presence of recent/historic trash within 5 RB1806 boundaries suggests a possible non-aboriginal origin for structural remains recorded within this site (see pages 170-173).

One campsite, 5 RB956 (Plate I.a), consists of a large rockshelter located

FIGURE 3

5 RB1805 Layout



# TABLE 5: Sites

| Site Section Region | Total No. Lithics | 100% Tally | Partial Tally | Tally Transect | Density Square | MATERIAL TYPES: Chert # / % | Quartzite # / % | Chalcedony # / % | Siltstone # / % | Obsidian # / % | Other # / % | STAGES OF REDUCTION: Pressure # / % | Frags. Cores # / % | Interior # / % | Decortication # / % | Finished Tools # / % | Material Types (tools) / % | Features, Structures, Other Artifacts, etc., |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 480 26 Evac. | | | | | | | | | | | | | | | | | | historic structural remains and associated debris |
| 952 12 Tex-L.Mo | 7 | | | | x | | | | 7 100% | present | | | | 5 71% | 2 29% | | | 3 adjoining depressions with flakes |
| 953 17 Tex-L.Mo | 73 | x | | | | 45 62% | 3 4% | | 25 34% | | | 7 10% | 2 3% | 44 60% | 20 27% | 1 1% | siltstone-100% | |
| 954 8 Tex-L.Mo | 299 | x | | | | 187 62% | 2 1% | | 102 34% | 8 3% | | | 2 0.6% | 277 92% | 19 6% | 1 0.3% | chert-100% | hammerstone |
| 955 8 Tex-L.Mo | 11 | x | | | | 7 64% | 1 9% | | 3 27% | | | 1 9% | | 9 82% | 1 9% | | | |
| 956 8 Tex-L.Mo | 28 | x | | | | 23 82% | | | 5 18% | | | | 1 4% | 14 50% | 11 39% | 2 7% | chert-100% | rock shelter - 2 manos 1 metate, hearth |
| 957 8 Tex-L.Mo | 8 | x | | | | 3 37.5% | 3 37.5% | | 2 25% | | | | 1 12.5% | 4 50% | 3 37.5% | | | |
| 958 8 Tex-L.Mo | 81 | x | | | | 6 8% | 1 1% | | 73 90% | 1 1% | | 4 5% | 2 2% | 59 73% | 15 19% | 1 1% | chert-100% | burnt bone - probably recent |
| 959 8 Tex-L.Mo | 49 | x | | | | 30 61% | 1 2% | 1 2% | 17 35% | | | | | 38 78% | 10 20% | 1 2% | chert-100% | |
| 960 8 Tex-L.Mo | 8 | x | | | | 5 62.5% | | 1 12.5% | 2 25% | | | | 2 25% | 5 62.5% | 1 12.5% | | | |
| 961 8 Tex-L.Mo | 186 | x | | | | 41 22% | 22 12% | 3 1.5% | 116 62% | 1 0.5% | 3 1.5% | 3 1.5% | 6 3% | 149 80% | 28 15% | 1 0.5% | chert-100% | |
| 962 17 Tex-L.Mo | 194 | x | | | | 58 30% | 4 2% | | 132 68% | | | | 11 6% | 150 77% | 30 15.5% | 3 1.5% | chert- 33% siltstone- 67% | |
| 963 17 Tex-L.Mo | 326 | x | | | | 3 1% | 17 5% | | 306 94% | | | | 14 4% | 219 67% | 93 29% | | | |
| 964 17 Tex-L.Mo | 6 | x | | | | | | | 6 100% | | | | | 3 50% | 3 50% | | | |
| 965 17 Tex-L.Mo | 65 | x | | | | 26 40% | 24 37% | 1 1.5% | 14 21.5% | | | 7 11% | 47 72% | 11 17% | | | | |
| 966 7 Tex-L.Mo | 56 | x | | | | 2 3.5% | | 54 96.5% | | | | 6 11% | 4 7% | 35 62% | 11 20% | | | |
| 967 7 Tex-L.Mo | 31 | x | | | | | | | 31 100% | | | | 2 6% | 20 65% | 9 29% | | | |
| 968 11 14 Tex-L.Mo | 89 | | x | | x | 4 4.5% | 4 4.5% | 2 2% | 79 89% | | | | 3 3.3% | 55 62% | 28 31.4% | 3 3.3% | chalcedony- 67% siltstone-33% | |
| 969 12 Tex-L.Mo | 138 | | x | | | 14 10% | 5 4% | 3 2% | 115 83% | | | 6 4% | 17 12% | 68 49% | 45 33% | 2 2% | chert-50% siltstone-50% | possible hearth |

Table 5 cont.

| Site Section Region | Total No. Lithics | 100% Tally | Partial Tally | Tally Transect | Density Square | MATERIAL TYPES: Chert # / % | Quartzite # / % | Chalcedony # / % | Siltstone # / % | Obsidian # / % | Other # / % | STAGES OF REDUCTION: Pressure # / % | Frags. Cores # / % | Interior # / % | Decortication # / % | Finished Tools # / % | Material Types (tools) / % | Features, Structures, Other Artifacts, etc., |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 970 12 Tex-L.Mo | 10 | x | | | | | | | 10 100% | | | | | 6 60% | 4 40% | | | |
| 971 12 Tex-L.Mo | 74 | x | | | | 8 11% | 1 1% | 3 4% | 62 84% | | | | 3 4% | 47 64% | 24 32% | | | |
| 1537 12 Tex-L.Mo | 295 | x | | | | 13 4% | 1 0.3% | 5 1.6% | 276 94% | | | 3 1% | 19 6% | 137 46.5% | 128 43.5% | 8 3% | chert-25% siltstone-63% quartzite-12% | |
| 1538 12 Tex-L.Mo | 18 | x | | | | 2 11% | | | 16 89% | | | | 1 6% | 8 44% | 9 50% | | | |
| 1539 11 12 14 Tex-L.Mo | 160 | | x | | | 22 13% | | 1 1% | 136 85% | 1 1% | | 10 6% | 3 2% | 82 52% | 51 32% | 14 8% | chert-43% siltstone-57% | |
| 1540 12 Tex-L.Mo | 330 | | x | | | 104 31% | 26 8% | | 184 56% | 16 5% | | | 1 0.3% | 245 74.2% | 80 24.2% | 4 1.2% | chert-50% quartzite-50% | |
| 1541 12 Tex-L.Mo | 110 | x | | | | 109 99% | | | | 1 1% | | | | 110 100% | | | | |
| 1542 7 Tex-L.Mo | 22 | x | | | | 1 5% | | | 21 95% | | | | | 16 73% | 6 27% | | | |
| 1543 18 Tex-L.Mo | 9 | x | | | | 1 11% | | 1 11% | 7 78% | | | | | 3 33% | 5 56% | 1 11% | chalcedony-100% | |
| 1544 13 Tex-L.Mo | 73 | x | | | | 2 3% | | | 71 97% | | | | 2 3% | 24 33% | 46 63% | 1 1% | siltstone-100% | |
| 1545 13 Tex-L.Mo | 31 | x | | | | | | | 31 100% | | | | 1 3% | 13 42% | 17 55% | | | |
| 1546 18 Tex-L.Mo | 50 | x | | | | | | | 50 100% | | | | | 32 64% | 18 36% | | | |
| 1547 14 Tex-L.Mo | 21 | | x | x | | | | | 21 100% | | | | 2 9.5% | 12 57% | 5 24% | 2 9.5% | siltstone-100% | |
| 1548 23 Tex-L.Mo | 61 | | | x | | | | | 61 100% | | | | | 42 69% | 19 31% | | | |
| 1549 14 Tex-L.Mo | 21 | | x | | | | | | 21 100% | | | | 3 14% | 6 29% | 12 57% | | | |
| 1550 14 Tex-L.Mo | 9 | x | | | | | | | 9 100% | | | | 1 11% | 4 44.5% | 4 44.5% | | | |
| 1552 13 Tex-L.Mo | 9 | | | x | | | | | 9 100% | | | | 1 11% | 3 33% | 5 56% | | | |
| 1553 22 U. Mo. | 14 | | | x | | 6 43% | 1 7% | 1 7% | 6 43% | | | | 2 14% | 5 36% | 4 29% | 3 21% | chert - 67% chalcedony- 33% | mano & metate-in situ |

Table 5 cont.

| Site Section Region | Total No. Lithics | 100% Tally | Partial Tally | Tally Transect | Density Square | MATERIAL TYPES: Chert # | Chert % | Quartzite # | Quartzite % | Chalcedony # | Chalcedony % | Siltstone # | Siltstone % | Obsidian # | Obsidian % | Other # | Other % | STAGES OF REDUCTION: Pressure # | Pressure % | Frags. Cores # | Frags. Cores % | Interior # | Interior % | Decortication # | Decortication % | Finished Tools # | Finished Tools % | Material Types (tools) % | Features, Structures, Other Artifacts, etc., |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1554 22 U. Mo. | 4 | | | x | | 1 | 25% | | | | | 3 | 75% | | | | | | | | | 1 | 25% | 2 | 50% | 1 | 25% | chert-100% | |
| 1556 18 Tex-L.Mo | 9 | x | | | | 3 | 33% | 1 | 11% | | | 5 | 56% | | | | | | | 1 | 11% | 3 | 33% | 4 | 45% | 1 | 11% | chert-100% | |
| 1557 42 Tex-L.Mo | 42 | x | | x | | 15 | 36% | 11 | 26% | 12 | 28% | 4 | 10% | | | | | | | 2 | 5% | 36 | 86% | 4 | 9% | | | | |
| 1558 18 Tex-L.Mo | 28 | x | | | | | | 1 | 3% | | | 27 | 97% | | | | | | | 4 | 14% | 14 | 50% | 8 | 29% | 2 | 7% | quartzite-50% siltstone-50% | |
| 1559 14 Tex-L.Mo | 43 | x | | | | 4 | 9% | | | | | 39 | 91% | | | | | | | 6 | 14% | 20 | 47% | 16 | 37% | 1 | 2% | siltstone-100% | |
| 1560 18 Tex-L.Mo | 14 | x | | | | 4 | 29% | 2 | 14% | | | 8 | 57% | | | | | | | | | 8 | 57% | 5 | 36% | 1 | 7% | chert-100% | |
| 1561 14 Tex-L.Mo | 47 | | | x | | 1 | 2% | | | 1 | 2% | 45 | 96% | | | | | | | 2 | 4% | 29 | 62% | 16 | 34% | | | | |
| 1562 13 Tex-L.Mo | 17 | x | | | | | | | | | | 17 | 100% | | | | | | | | | 7 | 41% | 10 | 59% | | | | |
| 1563 13 Tex-L.Mo | 23 | x | | | | 1 | 4% | | | | | 22 | 96% | | | | | | | | | 11 | 48% | 12 | 52% | | | | |
| 1564 13 Tex-L.Mo | 12 | | | x | | | | | | | | 12 | 100% | | | | | | | | | 1 | 8% | 10 | 84% | 1 | 8% | siltstone-100% | |
| 1565 13 Tex-L.Mo | 38 | | x | | | | | | | | | 38 | 100% | | | | | | | 7 | 18% | 11 | 29% | 20 | 53% | | | | 2 circular disturbed areas |
| 1566 13 Tex-L.Mo | 16 | x | | | | 2 | 13% | | | 1 | 6% | 13 | 81% | | | | | | | 3 | 19% | 5 | 31% | 7 | 44% | 1 | 6% | chert-100% | horseshoe-shaped rock alignment |
| 1567 13 Tex-L.Mo | 82 | | | x | | 1 | 1% | | | | | 81 | 94% | | | | | 2 | 2.4% | 1 | 1% | 49 | 60% | 28 | 34% | 2 | 2.4% | chert-50% siltstone-50% | |
| 1568 13 Tex-L.Mo | 23 | x | | | | | | | | | | 23 | 100% | | | | | | | 1 | 4.3% | 15 | 65.2% | 6 | 26% | 1 | 4.3% | siltstone-100% | |
| 1569 13 Tex-L.Mo | 53 | x | | | | 28 | 53% | 12 | 23% | | | 13 | 24% | | | | | | | 4 | 7.5% | 34 | 64% | 4 | 7.5% | 11 | 21% | chert-55% quartzite-18% siltstone-27% | metate fragment |
| 1570 15 U. Mo. | 191 | | | x | | 91 | 48% | 39 | 20% | 20 | 21% | 41 | 11% | | | | | | | 1 | 0.5% | 155 | 81% | 31 | 16.2% | 4 | 2% | chert-50% quartzite-50% | bone bead, burnt bone, hearth, wickiup(?) remains |
| 1571 15 U. Mo. | 14 | x | | | | 1 | 7% | | | | | 13 | 93% | | | | | | | 7 | 50% | 4 | 29% | 3 | 21% | | | | |
| 1572 15 U. Mo. | 37 | x | | | | 4 | 11% | 19 | 51% | | | 14 | 38% | | | | | | | 5 | 14% | 29 | 78% | 2 | 5% | 1 | 3% | siltstone-100% | |
| 1577 15 U. Mo. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | rock art |
| 1578 24 Tex-L.Mo | 8 | x | | | | | | | | 8 | 100% | | | | | | | | | | | 4 | 50% | 4 | 50% | | | | |

Table 5 cont.

| Site Section Region | Total No. Lithics | 100% Tally | Partial Tally | Tally Transect | Density Square | MATERIAL TYPES: Chert # / % | Quartzite # / % | Chalcedony # / % | Silt-Stone # / % | Obsidian # / % | Other # / % | STAGES OF REDUCTION: Pressure # / % | Frags. Cores # / % | Interior # / % | Decortication # / % | Finished Tools # / % | Material Types (tools) % | Features, Structures, Other Artifacts, etc., |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1579 17 Tex-L.Mo | 144 | | x | | | 13 9% | 81 56.5% | | 49 34% | 1 0.5% | | | 5 3.5% | 109 76% | 25 17% | 5 3.5% | chert-60% quartzite-20% siltstone-20% | 3 mano frags., 5 hearths, rock art |
| 1580 24 Tex-L.Mo | 9 | x | | | | | | | 9 100% | | | | 1 11% | 5 56% | 3 33% | | | |
| 1581 17 Tex-L.Mo | 39 | x | | | | 24 61.5% | 3 8% | 9 23% | 1 2.5% | 2 5% | | | 10 26% | 25 64% | 1 3% | 3 7% | chert- 67% chalcedony-33% | |
| 1582 24 Tex-L.Mo | 20 | | | x | | | | | 20 100% | | | | 1 5% | 15 75% | 4 20% | | | |
| 1583 24 Tex-L.Mo | 14 | x | | | | 3 21.5% | 3 21.5% | | 8 57% | | | 2 14% | | 5 36% | 3 21.5% | 4 28.5% | chert-75% siltstone-25% | |
| 1584 24 Tex-L.Mo | 113 | x | | | | 1 1% | 1 1% | | 111 98% | | | | 6 5% | 48 43% | 58 51% | 1 1% | chert-100% | |
| 1585 24 Tex-L.Mo | 16 | x | | | | | | | 15 94% | 1 6% | | | | 9 56% | 6 38% | 1 6% | chalcedony-100% | |
| 1586 13 Tex-L.Mo | 24 | x | | | | | | | 24 100% | | | | 6 25% | 3 12.5% | 15 62.5% | | | |
| 1587 24 Tex-L.Mo | 14 | | x | | | | | | 14 100% | | | | | 12 86% | 1 7% | 1 7% | siltstone-100% | |
| 1588 24 Tex-L.Mo | 15 | x | | | | | | | 15 100% | | | | 2 13% | 9 60% | 4 27% | | | |
| 1589 24 Tex-L.Mo | 102 | x | | | | 2 2% | 2 2% | | 98 96% | | | | 2 2% | 73 72% | 27 26% | | | |
| 1590 24 Tex-L.Mo | 13 | x | | | | 1 8% | 2 15% | | 10 77% | | | 1 8% | | 5 38.5% | 5 38.5% | 2 15% | quartzite-50% chert-50% | |
| 1614 13 Tex-L.Mo | 21 | | x | | | | 3 14% | | 18 86% | | | | | 8 38% | 13 62% | | | |
| 1615 19 Tex-L.Mo | 300+ | no | tally | sheet | | | | | | | | | | | | | | |
| 1616 19 Tex-L.Mo | 24 | | | x | | | | | 24 100% | | | | 4 17% | 12 50% | 8 33% | | | |
| 1617 15 U. Mo. | 8 | x | | | | 3 38% | 5 62% | | | | | | | 7 88% | | 1 12% | chert-100% | |
| 1618 17 Tex-L.Mo | 26 | x | | | | 2 8% | | | 24 92% | | | | | 15 57% | 9 35% | 2 8% | chert-100% | |
| 1619 17 Tex-L.Mo | 62 | x | | | | | | | 62 100% | | | | | 40 65% | 22 35% | | | |
| 1620 17 Tex-L.Mo | 41 | x | | | | 32 78% | 4 10% | | 4 10% | | 1 2% | | 4 10% | 35 83% | 3 7% | | | |

Table 5 cont.

| Site Section Region | Total No. Lithics | 100% Tally | Partial Tally | Tally Transect | Density Square | MATERIAL TYPES: Chert # / % | Quartzite # / % | Chalcedony # / % | Silt-Stone # / % | Obsidian # / % | Other # / % | STAGES OF REDUCTION: Pressure # / % | Frags. Cores # / % | Interior # / % | Decortication # / % | Finished Tools # / % | Material Types (tools) / % | Features, Structures, Other Artifacts, etc., |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1664 24 Tex-L.Mo | 8 | x | | | | 1 / 12% | | | 7 / 88% | | | | | 5 / 63% | 2 / 25% | 1 / 12% | chert-100% | |
| 1668 26 Evac. | 1 | x | | | | | 1 / 100% | | | | | | | | | | | rock shelter w/historic glass beads, hearth, rock art?, trash |
| 1702 36 Evac. | 46 | x | | | | | | | 46 / 100% | | | | 7 / 15% | 20 / 43% | 19 / 42% | | | |
| 1714 19 Tex-L.Mo | 33 | | | x | | 2 / 6% | 3 / 9% | | 28 / 85% | | | 2 / 6% | 3 / 9% | 16 / 49% | 11 / 33% | 1 / 3% | chert-100% | |
| 1715 19 24 Tex-L.Mo | 21 | x | | | | | | | 21 / 100% | | | | 2 / 10% | 13 / 62% | 6 / 28% | | | |
| 1716 24 25 Tex-L.Mo | 22 | | x | | | 2 / 9% | | | 20 / 91% | | | | 9 / 41% | 5 / 23% | 6 / 27% | 2 / 9% | chert-100% | |
| 1717 24 Tex-L.Mo | 36 | x | | | | 4 / 11% | | | 32 / 89% | | | | 7 / 20% | 17 / 47% | 12 / 33% | | | |
| 1718 24 Tex-L.Mo | 14 | x | | | | | | | 14 / 100% | | | | 4 / 28.5% | 4 / 28.5% | 6 / 43% | | | |
| 1719 23 Tex-L.Mo | 8 | x | | | | | | | 8 / 100% | | | | 1 / 12% | 2 / 25% | 5 / 63% | | | |
| 1720 23 Tex-L.Mo | 40,000? | no tally | | sheet | | | | | | | | | | | | | | hearth |
| 1721 23 Tex-L.Mo | 53 | | x | | | 2 / 4% | | | 51 / 96% | | | | 21 / 40% | 8 / 15% | 23 / 43% | 1 / 2% | chert-100% | |
| 1722 23 Tex-L.Mo | 35 | | x | | | | 1 / 3% | | 34 / 97% | | | | 8 / 23% | 12 / 34% | 15 / 43% | | | |
| 1723 23 Tex-L.Mo | 9 | x | | | | | | | 9 / 100% | | | | 2 / 22% | | 7 / 78% | | | |
| 1724 24 Tex-L.Mo | 19 | | | x | | | | | 19 / 100% | | | | 2 / 11% | 9 / 47% | 7 / 37% | 1 / 5% | siltstone-100% | |
| 1725 24 Tex-L.Mo | 13 | x | | | | | | | 13 / 100% | | | | 2 / 15% | 4 / 31% | 7 / 54% | | | |
| 1726 24 Tex-L.Mo | 15 | x | | | | | | | 15 / 100% | | | | 1 / 7% | 5 / 33% | 9 / 60% | | | |
| 1727 19 Tex-L.Mo | 11 | x | | | | | | | 11 / 100% | | | | | 5 / 45.5% | 5 / 45.5% | 1 / 9% | siltstone-100% | |
| 1728 23 Tex-L.Mo | 45 | | | | | | | | 44 / 98% | | 1 / 2% | | 1 / 2% | 17 / 38% | 27 / 60% | | | |

Table 5 cont.

| Site Section Region | Total No. Lithics | 100% Tally | Partial Tally | Tally Transect | Density Square | MATERIAL TYPES: Chert # / % | Quartzite # / % | Chalcedony # / % | Siltstone # / % | Obsidian # / % | Other # / % | STAGES OF REDUCTION: Pressure # / % | Frags. Cores # / % | Interior # / % | Decortication # / % | Finished Tools # / % | Material Types (tools) % | Features, Structures, Other Artifacts, etc., |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1729 23 Tex-L.Mo | 19 | x | | | | | | | 19 100% | | | | 1 5% | 6 32% | 11 58% | 1 5% | siltstone-100% | |
| 1730 23 Tex-L.Mo | 10 | x | | | | | | | 10 100% | | | | | 2 20% | 8 80% | | | |
| 1731 26 Tex-L.Mo | 9 | x | | | | | | | 9 100% | | | | 1 11% | 5 56% | 2 22% | 1 11% | siltstone-100% | |
| 1732 25 Tex-L.Mo | 558 | | | x | | 7 1.2% | | 2 0.3% | 549 98.3% | | | 13 2% | 14 3% | 291 52% | 237 42% | 3 0.5% | chert- 33% siltstone- 67% | |
| 1733 17 Tex-L.Mo | 10 | x | | | | 2 20% | | | 8 80% | | | | | 6 60% | 3 30% | 1 10% | chert-100% | |
| 1734 20 Tex-L.Mo | 83 | | x | x | | 3 4% | 5 6% | 13 15% | 62 75% | | | 4 5% | 1 1% | 50 60% | 26 31% | 2 3% | quartzite-50% siltstone-50% | |
| 1735 20 Tex-L.Mo | 202 | | | x | | 35 17% | 7 3% | | 160 80% | | | | | 156 77% | 40 20% | 6 3% | chert-50% quartzite-17% siltstone-33% | |
| 1736 20 Tex-L.Mo | 25 | | | x | | 5 20% | 3 12% | | 17 68% | | | | 1 4% | 9 36% | 12 48% | 3 12% | chert- 67% siltstone- 33% | |
| 1737 20 Tex-L.Mo | 28 | x | | | | 3 11% | 10 36% | 6 21% | 9 32% | | | | | 24 86% | 3 11% | 1 3% | siltstone-100% | |
| 1738 20 Tex-L.Mo | 10 | x | | | | 6 60% | | | 4 40% | | | | | 10 100% | | | | |
| 1739 20 Tex-L.Mo | 12 | x | | | | | | | 12 100% | | | | 1 8% | 7 59% | 4 33% | | | |
| 1740 20 Tex-L.Mo | 7 | x | | | | | 6 86% | | 1 14% | | | | 2 29% | 5 71% | | | | stone ring |
| 1741 23 Tex-L.Mo | 20 | x | | | | | | | 20 100% | | | | 10 50% | 6 30% | 4 20% | | | |
| 1742 20 Tex-L.Mo | 10 | x | | | | 5 50% | 1 10% | | 4 40% | | | | 1 10% | 8 80% | | 1 10% | siltstone-100% | |
| 1743 27 Evac. | 20 | | | x | | | 1 5% | | 19 95% | | | | 1 5% | 15 75% | 4 20% | | | |
| 1744 25 Tex-L.Mo | 77 | | x | | | 1 1.3% | 24 31% | 1 1.3% | 51 66.2% | | | 8 10% | 2 13% | 52 68% | 14 18% | 1 1% | quartzite-100% | |
| 1745 25 Tex-L.Mo | 83 | x | | | | 1 1% | | | 82 99% | | | | 21 25% | 36 43% | 24 29% | 2 3% | siltstone-100% | |
| 1746 26 Evac. | 10 | x | | | | 1 10% | | | 9 90% | | | | 1 10% | 4 40% | 4 40% | 1 10% | chert-100% | |
| 1747 26 Evac. | 64 | x | | | | 4 6% | 1 1.5% | 1 1.5% | 58 91% | | | | 3 5% | 36 56% | 23 36% | 2 3% | chert-50% chalcedony-50% | |
| 1748 27 Evac. | 14 | x | | | | | | | 14 100% | | | | | 11 79% | 2 14% | 1 7% | siltstone-100% | |

Table 5 cont.

| Site Section Region | Total No. Lithics | 100% Tally | Partial Tally | Tally Transect | Density Square | MATERIAL TYPES: Chert # / % | Quartzite # / % | Chalcedony # / % | Silt-Stone # / % | Obsidian # / % | Other # / % | STAGES OF REDUCTION: Pressure # / % | Frags. Cores # / % | Interior # / % | Decortication # / % | Finished Tools # / % | Material Types (tools) % | Features, Structures, Other Artifacts, etc., |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1749 27 Evac. | 27 | x | | | | | | | 27 100% | | | | 2 7.5% | 23 85% | 2 7.5% | | | |
| 1750 27 Evac. | 74 | | | x | | 1 1% | | | 73 99% | | | | 6 8% | 66 89% | 2 3% | | | |
| 1751 27 Evac. | 12 | x | | | | | | | 12 100% | | | | | 9 75% | 3 25% | | | |
| 1752 23 Tex-L.Mo | 42 | | | x | | | | | 42 100% | | | | 5 12% | 13 31% | 23 55% | 1 2% | siltstone-100% | |
| 1753 19 Tex-L.Mo | 27 | x | | | | | | | 27 100% | | | 10 37% | 1 4% | 11 41% | 5 18% | | | |
| 1754 27 Evac. | 20 | x | | | | 2 10% | | | 18 90% | | | | | 15 75% | 3 15% | 2 10% | chert-100% | |
| 1755 36 Evac. | 15 | x | | | | 11 73% | | | 4 27% | | | | 1 7% | 12 80% | 2 13% | | | |
| 1756 2 Evac. | 17 | x | | | | 5 29% | 3 18% | 4 24% | 5 29% | | | | 2 12% | 11 64% | 2 12% | 2 12% | chert-50% quartzite-50% | |
| 1757 25 Tex-L.Mo | 56 | | | x | | | 5 9% | | 51 91% | | | | 6 11% | 30 53% | 19 34% | 1 2% | quartzite-100% | |
| 1758 67 Evac. | 67 | x | | | | | | 1 1% | 66 99% | | | | 10 15% | 35 52% | 21 31% | 1 2% | siltstone-100% | |
| 1759 25 Tex-L.Mo | 87 | | | x | | | | | 87 100% | | | | 4 5% | 54 62% | 28 32% | 1 1% | siltstone-100% | hammerstone |
| 1760 25 Tex-L.Mo | 75 | x | | | | | | | 75 100% | | | 1 1% | 1 1% | 37 49% | 37 49% | | | |
| 1761 25 Tex-L.Mo | 117 | x | | | | 4 3% | 2 2% | | 111 95% | | | 12 10% | 8 7% | 39 33% | 55 47% | 3 3% | quartzite-33% chert-67% | hearth |
| 1762 26 Evac. | 53 | x | | | | 2 4% | | | 47 89% | 4 1% | | | 4 7.5% | 23 43% | 22 42% | 4 7.5% | siltstone-50% chert-50% | hearth, mano |
| 1763 53 Tex-L.Mo | 53 | x | | | | | | | 53 100% | | | | 1 2% | 15 28% | 36 68% | 1 2% | siltstone-100% | |
| 1764 25 Tex-L.Mo | 44 | | x | x | | | | | 44 100% | | | | 12 27% | 14 32% | 18 41% | | | |
| 1765 25 Tex-L.Mo | 31 | | | x | | 1 3% | | | 30 97% | | | 2 6.5% | 2 6.5% | 19 61% | 8 26% | | | 2 possible hearths |
| 1766 26 Evac. | 43 | | | x | | | | 1 2% | 42 98% | | | | 4 9% | 15 35% | 24 56% | | | |
| 1767 25 Evac. | 59 | x | | | | 3 5% | | | 56 95% | | | | 4 7% | 38 64% | 17 29% | | | |
| 1768 25 Tex-L.Mo | 75 | x | | | | 1 1% | 1 1% | 2 3% | 71 95% | | | 1 1% | 2 3% | 43 57% | 29 39% | | | |

Table 5 cont.

| Site Section Region | Total No. Lithics | 100% Tally | Partial Tally | Tally Transect | Density Square | MATERIAL TYPES: Chert # / % | Quartzite # / % | Chalcedony # / % | Silt-Stone # / % | Obsidian # / % | Other # / % | STAGES OF REDUCTION: Pressure # / % | Frags. Cores # / % | Interior # / % | Decortication # / % | Finished Tools # / % | Material Types (tools) / % | Features, Structures, Other Artifacts, etc. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1769 26 Tex-L.Mo | 32 | x | | | | 1 3% | | | 31 97% | | | | | 21 66% | 9 28% | 2 6% | chert-50% siltstone-50% | |
| 1770 26 35 Tex-L.Mo | 136 | x | | | | 1 1% | 1 1% | | 134 98% | | | 6 4% | 7 5% | 103 76% | 17 13% | 3 2% | quartzite-33% siltstone-67% | |
| 1771 2 Tex-L.Mo | 92 | | | x | | 4 4% | | | 88 96% | | | | 2 2% | 78 85% | 10 11% | 2 2% | siltstone-50% chert-50% | |
| 1772 25 Tex-L.Mo | 115 | x | | | | | | | 115 100% | | | 14 12% | 2 2% | 66 57% | 32 28% | 1 1% | siltstone-100% | |
| 1773 34 35 Evac. | 112 | | x | | | 43 38% | 1 1% | 3 3% | 64 57% | | 1 1% | 11 10% | 8 7% | 74 66% | 15 13% | 4 4% | chert-75% siltstone-25% | |
| 1774 34 Evac. | 61 | | | x | | 11 18% | | | 50 82% | | | | | 47 77% | 14 23% | | | |
| 1775 35 Evac. | 10 | x | | | | 2 20% | | 1 10% | 7 70% | | | | 2 20% | 1 10% | 3 30% | 4 40% | chert-50% siltstone-25% chalcedony-25% | culturally modified bark? |
| 1776 2 Evac. | 49 | x | | | | 10 20.5% | 1 2% | 10 20.5% | 22 45% | 6 12% | | 6 12.2% | | 31 63.2% | 7 14.2% | 5 10.2% | chert-20% chalcedony-60% siltstone-20% | |
| 1777 2,35 Evac. | | | | | | | | | | | | | | | | | | historic glass & cans, milled lumber, recent trash |
| 1778 35 Evac. | 11 | | x | | | 2 18% | | | 9 82% | | | | 2 18% | 5 46% | 3 27% | 1 9% | chert-100% | hearth |
| 1779 11 Evac. | 132 | | x | | | 12 9% | 4 3% | | 116 88% | | | | 7 5% | 68 52% | 57 43% | | | ceramics, hearth |
| 1780 11 Evac. | 66 | | x | | | 4 6% | 4 6% | | 58 88% | | | | 19 29% | 39 59% | 8 12% | | | historic cans & glass, recent trash |
| 1781 11 Evac. | 471 | | x | | | 129 27.5% | 23 5% | 10 2% | 308 65.3% | 1 0.2% | | | 31 6% | 343 73% | 84 18% | 13 3% | obsidian-8% siltstone-31% chert-61% | hearth, historic cans, recent trash , ceramics |
| 1782 35 Evac. | 82 | | x | x | | 11 13% | | | 71 87% | | | 3 3% | 1 1% | 58 71% | 16 20% | 4 5% | chert-100% | hammerstone , hearth |
| 1783 36 | 45 | x | | | | 5 11% | | | 40 89% | | | 1 2% | 2 4.5% | 30 67% | 10 22% | 2 4.5% | siltstone-100% | |
| 1784 35 | 8 | x | | | | 1 12% | | | 7 88% | | | | 3 38% | 4 50% | | 1 12% | chert-100% | |
| 1785 11 Evac. | 284 | | x | x | | 42 15% | 1 0.3% | 10 3.5% | 231 81% | | | 8 2.8% | 3 1% | 204 72% | 67 23.5% | 2 0.7% | chalcedony-50% chert-50% | unidentified excavation, historic cans, recent trash |
| 1786 11 Evac. | 16 | x | | | | 6 37% | 7 44% | 1 6% | | 2 13% | | 2 13% | 1 6% | 12 75% | | 1 6% | chert-100% | hammerstone, hearth, unidentified feature |

Table 5 cont.

| Site . Section Region | Total No. Lithics | 100% Tally | Partial Tally | Tally Transect | Density Square | MATERIAL TYPES: Chert # / % | Quartzite # / % | Chalcedony # / % | Silt-Stone # / % | Obsidian # / % | Other # / % | STAGES OF REDUCTION: Pressure # / % | Frags. Cores # / % | Interior # / % | Decortication # / % | Finished Tools # / % | Material Types (tools) % | Features, Structures, Other Artifacts, etc., |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1787 11 Evac. | 39 | | x | | | 9 23.2% | 4 10.2% | 2 5% | 20 51.2% | 4 10.2% | | | 3 8% | 35 90% | | 1 2% | chert-100% | ceramics, hearth |
| 1788 36 Evac. | 39 | x | | | | 1 3% | | | 38 97% | | | | | 30 77% | 7 18% | 2 5% | siltstone-50% chert-50% | |
| 1789 1 Evac. | 31 | x | | | | 27 87% | 1 3% | 2 7% | 1 3% | | | | 2 6% | 25 81% | | 4 13% | chert-100% | |
| 1790 35 Evac. | 26 | | | x | | 6 23% | 4 15% | | 16 62% | | | | 3 11% | 20 77% | 2 8% | 1 4% | chert-100% | |
| 1791 12 Evac. | 13 | x | | | | | | | 13 100% | | | | 3 23% | 10 77% | | | | |
| 1792 12 Evac. | 45 | x | | | | 2 4% | | | 43 96% | | | 4 9% | 3 7% | 34 75% | 4 9% | | | |
| 1796 36 Evac. | 29 | x | | | | 29 100% | | | | | | | 24 83% | 5 17% | | | | |
| 1797 12 Evac. | 92 | x | | | | 47 51% | 11 12% | | 3 3% | 30 33% | 1 1% | 46 50% | 1 1% | 34 37% | 3 3% | 8 9% | chert-75% obsidian-25% | ceramics, hearth, structure, tooth frag., ungulate bone, burnt bone |
| 1798 12 Evac. | 41 | x | | | | 11 27% | | | 30 73% | | | 3 7.3% | 3 7.3% | 25 61% | 10 24.3% | | | |
| 1799 12 Evac. | 53 | x | | | | 21 40% | 5 9% | 2 4% | 19 36% | 6 11% | | 2 4% | 1 2% | 41 77% | 4 8% | 5 9% | chert-100% | hammerstone, hearth |
| 1800 12 Evac. | 12 | x | | | | | | | 12 100% | | | 1 8% | 6 50% | 5 42% | | | | mano/hammerstone |
| 1801 12 Evac. | 32 | x | | | | 7 22% | 17 53% | 1 3% | 7 22% | | | 13 41% | | 16 50% | 1 3% | 2 6% | | |
| 1802 12 Evac. | 59 | x | | | | 18 31% | 6 10% | 2 3% | 31 53% | 2 3% | | 14 24% | 5 8% | 24 41% | 12 20% | 4 7% | quartzite-25% siltstone-50% chert-25% | hearth |
| 1803 12 Evac. | 20 | x | | | | 15 75% | 5 25% | | | | | 4 20% | 3 15% | 12 60% | | 1 5% | chert-100% | burnt bone, hearth |
| 1804 11 Evac. | 46 | x | | | | 23 50% | 19 41% | 2 4% | 1 2% | 1 2% | | 22 48% | 1 2% | 20 43% | 2 4% | 1 2% | quartzite-100% | historic glass |
| 1805 11 Evac. | 24 | x | | | | 6 25% | 6 25% | | 10 42% | 2 8% | | 5 21% | | 14 58% | 1 4% | 4 17% | chert-100% | sweat lodge, hearth, bone |
| 1806 11 Evac. | 18 | x | | | | 6 33% | 1 6% | | 10 55% | 1 6% | | | 1 6% | 13 72% | 4 22% | | | hearth, structure, historic glass, milled lumber, recent trash |
| 1808 11 Evac. | 30 | x | | | | 13 43% | 4 13% | 7 23% | 6 20% | | | 6 20% | 1 3.3% | 22 73.3% | 1 3.3% | | | industrial trash, possible structure |
| 1849 7 Tex-L.Mo | 157 | x | | | | 14 9% | | | 143 91% | | | | 5 3% | 69 44% | 81 52% | 2 1% | chert-100% | |

Table 5 cont.

| Site Section Region | Total No. Lithics | 100% Tally | Partial Tally | Tally Transect | Density Square | MATERIAL TYPES: Chert # / % | Quartzite # / % | Chalcedony # / % | Silt-Stone # / % | Obsidian # / % | Other # / % | STAGES OF REDUCTION: Pressure # / % | Frags. Cores # / % | Interior # / % | Decortication # / % | Finished Tools # / % | Material Types (tools) / % | Features, Structures, Other Artifacts, etc., |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1850 11 Evac. | 110 | x | | | | 9 / 8% | 37 / 34% | 4 / 4% | 60 / 55% | | | 5 / 5% | 10 / 9% | 77 / 70% | 14 / 13% | 4 / 3% | chert-25% quartzite-50% siltstone-25% | |
| 1939 35 Evac. | 7 | x | | | | 5 / 71% | | | 2 / 29% | | | | 3 / 43% | 1 / 14% | 3 / 43% | | | historic glass, railroad ties, rail plate, milled lumber |

TABLE 6

Campsite Characteristics

| Site Number | Rock-shelter | Structural Remains | Ceramics | Features | Ground-stone Artifacts |
|---|---|---|---|---|---|
| 952 | | | | D | |
| 956 | X | | | H | X |
| 969 | | | | H | |
| 1553 | | | | | X |
| 1565 | | | | V | |
| 1566 | | | | R | |
| 1569 | | | | | X |
| 1570 | | X | | H | |
| 1579 | | | | H | X |
| 1668 | X | | | H | |
| 1720 | | | | H | |
| 1732 | | | | H | |
| 1740 | | | | R | |
| 1761 | | | | H | |
| 1762 | | | | H | X |
| 1765 | | | | H | |
| 1778 | | | | H | |
| 1779 | | | X | H | |
| 1781 | | | X | | |
| 1782 | | | | H | |
| 1786 | | | | H | |
| 1787 | | | X | H | |
| 1797 | | X | X | H | |
| 1799 | | | | H | |
| 1800 | | | | H | X |
| 1802 | | | | H | |
| 1803 | | | | H | |
| 1805 | | X | | H | |
| 1806 | | X | | H | |
| 1808 | | X | | | |

H - Hearth
D - Depression
V - Vegetation Pattern
R - Rock Alignment

immediately above a major drainage channel in the study area. The shelter fill has been badly eroded, exposing 130+ cm of charcoal and artifact-laden strata. Artifactual materials are strewn throughout the eroding deposits, and several manos, as well as flakes, utilized flakes and finished tools, were noted in the slough or protruding from the remaining intact column of shelter fill.

Four campsites, 5 RB1799, 1781, 1787 and 1797, contain the remains of ceramics vessels. 5 RB1779, 1787 and 1797 also contain the remains of distinguishable hearths or possible hearth areas in association with ceramic artifacts. Collected ceramic sherds, representing 8 (?) ware types, are fully described in Appendix A of this report. Hypothesized cultural and temporal affiliations of these sites, based upon ceramic artifact identifications, will be discussed in the "General Conclusions" section.

Twenty-five of the sites classified as campsites contain one or more features believed to be suggestive of extended, repeated, or multipurpose use of the site area as a campsite location. The types of features recorded include depressions or unnatural patterns in the current vegetation, rock alignments, or hearths.

Enigmatic depressions or roughly circular vegetation patterns were recorded in association with lithic materials comprising 5 RB952 and 1565. 5 RB952 contains three, 6-10 cm deep depressions measuring roughly 1x0.7 m. The proximity of the site to an abandoned homestead may indicate that the features resulted from site vandalism; however, no conclusive evidence of post-depostional site disturbance was recorded. Lithic artifacts did, however, occur in dense concentrations or "piles" which may indicate site disturbance. The "flake piling phenomenon" is discussed more fully in "General Conclusions".

5 RB1565 (Plate I.b) consists of two circular patterns in site vegetation in association with a lithic scatter of varying intensity. In both areas, low scrub vegetation gives way to sparse grasses in an area measuring 8-10 m in diameter. Both areas of disturbance are located within a dense concentration of lithic materials. Obvious recent disturbance and debris appearing to stem from use of the area for livestock grazing was noted within site boundaries, suggesting that the features may have resulted from nonaboriginal activity. Remarkably similar features of equally questionable origin/function were recorded at Disappointment Circles (5MF196) in Dinosaur National Monument (Breternitz 1970:102-104).

Rock alignments were recorded within the boundaries of sites 5 RB1566, 1740, and 1806. The 5 RB1566 feature (Plate I.c) consists of nine sandstone slabs in a horseshoe-shaped alignment situated on the southeast rim of a high, open butte. The alignment opens to the northeast and measures approximately 8x5 m. Recent cans and lithic debris were noted in the vicinity of the feature.

5 RB1740 contains a circular rock alignment of 14 sandstone fragments measuring roughly 1.35 m in diameter. In the center of the alignment several rocks overlay the opening of a small rodent burrow. The hole was thoroughly examined for the presence of artifacts and/or charcoal, but no associated cultural debris was noted in the fill. The alignment is located at the base of a sandstone overhang near the northeast site boundary. Thin artifactural material is scattered around, but not within, the feature.

The 5 RB1806 rock alignment is also roughly horseshoe-shaped, opening to the southwest. The long axis is the "base" of the "U" and measures approximately 3 m in length. As mentioned earlier, 5 RB1806 contains evidence of recent/historic disturbance (see page 88).

Twenty-one campsites were so defined on the basis of the presence of

hearths, hearth-like features, or ash/charcoal stains or scatters. Hearth deposits have been classified as disarticulated, burned rock with charcoal, ash-stained and/or charcoal-flecked soil lacking surface evidence of excavation or structure, an apparently unlined pit hearth, and a blackened basin in a bedrock exposure. It must be pointed out that hearth classifications, with one exception, are based totally upon surface indications; were the ash/charcoal deposits to be excavated, actual hearth form could radically differ from that described herein. All hearth features measure between 0.20 and 1.00 m in all horizontal dimensions. Charcoal and ash deposits from the 5 RB1570 hearth area were collected for radiometric dating, but the sample has not been submitted for analysis.

Eight sites, 5 RB969, 1732, 1782, 1786, 1797, 1800, 1803, and 1805, contain hearth areas comprised of apparently disarticulated, burned rock mixed with burned or ash-stained soils. None of these hearths appeared to contain surface concentrations of charcoal and none of the hearths were probed, sampled or tested. Rock may or may not be a structural component of these features. In the case of 5 RB1805, it appears that quantities of heated rock may have been used in conjunction with a sweatlodge and discarded outside the structure.

5 RB1668 is the only campsite with what appeared, from surface evidence, to constitute an excavated pit hearth. Backdirt from the possible excavation was scattered throughout the low overhang in which the site is located, and the loose fill in the ash-stained area may indicate secondary soil deposition. Smoke stains were noted above the hearth near the back of the overhang. Though 5 RB1668 is believed to have constituted an aboriginal site, the hearth may be associated with the disturbance evidenced by recent debris. An historic glass trade bead (Appendix A) was collected from backdirt ad-

jacent to the hearth, suggesting that recent disturbance of alluvial soil deposits in the area has resulted in the exposure of a previously buried aboriginal site. The bead did not appear to be burned or deformed by exposure to heat.

One campsite, 5 RB1778, contains a blackened basin in a bedrock exposure which may or may not be indicative of use of the feature as a hearth. None of the surrounding bedrock appeared reddened or fractured as a result of heating, and it is possible that the blackening observed in the 5 RB1778 depression resulted from some sort of natural chemical process.

Deposits of ash-stained and/or charcoal-flecked soil occur in 5 RB956, 1570, 1579, 1720, 1761, 1762, 1765, 1778, 1779, 1787, 1797, 1799, 1802, and 1806. These features may constitute the remains of at one time more definable and distinct hearth deposits, or they may represent small, briefly utilized, unprepared campfire scars. More extensive analysis of this type of feature will be necessary before firm statements regarding origin, original forms and function can be made.

Charcoal flecks noted throughout the 5 RB956 deposits do not appear to represent concentrated hearth deposits, but rather seem to represent charcoal and ash scattered throughout the rock overhang. It is unknown at present whether all defined hearth deposits have been destroyed through erosion or whether hearths are currently contained in remaining intact deposits.

Groundstone artifacts (Plates III and A-10) were recorded in sites 5 RB956, 1553, 1569, 1579, 1762, and 1800. Groundstone artifacts, especially when they occur in the absence of other campsite indicators, may not be as reliable an indicator of site function as the other campsite criteria. However, in four of the five sites for which groundstone was recorded, evidence of hearths was also noted, indicating that groundstone artifacts may tend

to indicate a campsite function. Therefore, the presence of such materials was maintained as a definite indication of campsite function.

A loaf-shaped sandstone mano with two ground facets and a quartzite oval mano with a single ground facet were noted in slumped fill of 5 RB956. A sandstone slab, possibly a metate fragment, is visible in the remaining column of fill near the back of the shelter.

5 RB1553 (Plate III.a) contains one lightly ground, single-faceted sandstone slab metate on which is situated an oval sandstone mano fragment. 5 RB1569 contains a fragment of a sandstone slab metate with a single ground surface. Three small, single-faceted, sandstone or quartzite mano fragments were recorded within severely disturbed areas of 5 RB1579. A small depression in the ground surface adjacent to the mano fragments may have once held a metate which has since been removed by site vandals.

An unusual mano was collected from the 5 RB1762 surface. The artifact is plano-convex in cross section and is evenly ground on the convex surface. The artifact is more fully discussed in Appendix A of this report (Plate A-10).

Two quartzite mano fragments were recorded within 5 RB1800 boundaries in association with a small lithic scatter and a small concentration of burned rock.

5 RB1850 will be briefly discussed as a possible campsite, for which clear indicators are currently lacking. Present within site boundaries is a juniper stump that may have resulted from aboriginal structure construction. The cut edge of the stump is badly deteriorated, so it is impossible to ascertain the method used to cut the pole (e.g. iron axe, stone axe, etc.). Due to the location of 5 RB1850 in a concentrated area of structural remains, it is possible that the tree was cut for use in one of the structures recorded nearby. It is also possible that the stump is the only visible remains of

a structural component once associated with 5 RB1850. The site is further discussed under "Lithic Scatters", below.

The thirty campsites recorded during the T-M-E study can be discussed in terms of composition and location. Size of these sites ranges from 12 $m^2$ (5 RB1668) to 138.68 $m^2$ (5 RB1781), with several apparent internal size groupings:

| Size Range | Number of Sites |
|---|---|
| 1-100 $m^2$ | 4 |
| 100-1000 $m^2$ | 6 |
| 1000-5000 $m^2$ | 10 |
| 5000-15000 $m^2$ | 7 |
| 15000-50000 $m^2$ | 0 |
| 50000+ $m^2$ | 3 |

Seventeen of the 30 campsites contain artifacts of four or five different lithic materials, and sixteen of the campsites are comprised primarily (in excess of 50%) of siltstone tools and debitage. Finished tools, recorded in 19 of the 30 campsites, make up from 0.5% to 21% of the individual site assemblages. The most common finished tools recorded within campsites were bifaces (25), projectile points/projectile point preforms (15), scrapers (12) and assorted knives (11).

In terms of location, campsites exhibit several interesting charateristics and trends (see Figure 4). Fifteen of the 30 campsites are located in the geographic region designated as the Evacuation Creek area. The Texas-Lower Missouri and Upper Missouri areas contain 13 and two campsites, respectively. Four of the five sites containing structural remains are located in the Evacuation Creek area. Figure 4 indicates the general distribution of campsites within the study area.

Mean elevation for all campsites is 1872 m (SD=47.8 m). Distribution is much more limited when mean elevation is calculated for campsites within each of the geographic subareas, to control for areal elevation changes:

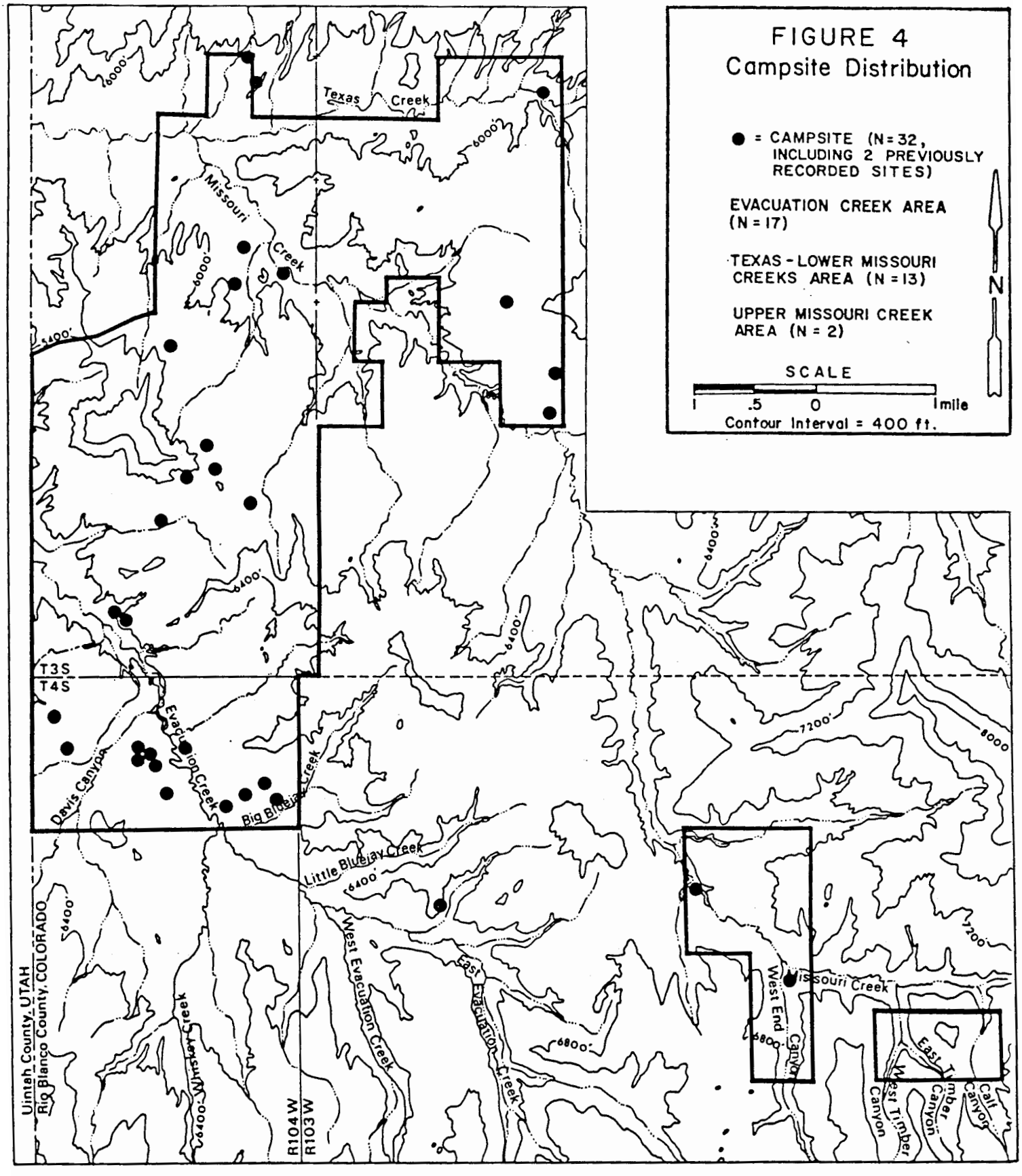


FIGURE 4
Campsite Distribution
● = CAMPSITE (N=32, INCLUDING 2 PREVIOUSLY RECORDED SITES)
EVACUATION CREEK AREA (N = 17)
TEXAS - LOWER MISSOURI CREEKS AREA (N = 13)
UPPER MISSOURI CREEK AREA (N = 2)
SCALE
1 .5 0 1 mile
Contour Interval = 400 ft.
N
Texas Creek
Missouri Creek
Davis Canyon
Evacuation Creek
Big Bluejay Creek
Little Bluejay Creek
West Evacuation Creek
East Evacuation Creek
West End Canyon
Missouri Creek
East Timber Canyon
West Timber Canyon
Calf Canyon
Uintah County, UTAH
Rio Blanco County, COLORADO
R104W
R103W
T3S
T4S
6000'
6400'
6800'
7200'
8000'

| | | | |
|---|---|---|---|
| Evacuation Creek: | N=15 | $\bar{m}$=1878.7 m | SD=25.0 m |
| Texas-Lower Missouri: | N=13 | $\bar{m}$=1847.5 m | SD=42.7 m |
| Upper Missouri: | N=2 | $\bar{m}$=1992.5 m | SD=43.1 m |

Mean horizontal distance to nearest drainage for sites classified as campsites is 163.6 m (SD=126.5 m), whereas mean vertical distance to nearest drainage is 23.8 m (SD=17.7 m).Campsites are most frequently (15 cases) most closely associated with a primary tributary of one of the major drainages of the study area. In eight instances, the closest drainage is a major drainage, and in seven cases, a secondary tributary to a major drainage is recorded as the nearest water source. Fifteen of the 30 campsites are located at or within .81 km (one half mile) of the confluence of two drainages, four are located within .81 km of both the head and a confluence of the nearest drainage(s). One campsite was neither within .81 km of the head or confluence of its nearest drainage(s).

In terms of topographic placement, campsites occur in numerous contexts. Upland features (including benches, and edges, rims and interiors of large elevated ridges) contain 16 of the 30 recorded campsites. Eight of the sites are located on "ridge fingers", defined to include the low extensions of large upland features which rise steadily from the study area floodplains. The remaining six campsites encompass more than one topographic feature (3), occupy overhangs or rockshelters (2), or are located on a drainage terrace (1). No campsites were recorded within floodplain contexts.

Campsites exhibit a strong association with the low elevation pinon/juniper vegetation community. Twenty-five of the 30 campsites are located within this zone, while two are located within pinon/juniper stands on cliffs/rocky breaks, two are located in low elevation big sagebrush shrubland, and one is located within the serviceberry shrubland community.

Of the 26 campsites for which data is available, eleven are located

closest to an isolated find, and one is most closely associated with a locality. Another site is the nearest neighbor to 14 of the recorded campsites. Mean distance to the nearest site for the 25 campsites for which this measurement is possible is 142.5 m (SD=94.0 m).

Obvious evidence of vandalism was noted for 12 of the 30 campsites recorded within the study area. Types of disturbance range from suspected minor surface assemblage alteration such as tool collection (e.g. 5 RB1551), to domestic livestock disturbance (e.g. 5 RB1565), to road construction/maintenance (e.g. 5 RB1762), to deliberate excavation and artifact disturbance (e.g. 5 RB1579; Plate II.a-b). Post depositional disturbance from wind and/or water erosion or animal activity was recorded for 29 of the 30 campsites. Information regarding the nature and extent of natural or cultural site disturbance for individual sites is available from the site inventory record forms filed with the BLM and the Colorado Preservation Office.

"Quarries"

Five sites, 5 RB1719, 1723, 1726, 1729 and 1730, have been classified as "quarries" or "quarry areas". Although raw lithic material procurement appears to be the primary function of these sites, they differ in certain respects from quarry sites as usually defined, and a brief explanation of the circumstances under which the term has been applied is warranted.

The term quarry generally connotes an exposure of useable lithic material surrounded by extensive deposits of flaking debitage. A quarry may also describe an area in which lithic source materials are excavated or mined. The material may occur in the forms of bedrock exposures, exfoliating inclusions within the bedrock, or concentrations of boulders or cobbles.

The T-M-E quarry sites uniformly lack the large exposures of useable ma-

terial traditionally associated with quarry sites. Rather, these sites occur in an area where numerous nodules or fragments of varying grades of siltstone are diffusely, yet consistently, scattered downslope from eroding sandstone and shale exposures. Clearly culturally-modified debris is sparse, and occurs in small concentrations across the feature. As will be further discussed below, these sites are thought to represent small concentrations of cultural debris within an area which was, in all probability, extensively exploited for the purpose of lithic material procurement. Portable nodules and fragments are believed to have been transported away from the source area for further reduction, and therefore, limited debitage occurs in the actual procurement area. Massive concentrations of siltstone debitage, occurring as campsites and lithic scatters, are located below the lithic source area on the flanks of the area's major drainages.

Two types of useable lithic materials were recorded in the vicinity of White Face Butte. Tan and brown varieties of siltstone tend to occur in nodules bearing a thick sandstone cortex, and are concentrated on the east and southeast portions of the Butte. A lower grade, banded to marled, orange/tan/brown siltstone predominates on the west and southwest slopes of the feature. The latter material tends to occur as small, tabular fragments and is less consistently utilized than the higher grade tan to brown variety. While scattered flakes and tools of this material were recorded, no "quarry" or procurement areas were identified for the lower grade siltstone.

The five quarry sites recorded within the T-M-E study area, all located within relatively close proximity to each other, exhibit a strong homogeneity in terms of locational characteristics. Elevation of these sites ranges from 1829 to 1908 m and four of the five sites are located within one half mile of the head of the closest associated drainage. All are located within

the Texas-Lower Missouri geographic region within the Missouri Creek drainage. Two of the sites classified as quarries are located in open areas supporting big sagebrush and shrubland vegetation, and three are located within the low elevation pinon/juniper vegetation community. Four of the five sites are situated on the tops or edges of ridge fingers.

As could be expected of lithic material procurement areas, the five quarry sites exhibit the relatively high mean distance from closest water source (C value) of 125.1 m indicating perhaps that availability of water was not of great importance to lithic material procurement activities. Their occurrence in an area of diminished intensity of activity is demonstrated by an average distance of 134 m to the closest recorded site. Site size ranges from 396 $m^2$ to 7875 $m^2$ and averages approximately 3450 $m^2$. Low artifact densities, ranging from 0.19 to 2.27 artifacts per $m^2$ may support the interpretation that minimal lithic reduction was undertaken in site areas, and that nodules or fragments of useable lithic material were most likely transported with minimal modification to activity areas below.

All five quarry sites contain artifacts of only one lithic material, namely the siltstone that was procured from the area. Four of the sites consist wholly of debitage in association with naturally-occurring fragments of siltstone, whereas 5 RB1729 contains only a single tool fragment.

To demonstrate the importance of this material source area to the artifact assemblages of the other sites recorded within this portion of the study area, it is necessary to examine other site types within the immediate vicinity of the quarry sites. If the quarry areas are correctly interpreted, it would stand to reason that campsites, lithic scatters, localities, and isolated finds in the immediate vicinity of the quarry sites would be primarily composed of siltstone artifacts. If it is valid to claim that nodules and fragments were gathered with little modification from the procurement area and

transported to nearby sites for reduction, it could be expected that the "non-quarry" sites in the region would contain vast amounts of siltstone debitage representing all stages of lithic reduction. In addition, whereas cores might be found in abundance in the nonquarry sites, we would expect to find relatively few unmodified nodules or boulders in these areas as compared to the quarry sites.

Figure 5 indicates the general lithic procurement area in relation to a broad "influence" area delineated on the basis of subjectively determined accessibility from the quarry sites. This area encompasses three intermittent drainage basins which can be easily reached from the eastern flanks of White Face Butte. Boundaries were drawn where topographic features (cliffs, canyons, major divides, etc.) might be expected to have an effect upon lithic material distribution, or where study area boundaries occur. Within this arbitrarily defined area, 43 sites, 14 localities, and 29 isolated finds were recorded. Of these 86 resources, 56 (65%) are comprised entirely of siltstone artifacts, and 74 (86%) are made up of in excess of 80% siltstone artifacts. Only five resources contain between 1% and 80% siltstone artifacts. The remaining seven resources are non-siltstone isolated finds (6) and a single site which was insufficiently tallied to allow this assessment to be made. From one to four apparently culturally unmodified siltstone nodules were noted in association with three of the resources within this area.

Sites within the arbitrarily defined influence area contain materials representative of all stages of lithic reduction. All of the 43 sites within the area contain primary and/or secondary decortication flakes which comprise between 7% and 68% of the assemblages. Roughly 63% of the sites (27) contain between 20% and 50% decortication flakes, indicating extensive primary

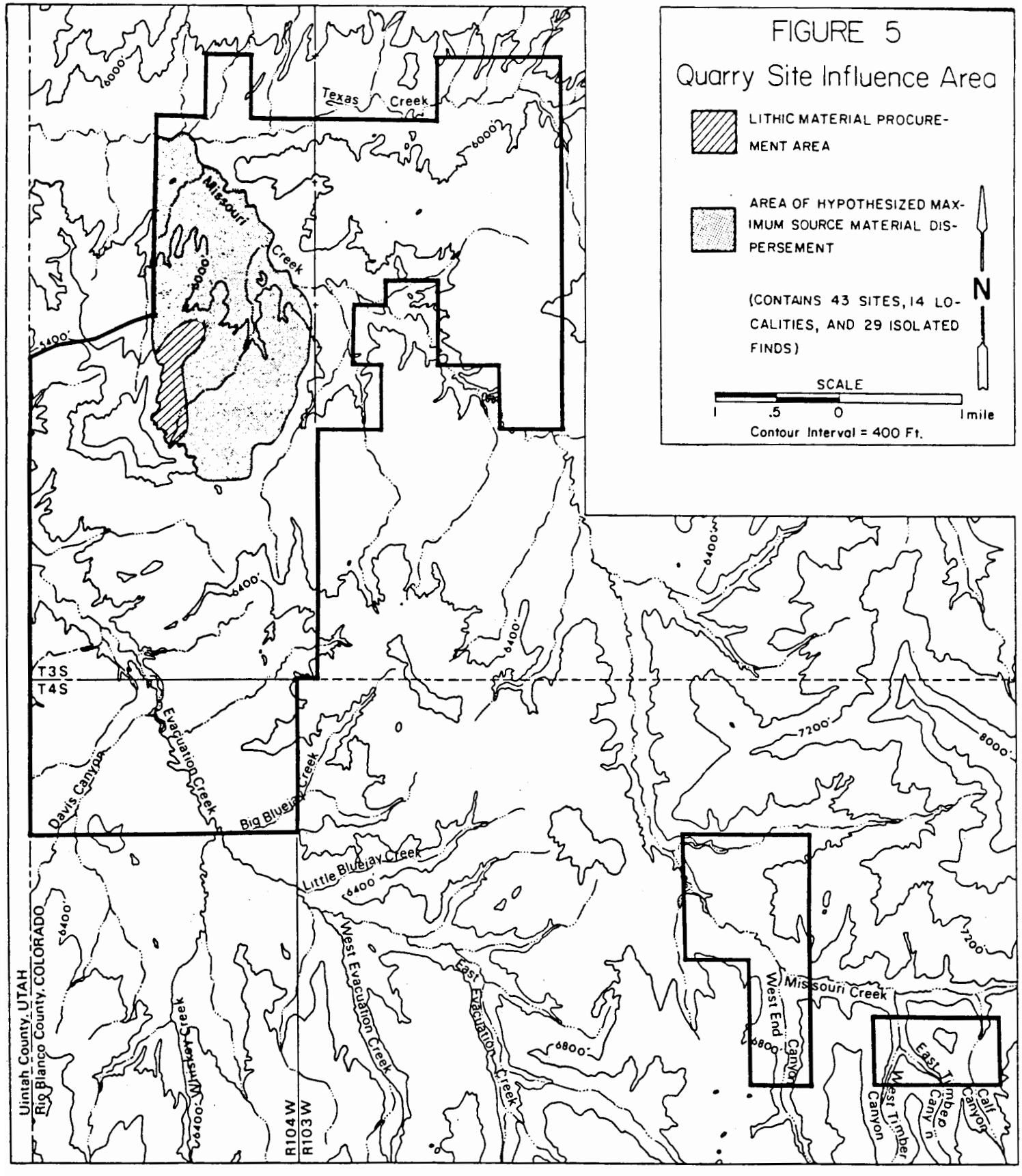


FIGURE 5
Quarry Site Influence Area
LITHIC MATERIAL PROCUREMENT AREA
AREA OF HYPOTHESIZED MAXIMUM SOURCE MATERIAL DISPERSEMENT
(CONTAINS 43 SITES, 14 LOCALITIES, AND 29 ISOLATED FINDS)
N
SCALE
1 .5 0 1 mile
Contour Interval = 400 Ft.
Texas Creek
Missouri Creek
6000'
6400'
6800'
7200'
8000'
T3S
T4S
Davis Canyon
Evacuation Creek
Big Bluejay Creek
Little Bluejay Creek
West Evacuation Creek
East Evacuation Creek
Missouri Creek
West End Canyon
East Timber Canyon
West Timber Canyon
Calf Canyon
Uintah County, UTAH
Rio Blanco County, COLORADO
R104W
R103W

and secondary lithic reduction in these areas. All contain interior percussion flakes as well, which generally comprise in excess of 50% of the recorded assemblages. Finished tools were recorded within 21 of the 43 sites recorded for this area.

No diagnostic artifacts were encountered within the five recorded quarry areas in the T-M-E study area, and therefore, it is difficult to postulate the period(s) of extensive exploitation of the resource. The majority of the diagnostic artifacts collected from sites within the influence area (9 of 10) however, are believed to have ranged in occurrence from Archaic through Fremont or later times (roughly 3000 BC through AD 1250). Only one projectile point from this area is believed to have originated during the Paleoindian period (pre-dating ca. 5000 BC) and only one is believed to have occurred as late as the Proto-historic period (AD 1250-1880).

Rock Art

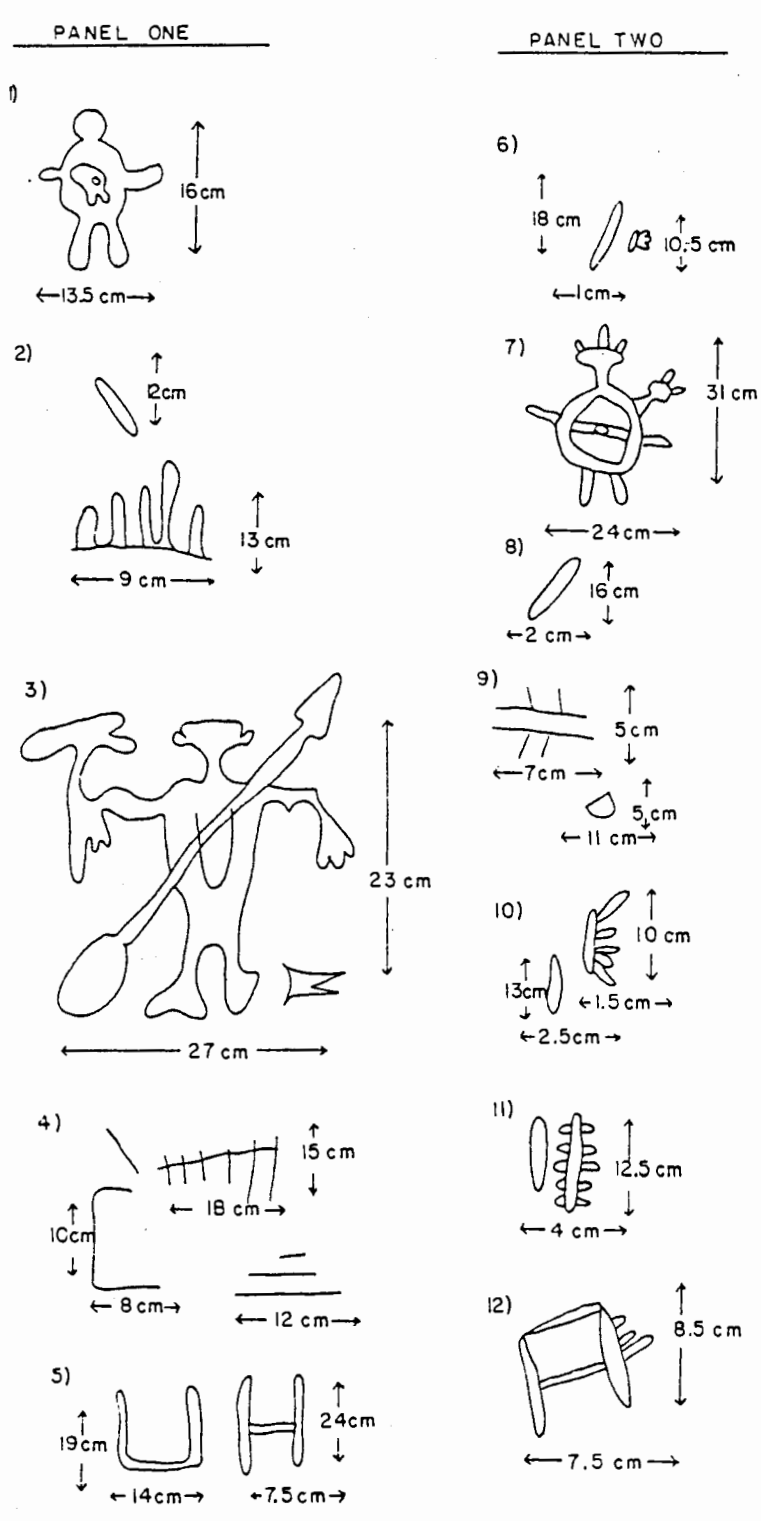
Two sites located during the Texas-Missouri-Evacuation Creeks survey contain pecked and incised petrograph panels. 5 RB1579 petrographs were found in association with a severely vandalized prehistoric camp, and 5 RB1577 consists of a single southeast-facing petrograph panel sheltered by large boulders overlooking Missouri Creek. This site has also been vandalized, as evidenced by shallow excavations in the fill beneath the rock art panels. Motifs from the two sites are discussed separately due to a perceived difference in style.

Petrographs from 5 RB1579 are both pecked and incised, consisting of one anthropomorphic figure, two possible "shield motifs" and an assortment of abstract line elements (Figure 6). The designs are positioned along a sandstone rock face above several vandalized hearths and disturbed lithic manu-

FIGURE 6

5 RB1579
PETROGRAPHS
8-19-80

(Interfigure relationships are not accurate.)



facturing activity areas (Plate II.a-b). Anthropomorphic and shield figures dominate the upper portions of both rock art panels, while lined motifs occupy the space below, closer to the present ground surface.

Directly in front of the panels are two large, flat slabs of sandstone (probably sheared from the adjacent rock face) with the incised inscription: "3 - 3 - 40 PANTENOLO". Another inscription has been almost completely obliterated; the remaining graffiti is also very faint but reads: "__ANT __PIP."

A Rose Springs Series/TME-16 projectile point, also found at sites in the Great Basin and Northern Colorado Plateau regions, was recovered from the fill in one of the potted areas. The point is tentatively affiliated with Late Archaic-Fremont (AD 300-900) cultures (see Appendix A).

The anthropomorphic figure on Panel 1 (Figure 6.3) is entirely pecked. The figure has a trapezoidal body configuration and a flat-topped, elliptical head with up-turned "ears". Hands are depicted, the right bearing a stylized club or weapon. A large incised spear bisects the figure diagonally through a "breastplate", which stands out in relief.

Figures 6.1 and 6.7 are both categorized as shield motifs due to their resemblance to other such designs found in the literature. Both are incised with round bodies, arms and legs, and designs on the interior of the "shields". Figure 6.1 has a round head, while Figure 6.7 has a more elliptical-shaped head with a three-pronged headdress. A smaller head or possible weapon with identical headgear projects diagonally from the left shoulder of Figure 6.7. The arms appear to be linear extensions of a "belt", which bisects the figure horizontally.

All three anthropomorphic figures are rendered in a fluid, nongeometric fashion. Body outlines for Figures 6.1 and 6.3 are depicted by means of a continuous, curvilinear line, which is lacking in the rendering of Figure 6.7.

The line motif frequently represented at 5 RB1579 is the "rake" element (Figures 6.2, .4, .6, .9, .10, .12), which is rotated directionally to assure a variety of postions. Two (Figures 6.6 and 6.10) are associated with a single, vertical incised line. Figure 6.12 combines the rake motif with a "two-pole ladder" element, and Figure 6.11 combines a "one-pole ladder" design with a single, vertical incised line. The only other line motif which forms a recognizable design is Figure 6.5, which consists of deeply incised lines forming the letters "U" and "H".

Anthropomorphic Figure 6.3 does not clearly resemble any figures in the literature, but closely parallels those described by Schaafsma (1971:29-54) for the San Rafael Fremont Area, and particularly those from the La Sal mountains in the southern zone as described by Hunt (1953). According to Schaafsma, these Moab-La Sal district variants exhibit characteristics pointing to more mixed influences within this area of the Fremont rock art tradition, and may suggest the necessity for creating a separate style zone, which would also encompass the Westwater Creek-Glade Park districts.

Stylistically, the trapezoidal body type, arm position and head shape (which is at least rounded on the comparative figure) are similar to Hunt's Figure "i" and Figure "k" (1953:185, 190). Figure k at least has a flattened, elliptical head, hands, bends in the arms, and a similar treatment of the feet. Figure 6.3 also vaguely resembles anthropomorphs of the Uintah Fremont Classic Vernal Style variant from the Ashley-Dry Fort Valleys (Schaafsma 1971:19, Plate 8) and a Basketmaker figure from Buttress Canyon, Arizona (Ibid.:141, Figure 134). The only flat, elliptical head shapes found to be similar to that of Figure 6.3 belong to figures included in Schaafsma's Barrier Canyon Style (Ibid.:70, Plate 32). No comparitive specimens were found with weapons such as that wielded by Figure 6.3, nor any with spears bi-

secting the body.

One of the most striking stylistic elements of Figure 6.3 is the upturned ears or "hairbobs", which are without parallel in comparative figures in the literature. In most instances, comparative figures with round or elliptical heads are depicted with downturned ears or hairbobs, rather than the upturned style (cf. Hunt 1953:189, Figure c). It is possible that the smaller, upturned projections exhibited on Figure 6.3 are stylistic variations of these traditional hairbob depictions, or they may represent a new configuration.

Overall, certain elements are lacking in all comparative figures. Figure 6.3 is similar in terms of selected traits and overall configuration, yet it is not as rigidly executed as other documented styles.

The shield motif, as represented by Figure 6.1 and Figure 6.7 from 5 RB 1579, has long been the topic of considerable consternation regarding its origins, age, and path of diffusion. The motif is associated with a variety of cultures, both in the Southwest and the Plains, including Fremont and late Ute occupations (Gebhard 1966:727-728). H.M. Wormington (1955), who is responsible for much of the early research in the Fremont area, subscribes to the idea that the shield motif originated in the northern Plains, then later appeared as a Fremont element. Gebhard (1966), however, believes that the evidence suggests shield figures are ultimately Mexican in origin, then spread to the Rio Grande Pecos cultures, the Fremont, and to the northern Plains (Ibid.). Buckles (1964) concurs, insofar as the motif diffused out of the Fremont areas and into the Plains around AD 1150.

Shield figures from 5 RB1579 (Figures 6.1 and 6.7) lack explicit parallels in comparative literature, although some tentative correlations can be made. In terms of headdress and body rendering, Figure 6.7 resembles a

shield figure from the Uncompahgre Plateau originally recorded by Huscher (Buckles 1964:178), and vaguely resembles the crudely executed shield figures from Salt Creek (Schaafsma 1971: 53, Figure 55) in general head configuration, misshapen shield rendering and leg treatment, although arms are again lacking in the comparative figure. Figure 6.7 also shares some characteristics with a shield figure, recorded by Buckles (1971) in the Uncompahgre Plateau area, which has a three-pronged headdress and a projection protruding from the left shoulder (without headdress or "horns"). Otherwise, the comparative figure is very different, in that it lacks arms and has very long legs.

Certain stylistic components of shield figures are thought to be diagnostic of early and later shield representations. According to Gebhard (1966), the earliest shield figures were depicted without arms; instead, a club or spear often projected diagonally from the side of the figure, usually from the left. The head was often depicted with a horned headdress and geometric, non-representational designs were more frequently depicted on the interior of the shield. Later styles are characterized by shields decorated with animals, birds, humans, etc., sometimes portrayed with a bow and arrow. Arms, hands and fingers are also often depicted (Ibid.:726-728).

According to the above interpretation, Figure 6.7 contains elements of both early and late styles. The "horned" headdress, the projection of the left side of the body and non-representational shield design are all stylistic components associated with the earlier style. If the horizontal extension of the figure's "belt" can be interpreted as arms, this characteristic is usually associated with the later style. Although evidence is by no means conclusive, it is possible that Figure 6.7 represents an intermediate shield style containing elements of both early and later renderings, and a combination of both Fremont and Uncompahgre Plateau styles.

It is possible that Figure 6.1 from 5 RB1579 has been wrongly classified as a shield figure, but it was placed in this category because of its generally rounded body shape and abstract design incised in the center of the figure. Examples of the generalized body type were found in the literature (Schaafsma 1971:39, Plate 18), but none were found with associated abstract motifs.

Lined motifs make up the greater percentage of petrographs represented at 5 RB1579. No interpretation of their actual signification is given in the literature, although several such motifs are widely distributed. Schaafsma's (1971:16, Figure 21) data indicates that all abstract elements show a significant increase in San Rafael Fremont panels east of the Wasatch Mountains. The rake and one-pole ladder motifs occur fairly frequently in Schaafsma's Fremont area (Ibid.). These motifs are rare in the La Sal Mountain region, but are widely distributed in the Basin and Range Province, Plains, and Columbia Plateau (Hunt 1953:198). Single incised or ground lines may suggest tool marks, or groups of lines such as the upper and lower elements of Figure 6.4 may represent the repetition of a particular event or experience. These motifs may appear over a wide area, but do not really constitute a diagnostic art style in terms of distribution (Buckles 1965:148).

As stated previously, rock art from 5 RB1577 (Plate VIII; Figure 7) is discussed separately due to a perceived difference in style and subject matter. Panel 1 consists of three "bear paws" (Figures 7.1, 7.2, and 7.5). Two (Figures 7.1 and 7.5) are pecked, and Figure 7.2 (as well as the "claws" on Figure 7.1) are incised. Two are similar in style and the third is more geometrically executed. A realistically portrayed "cervine" with an elongated, pecked body and vertically rendered horns is also depicted (Figure 7.6), as well as two vertically rendered pecked "snakes" (Figures 7.3 and 7.7) and an

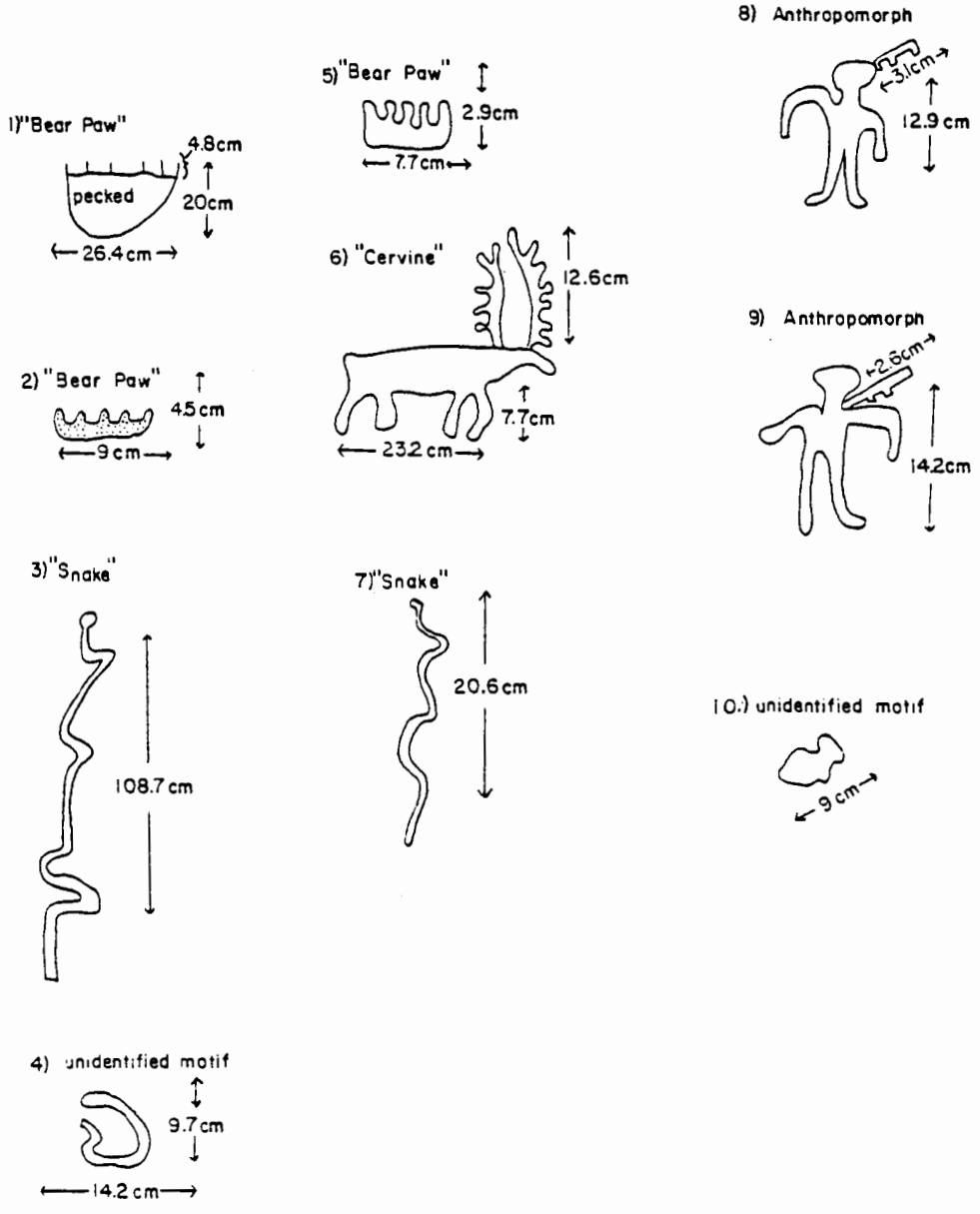
FIGURE 7

5 RB1577 Rock Art Motifs

Numbers 1 through 7 are located on Panel 1.

Numbers 8 through 10 are located on Panel 2.

(Interfigure relationships not accurate)



unidentified meandering line motif (Figure 7.4). Panel 2 contains two anthropomorphic figures (Figures 7.8 and 7.9) with serrated projections emanating from the left of the head to shoulder. The right arm of Figure 7.8 and left on Figure 7.9 are bent downwards in an unnatural position. Body types are generally more curvilinear than geometric, and both heads are elliptical and flattened. A third pecked motif on Panel 2 was unidentifiable, but faintly resembles a projectile point.

The "bear paw" motif was a popular element in Western Colorado rock art and is widely distributed in the Basin and Range Province and Colorado Plateau (Schaafsma 1971:27; Hunt 1953:196). Figure 7.1 from 5 RB1577 closely resembles a similar recorded motif from Dinosaur National Monument in its semicircular rendering and incised treatment of the claws (Burton 1971:44). Figures 7.2 and 7.5 are comparable to La Sal Mountain "feet" motifs, although the former exhibit straight rather than curved lines at the base (Hunt 1953: 197). It would be difficult to say that the two separate bear paw styles represent different temporal or cultural periods, but it might be safe to assume that they at least represent separate authorship.

The snake motif is also widely distributed but cannot necessarily be construed as a diagnostic element because of its almost universal appearance in association with a variety of rock art styles. Comparative examples of this motif executed in the vertical position are voluminous, and were found in every source consulted. Although this meandering line motif is generally interpreted to be a snake provided the figure exhibits a bulbular head, this may not always be the case. This motif may also have been used to symbolically relate locational or geographic information such as the meandering configuration of a drainage or canyon network. The erratic curves represented in Figure 7.3 are suggestive of this sort of purpose, as opposed to the smoother,

more representational body configuration noted in Figure 7.7. Shoshoni and Bannock cultures are known to have made petrogrophs specifically to relate locational information, although it is not stated whether the snake motif in particular was employed (Buckles 1964:20-29).

Comparative cervine figures resembling Figure 7.6 proved to be more elusive. Fremont-associated figures are more rectanglar in body configuration, and antlers are frequently portrayed in a stick-like fashion and in an entirely different position. Figures from other surrounding regions (Uncompahgre Plateau, Northern Plains) are also dissimilar, and do not warrant comparison. The only specimens rendered in the same fluid style exhibiting at least basic similar characteristics were historic equestrian motifs, primarily from the Northern Plains. In terms of overall body type, Figure 7.6 resembles Historic Ute horse depictions (Buckles 1964:23, Figure 6). Huscher maintains that earlier Ute depictions of horses are pecked and more recent examples are incised (Ibid.:20-29). The body configuration and active positioning of the legs are even more similar to Paiute-Shoshonian depictions from the Great Basin and Western Plains and likewise to figures from western Texas in the southern plains (Ibid.:26, 34, Figure 4). These figures exhibit the more elongated body type and realistic representation as noted in Figure 7.6.

Although the evidence is not conclusive by any means, these similarities to historic equestrian motifs may indicate that Figure 7.6 was executed during the late Proto-historic period, and possibly during an earlier occupation if Huscher's distinction between earlier pecked and more recent incised motifs is correct.

Anthropomorphic Figures 7.8 and 7.9 were also difficult to classify. Similar body configurations were noted in figures depicted on panels from the Northern San Rafael Fremont area, the Southern San Rafael, and in a set of

petrographs of unknown origin in the Florence Canyon area of eastern Utah (Schaafsma 1971:65, Plate 31). Similarities were also noted in figures from the Uncompahgre Plateau and Glade Park areas, but arms and legs are longer and splayed fingers are frequently depicted.

Comparative figures with spear- or lance-like objects projecting from the body were also sought, regardless of body configuration or other comparable characteristics. (This projection is interpreted to be a spear or arrow due to the rigidity of its form. Feathers are ordinarily rendered in a more curvaceous style.) In the La Sal Mountains area, figures are portrayed with an object projecting from the head (Hunt 1953:185, 195). In these cases, however, the objects appear to be either headgear or wings. Two figures exhibit similar downturned arm positions as Figures 7.8 and 7.9, although the renderings do not seem to be as intentional (Ibid.). A classic Vernal style figure exhibits an object projecting from the head, but from there, all similarities cease (Schaafsma 1971:22). There is also a shield motif anthropomorph depicted at 5 RB92 in Canyon Pintado with what may be a spear protruding from under the left arm (Creasman 1979:III-42). Such lanced figures may reflect warfare activities between cultural groups sharing a single region.

In summary, the occupation of 5 RB1579 is tentatively dated to the Late Archaic-Fremont period (AD 300-900) which may or may not reflect the period of execution of the rock art associated with this site. Most Fremont rock art is presumed to have been produced somewhere between AD 1000 and 1200, although earlier dates for the inception of Fremont culture have been proposed for the Uintah Basin, Great Salt Lake areas and Castle Park, Colorado, to name a few (Schaafsma 1971:127). Anthropormorphic figures from 5 RB1579 are distinctively different from most comparative examples in the literature, but cer-

tain stylistic components are similar to figures from the San Rafael Fremont area, the La Sal Monntains (both of which show the strongest correlation) and the Uncompahgre Plateau. Abstract motifs, which constitute a large percentage of the petrographs at 5 RB1579, are also present in the Utah Fremont area, and show an increase in frequency in the San Rafael zone.

Petrographs from 5 RB1577 are even more difficult to classify. The two styles of "bear paws" closely resemble motifs from Dinosaur National Monument and the La Sal Mountains, and comparable snake motifs were found in every source consulted. The cervine figure from 5 RB1577 resembles Ute, Paiute-Shoshonian and western Texas equestrian motifs in overall body configuration. Finally, the two anthropomorphic figures from this site are faintly similar to Utah Fremont and Uncompahgre figures in body type, but strong correlations to these examples were generally lacking.

## Lithic Scatters

The term "lithic scatters" is used to describe lithic sites which lack the immediately obvious structural or artifactual indications used to define site function. Although the tools and debitage recorded as lithic scatters are often used to infer a general site function, the class remains a morphologically defined, "catch-all" category for generally small, insignificant sites from which few behavioral inferences or regionally applicable data can yet be drawn.

Lithic scatters comprise roughly 79% of all sites, and 38% of all resources, recorded within the T-M-E study area. Obviously, the fact that the single largest site type is also the most poorly understood is a hinderance to this analysis. Although it is not within the scope of this project to redefine lithic scatters in terms of function or to suggest more meaningful

divisions of the "catch-all" category, the prevalence of lithic scatters and their meanings in terms of aboriginal utilization of the area is pertinent not only to the T-M-E study but to the understanding of the prehistory of northwest Colorado as well. A basic description of the T-M-E lithic scatters will provide the foundation for further generalizations regarding site function and frequency. Due to the wide variations among the sites included under this category, many of the measurements recorded during pedestrian inventory are meaningless for the group as a whole. In the discussion that follows, only those characteristics that are believed to help explain this variation, and general trends that can be noted for the group as a whole are discussed.

The T-M-E lithic scatters are highly variable in terms of size, ranging roughly from 3 $m^2$ to 270,000 $m^2$ in surface area. Of the 135 lithic scatters recorded, 50 (37%) have a surface area under 500 $m^2$, 67 (50%) range from 500 to 10,000 $m^2$ in size, and roughly 13% (18) exceed 10,000 m in size. Mean surface area for lithic scatters is approximately 7400 $m^2$ (s=27631.9 $m^2$, v=7.58 x $10^8$). However, as is obvious from this statistic, the distribution is skewed by a very few, very large sites. Only 18 lithic scatters exceed the mean surface area. Excluding these sites from consideration, mean size is 1346.8 $m^2$ (s=1930.3$m^2$, v=3,693,491.1). Though still highly variable,(and far from normally distributed), the reduction in standard deviation and variation about the mean suggest that the very large lithic scatters are possibly aberrant and should not be included as members of the group. It is considered possible that the largest of the lithic scatters represent several functionally, culturally and/or temporally separate sites, localities and/or isolated finds that, due to proximity, were recorded as a single site. It is also possible that erosion and downslope artifact migration have expanded the original surface area of some sites. Although precise calculations of artifact

density are available for only those sites in which 100% artifact tally was undertaken, 15 of the 18 very large lithic scatters consist of diffuse scatters, or diffuse scatters with several interior concentrations of artifacts, suggesting perhaps an erroneous grouping of resources under a single site designation. Ten of these 18 sites consist of artifact concentration(s) located upslope from diffuse artifact scatters, indicating that post-depositional phenomena may play a major role in determining observed site size. None of the very large lithic scatters contain multiple diagnostic artifacts from clearly different prehistoric periods. Evidence of "horizontal stratigraphy" is the only data that can conclusively indicate erroneous grouping of resources due to proximity.

Sixty-two percent (84) of the lithic scatters recorded during this inventory are comprised of tools and/or debitage of one or two lithic materials. This represents a major difference from the T-M-E campsites, of which roughly 63% contain three, four or five lithic materials, and quarries, which of course tend to be dominated by a single material. A lack of variety in lithic assemblage may support the hypothesis that lithic scatters result from brief, single, perhaps opportunistic utilizations for a single or a very few specialized purposes.

Finished tools of any type comprise under 5% of the assemblages recorded for 76% (102) of the T-M-E lithic scatters, whereas approximately 41% of campsite assemblages contain in excess of 5% finished tools. While these figures cannot be heavily relied upon due to the effects of vandalism (discussed below), they may again emphasize the brief or single site utilizations for limited purposes. Less finished tool manufacture, rejuvenation, breakage and exhaustion might be expected in briefly utilized locations.

Of the 135 lithic scatters, 108 (80%) contain 50% or greater siltstone

artifacts. In addition, approximately 72% (97) are located in the Texas-Lower Missouri Creeks geographic area which is recognized as the primary area of siltstone procurement and reduction (Figure 5), and the frequency of lithic scatters in the Texas-Lower Missouri area (based upon total acreage) is significantly higher than expected ($x^2$=26.3, df=1, $p \leq .001$). It is therefore believed that tool manufacture from the locally available siltstone was the primary function of many of the T-M-E lithic scatters, particularly those located within relatively close proximity to the siltstone sources in the White Face Butte area.

Lithic scatters tend to occur in upland contexts, with the following distribution: 48 (35.5%) are situated on the top or edge of a ridge finger, 31 (23%) are located on the edges or rims of major upland features, and 22 (16.3%) are located in the interiors of upland features. The remaining 34 (25.2%) lithic scatters occur on stream terraces (14), on ridge slopes (4), on upland benches or ledges (13), or across a combination of features (3).

A vast majority (115 of 135, or 85%) of the T-M-E lithic scatters are located in the low elevation pinon/juniper vegetation community, and seven occur in pinon/juniper on cliffs or rocky breaks. Since it is estimated that roughly 43.3% of the total project area is forested (or supports any of the five forest vegetation zones), it is significant that lithic scatters are almost exclusively confined to forested areas ($x^2$=121.6, df=1, $p < .001$).

Mean linear distance to nearest water source (C value) for lithic scatters is 173.6 m. Seventy five of the 135 lithic scatters (55.5%) are located nearest to a primary tributary of one of the seven major drainages and 58 (43%) are located within .81 km (one half mile) of stream confluences.

Of the 116 lithic scatters for which a nearest neighbor could be established, 63 (54.3%) are located closest to another site, and lithic scatters

tend to be located nearest to another site significantly more frequently than would be expected in light of the observed resource distribution ($x^2$= 6.86, df=1, $p \leq .01$). This may reflect a concentration of these limited use sites in areas where the sought after resources (lithic materials, game, etc.) occur in abundance.

Vandalism of 40 (approximately 30%) of the T-M-E lithic scatters is suspected to have in part determined the observed surface distribution of artifacts and may have caused certain sites that would, if the full artifact assemblage were known, have been classified as camps. Evidence of vandalism most frequently consists of concentrations of recent trash within or adjacent to site boundaries. Less frequently, survey markings, vehicular disturbance, footprints, or acccounts of local informants were recorded as probable evidence of site vandalism. Interestingly, evidence of site vandalism does not directly correspond with a lower incidence of projectile points or other finished tools. Roughly equal percentages of vandalized as compared to unvandalized lithic scatters contained under 5% finished tools (80% and 73.7%, respectively). However, 16.9% of the unvandalized lithic scatters contained over ten percent finished tools at the time of recordation, whereas only 5% of the lithic scatters for which a clear suggestion of vandalism was recorded contained over ten percent finished tools. Site vandalism, at least within the T-M-E study area, is believed to have a major role in interpretive difficulties associated with lithic scatters.

Thirty-five projectile points believed to be of diagnostic value were collected from the 135 T-M-E lithic scatters. Suggested temporal affiliations range from the Paleoindian through the Proto-historic periods. All three Paleoindian (pre-5000 BC) projectile points encountered during the study were associated with lithic scatters. Twenty of the collected projectile

points are believed to have been utilized during the Archaic period (5000 BC-AD 400) (most probably Middle (3000-1000 BC) to Late (1000 BC-AD 400) Archaic), although 18 of these specimens are known to occur in Fremont (AD 400-1250) and/or Proto-historic Numic (AD 1250-1880) sites in other areas. Eight of the collected projectile points could indicate Fremont occupation of the area, however, six of these are known to occur in Proto-historic period sites as well. One projectile point is believed to indicate Proto-historic areal utilization and three remain unidentified as to cultural/temporal affiliations. In general, it can be said that the projectile points collected from lithic scatters reflect the apparent increase in aboriginal activity in the area from the Middle Archaic period on that has been noted for the study area as a whole (pages 184ff). More detailed discussions of collected artifacts and the chronological indications drawn from them are contained in Appendix A and the section of this report entitled "General Conclusions".

If there is a single, immediate observation that can be made from the T-M-E data, it is the overwhelming abundance of lithic scatters in relationship to other site types. This ratio is accentuated by the fact that the T-M-E campsite classification is purposely broad, and therefore, includes more sites than would other common definitions (Table 1). Although the T-M-E lithic scatters have not been individually analyzed in terms of function, certain generalizations can be made.

Many of the T-M-E lithic scatters, especially in the Texas-Lower Missouri Creeks geographic subarea (Figure 2), appear to result primarily from reduction of the locally available siltstone nodules to flakes, blanks or tools. Such sites are large, the assemblages are dominated by, if not totally comprised of, unutilized siltstone debitage, and finished tools are rare to non-existent. In sites where all stages of tool manufacture are represented in the

debitage, finished tools generally appear to have been carried away either by the manufacturers or by site vandals.

Small, concentrated lithic scatters probably represent brief utilization of the site area for resource procurement or as brief camping or stopping points. At present, it is believed that assemblages containing high percentages of spent or broken tools, resharpening flakes, and utilized flakes in relationship to unutilized debitage represent hunting/butchering locations or perhaps perishable food or artifact processing sites (depending upon the types of tools recorded and the methods in which they were used). Small scatters of unutilized debitage may merely represent a brief stop by one or a few individuals during which at least part of the lithic tool manufacturing process was undertaken.

Extremely large and diffuse lithic scatters, with or without internal concentrations, are believed to represent the investigators' inability to discriminate between functionally, temporally or culturally distinct site components due to proximity of artifactual deposits. At present, only when reliable temporally diagnostic artifacts from each site utilization remain can hypotheses be made regarding site occupation through time, especially for surface sites.

It is apparent, therefore, from the data extracted from the 135 lithic scatters, that the T-M-E study area, with the exception of several small areas in which campsites are concentrated, was primarily utilized for lithic and organic resource procurement on a limited, probably seasonal basis. Due to the infrequency of milling stones and absence of granaries in the study area, and the abundance of locally available materials in the lithic assemblages, lithic material and faunal resource procurement are believed to have been the primary activities pursued. The broader implications of this assessment will be discussed in "General Conclusions" at the end of this report.

## HISTORY

### Background

The first documented incidence of European contact in northwestern Colorado is generally recognized as the Dominguez-Escalante expedition of 1776. This Spanish exploration party traveled north through Douglas Canyon, then west along the White River into Utah. The years subsequent to this expedition witnessed growth of fur-trapping in northwestern Colorado. Exploitation of the region's animal resources through trapping and trading continued until the 1840's, when the demand for pelts decreased and the area was essentially trapped-out (Athearn 1977:17, 19).

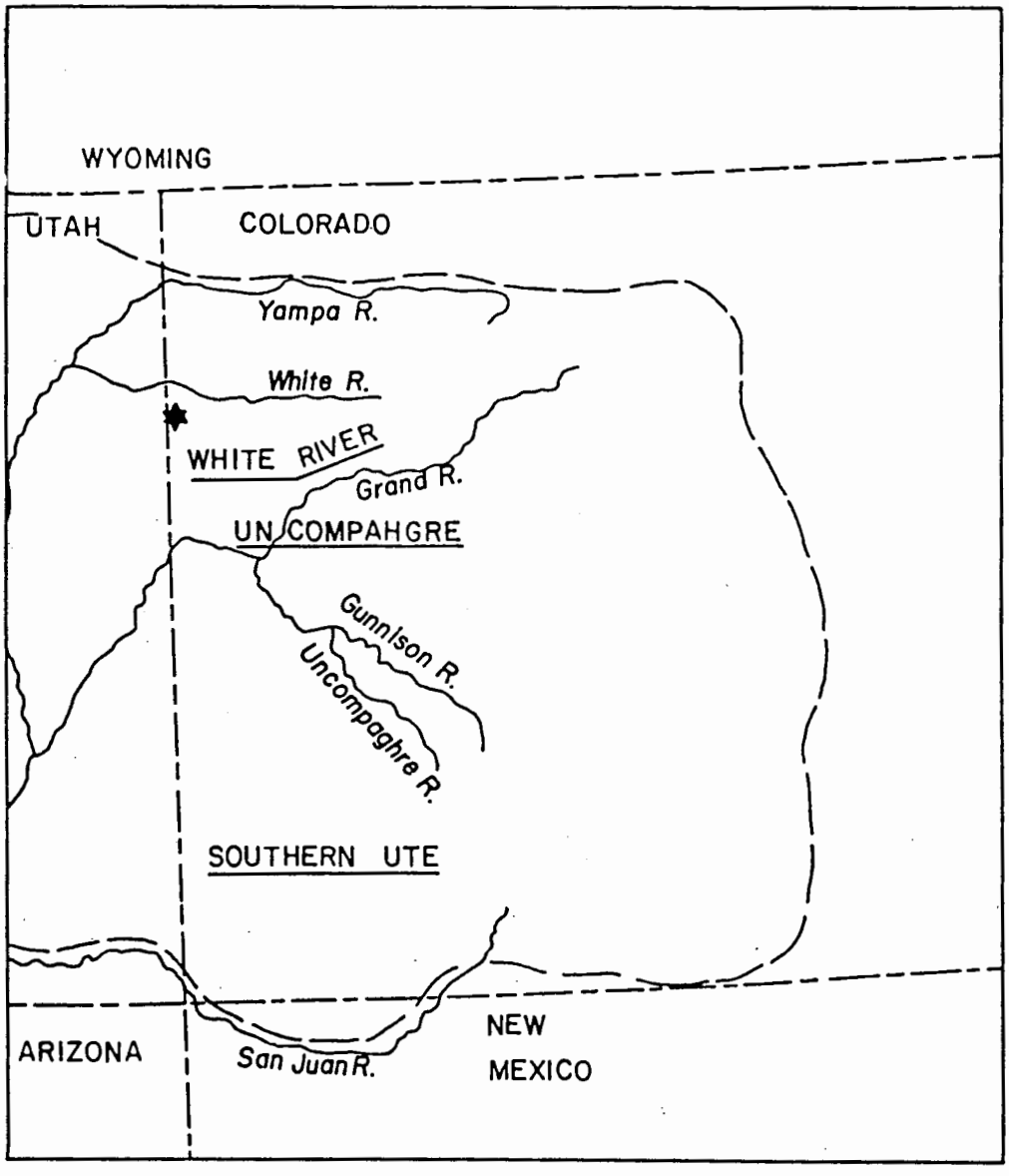
In 1844, John Charles Fremont led the first US Government expedition into northwest Colorado. During a second expedition in 1845, Fremont followed the White River to its confluence with the Green River in Utah (Ibid.: 26-28). Fremont's expeditions were mounted to map practical routes through the West. From the time of Fremont's expeditions until 1868, little activity is recorded for the northwest Colorado region except for a few prospectors known to have entered the White River Area in 1860 (Chandler and Nickens 1979b:35). In 1868, John Wesley Powell undertook a government survey in northwestern Colorado. Powell's expedition wintered near what is now Meeker, Colorado, before heading down the Green River in the spring of 1869 (Ibid.:30)

Due to the remoteness of northwest Colorado and the presence of the Ute Indians, white settlement during the early 1800's was minimal. In 1868, the Ute Indians, who traditionally roamed throughout the Colorado Territory (Figure 8), signed a treaty deeding to the U.S. all of their lands except those west of the 107th meridian and south of a line 15 miles north of the 104th parallel. This area was made into a reservation, and the White River and Los Pinos

FIGURE 8

DISTRIBUTION OF UTES IN COLORADO

(After Smith 1974)




Area in Colorado traditionally roamed by Utes prior to establishment of reservations.

✱ Texas-Missouri-Evacuation Creeks study area (approximate location).

Indian agencies were established (Figure 9). The Brunot Treaty of 1873 resulted in the San Juan Cession in which the Utes ceded that part of their reservation containing the San Juan Mountains. Trouble with the White River Utes erupted in 1878 and the uprising resulted in the Thornburgh Battle and the Meeker Massacre. A new treaty was signed on June 15, 1880, requiring the Utes to pay damages to the victims of the massacre and ceding all of the Ute reservation in Colorado to the U.S. except for a 40-mile strip in southwestern Colorado. The White River Utes were removed to the Uintah Reservation in Utah, and the Southern Utes and Uncompahgre Utes agreed to settle on new reservations along the La Plata River and Grand River (Colorado River) near the mouth of the Gunnison River, respectively (Fritz 1941:290). In January of 1882, an Executive Order was issued to remove the Uncompahgre Utes to Utah (Steward 1974:22). On June 28, 1882, Congress declared what had been the Ute Reservation in Colorado to be public land open for sale and settlement (op. cit.).

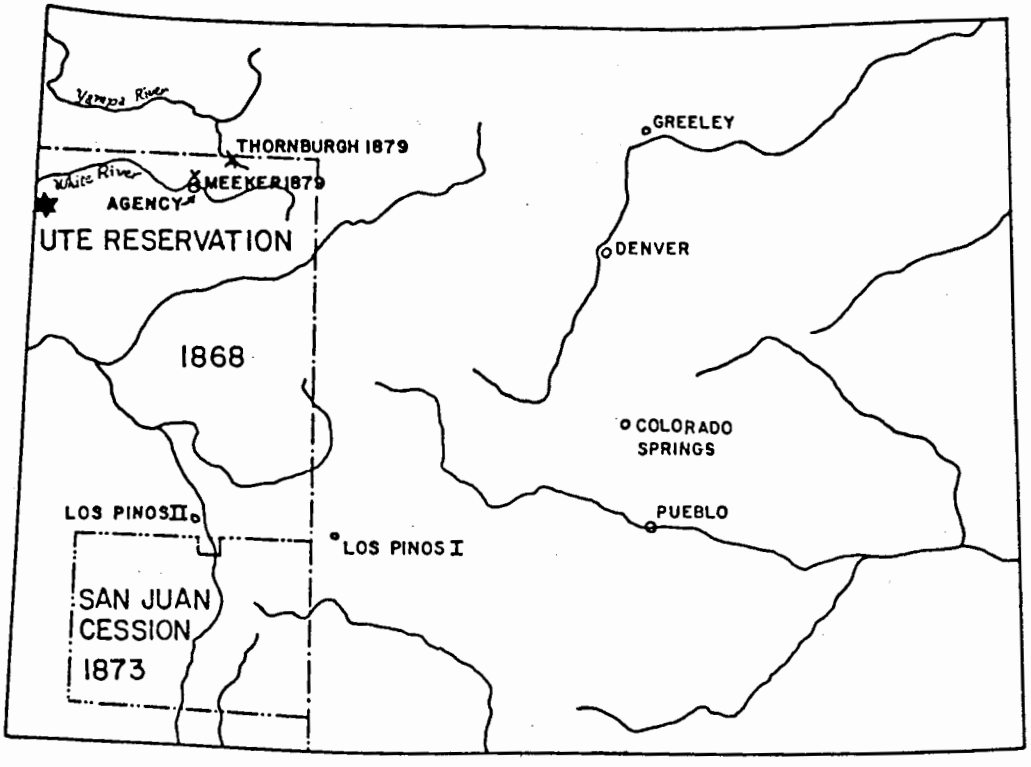
Settlement of Colorado's western slope had begun prior to this Congressional declaration and was facilitated by construction of the Denver and Rio Grande Railroad from Salida to Gunnison in 1881. The line was continued to the Utah border through Montrose and Grand Junction in 1882 (Fritz 1941:192-293). In the more remote Northwestern part of the state, Rifle, Meeker, and Rangely had sprung up by 1883, even though the railroad had not yet made its way into this area.

By the end of the 19th century, cattle ranching utilizing open range grazing became widespread in northwestern Colorado and remained the mainstay of northwestern Colorado's economy until 1910 (Athearn 1977:86). The first attempt to introduce sheep into the northwestern Colorado livestock industry occurred in 1894, and was followed by sheep wars which continued into the 1920's (Ibid.:79-82).

FIGURE 9

UTE RESERVATION LANDS IN COLORADO

(After Hughes 1977)




★ Texas-Missouri-Evacuation Creeks study area (approximate location).

Agriculture in northwest Colorado was for the most part confined to marginal areas bordering streams and rivers. Production of hay in connection with the cattle industry was the major agricultural endeavor. In 1915, an attempt to dry-land farm the Great Divide area was made, but was never very successful (Ibid.:120-121).

Homesteading, although documented as early as the 1880s -1890s in the White and Colorado River areas, was not widely evident throughout northwestern Colorado before the turn of the century. The lack of adequate transportation and water within the area probably accounted for the sparse settlement of the more remote portions of northwest Colorado. General land patent information for northwest Colorado indicates that land entries were filed under the original Homestead Act of 1861, the Enlarged Homestead Act of 1909, the Stock Grazing Homestead Act of 1916, and the Desert Land Act of 1891. As cattle ranching was a major industry and as water was limited in northwest Colorado, a predominance of Stock-Raising Homestead entries under the 1916 Act is noted for the area. Under this land act, applicants were allowed 640-acre claims on non-irrigable, unforested land for grazing and raising forage crops. The Homestead Act of 1861 allowed only 160 acres with cultivation of a portion of the acreage required prior to patenting. The Homestead Act of 1909 allowed 320 acres and also required cultivation. The Stock Grazing Homestead Act required no cultivation and allowed a larger acreage necessary for cattle grazing. The Desert Land Act, although allowing up to 640 acres per claim, required that the applicant reclaim the land by irrigation and cultivate at least 1/8 of the acreage prior to patenting. For a more in-depth discussion of these land acts and the various requirements for acquiring a land patent, please refer to Dick (1970) and Peffer (1951).

Around the turn of the century, mineral extraction and related trans-

portation activities were added to the economic industries in Northwestern Colorado. Veins of gilsonite were located and mined in Rio Blanco County and across the Utah border in Duchesne and Uintah Counties (Bender 1970:13). In 1904, the Barber Asphalt Company began construction on the Uintah Railway, a narrow-guage line built to haul gilsonite from the Black Dragon gilsonite mine in Utah, southeast over Baxter Pass to Mack, Colorado and the Rio Grande Western railhead (Ibid.:24). A toll road connecting Dragon to Vernal, Utah was constructed by 1905 by the Uintah Railway Company. A stage freight line from Dragon to Rangely was also constructed by the Uintah Railway people in 1906 (CPO Files 1981).

Major oil production in northwestern Colorado began in 1902 when the Poole oil well was brought in near Rangely. Numerous other fields were discovered during the 1920's and oil prodiction continues to be a major economic factor in northwest Colorado today. Large quantities of coal and oil shale were noted during geologic geographic land surveys of Rio Blanco County. Although these resources were not, until recently, exploited on a large scale, some coal mines were established in the 1920's in Rio Blanco County, and a short-lived oil shale boom is known to have occurred ca. 1918 in western Colorado (Chandler and Nickens 1979b:47).

Today energy development in the forms of oil and gas production and oil shale and coal mining is the main economic activity in northwestern Colorado. Sheep and cattle ranching along with recreational hunting also form a major part of the northwestern Colorado economic picture.

Historically, the Texas-Missouri-Evacuation Creeks study area itself was encompassed within the Ute Reservation as delineated by the Treaty of 1868 (Figure 9). Prior to that time, it is believed that the area was traditionally utilized by the Utes and other Numic-speakers (Figure 8), however,

actual dates defining this utilization have not been established (please refer to "Prehistory: Background" for a discussion of specific sites which have been assigned probable Numic affiliations). With the cession of Ute lands in 1880, and the declaration of reservation lands as public and up for sale in 1882, study area lands were open for settlement. However, due to the limited availability of water, the roughness of terrain, and the lack of transportation routes within the region, these lands were not immediately claimed.

Information concerning earliest settlement of study area lands is derived primarily from past geographic land surveys of the area and from land office records. Initial land surveys within the study area for lands in T3 and 4S, R103W were completed in 1885. During those surveys, no houses or structures were recorded in the surveyors' field notes or indicated on the survey plat map constructed from the surveys. No entries are recorded in land office tract books prior to the turn of the century for study area lands. An exception to this is an Act of Congress dated 3/3/1875, creating a State Grant involving Section 36 in T3S, R104W. The Act reserved two sections in each township in the state for sale at a later date to benefit school revenues. Control of this section later passed to the Federal Government, and sale revenues were earmarked for the Colorado River Storage Reclamation Project.

After 1900, the first date listed in land office records for an action concerning study area lands is June 4, 1904--the date on which the Uintah Railway right-of-way (#C-093856) was granted by the US Government. Survey for the narrow gauge rail line was conducted in 1903 and construction began in 1904 (Bender 1970:24). Within the study area, the line was constructed through sections in T3 and 4S, R104W. The railway, built primarily to haul

gilsonite from the Dragon, Utah mines to the railhead at Mack, Colorado, also provided a limited passenger service from Dragon--and later from Watson, Utah to Mack. (A wagon road is known to have existed prior to construction of the railway, and was used to haul freight over Baxter Pass (Ibid.:23-24).) The line was abandoned in 1939, and in 1941, the Uintah Railway Company relinquished its right-of-way.

Visible surface remains of the Uintah Railway occur in 5 sections within the study area. These remains include a raised railbed, ties, spikes, and other associated debris. These known historic resources have previously been recorded and discussed by Gordon, Kranzush, and Knox (1979), and more recently, by Babcock and Sciscenti (1980). In addition to the actual remains of the railway bed, one other known site associated with the historic railway is located within the study area. 5 RB662 is believed to be the site of a tent stop along the railway. The tent stop possibly represents a temporary camp erected during construction of the line. Although other historic remains associated with the Uintah Railway have been recorded (such as the Whiskey Creek Trestle, 5 RB1925, a bridge/trestle; 5 GF740, a wooden water pipeline; 5 RB1926, can, glass, and railtie debris; and numerous other occurrences of visible surface remains of the railbed and associated debris) at various points along the railway route, none of these resources fall within the actual study area and they will not be discussed here. For an in-depth discussion of the National Register of Historic Places eligibility of the Uintah Railway route and associated remains, please refer to Athearn (1980).

In 1906, the Uintah Railway Company built a stage/freight road between Dragon, Utah and Rangely, Colorado. The route of this road, believed to be part of the Dragon Trail (CHS-DHP #52/05/0007), crosses through one section within the study area. The trail was part of an effort to improve access

to and from the gilsonite mines in the Dragon area.

Although the introduction of the railway and stage road did improve access into the study area, little increase in settlement of the area was evident. Subsequent geographic surveys of T3 and 4S, R103-104W, conducted during the years from 1901 to 1924, reveal a few claimed land tracts and structures in areas outside the study area, but only a single habitational structure within actual study area boundaries. The survey plat map constructed from surveys of T3S, R104W, which were completed in 1924, depicts a single house with a fence and ditch in Section 35. Also depicted are a road and telephone line along Evacuation Creek, the Uintah railway route, and the Dragon-to-Rangely road and telephone line. The location of the house corresponds to an historic multicomponent site 5 RB951, recorded by the Laboratory of Public Archaeology (LaPoint 1980:3). The site consists of the remains of a small log cabin, a collapsed barn and two semi-subterrean structures, with a 2-track roadbed running between the site and Evacuation Creek (the road corresponds to that depicted on the 1924 survey plat).

Land patent information indicates that no patent was ever issued for the land on which the site is located. However, two separate claims were entered on the land. Stock-Raising Homestead Entry (SRHE) #044225 encompassing approximately 720 acres was filed by M. Everett Bascom of Dragon, Utah on 7/31/31, and was rejected by the General Land Office on 11/25/35. (The claim may have been rejected as it exceeded the 620-acre limit for entries under the Stock Grazing Homestead Act of 1916.) A second claim, Desert Land Entry (DLE) #044723, was filed in 1932 by Cyrus Engberson of Dragon, Utah. His claim is recorded as conflicting with Bascom's and resulted in a protest filed by Bascom concerning duplicated land parcels. Engberson's entry was withdrawn in 1939 as he was unable to meet DLE requirements. The structures

comprising site 5 RB951 (only one of which is mentioned along with the fence and ditch in surveyors' field notes, dated 1921) may represent improvements necessary for the claim requirements of either applicant's attempt to acquire the land. Local resident Allen Gentry (personal communication) recalls that a man named Harris built the original cabin at the 951 location ca. 1910, and that later, in 1931, Gentry's brother-in-law, Everett Bascom, attempted to acquire the property, but was unable to prove up. Apparently Harris did not file on the land, as there is no record of an entry under his name. Structures additional to the original cabin which Harris built were probably added as subsequent claimants attempted to prove up on the land.

In addition to the known historical resources cited above (Uintah Railway route and remains, Dragon Trail Route, 5 RB662, and 5 RB951) which are located within the study area, one other site, 5 RB950, is recorded as having an historic component. 5 RB950, a prehistoric sheltered camp containing flakes and charcoal, also exhibits an area of historic trash described as shards of purple glass from hand-blown bottles (CPO Site Inventory File 1980). The old Evacuation Creek roadbed depicted on the early survey plat corresponds to the road which is shown running in front of the site on the 5 RB950 site map. The historic debris found at this site probably represents trash discarded by persons traveling along the road.

The overall settlement and utilization picture of the Texas-Missouri-Evacuation Creek areas as demonstrated by known historic resources is somewhat distorted by these limited resource examples found within the specific study area. Outside the study area, in T3-4S, R103-104W, a total of five historic homestead/ranch sites (5 RB889, 5 RB911, 5 RB920, 5 RB927, 5 RB928) have been previously recorded. In addition to these sites, three as yet unrecorded homesteads/ranch complexes of probable historic age (Gentry Ranch,

Finicum Property, and Gothard Property) are noted within the townships and ranges specified above. Early land patents for T3-4S, R103-104W indicate that lands in areas surrounding the study area were patented by 1916, with one dated Desert Land Entry as early as 1905.

Within the actual study area, the first homestead entry listed in the land office tract book was made in 1925 by John W. Johnson of Rangely, Colo. His application, #026266, encompassed 320 acres of land which had been offered as part of the Ute Lands Sale. The entry was canceled in 1931 as no final proof of having met Homestead Act requirements was submitted by Johnson. Only two other homestead entries are on record for study area lands. Both applications were filed in 1931 and neither resulted in a land patent.

Prior to the first homestead entry, the tract book Historical Index lists a number of oil and gas permits applied for during the years from 1922 to 1927 for sections within the study area. Applicants from Grand Junction, Vernal, and Denver are recorded as receiving these oil and gas permits. Such permits usually encompassed one or more entire section, and once issued, allowed the applicant to conduct oil and gas "prospecting" within the specified area. Upon discovery of oil or gas, an application for lease of the land was usually submitted (Montoya, personal communication). All six oil and gas permits issued within the study area were cancelled within one to four years of issuance. No known oil and gas leases were granted to any of the prospecting-permit applicants.

The Historical Index also lists the first oil shale placer claim made within the study area. In 1926 (date of sale), the Dragon Oil Shale Corporation under the direction of D.M. Guilotte, acquired the Petroleum and the Petroleum 1, 2, 3, and 4 claims in Sections 11 and 12, T3S, R104W. These claims were later patented in 1934 under mineral entry patent #1068356. Numerous

additional oil shale placer claims subsequently applied for by the Dragon Oil Shale Corporation in surrounding sections were declared null and void by court actions. Information concerning the activities in working such oil shale placer claims was not available. These rather unsuccessful attempts to exploit hydrocarbon resources mark the beginnings of the energy development industry within the study area.

Documentation of utilization of the study area for livestock-related activities occurs somewhat later in the Historical Index. Initial stock-raising homestead entries date from 1930, and only five such applications (all by residents from Dragon, Utah) were filed for study area lands. All of these applications were either withdrawn, rejected or relinquished by 1935, and therefore did not result in land patents. It is not known whether livestock were actually brought onto the claimed land before they reverted to public domain. Prior to these attempts to claim study area lands for actual livestock-related use, it is probable that these public lands were utilized as open range by ranchers in surrounding areas. The presence of a "stock driveway" in T4S R104W within the study area lends some support of this idea. The stock driveway listed in the Historical Index was created in 1918 by a Secreterial Order. Under the Order, all of Sections 3 and 10, W½W½ of Section 11, and Lot 4 of Section 2 within the study area, were withdrawn from public sale to be utilized for the herding of livestock. Such "driveways" were generally established to ensure access between public grazing areas or from a grazing area to a railhead for shipment (M. Maxwell, personal communication).

Opportunities to homestead previously unacquired lands within the study area ended with the Taylor Grazing Act of 1934. Under this act, all unappropriated and unreserved public lands in the range states were withdrawn from

homestead entry until their suitability as range land could be determined (Fritz 1941:279). In 1936, grazing licenses and fees were established for grazing use of these public lands (Ibid.). Due to the failure of early settlers to patent study area lands, the lands remained public domain and today are still used for grazing by private ranchers in the area.

Currently, study area lands are utilized to a greater extent by the energy development companies. Activities involving oil and gas drilling,as well as the transportation of these commodities via pipelines, constitute the major economic endeavors within the study area. In addition to energy development and cattle grazing, the area is seasonally utilized for hunting and recreation. See Table 7 for a summary of historic chronology for this region.

## Inventory Results and Interpretations

During field reconnaissance of the study area, two historic isolated finds, five historic localities, two historic open architectural sites, and six historic open industrial scatter sites were recorded (see Table 8). Each of these resources will be described, interpreted, and discussed in the following section in terms of its significance to the history of the region and its eligibility for nomination to the National Register of Historic Places.

Subsequent to field recordation of remains believed to be of an historic age, an extensive research program designed to gather a maximum of information applicable to the evaluation and interpretation of these finds was undertaken. This research data was compiled primarily from the sources detailed on pages 6 - 7. In addition, personal communications with staff members of the Colorado Railroad Museum, local residents in the vicinity of the study area, and other cultural resource professionals provided supplemental information included in the background and interpretations presented below.

TABLE 7

Chronological Summary of Events Affecting Lands Within the Study Area

1868 - Treaty establishing Ute Reservation encompassing study area

1875 - State Grant withdrawing Section 36 for school revenues

1880 - White River Utes removed to Uath

1882 - Ute Reservation Land declared public and for sale by Congress

1885 - Partial geographic survey of study area

1903 - Surveys for Uintah Railway right-of-way conducted

1904 - Uintah Railway right-of-way granted and railway constructed

1906 -Dragon to Rangely stage road constructed

1908 - Passage of Section 36 to federal control for Colorado River Storage Project revenues

1909-1910 - Survey of north boundary of T4S, R103W conducted

1910-1911 - Resurvey of T3S, R103W conducted

1918 - Secretary's Order for withdrawal of Sections 2, 3, 10 and 11 for stock driveway

1921 - Survey of T3S, R104W conducted

1921 - Survey of north boundary of T4S, R104W and resurvey of T3S, R104W conducted

1922 - Application for first oil and gas permit within study area

1924 - Survey of remainder of T4S, R104W conducted

1925 - First Homestead Entry filed for lands in study area

1926 - Date of sale of Dragon Oil Shale Corp.'s initial oil shale placer claim within study area

1930 - First Stock-Raising Homestead Entry filed for lands within study area

TABLE 8

TEXAS - MISSOURI - EVACUATION SITE TYPES AND EQUIVALENTS
(Euroamerican Sites)

| G&K Site Type | Canyon Pintado Equivalent | Green River-Hams Fork Equivalent |
|---|---|---|
| Open Industrial Scatter | Open Campsite | — |
| Definition: | Typically an extensive concentration of portable industrial artifacts, lacking structural remains, which may or may not contain hearths. | |
| Example: | 5 RB1777 | |
| Open Architectural | Open Architecture Site | — |
| Definition: | Ruinous/intact architectural remains regardless of function, usually occurring with industrial artifacts. | |
| Example: | 5 RB480 | |

Note: Any concentration of demonstrably historic debris encountered within designated boundaries of an aboriginal site has been included within the open scatter category, regardless of the extent of the historic remains.

This data was used in conjunction with field notes detailing specific physical characteristics of the resource and reference materials employed in analysis of any diagnostic remains to present a comprehensive interpretation of the resource.

Isolated Finds

5 rb1495 consists of the fragments of a purple glass bottle including the neck, shoulder, base, and eleven other pieces. The rectangular base measures 6 x 3 x 1 cm and exhibits a trademark of an "S" within a diamond (S). Mold seams of the bottle extend past the collar bead, but stop low on the finish. Side wall glass thickness is approximately 0.5 cm, and striations occur in the glass of the neck and base.

Analysis of physical characteristics of the bottle fragments constituting 5 rb1495 generally indicate a probable date of manufacture between 1900 and 1917. Berge (1980:77) states that bottles manufactured after ca. 1917 would not turn purple after exposure to the sun, as manganese was no longer added to bottle glass after that date (another source suggests 1925 as a terminal date for the use of manganese in glass (Ibid.)). As the mold seam does not visibly extend to the top of the finish, and as striations occurring above the neck bead run opposite to those below the bead, it is postulated that a lipping tool may have been applied to form the mouth of the bottle. Rotation of the lipping tool generally obliterated a portion of the mold seam (Ibid.:65) thereby resulting in a "wiped" finish. Kendrick (1967: 23) cites that lipping tools were in use ca. 1900.

Research on the s-in-diamond trademark did not result in a definite identification, as numerous bottles with similar trademarks were illustrated in reference materials. Several examples of liquor bottles (notably one by

Croff and Collins Wines and Liquors of Denver and Salida--ca. 1884-1890 (Clint et. al. 1976:12) and a Chas. H. Richter Kentucky Liquor Store, Trinidad, Colorado bottle, manufactured ca. 1888-1894 (Ibid.:190)) exhibited similar trademarks on the bases, however,bottle shapes ond other physical characteristics did not correspond to those of 5 rb1495. It is therefore assumed that the trademark was of the glass or bottle maker, rather than of the company supplying the contents of the bottle. Toulouse (1971) lists one manufacturer as utilizing an s-in-diamond trademark prior to 1917. The T.A. Snyder Preserve Co. of Cincinnati and Chicago used a similar trademark ca. 1900 (Firebaugh, personal communication). No description of this company's bottle was available and therefore comparison with 5 rb1495 remains inconclusive.

The IF was encountered at the top of a ridge above Texas Creek. Research on the historical background of this location reveals that the land on which the IF was found was part of a homestead entry (#026266) filed by John W. Johnson in 1925. This 320-acre claim, the first homestead entry on file for lands within the study area, was cancelled in 1931. Also listed as encompassing this resource's location is an oil and gas permit issued to Hawley Kelley in 1924 and cancelled in 1928, and a Stock-Raising Homestead Entry filed by Pearl W. Martin in 1931 and withdrawn in 1933. Prior to these entries, land surveyors entered the area during surveys conducted in 1885, and again in 1910 and 1911. (As 5 rb1495 is situated approximately 150m from the Section corner, it may represent debris discarded by surveyors during one of these land surveys.) From this information, a time range of 1885 to 1933 for documented historic activity involving the area in which the resource was found can be derived.

As an isolated find, 5 rb1495 can contribute little information other than to evidence utilization of the study area during historic times. The resource

is therefore felt to be insignificant to the history of the region and as such, is deemed ineligible for nominatinn to the National Register of Historic Places.

5 rb1495 is the remains of a shattered purple glass bottle, including an intact neck terminus. On the terminus, the mold seam extends above the collar bead to within 6 mm of the top of the finish. The lips appear to have been formed with a lipping tool, as the finish exhibits horizontal striations opposite to the flow lines in the glass below the collar bead. Glass thickness is irregular.

The purple of these glass remains again places the date of manufacture for this resource prior to 1917 (or 1925 (Berge 1980:77)). Other 5 rb1691 physical features involved in dating historic bottles, such as length of mold seam and lipping tool evidence, correspond to those of 5 rb1495, detailed above. The date of manufacture for this IF is therefore believed to be contemporaneous with that of 5 rb1495 ( ca. 1900 - 1917). No identification of the contents or manufacturer can be made, as no glass fragments bearing a trademark were found.

The IF was found on a low slope of a ridge finger, southwest of Evacuation Creek. This area was a part of a stock driveway created by a Secretarial Order in 1918. A total of 5 historic resources were encountered within study area lands designated for the stock driveway, and it is felt that the majority of these resources may represent the remains of livestock herders' camps utilized during stock drives through the area. Other than the stock driveway, no historic actions involving this location were recorded in the BLM Colorado State Office Records. Earliest geographic land surveys were conducted in 1921 and 1924 for this area.

Of and by itself, isolated find 5 rb1691 is not significant to the history of the region as it can contribute little significant information. This resource is therefore deemed ineligible for nomination to the National Register of Historic Places.

Localities

5 Rb1490 is a deadfall corral of pinon and juniper, woven and piled approximately 1 m high between live trees. The structure is roughly circular and is intact only on its west side. This resource is located on the lower slope of a north/south-trending redge lobe, between a tributary of Texas Creek and a recent road.

Documented historic utilization of this area includes a Stock-Raising Homestead Entry for the entire section filed by Pearl W. Martin in 1931 (withdrawn in 1933), and an oil and gas permit for the section issued in 1924 (cancelled in 1928) to Hawley Kelley. It is probable that some activity associated with these entries occurred during the years between 1924 and 1933 in the general area of the resource.

Although this locality has been included within this report section, its designation as an historic resource is tentative, as no diagnostic remains which might substantiate construction or use during historic times were found in association with the structure. As the corral is located within 61 m of an extensive prehistoric lithic scatter, 5 RB954, the possibility exists that the structure may be associated with this site, and therefore may have aboriginal affiliations. Finally, recent debris such as tobacco, evaporated milk cans, fold and crimp cans, a spoon, and a shotgun shell found within the boundaries of 5 RB954 constitutes recent (post-1930) utilization of the area, perhaps as a temporary hunter's camp. Therefore, a possibility also exists that the 5 Rb1490 corral could be of recent origin. The corral's proximity to a recent road lends support to this theory of origin. Although no definitive assessment of the structure's temporal or cultural affiliations can be made, 5 Rb1490 has been included for discussion here primarily on the basis of

its overall physical appearance and manner of construction. It is felt that this resource is most likely of historic Euroamerican or aboriginal origin.

The 5 RB1490 corral, if of historic or recent origin, is not considered eligible for nomination to the National Register of Historic Places, as a lack of associated artifactual deposits indicate that little, if any additional information could be obtained through preservation or additional investigation. The locality lacks architectural distinction as well. However, if the structure is temporally/culturally associated with aboriginal lithic scatter 5 RB954, it would be considered a unique feature to the area, and would conclusively date the site to the Proto-historic period. It is suggested therefore, that until additional investigation of 5 RB954 to determine its eligibility for nomination to the National Register of Historic Places is conducted, and until a positive association between 5 RB954 and 5 Rb1490 can be demonstrated, 5 Rb1490 should be considered ineligible for nomination to the NRHP. If association between 5 RB954 and 5 Rb1490 can be demonstrated, the corral should be subsumed under the 5 RB954 site designation and the final eligibili y assessment for the site should apply to the corral as well.

5 Rb1555 consists of a rock cairn and the fragments of an aquamarine bottle located on a lower slope of White Face Butte. The cairn, measuring approximately 0.75 x 1 m is composed of untrimmed sandstone slabs and exhibits an opening at the top (presumably for the insertion of a pole). The bottle fragments found nearby include a round base embossed with a trademark reading "AB - H14". Mold seams extend through the edges of the base, and bubbles were noted in the glass.

The aquamarine bottle remains provide the basis for designation of this locality as historic. The trademark "AB" on the fragmentary bottle base is attributed to the Adolphus Busch Glass Manufacturing Co., in operation in Belle-

ville, Illinois from 1886-1907 and in St. Louis from 1904 to 1928 (Berge 1980: 114-115). Aqua-colored bottles bearing a similar trademark are known to have been manufactured by this company until 1910, and were used for beer bottling until the inventory of bottles was exhausted ca. 1915 (Ibid.:115). In addition to the trademark, the extension of the mold seams through the edge of the 5 Rb1555 bottle base compares favorably with an available illustration of one Adolphus Busch bottle (Ibid.:113; 51e), however the size of trademark letters is somewhat smaller on the 5 Rb1555 bottle base than on comparable specimens (Ibid.: 113, 138). Bubbles noted in the glass of the 5 Rb1555 remains confirm a manufacture date prior to 1920, as after that date, bubbles were eliminated from glass as bottle production became more refined (Ibid.:77).

Although cairns resembling the one at 5 Rb1555 are described in early (1921) surveyors' field notes for T3S, R104W, such survey cairns were generally erected only at points along survey lines such as Section corners, ¼ sections, section centers and mileage points along surveyed lines. Cairns are also known to have been used to mark land and mineral claims and elevation points. However, these uses for rock cairns do not appear to be applicable for the 5 Rb1555 cairn as it is not located on a section line or center, or at a notable elevation point. Field notes for surveys of the area do not indicate that a survey-related cairn was erected at the 5 Rb1555 location. No land or mineral entries are on record as encompassing the location, however, it remains possible that the cairn was used to mark a claim which was never filed. The 5 Rb1555 cairn is located approximately 183 meters to the west of historic site 5 RB480 (structural remains with associated industrial artifacts, discussed below), and may be a claim boundary marker associated with this site.

A total of nine rock cairns were encountered during field reconnaissance of the Texas-Missouri-Evacuation Creek areas. Of these cairns, four are believed

to be associated with a prehistoric game drive and are discussed under "Prehistory"; one is of recent construction and is a 7003-foot spot elevation marker atop White Face Butte; and four resemble the 1555 cairn and are felt to be of probable historic age. However, as only locality 5 Rb1555 exhibited a diagnostic element, positive historic associations can be demonstrated only for this locality. (It is felt that one other of the cairns located during field reconnaissance is most likely of historic age, due to certain aspects of its construction. This resource has been assigned locality number 5 Rb1847 and will be discussed below.)

5 Rb1699 consists of two items, an end/side soldered can, measuring approximately 13 x 13 cm and a flat, sardine-like can, measuring approximately 15 x 8 x 3 cm. Both cans were apparently opened with a knife rather than a can opener, and were extremely rusted.

Basis for designation of this locality as historic is the end/side soldered can. This method of manufacturing cans was prevalent until the 1900s (Fontana et. al. 1962:69). However, by 1922, the modern fold and crimp can had gained general acceptance in the industry (Ibid.:73) and had for the most part replaced the soldered can. The contents and manufacturers of both cans comprising 5 Rb 1699 are unknown, as the items were in an extremely deteriorated condition.

5 Rb1699 is located on lands withdrawn from the public domain in 1918 for the stock driveway mentioned in the discussion of 5 rb1691. It is therefore probable that these remains represent livestock herders' debris discarded during the use of the driveway.

As these remains are in an extremely deteriorated condition, and of and by themselves can contribute little significant information concerning the history of the region, 5 Rb1699 is deemed ineligible for nomination to the National Register of Historic Places.

5 Rb1700 contains a metal wash basin, an end/side soldered can, one fragment of green molded glass exhibiting iridescence, and two fragments of purple glass. Designation of this locality as an historic resource is based on the presence of purple glass, a color believed to occur only in glass manufactured prior to 1917 (or 1925 according to Berge (1980:77)). The soldered can most likely represents manufacture and use prior to 1922, the date when modern cans gained general acceptance in the industry (Fontana et. al. 1962:73).

This resource is located within the boundaries of the stock driveway, and was found along the same topographic feature in close proximity to multicomponent site 5 RB1780, and in the vicinity of IF 5 rb1691 and locality 5 Rb1699. 5 Rb 1700 is believed to represent a temporary camp utilized in connection with livestock-herding activities within the stock driveway.

As this locality contains no structural remains and as the items comprising 5 Rb1700 are in a fragmentary condition, it is unlikely that this resource is capable of yielding additional significant information. 5 Rb1700 is therefore deemed ineligible for nomination to the National Register of Historic Places.

5 Rb1847 consists of a stacked pile (five tiers high) of rocks, cemented with aeolian fill, located atop White Face Butte. The feature measures approximately 1 x 1 x 0.75 m. The sediment binding these rocks appears to be natural, perhaps composed of dirt which has filtered between the rocks and been cemented by water action, or by decomposition of the rocks themselves through wind and water actions.

Although the age of this feature is unknown, it is doubtful that such sedimentation would have occurred except through exposure to the elements over an extensive period of time. Comparison with other cairns located on and around White Face Butte and in the Texas-Missouri-Evacuation Creek area (including 5 Rb1555, a locality with demonstrated historic associations), indicate that

construction of 5 Rb1847 must have occurred at an earlier date than these other known examples of cairns (only 5 Rb1847 exhibits such sedimentation).

No entries are listed in historical background sources for this area prior to 1930. Documentation of activity in the area during historic times is supplied by past geographic survey maps and field notes for surveys conducted in 1921. No mention is made in these field notes of a cairn erected at the 5 Rb 1847 location in connection with survey activities, however a ¼ section brass survey cap (dated 1921) and adjacent cairn encountered some distance to the north of 5 Rb1847 confirm surveyors' activity in the vicinity of the locality. The function of this feature remains unknown and its designation as an historic resource is inconclusive.

As numerous cairns have been noted in this area, and as no specific function or definite origin can be advanced for this resource, 5 Rb1847 is not believed significant to history of the region. 5 Rb1847 is therefore deemed ineligible for nomination to the National Register of Historic Places.

Sites

5 RB480 is a structural site consisting of an untrimmed, dry-laid sandstone slab foundation and south-facing wall, a shallow excavation, piled axe-cut logs and scattered milled lumber, and associated industrial artifacts including a hinged-top, flat-sided tobacco can, a wash tub, a small steel bowl, an aquamarine beer bottle reading "G. Heilman Brewing La Crosse, Wis" with mold seams extending through the top of the finish, and a clear "Drey Perfect Mason" one quart jar with screw-on lid. Structural ruins measure approximately 2.1 x 3 m. Industrial artifacts are scattered outside of the structure, and a small runoff drainage is noted running north-south through the structure. This resource was encountered along a lower slope of White Face Butte.

Assignment of this site to the historic period is based on dating of industrial artifacts found in association with the structural remains. Toulouse (1972 99) states that the "Drey Perfect Mason" jar was manufactured ca. 1910 by the Schram Glass Manufacturing Co. of St. Louis, Missouri, in operation from 1906 to 1925. No information concerning manufacture of beer bottles for the G. Heilman Brewing Co. was obtainable, however it is known that aqua-colored glass was in use ca. 1900 (Kendrick 1967:23) and that mold seams extending to the top of the finish came about with the advent of the automatic machine-made bottle, ca. 1904 (Berge 1980:64), with such bottles dominating the market by ca. 1920 (op. cit.:24).

Other industrial artifacts such as the metal bowl and wash tub exhibited no distinguishing marks and were not considered diagnostic. Deposition of the hinged-top tobacco can at 5 RB480 would have to have occurred subsequent to 1910, the date such cans came into use (Berge 1980:261). Nails found in the structural ruins at 5 RB480 are large, wire nails (round head), indicating a probable date of construction after 1900, as square (cut) nails were predominately used prior to that date (Hunt 1959:8). (Fontana (et. al. 1962:55) states that ca. 1890 wire nails began to outnumber cut nails.)

From this information, a date of construction and use between 1900 and 1930 is postulated for 5 RB480. It is not known if the structure served as a permanent habitation, but the relatively small amount of associated trash would imply temporary rather than long-term use of the site. Tract Book and Historical Index records list no entries prior to 1930 involving the land on which 5 RB480 is located. (In 1930 a Secretarial Order, interpreting Executive Order #5327 concerning the status of oil shale lands within Section 26, was entered.) As no one is recorded as having filed for the land, it is improbable that the site represents improvements which would have been necessary for persons attempting

to acquire the land through Homestead, Stock-Raising Homestead, or Desert Land Entries.

Although no claims encompassing the 5 RB480 location are recorded in any of the sources consulted, a cairn (refer to locality 5 Rb1555) found approximately 183 m to the west of 5 RB480, along with two other cairns located within 0.8 km to the northeast and southwest of the site, may indicate a boundary line possibly associated with 5 RB480. The date of manufacture for a diagnostic artifact found with the nearest cairn (5 Rb1555) is contemporary with dates provided by industrial artifacts found at 5 RB480--thereby lending some credence to a connection between the resources. From analysis of the structural remains, diagnostic artifacts and available documentation of historic activity in the area, 5 RB480 appears to have been a short-term habitation utilized between 1900 to 1930, and may represent squatter activity.

In its present condition, 5 RB480 lacks physical integrity, the structural remains being dilapidated and disarticulated. It is felt that little significant information can be gained from further analysis of site remains, and that potential for significant subsurface remains is low due to the small amount of surface trash in and around the structure, and the apparently shallow soil depths in the vicinity of 5 RB480 (as evidenced by surface bedrock exposures in this upland location). 5 RB480 is therefore deemed ineligible for nomination to the National Register of Historic Places.

5 RB1777 is an extensive industrial artifact scatter of approximately 220 items including purple, aquamarine, and brown glass fragments, a purple bottle, purple and aqua bottle neck termini, end/side soldered and fold and crimp cans, tobacco cans, a metal bowl, two enameled pots, a bucket, fragments of crockery, metal, and leather, and milled lumber scrap. Seven distinct concentrations of debris encompassing an area of approximately 7.5 acres were

recorded along a wooded ridge just south of Evacuation Creek.

Of these items, a single diagnostic artifact was collected. This specimen is a large, intact amethyst bottle measuring 170 x 78 x 51 mm, and exhibiting the following distinguishing characteristics: regular, ball neck; subrectangular body shape; panel-type base with push-up; off-set mold seams extending through the collar bead to within 8 mm of the top of the finish and running down the sides to the heel, forming a ring around the outside of the base; horizontal striations (which may have obliterated extension of the mold seam to the top of the finish) encircling the upper portion of the finish from the lip to within 1 cm of the collar bead and running opposite to the vertical flow marks evident in the remainder of the neck and body; whittle marks and bubbles in the glass; regular glass thickness except at the base; and an embossed circle approximately 4 cm in diameter on the upper portion of the bottle front.

From these features, the following information concerning the manufacture of this artifact can be derived. The amethyst color results from addition of manganese to the glass and indicates a date of manufacture prior to ca. 1917, as manganese was not added after this date (Berge 1980:77). Horizontal striations apparent at the top of the finish indicate use of a lipping tool to form the mouth of the bottle. Such tools are known to have been used in the U.S. as early as ca. 1850 (Ibid.:65), and were prevalent around 1900 (Kendrick 1967:22). Although the mold seams encircling the base suggest use of a cup-bottom mold (Berge 1980:64), the indefinite length of the seams above the collar bead (seams may have been obliterated by a lipping tool) make use of this dating criterion ineffective. Bubbles in the glass suggest a date of manufacture prior to 1920, as after that date, bottles were refined and bubbles

eliminated (Ibid.:77). Whittle marks are noted in glass bottles prevalent ca. 1880 (Kendrick 1967:22), however, they are known to have occurred when hot glass was blown into a cold mold (Berge 1980:65). The base of the bottle is similar to flask specimens from the Simpson Station site in Utah (Ibid.: 134-135), some of which date from 1880 to 1915. The finish of the 5 RB1777 bottle (described as a brandy finish) resembles that of specimens used as whiskey flasks which were recovered from the same Utah site (Ibid.:124-125).

Although no complete bottles were available for comparison with the 5 RB1777 specimen, it is reasonably certain that the artifact is an alcholic beverage bottle with a date of manufacture falling between 1880 and 1917, with a possible end date of manufacture in 1920. However, the presence of bubbles in the glass of the 5 RB1777 indicates that the end date of manufacture for the item should be no later than 1920.

Other diagnostic artifacts recovered from 5 RB1777 include two dark purple bottle neck termini, three aqua bottle neck termini, and numerous end/side soldered cans. Possibly diagnostic items include a "Perfect Hunt" baking powder can lid, a "Schilling Best" 2½ pound can lid, and several flat-sided hinged-top tobacco cans. Although no information concerning the baking powder cans was located, tobacco cans of the type described are known to have been developed in 1910 (Berge 1980:261), and are still manufactured today. The 5 RB1777 tobacco can specimens were so rusted that distinguishing marks such as manufacturers' labels or trademarks were not discernible, however, their extremely eroded condition would suggest considerable age.

Of the two dark purple bottle neck termini, one is approximately 7.5 cm long and exhibits a neck diameter of approximately 1 cm below the top of the finish and a second collar bead .75 cm below the first; a slightly irregular lip; and a mold seam extending through both beads, but stopping 1 cm below the

top of the finish. From this information a date of manufacture for this artifact is postulated between 1880 and 1917 and felt to most likely have been ca. 1900. The deep purple shade of glass is known to have been abundant ca. 1900 (Kendrick 1967:22), and is believed to have not been manufactured after 1917 (Berge 1980:77). The irregular lips, apparently hand-formed, and the termination of the mold seam below the mouth are features evident in bottles from ca. 1900 (op. cit.).

The second dark purple neck termini is approximately 4.5 cm long with a neck diameter of 2.5 cm at the mouth, and exhibits a threaded finish, bubbles in the glass, uneven lip thickness, and a mold seam extending above the threading to within 1 cm of the top of the finish. The distinguishing features of this artifact indicate a probable date of manufacture between 1880 and 1917, again with a late date of 1920. The length of the mold seam in combination with the uneven lip thickness of this terminus--features evident in bottles from ca. 1880 and ca. 1900 --would normally indicate that the lips were hand-formed. However, it is not known if hand-formed lips and threaded finish are contemporaneous methods of manufacture. Use of metal screw closures is noted as extensive from 1900 to 1920 (Berge 1980:78). However, although screw-on caps are present prior to World War I, they did not grow in popularity until after the ar. A single continuous thread cap was not standardized until 1919 and standardization of the continuous thread bottle finish did not occur until 1924 (Ibid.:43). Kendrick (1967:24) states that externally-threaded bottles are a trademark of the machine made bottle, and are prevalent ca. 1920, thus, hand-formed lips and threaded finish may not be contemporaneous features.

Of three comparable glass artifacts illustrated in the Simpson Springs Site Report (Berge 1980) as having threaded finishes, one bottle exhibiting

mold seams from a cup bottom mold is listed as being in use from 1880 to 1913. On two bottle neck termini with continuous thread finishes recovered from that site, mold seams extend through the threading to the top of the finish (Ibid.: 125, 127) and are therefore attributed to automatic bottle machine manufacture (1904 on). Uses for these threaded bottle artifacts are listed as alcholic beverage (whiskey) and household (ketchup)(Ibid.:109, 125). Comparison of these specimens with the 5 RB1777 threaded neck terminus is inconclusive, as the 5 RB1777 artifact is too fragmentary to compare with the intact bottle specimen, and differs from the two illustrated termini in the length of mold seams.

Aquamarine bottle remains encountered at 5 RB1777 were concentrated in a small area. Along with three neck termini, approximately 60 glass fragments, two bottle bases, and one neck fragment with no terminus constituted a separate concentration within the site. Of the three aqua bottle neck termini recorded, two exhibit identical features including: irregular lips, crown finish, and mold seam stopping below the finish (indicating that the entire finish was hand-formed). The aqua color and manifestations of hand-formed finishes are indicative of bottles popular ca. 1880, as an abundance of aquamarine glass (Kendrick 1967:22), as well as hand-formed finishes with mold seams ending just below the finish (Berge 1980:73), are noted for bottles of this period. However, the crown cap utilized for closure of crown finishes was not patented until 1892 (Ibid.:43), and the crown finish did not become popular until the turn of the century (Ibid.:58). Therefore,a date of manufacture for these specimens is more likely to be between ca. 1800 and 1900. The third aqua neck terminus also exhibits a crown finish and irregular lips, however the mold seam extends half way up the finish, suggesting that perhaps only the lips were hand-formed. Dating of this terminus is also based on development and popularization of the crown finish ca. 1890 to ca. 1900 (Berge 1980:

43, 58).

Finally, end/side soldered cans of various sizes found at 5 RB1777 are known to have been in use prior to 1900 and until after World War I, when predominantly modern fold and crimp cans were manufactured (Hunt 1959:8). Cans of fold and crimp manufacture were also recorded at the site, and may represent recent (post-1930) activity at the site. However, cans with crimped tops and bottoms with double seams are known to have been manufactured as early as 1897, and by 1902 were replacing the "hole-in-top" can (Fontana et. al. 1962: 72-73). These modern cans had gained general acceptance by 1922 (Ibid.:73).

Probable dates of manufacture for artifacts recorded at 5 RB1777 are summarized as follows:

| | |
|---|---|
| Amethyst bottle | ca. 1880-1917 (bubbles) |
| 1st dark purple terminus | 1880-1925 |
| 2nd dark purple terminus | 1880-1920 (bubbles) |
| Aqua neck termini | 1890-1900 |
| Tobacco cans | post-1910 |
| End/side soldered | 1800s to 1920s (except) evaporated milk cans) |
| Fold and crimp cans | 1897 to present |

Viewed in combination, these dates of manufacture imply that the most likely dates of utilization of the 5 RB1777 site may have occurred from the 1880's to 1920s. However, as certain of the artifacts were in use subsequent to known cut-off dates of manufacture, the upper end of this range may be somewhat later. The nature of the debris recorded at 5 RB1777 suggests that the site was utilized as a temporary campsite, though it is not clear whether the site represents repeated short-term use or intensive one-time use. The occurrence at the site of hinged-top tobacco cans, developed in 1910, signals

that one-time use of the site could not have occurred prior to 1910. However, as no specific dates of manufacture could be advanced for any 5 RB1777 artifact and therefore no chronological sequence established, both theories of utilization of the site are possible and can be supported by information provided by analysis of these artifacts.

Elements comprising 5 RB1777 are strewn along lower ridge slopes just south of Evacuation Creek. The proximity of 5 RB1777's location to the Uintah Railway right-of way, along with general dates of manufacture evidenced by artifacts from the site, suggest that 5 RB1777 may have been utilized in connection with the construction and early operation of the Uintah Railway. The site is located near, though not within, the boundaries of the stock driveway, and may also be associated with livestock herding. Other historical actions concerning small portions of the land in which the site is located include Stock-Raising Homestead Entries filed by M. Everett Bascom in 1931 (rejected 1935), and Maggie Daley in 1931 (withdrawn 1933). The majority of the site, however is located on lands for which no entries are recorded. Early geographic surveys of the area were conducted in 1921 and 1924, and maps from these surveys depict only the Uintah Railway, Evacuation Creek road, and the telephone/telegraph line following the railway in the vicinity of the site's location.

5 RB1777, although extensive, exhibits no structural elements. The artifactual remains comprising the site are in deteriorated condition, and as these remains have been recorded, mapped, photographed and evaluated, it is felt that little significant information can be gained from further analysis of the site. 5 RB1777 is not believed to be significant to the history of the area and is therefore deemed ineligible for nomination to the National Register of Historic Places.

5 RB1780 is a multicomponent site containing a small concentration of

historic elements such as end/side soldered cans (of various sizes), a brown glass bottle neck terminus, and a brown glass fragment scatter. Other remains classified as recent, but which may in fact be historic, include shotgun shell casings and a fence post.

Historic classification of this component of the site is based solely on the end/side soldered cans, which imply Euroamerican utilization of the site prior to 1922 when fold and crimp cans gained general acceptance in the industry (Fontana et. al. 1962:73) and had generally replaced cans produced by older methods of manufacture. Little information concerning the distinguishing features of the brown glass was recorded as the fragments were not deemed diagnostic in the field.

5 RB1780 is located on a low slope overlooking a tributary to Evacuation Creek within stock driveway boundaries, and in close proximity to historic locality 5 Rb1700 and other historic resources discussed above. As dates of manufacture for 5 RB1780 industrial artifacts compare favorably with the 1918 date of establishment for the stock driveway, it is probable that the historic component of this site represents a livestock herder's temporary camp which was occupied during use of the stock driveway. Use of the site during hunting-related activities is also possible, as shotgun shells were noted. Observation of both industrial and aboriginal artifacts within the site presents the possibility that aboriginal use of the site may have occurred during historic times, or,though less likely, that aboriginal and Euroamerican utilization of the site occurred within the same time frame. No diagnostic lithic items which might lend support to these theories were recovered from 5 RB1780.

Due to the paucity and nature of the remains, the historic component of 5 RB1780 can contribute little significant information concerning the history of the region. However, the presence of historic elements in conjunction with

aboriginal remains may indicate reuse of the site through time. Please refer to "Management Summary" for a complete evaluation of 5 RB1780 in terms of significance and National Register of Historic Places eligibility.

5 RB1781 is a multicomponent site consisting of an extensive aboriginal campsite and a possibly historic campsite. Components believed to be historic include metal scrap, hinge-lidded, flat-sided tobacco cans, end/side soldered cans of various sizes, fold and crimp cans and a sandstone ringed hearth. Tobacco cans of this type attest to use of the camp after 1910, the date that hinged-top tobacco cans came into use (Berge 1980:261). The combination of soldered (25) and fold and crimp (32) cans at the site apparently evidences activity (within one area of the site) during the interfacial period of can use, when end/side cans were decreasing and fold and crimp cans were gaining in popularity ( ca. 1900 to 1922). It may also indicate that the site has experienced repeated use through time and represents prehistoric, historic, and recent activities in the area.

Artifactual information suggests that the site was occupied at some time between 1910 and 1930, however dating of this component of 5 RB1781 on the basis of cans alone is somewhat unreliable. The presence of both aboriginal and Euroamerican artifacts throughout the site further complicates dating and interpretation of 5 RB1781. This mixture of remains most likely implies repeated utilization of the site through time. However it should be noted that a projectile point with possible Proto-historic (up to 1880) temporal affiliations was recovered from the site and may indicate that relatively concurrent aboriginal/Euroamerican activity is represented at 5 RB1781 (See "Prehistory" and Appendix A).

5 RB1781 is located along an interfluvial ridge separating tributaries of Evacuation Creek. A major portion of land on which the site is situated

falls within the boundaries of the stock driveway established in 1918. However, the historic can scatter components of the site are located just east of the actual driveway boundaries and west of Davis Canyon road. The remains of an old road bed curving around the tip of the ridge on which the historic component is located, were noted approximately 15 m from the can scatters. These two roads could have provided wagon or truck access into the site area, however, they are presently separated by the Davis Creek arroyo. Historic survey maps of the area depict only the Davis Creek road as of 1921, but it is doubtful such maps would have indicated a small turnoff road or other insignificant road bed.

The land on which the historic component of 5 RB1781 is actually located was encompassed within Stock-Raising Homestead Entries filed by Maggie Daley in 1931 (withdrawn in 1933) and by James Barr in 1931 (relinquished 1933). Both applicants were from Dragon, Utah, and neither was able to acquire the land.

Taking into account the site's proximity to the livestock driveway and the intended use of the land as evidenced by the claims filed on it, it is likely that the historic component of 5 RB1781 represents a temporory camp occupied in connection with the livestock-related activities in the area.

Of and by itself, the historic component of 5 RB1781 is not significant to the history of the region. For a discussion of the significance of the prehistoric component of the site, and the potential eligibility for nomination to the National Register of Historic Places of the site as a whole, please refer to "Management Summary", Table 10.

5 RB1785 is an extensive multicomponent site containing aboriginal elements, a scatter of historic and/or recent industrial artifacts, and a large, shallow excavation. Historic artifacts include purple glass fragments and end/side soldered cans. Possibly historic artifacts include a horseshoe, an iron railroad

plate reading "Western RY EQ CO - St. Louis MO", crockery fragments, two "Shilling's Best" 2-pound cans, a piece of a leather strap, an iron bar, a 7 foot-long pole with wire around it, milled lumber scrap, and a log with axe-cut hatch marks. A number of recent cans and bottles were encountered along the east ridge edge of the site overlooking Evacuation Creek road and probably represent trash discarded by persons using the road.

The presence of purple glass fragments confirms utilization of the site during historic times (Berge 1980:77). End/side soldered cans also indicate historic use of 5 RB1785, as fold and crimp cans did not experience general acceptance until 1922 (Fontana et. al. 196273). The condition of the soldered cans at 5 RB1785 was considerably more deteriorated than that of the fold and crimp cans found along the ridge edge, attesting to the fact that these two types of cans were apparently deposited at different times. No information was available concerning the Shilling's Best cans or the majority of other possibly historic items which are not diagnostic. Research on the stamped iron plate found that the Western Railway Equipment Company was in business in 1919, as the company advertised in the 1919 edition of Carbuilder's Cyclopedia. The company did not advertise in the 1928 edition of this industrial catalogue, and may have been out of business by that date (J. Maxwell, personal communication). Intervening editions of this publication were not available.

The shallow excavation recorded in proximity to a soldered can concentration measures approximately 50 x 9 x 0.5 m. Pebbly, gravel-like soil and rock were observed within the actual depression. The specific purpose of this feature is unknown, however it may be a prospect excavation, or a gravel pit associated with construction or maintenance of the nearby railbed, roads, or telephone/telegraph line. Due to this feature's proximity to the Uintah Railway railbed and to 5 RB662 (a Uintah tent stop or construction camp), and the

presence of railroad-related debris within the site, a railroad-related functional explanation seems more likely. In any case, the origin of this feature is believed to be historic or perhaps recent, rather than aboriginal. The past geographic survey map shows that by 1929, both the Evacuation Creek road and the Davis Canyon road were evident in the vicinity of the site, thereby providing general access into the area. Other historical background sources indicate that the land on which the historic component of the site is located was part of two Stock-Raising Homestead Entries filed in 1931 by James Barr and Maggie Daley. No mineral claims which might have provided information concerning the excavation at 5 RB1785 are recorded for the area.

Although no definite function can be assigned 5 RB1785, it is felt that Uintah Railway associations provide the most applicable interpretations of the site. It can be said that deposition of site elements has apparently occurred at various intervals in the past, and probably represents aboriginal, historic and recent utilization of the site. (As no specific dates of utilization can be determined for 5 RB1785, and as aboriginal and Euroamerican artifacts coexist within the site, the possibility exists of concurrent aboriginal and Euroamerican utilization of the site. Concurrent utilization implies relatively late aboriginal activity in the area, and as there were no diagnostic artifacts recovered from the site, supporting data for this theory does not exist.)

As no extensive trash midden or structural remains were encountered within the historic component of 5 RB1785, the paucity and nature of the remains comprising that component would imply short-term historic utilization of the site. Therefore it is hypothesized that the historic component of 5 RB1785 constitutes the remains of a short-term camp or work site perhaps utilized in association with the Uintah Railway.

Due to the paucity and nature of the remains comprising the historic compo-

nent of 5 RB1785, this component, considered by itself, is not believed to be significant to the history of the region. Potential for significant sub-surface historic remains is low, and the paucity of surface artifacts and the lack of structural remains indicate short-term activities rather than long-term intensive use. However, 5 RB1785 exhibits an extensive aboriginal component that makes this site potentially eligible for NRHP nomination individually, and its location places it within the potentially eligible Davis Confluence Resource Cluster (see "Management Summary" section).

5 RB1804 is an open lithic scatter; however, during recordation of this site, a large (approximately 8 x 2 m) concentration of amethyst glass fragments was encountered approximately 50 m northeast of the main lithic concentration. No bottle neck termini were included in the glass fragment scatter, however some fragments bore embossed numbers indicative of mold-made glassware. No other historic artifacts were observed in the vicinity of the scatter. The amethyst color of the glass fragments is the sole basis for designation of these remains as historic.

These historic remains are located just above the floodplain on a low ridge slope, approximately midway between historic components of sites 5 RB1781 and 5 RB1785, and within 152 m of the Davis Canyon road. The land on which the remains are located was also encompassed in the Stock-Raising Homestead Entries mentioned during the preceding discussions of 5 RB1781 and 5 RB1785. It is reasonable to assume that deposition of the 5RB1804 historic debris may have occurred during transient activity associated with either or both of these sites, or with use of the Davis Canyon road.

The distance between the historic glass scatter and the aboriginal elements of this site, along with the lack of any interspersion of artifacts be-

tween the two activity areas, implies that there is little possibility of concurrent aboriginal and Euroamerican activities in the site area. However, a projectile point (Plate A-2.h) with possible Proto-historic temporal affiliations was recorded from the lithic scatter area of the site and attests to utilization of the area by aboriginals during Proto-historic times (up to 1880).

Due to the disarticulated condition of the historic glass at 5 RB1894, the remains are capable of yielding little significant data concerning the history of the area. Significance and National Register of Historic Places eligibility of the site as a whole are discussed in the "Management Summary" section of this report.

5 RB1806 is a multicomponent site consisting of an historic/recent campsite and an aboriginal lithic scatter/possible campsite. Historic artifacts include purple glass fragments and end/side soldered cans. Possibly historic elements of the site include a sardine can, axe-cut poles, a partially collapsed conical structure constructed of axe-cut (?) poles, a crown bottle cap, a stone alignment, two hearths, brown glass fragments, milled lumber scraps, leather fragments, wire, and shell casings stamped ".25 - .35 WCF W.R.A. Co.". Clear glass fragments and a clear glass bottle are the only definitely recent items found within the site. (It is unclear whether the structure, hearths, and stone alignment are of aboriginal or historic origin. All other possibly historic items listed above could also represent recent, i.e. post-1930, utilization of the site.)

The purple color of the glass fragments (a square bottle base and numerous unidentifiable pieces) indicates a date of manufacture prior to 1917 (1925) (Berge 1980:77). The presence of end/side soldered cans (although some of these resembled evaporated milk cans which may be of recent manufacture) and a noted absence of fold and crimp cans implies utilization of the camp prior to 1922,

when fold and crimp cans are noted as having overtaken soldered cans in popularity (Fontana et. al. 1962:73). Dates of manufacture and use for two items could also fall within the historic period. The crown bottle cap patented in 1892 is known to have been popular ca. 1900 (op. cit.:43,58), although it is manufactured today. The shell casings exhibiting headstamps can be traced to the Winchester Repeating Arms Co., and are external centerfire cartridges used in rifles manufactured from 1895 to 1945 (Berge 1980:230-231).

Although no definite dates for historic utilization of the site can be determined from this information, it does demonstrate that dates of manufacture and use for the industural artifacts described above could well have been contemporaneous and within the historic time range. However, except for the purple glass, all of these artifacts could also represent recent utilization of 5 RB1806. (Evaporated milk cans have retained the same shape since ca. 1885, and are distinguishable by can size and soldered hole size. Evidence of definitely recent (post-1930) utilization of the site is present in the form of clear glass fragments and a clear glass bottle. Kendrick (1967:24) states that clear glass that did not change color after exposure to ultra-violet rays was manufactured only after 1930.)

The stone alignment recorded at 5 RB1806 is 3-sided, roughly rectangluar in shape and measures approximately 5 x 3 m. The rocks forming this feature are large and are recessed into the ground. This feature opens southwest toward a hearth area containing end/side soldered cans as well as lithic items (flakes). No function is postulated for this feature, and it is not known whether its origin is prehistoric, Proto-historic, historic, or recent.

The partially collapsed pole structure (Plate IV) observed at the site is located among a few juniper trees approximately 10 m to the west-northwest of the rock alignment/hearth area. Several axe-cut (?) poles were noted leaning

against living trees, with the majority of poles scattered on the ground among the trees. No artifactual items were observed in direct association with these structural remains. Although this feature is thought to be the remains of a wickiup, the presence of other axe-cut poles and the nature of the historic/recent debris (e.g. rifle cartridges), indicate that the feature could represent an historic "lean to" rather than an aboriginal construction. (It should be noted that 5 RB1805, believed to be the remains of an aboriginal sweatlodge, is located approximately 200 m to the northwest, and that a total of four prehistoric sites are located within ¼ mile of 5 RB1806. The nearest of these sites, 5 RB1850, a lithic scatter, is approximately 80 m to the south-southeast, and its utilization may be associated with that of 5 RB1806.)

Two hearths were identified at 5 RB1806--one containing lithic items, soldered cans, and a large rock; and the other containing only lithic materials, though soldered cans and two axe-cut poles are located nearby. No carbon samples were collected from these areas, and therefore no dates of utilization are advanced.

The information derived from analysis of artifacts and features recorded at 5 RB1806 confirms that to some degree, both historic and recent activity occurred at the site. As no prehistoric diagnostic artifacts were recovered from the site and no carbon samples collected, prehistoric periods of utilization of the site are somewhat less assured. The lithic materials, as well as the hearths and structural remains observed at 5 RB1806 might represent aboriginal utilization of the site during Proto-historic times.

5 RB1806 is located on the tip of a low ridge slope just west of Evacuation Creek and the Evacuation Creek road. Historic background sources list a single entry concerning the land on which the site is situated. A Stock-Raising Homestead Entry was filed in 1931 by Maggie Daley and was withdrawn in 1933. The

past geographic survey map for surveys conducted in 1921 and 1924 depicts Evacuation Creek road, the Uintah Railway right-of-way and the telegraph/telephone line alongside the railway in the vicinity of the site. These sources convey little information other than to document when access to the area was available and when an interest in the land occurred.

It is recommended that prior to a final evaluation of 5 RB1806, the hearth and structural areas within the site be tested to provide more definite dates of utilization, thereby clarifying prehistoric and historic occupation of the site. Presently, it is felt that 5 RB1806 may have been occupied during Protohistoric, historic, and recent periods, and that the Euroamerican historic/recent component(s) of the site most likely represent the remains of hunters' camps. A final evaluation of the significance of this site as a whole requires that more data be collected. However, it is felt that the Euroamerican historic component of 5 RB1806, by itself, is not significant to the history of the region, due to the paucity, nature, and condition of the remains which are of a Euroamerican historic origin, or which may upon final analysis, be attributed to Euroamerican utilization of the site. Please refer to Table 10 in the "Management Summary" section for the site's overall significance in terms of National Register of Historic Places eligibility.

5 RB1939 is a multi-component site exhibiting lithic items, amethyst glass fragments and bottle neck terminus, fold and crimp cans, rubber and leather scraps, a milled-board door, several railroad ties, one rail, a rail plate, and an axe-head. These items were found in relativily distinct concentrations within the site. The amethyst glass fragments were found on and around the old Evacuation Creek roadbed, the amethyst bottle neck terminus is upslope to the southeast of the glass scatter, six of the seven lithic items occur in the roadbed within the glass scatter, and the recent debris and scavenged railroad ties,

etc. were found in the trees to the northeast of the glass scatter.

The historic component of the site is comprised of purple glass fragments and bottle neck terminus. The terminus exhibits thick walls, irregular lips (apparently hand-formed), and mold seam stopping below the lips. The purple color of the glass indicates manufacture prior to 1917 (1925) (Berge 1980:77), and the mold seam and hand-formed lips are indicative of bottles predominately in use ca. 1880 to ca. 1900 (Kendrick 1967:22).

The railroad ties and other railroad-related debris, though of an historic age, were presumably scavenged from the Uintah Railway subsequent to its abandonment in 1939, and therefore represent recent utilization of the area. The trash areas, found in association with railroad-related debris, are also believed to represent recent activity, as no definitely historic items were noted within these areas. (The two trash areas are separate and distinct from obviously historic elements of the site.) Fold and crimp cans comprise a good part of these recent debris areas, and although fold and crimp cans are known to have been manufactured prior to the end of the historic period, their location within the site, separate from known historic elements, and the lack of any soldered cans (which would suggest a period of utilization when both types of can were available), indicate that these items are of recent rather than historic manufacture.

5 RB1939 is located on a southerly protrusion of a ridge to the north of Evacuation Creek. The old roadbed which provided access into the site, and in which the glass scatter and lithic items were observed, corresponds to the Evacuation Creek road as depicted on the 1921 survey map for that area. The Uintah Railway right-of-way is shown a short distance to the west of the road, and it is probable that activity related to the construction and use of the railway in the vicinity of 5 RB1939 may have occurred from 1903 to 1939. The land

on which the site is located was encompassed within a Stock-Raising Homestead Entry filed by Everett Bascom in 1931, and relinquished in 1935. This is the same tract of land which encompassed known historic site 5 RB951--located less than .81 km to the north of 5 RB1939. Construction of 5 RB951 is believed to have occurred ca. 1910 (Gentry, personal communication), thus providing additional indications that Euroamerican activity in the vicinity of 5 RB1939 was probable in the early 1900s. A previously recorded site, 5 RB950, located approximately 200 m/700 ft. to the south of 5 RB1939, also exhibits purple glass fragments possibly deposited during use of the old Evacuation Creek Road.

Similar road-use circumstances are postulated for the deposition of historic glass at 5 RB1939, as the lack of structural features or extensive accumulation of varied historic debris implies short-term use of the site. The recent component of the site, located in the trees just east of the road, is considerably more extensive than either the aboriginal or historic elements. Occupation of this area within the site during recent times may have been related to the dismantling of the Uintah Railway line after its abandonment in 1939. This component of the site may also represent the remains of a hunter's camp, with the scavenged rail ties serving as seats within the camp.

The presence of lithic items in association with historic industrial remains might suggest concurrent aboriginal/Euroamerican use of the site during historic times. No diagnostic lithic items were recovered from the site, so the origin of that component remains indefinite. However, it is more feasible that the aboriginal component of 5 RB1939 was exposed by down-cutting incurred through use of the road, or perhaps was collected from a nearby site and brought into the area by persons using the road.

The historic component of 5 RB1939 is not believed significant to the

history of the region, as the remains are fragmentary and possess no unique or representative characteristics. Please refer to Table 5 for information on the aboriginal component of the site. As this component is comprised of only a few lithic items, none of which are diagnostic, it is felt that the site as a whole is not significant to the prehistory or history of the area. 5 RB1939 is therefore deemed ineligible for nomination to the National Register of Historic Places.

## GENERAL CONCLUSIONS

In the "Introduction" of this report a series of four goals of this study were identified as follow:

A - Recordation of all cultural resources within the areas surveyed under the Class III inventory, and assessments of their significances,

B - Checking the value of utilizing historic documents and records to predict historic resource locations,

C - Elaboration of a chronology for the T-M-E study area, and

D - Comparisons of subsistence modes and settlement patterns reflected by resource and artifact type changes within the study area, and between the study area and the Douglas Creek/Canyon Pintado area to the east.

Goal A has been addressed in the preceding pages, and a summary of results, resource significances and management recommendations will be presented in the following "Management Summary" section. The three remaining goals will be considered below.

### Reliability of Historic Research

The 1978 Taiga/Coseka-Northwest Pipeline Inventory (Gordon, Kranzush and Knox 1979) resulted in the recordation of numerous historic resources in the vicinity of the T-M-E study area. During analysis, it appeared that to a large degree, historic resource locations could have been predicted on the basis of current quadrangles, historic survey maps and land and mineral patent information. G&K was therefore anxious to establish the reliability of historic research in predicting site locations. If such research were highly reliable, it could become an extremely useful early planning tool, in that historic sites could be consistently located without time-consuming and costly pedestrian survey during the early phases of the land use planning process.

Unfortunately, historic research did not prove to be particularly reliable in terms of prediction of either site types or locations within the T-M-E study area. This is in part due to the paucity of historic remains within the area, and the limited tangible remains associated with the types of activities (stock-raising, transportation, energy mineral exploitation) undertaken within the area. It is concluded that certain types of historic sites/activity areas might not reliably predict the full range of historic resources within an area.

As evidenced by the historic resources recorded during survey, historic activity within the study area is primarily attributed to livestock herding, the construction, use and maintenance of the Uintah Railway and other transportation routes, and hunting. Little or no field evidence of homesteading or energy development was encountered during pedestrian survey. Table 9 lists probable functions of the historic resources encountered during survey, suggests a time frame for the historic utilization of each resource, and summarizes possible activities believed to be related to the deposition or construction of the remains.

Although previously recorded historic sites within the study area and adjacent lands demonstrate homestead/ranch activity in the region, the Texas-Missouri-Evacuation Creeks Class III survey encountered a general lack of architectural sites associated with efforts to acquire land for permanent homestead or ranching purposes within the study area. This observation is supported by historical background sources detailing numerous Homestead, Stock-Raising Homestead, and Desert Land claims which were filed but never patented for study area lands, and which were cancelled, relinquished, or withdrawn usually within one to five years of application. As expected, such temproary interest in a parcel of land would not likely result in permanent improvements of the type required for patenting of the claim. In fact, the inability to provide proof

of such permanent improvements on the land was frequently the cause stated for failure to patent a claim. (Other reasons listed include filing conflicts, possession of additional lands thereby violating requirements of land acts, application for allotments exceeding maximum acreages allowed, and erroneous land descriptions.) For the Texas-Missouri-Evacuation Creeks study area, the lack of patented land claims as recorded in historical background sources can seemingly be translated into a lack of "permanent" architectural remains (such as cabins, sheds, barns, dug-outs, etc.) recorded in the field. An exception is the open architectural site 5 RB480, situated on land for which no claims were filed. However, this site, although containing architectural remains, was apparently utilized on a temporary basis, as evidenced by the nature and extent of associated debris and the methods of construction used. Little information concerning the function of this site was available, as local informants did not know of its existence, past survey maps did not depict it, and no land or mineral claims were noted for the area. The site is therefore attributed to squatter activity which would not be apparent from historical background sources.

These sources were also consulted concerning previously recorded site 5 RB951 (within the study area), and provide the following information. The tract book indicates that initial interest in this property occurred in 1931 when the first applicant filed on the land. However the earliest survey notes and maps depicting a house, fence and ditch in the site area are dated 1921 and 1924. Therefore, at least one structure is known to have been in existence by 1931--pushing back dates of utilization of the site by seven to ten years. However, it was not until local informants were consulted that a date of construction ca. 1910 was indicated, and that the first applicant (Bascom) was believed to be the original occupant. (As no diagnostic artifacts were recorded at the site, confirmation of the 1910 date is unavailable.)

TABLE 9

HISTORIC RESOURCE FUNCTION, ACTIVITY ASSOCIATIONS, AND UTILIZATION TIME FRAME

| FUNCTIONAL CATEGORIES | RESOURCE | POSSIBLE RELATED ACTIVITIES | | PROBABLE DATES OF UTILIZATION |
|---|---|---|---|---|
| HABITATION | 5 RB480 | Squatting | | 1900-1930 |
| CAMPING DEBRIS | 5 Rb1700 | Livestock | | 1880-1925 |
| | 5 RB1777 | Livestock/URY | | 1880-1925 |
| | 5 RB1780 | Livestock/Hunting | (historic component) | pre-1922 |
| | 5 RB1781 | Livestock/Road Use? | (historic component) | 1910-1930 |
| | 5 RB1785 | URY/Road Use? | (historic component) | 1880-1925 |
| | 5 RB1806 | Hunting | (historic component) | 1880-1925 |
| ISOLATED DEBRIS | 5 rb1495 | Land Survey? | | 1880-1925 |
| | 5 rb1691 | Livestock | | 1900-1925 |
| | 5 Rb1699 | Livestock | | pre-1922 |
| | 5 RB1804 | Road Use? | (historic component) | 1880-1925 |
| | 5 RB1939 | Road Use | (historic component) | 1880-1925 |
| MARKER | 5 Rb1555 | Claim Boundary | | 1886-1915 |
| | 5 Rb1847 | Unknown | | indefinite |
| CORRAL | 5 Rb1490 | Hunting? | | indefinite |

Results of the ground survey also reveal a noted absence of historic energy development-related remains within the study area. As mentioned above, documentation of energy-related interest includes oil shale placer claims and oil and gas permits, and indicates that the areas encompassed by these entries should be potential zones of historic activity. Actual survey results present contrary data, and tend to discredit use of the historical background sources in this case. Of the various reasons (detailed on page 205) for this discrepancy, it is most likely that either the oil shale/oil and gas claims incurred no lasting visible surface disturbance, or that further research into such claims will supply data concerning any procedures or requirements which are currently unknown, and which might explain this apparent lack of physical evidence.

Application of historical background data concerning livestock-related activities to actual field remains proved more informative. Although no specific resources were delineated prior to field reconnaissance, a zone of potential historic activity--the stock driveway in T4S, R104W--was indicated by the historical index. Results of the survey show a substantial number (approximately 40% of the recorded historic resources) of resources indicative of short-term camping activities, clustered within or near stock driveway boundaries. Although these resources cannot be definitely attributed to use of the stock driveway by livestock herders, the nature and extent, as well as dates of manufacture (generally contemporaneous with the 1918 date of establishment for the driveway), of the remains encountered strongly suggests such associations.

Historical background data concerning transportation routes within the study area also proved valuable. The Uintah Railway right-of-way is depicted on the Master Title Plat and past historic geographic survey maps, and the main roads in the area, including Davis Canyon Road, Evacuation Creek Road, and Dragon Road, are also shown on the survey maps. Comparison of past maps with cur-

rent ones shows that the route of the Evacuation Creek Road has changed, as a portion of it within the study area was once depicted north of the creek. The present route of the road through the study area remains wholly on the south side of the creek. This information was useful in identifying an old roadbed associated with previously recorded sites 5 RB951 and 5 RB950, and with Texas-Missouri-Evacuation survey site 5 RB1939. These sites are located on or near the roadbed in question, and deposition of historic components within 5 RB950 and 1939 are thought to be associated with use of the road. (Site 5 RB951 is a habitation site, and although its location may have been affected, and its construction probably facilitated, by the presence of the road, the site cannot be attributed to road use as such.) Depiction of the Uintah Railway right-of-way in historical sources provides graphic illustration of this significant historic resource, and is useful in plotting areas where the present Evacuation Creek Road has obscured or disturbed remains of the actual railbed. In general, knowledge of the historic transportation routes within an area provides an idea of when access into the area was available, and implies a certain amount of activity involved in the construction and use of these routes.

Field evidence of probable hunting activities within the study area occurs in the form of discarded rifle cartridges recorded at two sites, 5 RB1806 and 5 RB1780. Of these resources, only the cartridges found at 5 RB1806 could be shown to have possible historic origins. At 5 RB1780, cartridges were found adjacent to diagnostic historic remains, but may represent recent utilization of the site. A third resource, locality 5 Rb1490, a brush corral, may be associated with hunting activities, as it was located near an area of hunters' trash (including cartridges) of indeterminate age. However, as no diagnostic remains attributable to hunting in historic times were found, this association remains tenuous. No information concerning hunting activities was provided by

the historical background sources consulted.

Spatial distribution of the historic Euroamerican resources encountered during survey places 11 (73%) of these resources within 1.6 km (one mile) of the Uintah Railway right-of-way/Evacuation Creek road, with nine of these clustered within a 1.6 km radius of the Davis Canyon Road/Evacuation Creek Road/Uintah Railway right-of-way intersection. The concentration of historic resources in this area is attributed to the increased accessibility to the area which was provided by these transportation routes that appear relatively early in historic background sources. Additional information from these sources indicates that activity in this area was further enhanced by the presence of another "transportation route"--the stock driveway. Viewed from the historical background sources, this area was seen as a potential historic zone of archaeological sensitivity, and was confirmed as such by field results. By way of addressing contract proposal Goal B (page 177), the results outlined above demonstrate that although information provided by historical background sources (listed on page 6 ) did delineate an historic zone of potential archaeological sensitivity, which to some degree was confirmed in the field, and did occassionally isolate a potential site of historic significance (e.g. the Uintah Railway), it was not always accurate or complete. Historic geographic survey plat maps and homestead patents (as opposed to claims or applications) provide the highest degree of predictive accuracy for architectural remains and transportation facilities. However, these documents do not exsit for all areas, and where they do exist, they cannot accurately predict the true resource density and diversity. Therefore, it is concluded that although historical background information is valuable as an indicator of potential activity zones prior to field reconnaissance, it should not be solely relied upon to isolate or identify potential sites. Rather it is recommended that such information should be used in conjunction with other

data sources both prior to survey, and subsequent to collection of field data to provide a complete understanding of the resources encountered. It should also be noted that the paucity of the historic remains recorded within the Texas-Missouri-Evacuation Creeks study area prevents thorough testing of utilization of historical background information to predict historic site locations.

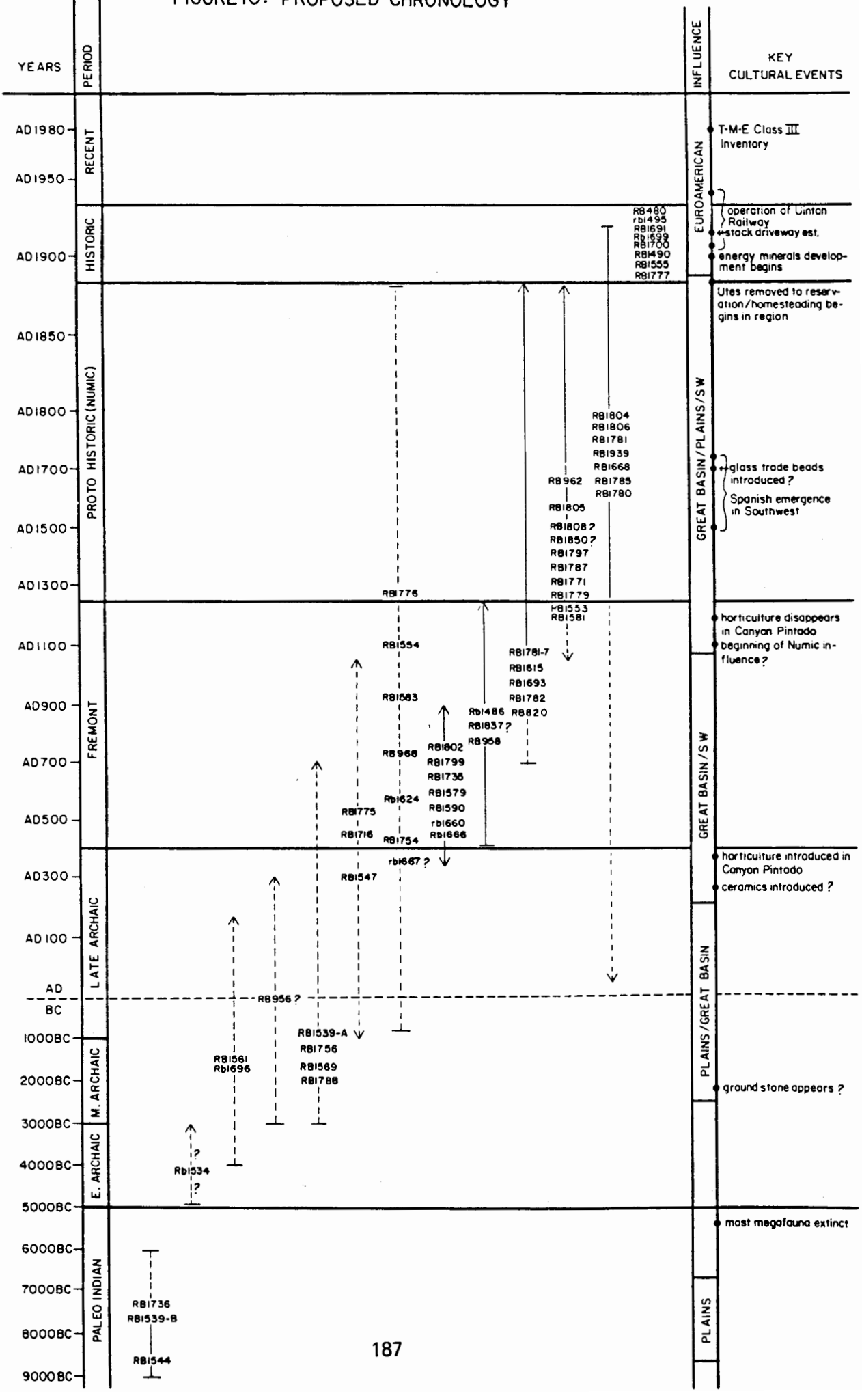
## Chronology

To date, only a single radiometric date has been obtained for the T-M-E study area. This date was calculated from a surface hearth carbon sample drawn from 5 RB817, and places a use period of this resource at AD 1245± 60 years (Gordon, Kranzush, and Knox 1979:122). Therefore, despite a wealth of sites now recorded that contain deposits suitable for radiometric analysis (e.g. 5 RB1805, 1720, 1797, 1787), the cultural and temporal data for the study area are currently based primarily on artifact typologies established for surrounding regions and thought to characterize general cultural periods. The following chronological inferences are based almost entirely on the analysis of collected artifacts, the results of which are presented in Appendix A of this report. It cannot be overly stressed that inferences based on typological comparisons are subject to error and should be viewed as extremely tentative until such inferences can be corroborated by more scientific means. Figure 10 depicts a proposed chronology for certain resources based on comparative analysis.

### Paleoindian Period (pre-dating 5000 BC):

This period is also known as the Early Desert Archaic Period in this region due to the lack of associations of cultural remains with extinct fauna generally noted for ancient sites on the Great Plains (Creasman 1979:VI-1). The evidence of Paleoindian occupation recorded for the T-M-E study area seems to reflect

FIGURE 10: PROPOSED CHRONOLOGY



Great Plains influence, and for this reason the Plains terminology has been preserved here.

Three sites, 5 RB1539-B, 1544, and 1736, contain projectile points that strongly resemble types assigned to the Paleoindian period in other areas. Site 5 RB1539-B contained two fragments of a type, TME-2, which is similar to Angostura or Agate Basin Plains specimens that date to 7700-6000 BC in sites in the Rocky Mountains and southwestern Wyoming (Plate A-1.b). Type TME-1, represented by a fragment from 5 RB1544, strongly resembles a Folsom point (ca.8800-8600 BC), and represents one of the western-most documentations of such a specimen in this region (BLM 1980:76). A third Plains Paleoindian specimen, TME-3, was recovered from 5 RB1736 and bears a striking resemblance to the Hell Gap type (ca. 6800 BC) found in Plains and Rocky Mountain sites.

All three sites containing these apparently ancient components are lithic scatters that occur in upland contexts along a 6.5 km (four mile) stretch of the lower Missouri Creek drainage (Figure 11). Paleoenvironmental data has not been compiled for this specific area, but it is possible that Missouri Creek constituted a major corridor of movement during Paleoindian times, and may have been a more reliable water source than it is today. Sedimentation rates, if they parallel those indicated for drainage systems to the east and north (Creasman 1979:VI-2), may well have obscured other early sites located on floodplains or low terraces in this and other drainages in the study area.

It is interesting to note that all three point specimens of the Paleoindian period represent types originally defined for Great Plains areas, and that two of these types - the Folsom and the Hell Gap - are not common in the literature of northwestern Colorado-northeastern Utah-southwestern Wyoming. While it is not unusual for the earlier cultural traditions to be spatially ubiquitous, the occurrence of three rare specimens in fairly close proximity to one another does

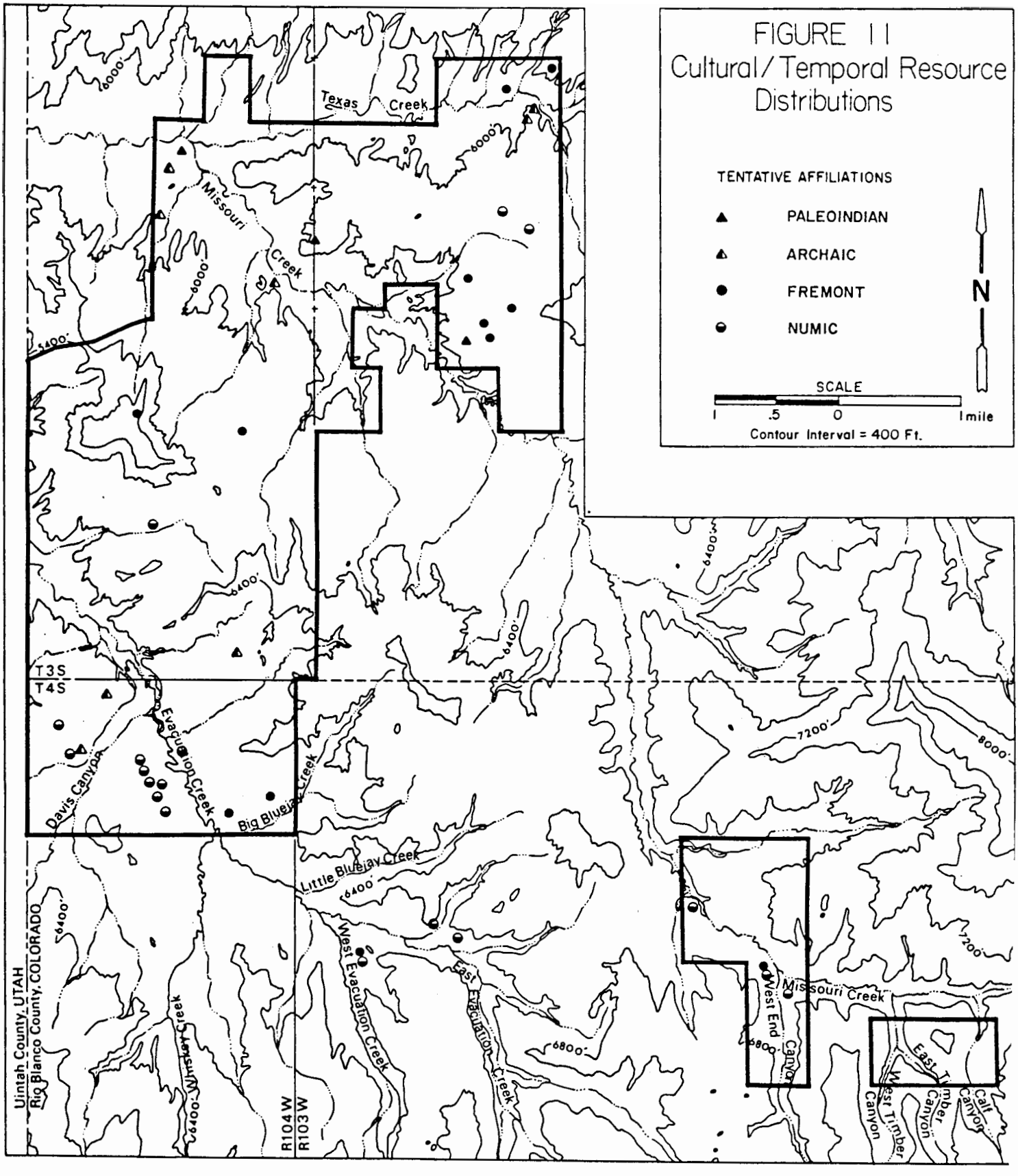


FIGURE 11
Cultural/Temporal Resource Distributions
TENTATIVE AFFILIATIONS
PALEOINDIAN
ARCHAIC
FREMONT
NUMIC
N
SCALE
1 .5 0 1 mile
Contour Interval = 400 Ft.
Texas Creek
Missouri Creek
Davis Canyon
Evacuation Creek
Big Bluejay Creek
Little Bluejay Creek
West Evacuation Creek
East Evacuation Creek
Missouri Creek
West End Canyon
East Timber Canyon
West Timber Canyon
Calf Canyon
T3S
T4S
R104W
R103W
Uintah County, UTAH
Rio Blanco County, COLORADO
8000'
6000'
6400'
7200'
6800'

suggest that this portion of Missouri Creek was the scene of relatively intensive Paleoindian exploitation over a period of several thousand years. The density of these artifact types in this area weakens the frequently suggested "heirloom" artifact argument in this case, and the fact that the Folsom specimen is made of a distinctive local lithic material further supports their temporal authenticity.

Subsistence strategies for these early sites is not clear from the available data, though a big-game based economy is hypothesized. Proto-historic evidence for bison in the study area occurs at a petrograph site, 5 RB915, in Evacuation Creek, and perhaps such megafauna species inhabited the region in earlier times as well. If this was the case, perhaps the extinction of this source of food and materials led to the decline of the Paleoindian cultures in the T-M-E area, as it did on the Plains.

Archaic Period (5000 BC - AD 400)

This period has been subdivided into Early (5000-3000 BC), Middle (3000-1000 BC), and Late (1000 BC-AD 400) periods to facilitate discussions of recorded resources. Only one projectile point, type TME-4, has been tentatively assigned to the Early Archaic period (Wheat, personal communication). This specimen was recovered from a locality, 5 Rb1534, that contains little additional evidence of interpretive value, and the tenuous nature of the typological comparisons (see Appendix A) allows for little confidence in documenting aboriginal activity during this time period.

After the apparent hiatus following the Paleoindian period, the first strong evidence for prehistoric activity dates to the Middle Archaic period, and is represented by McKean Technocomplex-Pinto Series projectile points, designated type TME-5 (Plate A-1.e-i), from 5 RB1539-A, 1569, 1756, and 1788, and by Rocker

Side-Notched and Elko Series points (TME-10a and 14) from 5 RB956, 968, 1547, and 1781-7. It is likely that at least the latter two types persisted into Late Archaic times, or later. Some Pinto-like specimens are known in Fremont Period sites in Dinosaur National Monument as well (Breternitz 1970:36). Aboriginal activity seems to have increased through the Late Archaic period, which is represented by point types TME-10b, TME-11(?), TME-13, TME-16, and TME-17(?) (see Table A-1 for point type distributions).

Most sites from the Archaic period are open lithic scatters or small open camps located primarily in pinon-juniper woodland or fringe on terraces and benches above major drainages throughout the largest tract of the T-M-E study area (Figure 11). An exception is 5 RB956, a severely eroded stratified rockshelter, located on the floodplain at the base of a sandstone wall. Upper Evacuation and Upper Missouri Creeks have no clearly recognized Archaic sites (Figure 11). Ground stone occurs with Middle Archaic resources during this period. While no faunal data was collected during the inventory, a broad-based subsistence strategy, with a possible emphasis on deer, is considered likely. End scrapers and small to medium, triangular to irregular knives imply that hunting, butchering, and hide preparation were common tasks.

The Archaic period in the T-M-E study area witnesses increasing influence from the Great Basin, as evidenced by Basin projectile point types, with a continuing, but perhaps weakened, influence from the Great Plains. It is possible that the apparent influx of Great Basin cultural attributes during the Middle to Late Archaic in part reflects a movement of peoples eastwards in response to a drought thought to have affected the northeastern Great Basin ca. 550 BC-AD 450, as hypothesized by Madsen and Berry (1975:104). A similar Late Archaic increase in prehistoric activity in Canyon Pintado has been noted as a possible corroboration of the Madsen-Berry hypothesis as well (Creasman 1979:VI-5, 11-13).

Continuing Great Basin influences may also have helped shape the following Fremont Period.

Fremont Period (AD 400-1250):

Identification of a Fremont cultural phase in the T-M-E study area is based nearly entirely on the occurrence of ceramic and projectile point styles common in Fremont period sites in surrounding areas such as Canyon Pintado and Dinosaur National Monument. Absent from the study area are such classic Fremont attributes as masonry architecture, clear evidence of horticulture, village settlements, and the numerous petrograph sites common in surrounding areas.

Only two petrograph sites containing motifs usually attributed to Fremont peoples have been recorded in the vicinity, and one of these, 5 RB888, falls outside of the T-M-E study boundaries along the Evacuation Creek drainage. The other resource is Collage Shelter (5 RB820), a National Register site with Fremont and Proto-historic rock art components, located in the upper Missouri Creek area (see Figure 11). Both sites exhibit shield and horned, trapezoidal or "carrot-shaped" anthropomorphs thought to be representative of the Uinta (pre-AD 1000) and Classic Vernal (AD 1000-1200) styles of Fremont art (Gordon, Kranzush, and Knox 1979:125-126, 128). Both of these sites exhibit motifs of post-Fremont cultures as well. A third petrograph site, 5 RB1579, recorded during the Class III inventory of the T-M-E study area, exhibits motifs that bear generic or general resemblances to certain Fremont styles. A Rose Springs series projectile point (TME-16; AD 300-900) found in the associated campsite lithic scatter tends to strengthen a possible Fremont association for this site (see pages 114ff.).

Evidence of horticulture, a key defining Fremont characteristic in surrounding areas, is almost wholly absent from the study area. No granaries such as are documented for Canyon Pintado were located during the inventory, nor were any

Fremont-style manos or metates (Breternitz 1970) located. The few milling stones recorded are most frequently found in association with artifacts that pre- or post-date the period of presumed Fremont activity in the region. A single instance of indirect evidence of possible horticulture was noted at Collage Shelter in 1978. A floral motif resembling a grain head appears on one of the petrograph panels, and could be a representation of a cultigen (Gordon, Kranzush, and Knox 1979:125). It is also of interest that the topographic context of Collage Shelter, at a confluence of a major drainage and one of its tributaries on a level floodplain, closely parallels the locations of sites with horticultural evidence recorded in Douglas Creek to the east (Creasman 1979:VI-7).

The most common projectile point style thought to date to the period of Fremont activity is the Rose Springs Series (TME-16, see Appendix A). This type is common in Great Basin and northern Colorado Plateau sites and has been dated in some places to AD 300-900 (Holmer and Weder 1980:56-60). Similar specimens have been recorded in Canyon Pintado (Creasman 1979), Dinosaur National Monument (Breternitz 1970), at Pine Spring, Wyoming (Sharrock 1966), and on the Uncompahgre Plateau (Wormington and Lister 1956). In the T-M-E study area, this point style is the most frequently recorded of the 18 point types classified from the collections, and may represent extensive aboriginal use of the area during the Late Archaic and Fremont Periods (Table A-1).

Another projectile point style of possible Fremont association is the Uinta Side-Notched (TME-9) variety (AD 800-1200) which may be a forerunner of the more common Desert Side-Notched style (AD 1150-historic). Other point types undoubtedly overlap the Fremont Period, but seem to have their origins or declines in earlier or later times. Table A-1 in Appendix A depicts the frequencies, distributions, and possible associations of all collected and classified projectile points and pottery from the T-M-E study area.

Of the 89 collected pottery sherds thought to represent at least eight wares, only one type from 5 Rb1436 contains ceramics (TME-44) that seem to clearly fall into the Fremont period of use. TME-44 includes four black-on-white/grey sherds of Pueblo II or III (AD 1050-1250) style and either Kayenta or Mesa Verde varieties. Whether these sherds are trade wares or local imitations of Anasazi styles is not clear (Appendix A), but it is likely that Fremont Period peoples are responsible for the deposition of the sherds in the T-M-E area.

Other ceramics of possible Fremont associations include a Tusayan (Kayenta?) corrugated sherd (TME-43) from 5 Rb1837, and sherds that are generally similar to Uinta (TME-37, 5 RB1781-7) and Emery (TME-38, 5 RB1787-2 and TME-39, 5 RB1779) Gray wares, but which occur with other materials that suggest post-Fremont cultures (see below, pages 195-197).

Clearly, the material manifestations of a Fremont period of activity in the T-M-E study area are far less conclusive than evidence recorded for this period in surrounding areas. Subsistence seems to be based on the Archaic patterns of broad-based exploitation of locally available resources, rather than on maize horticulture--also a trend noticeable, but not as pronounced, in Canyon Pintado (Creasman 1979:VI-7). The two most characteristic Fremont resources are the rock art sites 5 RB888 and Collage Shelter, both located in typical confluence/floodplain situations in the upper reaches of major drainage networks (Figure 15). Utilizing the less reliable projectile point styles as Fremont indicators, there is evidence of scattered Fremont activity along the lower reaches of Texas and Missouri Creeks, and possibly along Big Blue Jay Creek as well. Excluding the two rock art sites, sites tend to be on terraces or benches flanking drainages (Figure 11). One site, 5 RB1579, is located on a promontory in a highly defensible position, and though lacking structure, this rock art/campsite/lithic scatter may have served a function similar to that of promontory habitation sites

recorded in Canyon Pintado (Ibid.:VI-5).

Generally, the paucity or lack of habitation sites, architecture, evidence of horticulture, and ceramics in what are thought to be Fremont Period sites suggests that these peoples were not sedentary, or even semi-sedentary, as their counterparts to the north and west were. Distinct cultural and temporal shifts as reflected by the recorded material evidence are blurred, with traits and features of Archaic, Fremont and Proto-historic cultures frequently occurring in mixed contexts. One interpretation of the Fremont manifestations in the study area is that they represent adaptations to the local environment - an environment which was perhaps more favorable for short-term hunting and gathering forays (launched from more permanent camps outside of the study area?) than for horticultural pursuits. Such local variation in Fremont cultural subareas has been widely documented (cf. Creasman 1979:VI-14), and in the T-M-E study area there appears to be a variant lacking many of the established Fremont traits, but showing influence from the Southwest (in the form of Anasazi ceramics), The Great Basin (in the forms of Uinta and Vernal petrograph motifs and various point types), and possibly Canyon Pintado.

The difficulty in distinguishing the Fremont Period resources from the earlier Archaic and the later Proto-historic sites is in all likelihood due to a striking continuity of subsistence and settlement patterns throughout these cultural periods. It may well be that the T-M-E study area served as a peripheral hunting and gathering area for Fremont groups based in surrounding drainages with environmental capacities better suited to semi-sedentary, horticultural lifeways. It has been suggested that the Piceance Basin, to the east of Douglas Creek, served Fremont period peoples in a similar way (Ibid.:VI-15).

Also, the frequent mixing of Archaic, Fremont and Proto-historic components in several sites may indicate an actual contemporaenity among these cultural

groups during early and late Fremont times. If, as is generally accepted, the Douglas Creek (and T-M-E?) Fremont groups developed in situ from the preceding Archaic populations (Ibid.:VI), and if the T-M-E area was never a favored horticultural zone, then the very occurrence of mixed traits, weakness of "typical" Fremont influence as manifested in the cultural remains, and the similarities in tool kits in Archaic through Proto-historic resources recorded for the area, are to be expected. Therefore, the results of the T-M-E Class III inventory tend to corroborate the ever-increasing body of knowledge which points to dramatic regional differences in Fremont and/or Fremont-influenced cultures that arose from highly adaptive mechanisms which were responsive to the local environment, and through which adjacent geographic zones might reflect the seasonal and/or drainage-specific adaptations of a single cultural group. Borrowing from data amassed from surrounding areas, it is thought that by ca. AD 1250, Proto-historic, Numic-speaking groups had entered the T-M-E area, replacing the earlier Fremont culture.

Proto-historic Period (AD 1250-1880):

Perhaps the most active aboriginal period for which there is evidence in the T-M-E study area is the Proto-historic. The difficulties in differentiation between the sub-periods undoubtedly contained within this broad period has led to the inclusion of all post-Fremont aboriginal activity under a single heading. The evidence in this region suggests that ca. AD 1150, an influx of Numic-speaking peoples began. The cultural affiliations of these groups, which persisted into historic times, are uncertain at this point (BLM 1980:77; Creasman 1979:VI-9). There is evidence of use of the region by Shoshoni groups from the Great Basin, and historical accounts place the Ute in the area in the late 18th and 19th centuries (Figures 8 and 9). The results of the Class III inventory of the T-M-E

area suggest the possibility of Apache presence or influence in the region as well. Ethnographically, the Numic-speaking groups (Ute-Shoshoni) were on good terms with each other, and a sharing of territories by the later tribes and their ancestral groups during seasonal procurement rounds might be expected to appear in the archaeological record (Op. cit.).

As was noted above, from the projectile point and ceramic evidence, there is no clear break,as is suggested for Canyon Pintado (Creasman 1979:VI-9), in aboriginal exploitation of the study area between the Fremont and Proto-historic periods. In fact, the solitary radiocarbon date available for the study area places an occupation of 5 RB817 at AD 1245± 60 years (Gordon, Kranzush, and Knox 1979:122), during the approximate transition period between Fremont-dominated (at least in Canyon Pintado and other surrounding areas) and post-Fremont cultures. Circumstantial evidence further suggests that 5 RB817 may be of Proto-historic origins.

A set of new material culture criteria characterize Proto-historic sites. These traits include numerous small, triangular unnotched and side-notched projectile points, various Intermountain and Athabaskan ceramic wares, trade with Europeans in the Southwest (18th-19th centuries), equestrian cultures (post-AD 1500), juniper pole-and-bark wickiups and sweatlodges(?), and an apparent increase in the use of obsidian for tool manufacture.

The most common projectile point types thought to be of Numic origins are the Cottonwood series (TME-6) points (ca. AD 1100-1700?) found at 5 RB1554, 1615, 1797, 1782, and 5 Rb1693, and the Desert Side-Notched (TME-7 and 8) points (ca. AD 1150-1750?) recovered from ten resource areas in the study area (see Table A-1, Appendix A, for distributions). Types TME-14 (Elko series) and TME-11 may also overlap into Proto-historic times from earlier periods.

Of the eight recorded ceramic types, six may have Proto-historic origins. Three ware types, TME-37 (5 RB1781-7),TME-38 (5 RB1787-2), and TME-39 (5 RB1779),

exhibit characteristics similar to Fremont Uinta and Emery Gray Wares, but also have features ascribed to Intermountain wares of the region (Jennings, personal communication). At 5 RB1781-7 the TME-37 sherds occur with a TME-14 Elko Series point (Archaic through Proto-historic?) and TME-42 ceramics which may post-date AD 1700 (Appendix A). At 5 RB1787-2, the TME-38 sherds occur with a Desert Side-Notched point (TME-7) of probable Numic manufacture. Therefore, the evidence for these two sites suggests either successional or concurrent use of these locales by Fremont and Proto-historic groups, or - more probably - exclusive Proto-historic activity. While no additional culturally diagnostic data were collected from 5 RB1779, thus precluding an assignment of this site to either culture group, its proximity to the Davis Confluence Resource Cluster of overwhelmingly Proto-historic resources (see Figures 11 and 14) tempts the inference of Proto-historic associations for 5 RB1779 as well.

Three other ceramic types, TME-40 (5 RB1797), TME-41 (5 RB1787-1), and TME-42 (5 RB1781-7), offer more precise cultural information. The sherds typed as TME-40 bear a close resemblance to Ute Uncompahgre Brown Ware (Annand 1967), and occur at 5 RB1797 with wickiup structures, multiple surface hearths, a TME-6/ Cottonwood Series projectile point, and a lithic assemblage in which obsidian represents a significant percentage (33%) of the materials tabulated. As the Ute are historically known to have been in the area, and as wickiup remains are often associated with Ute resources in the region (Weber, et. al. 1977:104, 120, 221ff; BLM 1980:77), the presence of a Ute pottery type supplements the existing evidence of Ute activity in the T-M-E study area. The implication that at least some Ute groups entered the study area from the Uncompahgre Plateau to the south concurs with other evidence for this pattern of Ute (and Apache?) movement in the northern Colorado Plateau region.

The TME-41 sherds recovered from a subconcentration of 5 RB1787 resemble

Dismal River Apache wares (AD 1700) from the Plains, or could possibly be examples of Faraon Apache plainware (AD 1650) from northern New Mexico (Gunnerson and Gunnerson 1971). Interestingly, another subconcentration of the same site yielded TME-38 (Numic?) pottery in association with a Numic Desert Side-Notched point. The TME-42 sherds from 5 RB1781-7 are a very thin micaceous ware that generally resembles post-AD 1700 Puebloid pottery from the Taos/Picuris area of New Mexico, but seem to more closely ressmble Jicarilla Apache wares from the same area. Again, these possibly Athabaskan sherds occur with Fremont or Numic (TME-37) sherds, as well as with a TME-14 point.

As both the Puebloid and Apachean wares post-date the Fremont period and likely derive from the regions south of the study area, Ute rather than Fremont or Shoshoni associations are hypothesized for 5 RB1781-7 and 1787-1. Since Numic groups were traditionally hostile to Athabaskan groups, and as the Apache had, ethnographically, a strictly Plains-oriented culture that allowed for only limited contact with Southwestern pueblos on trading missions, it seems unlikely that Apache groups visited the study area, and that any Athabaskan influence on the Numic-speakers must have been filtered through common Southwest (New Mexico?) trade contacts. A single possible explanation of direct Athabaskan influence occurs in the literature: O'Neill (1973) states that Utes took slaves from neighboring (especially Athabaskan) tribes during the 17th and 18th centuries for use in trade with the Spanish in the Southwest. Such a slave trade circumstance could possibly explain the co-occurrence of Numic and Athabaskan traits in study area sites, and may account for the unique sweatlodge structure recorded at 5 RB1805 (see below). At any rate, the presence of the TME-41 and 42 ceramics represents the first evidence of any such Athabaskan influence in the T-M-E study area.

Additional support for the idea of Numic trade with the Southwest during

the late Proto-historic period was recovered from 5 RB1668. This resource contained two varieties (TME-35a and 35b) of European glass beads that date to ca. AD 1739-1800 (Appendix A, Plate A-12), and which resemble trade beads of the Southwest (Carlson 1966). The beads were found in a rockshelter in association with lithic debitage, and are therefore ascribed to aboriginal rather than Euro-american activity. Again, the dates of manufacture and the presumed point of origin of these artifacts suggest Ute affiliations for 5 RB1668.

Structural remains of probable Proto-historic vintage were recorded at 5 sites, with indirect evidence for such a structure at a sixth site. Juniper poles of varying lengths and generally small (5-10 cm) diameters were recorded in what appear to be artificial arrangements at 5 RB1570, 1797, 1806, and 1808 (Plate IV). At the first three of these sites, the structures consist of poles leaning into living trees and are similar to other such structures, commonly called wickiups, recorded in the Piceance Creek area to the east (Weber et. al. 1977; Olson et. al. 1975). Such features are usually ascribed to Ute cultures. At 5 RB1808 (Plate IV.c), a small conical arrangement of poles constructed over deadfall was recorded, and is quite similar to a feature recorded in Stake Springs Draw to the east and attributed to Ute activity (Op. cit.:84-88). At 5 RB1850, a weathered axe-cut juniper stump, approximately 8 cm in diameter, was recorded within an apparently undisturbed lithic concentration. It is considered possible that the stump represents aboriginal procurement of a structural pole. A lack of cultural diagnostics at 5 RB1850 prevents a clear assignment of this resource to a cultural period, but it is likely that it dates to the Proto-historic period.

Another type of structure was recorded at 5 RB1805, and represents a unique occurrence in the cultural record of this area. The structure, consisting of a shallow circular depression with a collapsed conical juniper pole superstructure

covered with juniper bark, and an adjacent fire-cracked rock mound (Figure 3 and Plate V), has been interpreted as the remains of a sweatlodge (Jennings and Firebaugh, personal communications). The presence of some lithic debitage and tool fragments, a nearby hearth, and charred bone suggests that the site may have been multifunctional. While no culturally or temporally diagnostic artifacts were recovered from this site, its location within the predominantly Proto-historic Davis Confluence Resource Cluster (Figure 14), the presence of obsidian detritus (8% of recorded materials),and the general nature and condition of the site suggest Numic associations for 5 RB1805. Such a structure as a sweatlodge may imply occupation of the area for more extended, or seasonally repeated periods of use than would be expected if the vicinity was the scene of only brief hunting and gathering forays. Also, while no clear associations can be demonstrated, sweatlodges were a common feature among the Navaho Athabaskans in the Southwest from AD 1550 to 1775 (Jennings 1968:280-281), and the presence of such a structure may be additional evidence of some form of Athabaskan/Puebloid influence (through slaving?) during Proto-historic times.

It is ethnographically documented that the later Numic speaking Ute and Shoshoni groups pursued subsistence strategies similar to those of the Archaic (and T-M-E Fremont?) period. In addition to generalized hunting and gathering, there is evidence, in the form of an equestrian hunting scene in rock art at 5 RB915, that a certain level of bison procurement took place in the study area in later Proto-historic times (Gordon, Kranzush, and Knox 1979:143). Similar evidence from Canyon Pintado has been interpreted as a possible reflection of migrating Shoshoni mounted hunting parties moving into the region during their Plains-oriented hunting forays (Creasman 1979:VI-10). Creasman also cites evidence that specific resources utilized may have varied between the Archaic and Proto-historic periods, as pinon-juniper stands expanded during the later period and

pinon procurement (Late Fremont?) may have been augmented by juniper berry use in Proto-historic times (Ibid.).

The settlement patterns for Proto-historic period resources recorded in the T-M-E study area are distinct from those observed for earlier periods. An area of very intensive Numic (and Athabaskan?) utilization/influence was recorded along Evacuation Creek, primarily between Davis Canyon and Whiskey/Big Blue Jay Creeks (Figure 11). There is also evidence of smaller Numic enclaves further upstream along Evacuation Creek (5 RB817, 915, 888), in upper Missouri Creek (5 RB 1570, 820, 1553), and in lower Missouri Creek (5 RB962, 1581). Other resources in these areas may also be of Proto-historic origins, but are lacking diagnostic materials.

The main recognized area of Proto-historic activity along Evacuation Creek contains 12 resources (5 RB1776, 1779?,1781, 1785?, 1786?, 1787, 1797, 1804, 1805, 1806, 1808 and 1850) of presumed Numic origins, and of these, eight exhibit features (structures, hearths) that indicate a habitation/campsite function. Such features imply possible extended or repeated use periods, and reveal this drainage area to have been a preferred one during these times. Of the six Proto-historic sites in the upper reaches of Evacuation and Missouri Creeks, at least three (5 RB817, 1553, and 1570) are camp/habitation sites, and the remaining three are petrograph/rockshelter sites that could have served as campsites as well.

All of the above listed sites are located in heavy to moderate density pinon-juniper woodlands on low, primary terraces of major drainages or, in the case of the petrograph sites, at the edges of open floodplains in confluence situations. In the absence of economic floral and faunal data for these sites, the resources utilized are not clear, but it is likely that both bottomland and upland ecological zones were exploited. The presence of obsidian, Apache and Ute cer -

mics, and equestrian motifs, in conjunction with wickiups, a sweatlodge, and extensive campsites, implies a mobile subsistence strategy operated from what may have been semi-permanent seasonal camps. The area of densest Proto-historic use occurs along the portion of Evacuation Creek that is a permanent water source today, and seasonal water sources may have been more reliable and less ephemeral during the Proto-historic period than at present.

The two sites with Proto-historic evidence (TME-7/Desert Side-Notched points) located along a tributary of Lower Missouri Creek (5 RB962 and 1581), are both lithic scatters situated on a high wooded interfluvial ridge (Figure 11). Neither site contains rock art, structure, ceramics or hearths, and neither appears to have been a campsite. This evidence may suggest that these more northerly Proto-historic sites were the scenes of temporary tool manufacturing and hunting activities, rather than the more extended camping functions represented by sites to the south.

At any rate, there appears to be a definite shift in type and location of sites between the earlier temporal periods and the Proto-historic (Figure 11). The density of the later period resources, particularly along Evacuation Creek, is reflective of intensive use of the study area from perhaps AD 1200 through the end of the period. This activity may have influenced the activity of late Fremont groups in the area. Indeed, several sites (e.g. 5 RB1776, 1781, 820) have components which suggest some contact between the Fremont and presumed Numic-speaking groups - a circumstance also noted for some sites in Canyon Pintado (Creasman 1979:VI-8ff).

With the possible exception of 5 RB1579, the absence of defensible fortifications or refuges in the T-M-E area is in contrast to conditions recorded elsewhere that are often attributed to hostilities between the indigenous Fremont and the immigrating Numic-speakers (Wormington 1955; Aikens 1966; Creasman 1979).

However, the single exception in the T-M-E area, 5 RB1579, contains additional unique evidence that may support a theory of conflict during its period of occupation. This site, assigned to the Fremont period on the basis of a TME-16/ Rose Springs series projectile point and certain rock art motifs, contains on its petrograph panels an anthropomorph pierced through with what seems to be a spear, and another motif thought to represent a shield-bearing figure (Figure 6). These motifs could be interpreted as graphic depictions of warfare, though the contestants in such strife cannot be clearly determined. It is particularly unfortunate that 5 RB1579 has been extensively vandalized, as its deposits may have held invaluable data concerning inter-cultural conflict and the nature of defensive sites.

Aboriginal activity was effectively terminated in the T-M-E study area by the 1880s upon removal of the Ute to the Utah reservation.

Historic Period (AD 1880-1930):

The field inventory conducted during contract #YA-512-CT9-252 resulted in recordation of 15 resources believed to represent Euoroamerican utilization of the study area during historic times. These resources include two isolated finds: 5 rb1495 and 5 rb1691; 5 localities: 5 Rb1490, 1555, 1699, 1700, 1847; two open architectural sites:5 RB480 and 5 RB1806; and six open industrial scatters: 5 RB1777, 1780, 1781, 1785, 1804, 1939 (see Table 8 for site type definitions).

Analysis of artifactual materials encountered during field investigations, and research concerning known historic events and actions involving study area land, have provided the following temporal data for outlining historic utilization of the study area. Dateable artifactual remains from historic resources present a range of possible manufacture dates from 1880 to 1930, with a majority

of dates occurring between ca. 1900 and ca. 1917, and with a single identifiable item, a "Drey Perfect Mason" jar (from site 5 RB480), dated at ca. 1910 (Figure 10 and see Table 9).

Past geographic surveys documenting activity within the study area during historic times are known to have been conducted in 1885, 1910, 1911, 1921, and 1924. Physical evidence of survey-related activities include cairns, brass caps, and possibly discarded debris (5 rb1495). Transportation routes in the study area are depicted on early geographic survey maps, with the Evacuation Creek Road pictured as early as 1885. Use during historic times of this road and others within the study area is manifested in the field by the presence of diagnostic historic artifacts (within resources 5RB1939 and possibly 5 RB1781, 1785, 1804) located on or near these road beds, and by the remains of the old roadbeds themselves. The presence within the study area of the Uintah Railway, built in 1903 and 1904 and abandoned in 1939, is evident in actual railbed debris (previously recorded) along the route depicted on early survey maps. Utilization and construction of this railway is believed to be represented in the field by tent stop/campsite 5 RB662 (previously recorded), by 5 RB1785, containing railroad-related debris and other historic artifacts contemporaneous with dates of railway construction and use; and possibly by 5 RB1777, located in close proximity to the railway right-of-way.

Attempts to acquire study area land for homestead/ranch purposes are documented in historical background sources from 1925 to post-1930, however they are believed to have occurred somewhat earlier as evidenced in the field by architectural site 5 RB951, believed to have been built in 1910 (Gentry, personal communication). Documented livestock-related interest within the study area occurrs as early as 1918, with the establishment of the stock driveway in T4S, R104W. Activity involved with its use is thought to be represented by numerous

resources (5 rb1691, 5 Rb1699, 5 Rb1700, 5 RB1777, 5 RB1780, 5 RB1781) encountered during survey within and near the stock driveway boundaries, and which contain artifactual materials generally contemporaneous with establishment of the stock driveway.

Energy development within the study area, though documented in the 1920s through oil shale placer claims and patents and oil and gas permits, left no apparent physical evidence in the field which could be directly attributable to mineral extraction or exploration during historic times. Several factors may have resulted in the absence of corroborative field remains associated with documented historic interest in energy development. Oil shale placer claims recorded were not patented until 1934, and may not have required any associated activity until that date. Likewise, the oil and gas permits issued were for prospecting, and no actual leases were recorded for these areas during historic times. Therefore, there may have been a lack of associated activity that would have resulted in tangible cultural remains.

Hunting activities within the study area during historic times are represented by at least one site, 5 RB1806, and possibly by two others--5 RB1780 and 5 RB1490. Diagnostic artifacts from 5RB1806 indicate its probable utilization between 1880 and 1925, with the site containing rifle cartridges manufactured between 1895 and 1945. However, recent artifacts were also recovered from 5 RB 1806 and may indicate recent hunting activity.

By 1930 it is likely that the T-M-E study area was the scene of multiple land uses that included transportation of energy and other minerals, livestock grazing associated with homesteads known to have been established in adjacent areas, and recreational use (represented by hunting debris and Late Historic-Early Recent rock art graffiti). The access roads established in the late nineteenth and early twentieth centuries (e.g. Evacuation Creek, Dragon, and

Davis Canyon Roads) continued to provide access into the region throughout the Historic period and up to the present. The Uintah Railway served the areas to the west and south of the study area until 1939, when it was abandoned. Post-railway abandonment activity in the study area is represented by several resources containing scavenged railroad debris such as ties (frequently used in construction of homestead buildings) and rails.

Since the end of the Historic period, the study area has been the scene of ever-increasing energy minerals development and exploration activities, ranching, and recreational hunting activities. The face of the landscape is being radically altered in some areas by the construction of new roads and facilities such as pipelines required for rapid development of the natural mineral resource base. With this increasing activity, the fates of the fragile cultural resources documented for the T-M-E study area are being increasingly jeopardized. Recommendations for protection of these resources are presented in the "Management Summary" section of this report.

## Regional Comparisons

One of the primary reaearch goals of this study was to compare and contrast resource frequencies and distributions for the T-M-E study area to those recorded for the Canyon Pintado Historic District (CPHD) and to infer from these comparisons differences in subsistence modes and settlement patterns for the two areas. Table 10 lists comparisons between the two areas for site type distributions, cultural patterns hypothesized for the four, broad pre-historic periods, site locations and frequencies of lithic material.

Two major differences in the prehistoric occupations and utilizations of the T-M-E study area and CPHD are immediately obvious from Table 10. First and foremost, the differences in the frequencies of the various site types suggest that

TABLE 10

Canyon Pintado / T-M-E Comparisons

| Canyon Pintado Historic District | Texas-Missouri-Evacuation Creeks |
|---|---|
| **OVERALL RESOURCE DENSITY** | |
| 1 / 61.9 acres | 1 / 32.8 acres |
| **SITE TYPE FREQUENCIES*** | |
| Camps - open and sheltered<br>64 (27.8%) | Campsites<br>33 (8.6%) |
| Architecture (2 historic)<br>22 (9.6%) | Structural remains and features (4 historic)<br>13 (3.4%) |
| Open lithic sites<br>20 (8.7%) | Lithic scatters<br>137 (35.6%) |
| Localities (included under OLS?)<br>NA NA | Localities (non-historic)<br>64 (16.6%) |
| Petrographs<br>47 (20.4%) | Rock art<br>3 (0.8%) |
| Sheltered storage<br>1 (0.4%) | Sheltered storage<br>0 (0.0%) |
| Quarries<br>0 (0.0%) | Quarry areas<br>5 (1.3%) |
| Isolated finds<br>76 (33.0%) | Isolated finds (non-historic)<br>116 (30.1%) |
| Non-structural historic resources<br>0 (0.0%) | Non-structural historic resources/components<br>14 (3.6%) |
| TOTALS<br>230 (99.9%) | 385 (100.0%) |

* Each site component (e.g., P, OC, SA, etc.) is counted once so that site types utilized in the two studies correspond. T-M-E totals include 12 previously recorded resources located within study area boundaries.

CULTURAL PERIODS

| | |
|---|---|
| Early Desert Archaic (pre-2750 BC)<br>-No distinct Paleoindian/ Early Desert Archaic remains.<br>-Surface materials dating to this period are believed to occur only at very high elevations. | Paleoindian (pre-5000 BC)<br>-Three projectile points (Folsom, Angostura/Agate Basin, Hell Gap) associated with Paleoindian period on the Plains.<br>-All from lithic scatters located in upland contexts.<br>-Folsom point is made of local siltstone. |

Table 10, cont.

| Canyon Pintado Historic District | Texas-Missouri-Evacuation Creeks |
|---|---|
| Late Desert Archaic (2750 BC - AD 375)<br>-Open camps on floodplains, sheltered camps at edges of floodplains.<br>-Only Late Archaic sites in upland contexts are lithic scatters.<br>-Increase in areal utilization ca. 550 BC - AD 450 during hypothesized abandonment of Great Basin. | Archaic Period (5000 BC - AD 400)<br>-Only one projectile point very tentatively dated to Early Archaic (5000 - 3000 BC).<br>-General increase in areal activity from Middle (3000 - 1000 BC) through Late (1000 BC - AD 400) Archaic.<br>-No floodplain campsites; lithic scatters and campsites are located terraces and benches.<br>-Use of area primarily for hunting/gathering and lithic procurement is hypothesized.<br>-Marked tendency for sites to occur in low elevation pinon/juniper.<br>-Artifact assemblage shows increased influence from Great Basin, decreased influence from Plains. |
| Horticultural (AD 375 - 1210)<br>-Most intensive utilization of area.<br>-Masonry architecture, slab-lined pithouses, brush/hide covered and wattle and daub constructions.<br>-Uinta Grey, Emery Grey and Southwest ceramics.<br>-Simple petrographs; triangular-bodied anthropomorphs lacking decoration except for horns; more elaborate trapezoidal- and rectangular-bodied motifs.<br>-Floodplain campsites, farmsteads(?), use of rockshelters.<br>-Reliance on hunting/gathering with corn horticulture.<br>-Sites located near mouths of canyons. | Fremont (AD 400 - 1250)<br>-Masonry architecture, clear evidence of horticulture, villages or farmsteads and abundant petrographs are lacking.<br>-Southwest ceramics (5 sherds) and possible Uinta and Emery Gray sherds.<br>-Subsistence pattern strongly resembles Archaic hunting/gathering.<br>-Campsites and lithic scatters tend to be located on terraces and benches flanking drainages.<br>-One defensible promontory site (non-architectural).<br>-Mixture of probable Fremont artifacts with materials from Archaic and/or Proto-historic periods. |
| Protohistoric/historic (AD 1300-1890)<br>-Limited evidence from this period.<br>-Sites are located on benches along cliff walls.<br>-Equestrian petrographs may indicate use of area in seasonal migrations between Plains and Great Basin. | Protohistoric (AD 1250 - 1880)<br>-May have been the most active period in the T-M-E study area.<br>-Probable Ute-Shoshonean areal utilization.<br>-Cottonwood Series and Desert Side-Notched points; six ceramic types, two of which show similarities to Athabaskan (Apachean) wares.<br>-European glass trade beads.<br>-Juniper pole wickiups and sweat lodge, concentrated along a now-permanent section of drainage.<br>-Apparent increase in use of obsidian. |

Table 10, cont.

| Canyon Pintado Historic District | Texas-Missouri-Evacuation Creeks |
|---|---|
| **SITE LOCATIONS** | |
| -Easy access to water and food; sites afford good vantage of surroundings.<br>-Sheltered camps show tendency toward southerly exposure which may indicate winter occupation.<br>-Open camps occur with a variety of aspects which may indicate summer occupation.<br>-Sites tend to be located at boundary between canyon floor and walls, possibly to maximize resource availability. | -Strong association of sites with low elevation pinon/juniper woodland vegetation community.<br>-Vantage often obscured by trees, but is usually available nearby.<br>-No apparent aspect preference.<br>-Higher than expected site density in Texas-Lower Missouri Creeks geographic area. |
| **LITHIC MATERIALS** | |
| (Based on information available in Creasman 1979) | (Based on tallied and collected artifacts) |
| -No siltstone.<br>-Predominantly cherts (of several varieties).<br>-Obsidian comprises less than 2% of collected chipped stone items. | -Siltstone is most prevalent material and comprises ca. 74% of all recorded material.<br>-Cherts comprise 16.6% of all recorded material and is the dominant material in Upper Missouri Creek area only.<br>-Obsidian comprises only 1.2% of recorded artifacts, but comprises 2.5% of recorded artifacts in Evacuation Creek area where Proto-historic evidence is greatest. |

the two areas were perhaps utilized for different purposes. Second, evidence of Fremont period occupation as recorded in CPHD is virtually absent in the T-M-E study area, suggesting either that cultural activity during this period was limited in the study area, or that areal utilization was sufficiently different to result in widely divergent archaeological manifestations, or both.

Table 10 indicates relative frequencies of correlated site types for CPHD and the T-M-E study area. It is apparent that the CPHD resource base is dominated by campsites and petrograph sites, while the T-M-E resource base is to a large degree comprised of lithic scatters and localities. (Although the locality classification is not utilized in the CPHD study, it is probable that these small, limited activity loci are contained within the open lithic site category.) Structural remains are not only more numerous in CPHD, but the types of structures recorded for that area (masonry and adobe habitation and storage sites) are vastly different than those encountered in the T-M-E study area (juniper pole, wickiup-like structures). Quarry areas which, although they comprise a small percentage of total resources in the T-M-E area, are of major importance in understanding the frequency and internal composition of sites, particularly in the Texas-Lower Missouri Creek geographic area, are totally absent in the CPHD study area.

The relative lack of large campsites and structural remains and the corresponding abundance of lithic scatters within the T-M-E area indicates that the area was probably being utilized on a less intensive (and more extensive) basis that the CPHD, and for reasons discussed below, it is suggested that hunting and lithic procurement were the two primary activities undertaken in the region. Hunting is suggested as a primary activity due to site locations (upland, forested features) and site contents (knives, projectile points, scrapers, utilized flakes and debitage), in spite of a failure to record non-recent bone deposits. The occurrence of groundstone artifacts is so limited in the region (six sites) that

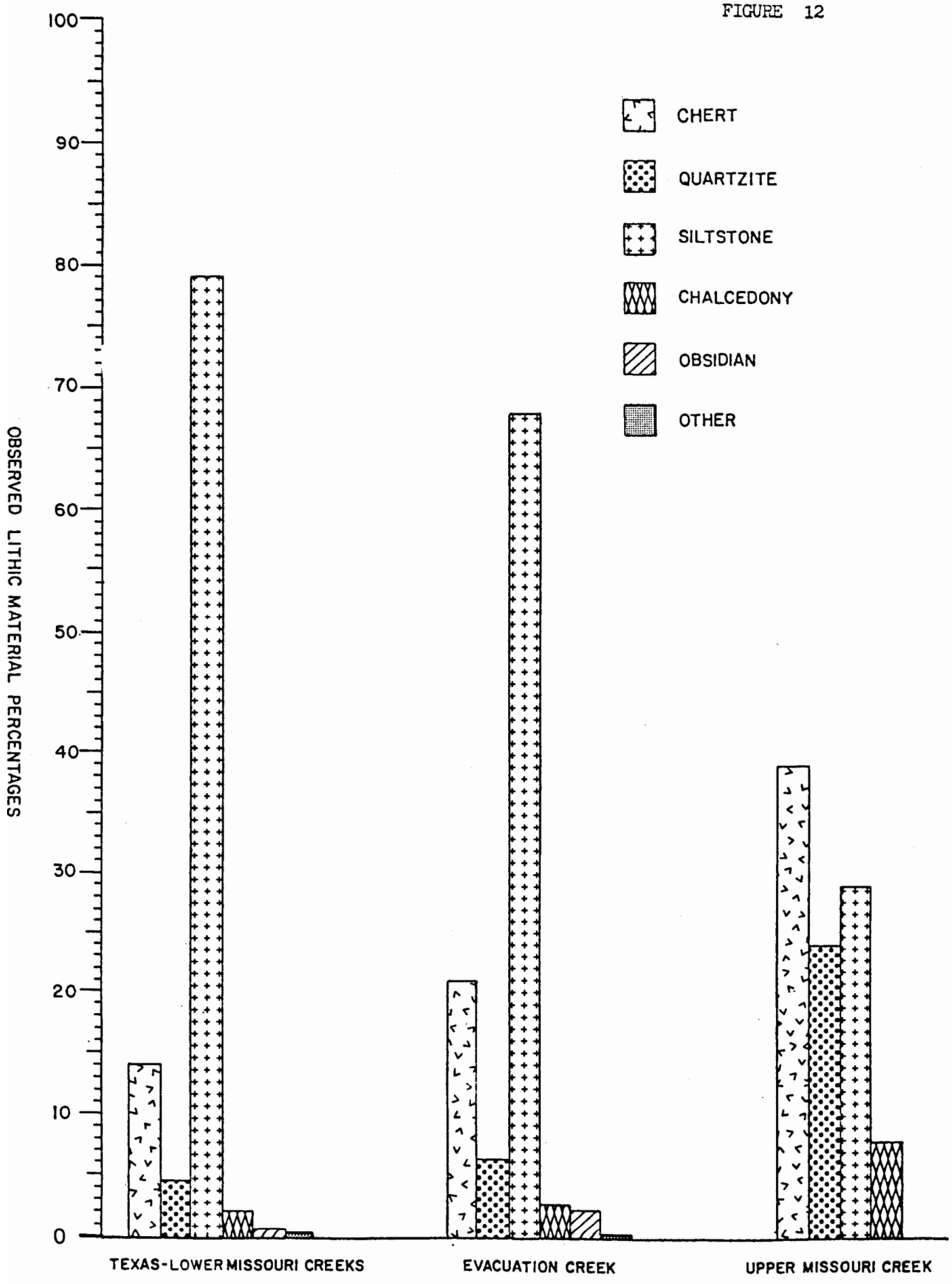
procurement of vegetal food resources requiring milling is considered to have probably comprised a very minor activity within the region, thereby indirectly supporting the hypothesis that the area was primarily used for hunting.

Lithic scatters composed primarily of siltstone debitage are believed to represent extensive reduction of locally occurring siltstone nodules for the purposes of tool manufacture. It is believed that as many as 50% of the T-M-E lithic scatters (and probably a greater percentage of lithic scatters within the Texas-Lower Missouri Creeks geographic area) can be attributed to tool manufacture from locally available materials.

Siltstone is by far the dominant lithic material in the T-M-E area (Figure 12), yet it curiously seems to be concentrated almost totally within the general region of local availability. Collections from the CPHD inventory (Creasman 1979) do not contain a single siltstone artifact. Neither Moon Lake Project report (Chandler and Nickens 1979a, 1979b) lists siltstone as a significant lithic material in regions to the north and west of the T-M-E study area. It is apparent that extensive use was made of locally available materials within the study zone, but that the materials were relatively opportunistically utilized. That is, procurement of the material was undertaken for utilization in activities within the area, but it was apparently not transported to other nearby regions. This may reflect the relative desirability of siltstone for use in tool manufacture. When readily available, it was used extensively, but apparently was not of sufficient value to transport more than a short distance. The percentage of finished tools made of siltstone in the T-M-E collections (29%), as compared to cherts, quartzites, obsidian, etc. (71%), indicates that siltstone was not a preferred lithic material, at least for certain purposes.

A phenomenon dubbed "flake piling" was noted throughout the project area, but particularly in association with large siltstone-dominated sites in the Tex-

FIGURE 12


CHERT
QUARTZITE
SILTSTONE
CHALCEDONY
OBSIDIAN
OTHER
OBSERVED LITHIC MATERIAL PERCENTAGES
100
90
80
70
60
50
40
30
20
10
0
TEXAS-LOWER MISSOURI CREEKS
EVACUATION CREEK
UPPER MISSOURI CREEK

and tentative dates are available from diagnostic artifacts. In the T-M-E area, the increased utilization appears to be concentrated in the Middle through Late Archaic periods (3000 BC-AD 400), while the CPHD study has noted an increase in utilization of floodplain campsites during the specific hypothesized period of Great Basin abandonment (Creasman 1979:VI-5). It will be necessary to obtain radiocarbon dates from T-M-E Archaic period campsites to ascertain whether increased utilization of the area precedes or corresponds to that noted for CPHD. Evidence that the T-M-E area may have been subject to increased utilization by peoples abandoning the Great Basin exists in the form of an increased similarity between T-M-E artifacts and specimens from the Great Basin, accompanied by an apparent decrease in Plains influence (pages 188-190).

A fundamental difference between Archaic period utilizations of the two areas is the presence of large floodplain campsites dating to this period in CPHD and a lack of this type of site in the T-M-E area. This divergence may reflect the utilization of the T-M-E area for brief seasonal hunting forays, while CPHD may have been the scene of more permanent seasonal camps. During Late Archaic times it is probable that incipient horticulture was commencing in suitable areas, which may have included the Douglas Creek floodplain but not the margins of Texas, Missouri and Evacuation Creeks.

Marked, major differences between CPHD and the T-M-E study area appear in relation to the Fremont (this study) or Horticultural (Ibid.:VI-5) Period (defined as AD 400-1250 and AD 375-1210, respectively). This period represents the most intensive utilization of CPHD, whereas Fremont manifestations, as defined for CPHD, are almost totally lacking in the T-M-E study area.

Evidence of Fremont period utilization of the T-M-E area exists in the forms of projectile points generally associated with the period (though often associated with Archaic or Proto-historic sites as well), ceramics that most probably

date to this period, and certain rock art motifs from sites 5 RB820, 1577 and 1579. No masonry, adobe, or wattle and daub architecture, slab-lined pithouses, or extensive floodplain campsites were encountered in the T-M-E area. Although rock art (petrograph) sites have been recorded in the T-M-E area, the relative frequency of this type of site is very low in comparison to CPHD (0.8% and 20.4%, respectively). In short, the "classic"or definitive characteristics of Fremont Culture sites are for the most part, absent from the T-M-E study area. Except for a single occurrence of very indirect evidence at 5 RB820 (page 191), the area lacks any indication of horticulture, even on a limited basis. It is currently thought that Fremont period exploitation of the T-M-E study area so closely resembles the general pattern of Archaic utilization of a broad range of economic resources as to be, for the most part, indistinguishable from the preceding Archaic period. It is hypothesized that the T-M-E region was used as a seasonal hunting area, perhaps by the semi-sedentary Fremont peoples who established the major campsites of, and developed a subsistence strategy at least partially dependent upon horticulture in, the Douglas Creek drainage. It can be stated that the T-M-E area seems to more closely parallel the Piceance Basin (Weber et. al. 1977; Creasman 1979:VI-15) in terms of Fremont period utilization than the Canyon Pintado area (page 193).

It is noteworthy that open lithic sites, precisely the type of site that is attributed to lithic material procurement and hunting activities in the T-M-E study area, comprise only a minor component of the CPHD resource base (8.7% of recorded resources). If large game were indeed an important resource of the Fremont people, it is apparent that hunting activities were either undertaken from sites for which other purposes are more obvious (e.g., campsites), or were carried out beyond CPHD survey boundaries. The relative lack of sites in CPHD for which hunting and butchering can be suggested as a primary purpose lends

support to the idea that hunting expeditions were launched to outlying areas such as the Piceance Basin and/or the T-M-E region. However, the absence of T-M-E siltstones in CPHD sites might be interpreted as an indication that the study area was minimally utilized by the Fremont period occupants of the Douglas Creek drainage.

Seasonality of Fremont period usage of the T-M-E study area is at present not clear. No preference for a particular aspect, used as evidence in support of fall/winter occupation of CPHD sheltered camps (Ibid.:VI-28), is clear from T-M-E site locational data. There is a strong tendency, as there is for all resources from all periods in the T-M-E area, for Fremont period sites to be associated with the low elevation pinon/juniper woodland vegetation community, especially where it occurs on benches or terraces overlooking drainages. This may represent an attempt to limit exposure to climatic conditions or to limit site visibility from adjacent floodplains, but it does not suggest a specific season of use. It can be argued that within certain limits, subjective locational preferences could be more easily exercised in the placement of habitation sites than in the location of a site associated with the exploitation of a specific resource. Furthermore, it is considered possible that an apparent cultural preference for a certain aspect exhibited by rockshelters and/or rock art sites may actually reflect a natural tendency for suitable site locations to occur primarily on one side of drainages due to differential weathering and erosion. Finally, if the southerly aspect preference exhibited by CPHD sheltered camp locations suggests winter occupation, and if open sites exhibit no dominant aspect possibly because of utilization during the warmer times of the year, the lack of aspect preference and sheltered camps in the T-M-E study area may indicate late spring through early fall occupation. If this were the case, location of sites within forested areas would provide shelter from solar radiation, and location of

sites above floodplains and cliff walls may indicate an attempt to limit site visibility while utilizing the coolest possible locations. The hypothesized summer exploitation, however, does not account for the apparent present day tendency (bsaed upon field observations) for large game to move to higher elevations than are represented in the study area during the warmer seasons.

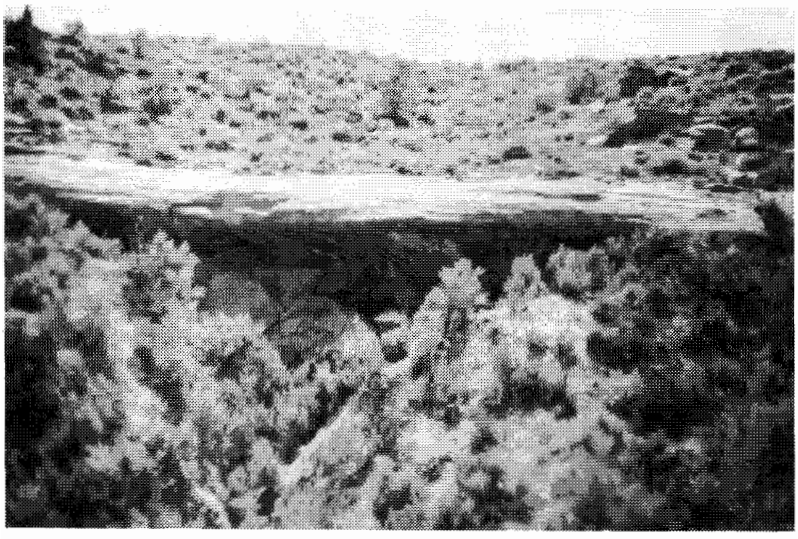
Probable Proto-historic/Historic period aboriginal sites comprise a major component of the T-M-E resource base, while only limited evidence of occupation during this time range has been recorded for CPHD. The T-M-E study area contains the standing remains of wickiup-like structures as well as Euroamerican trade beads, projectile points and ceramics dating to the Proto-historic period. In addition, 5 RB915, located east of the study area, is a rock art site depicting a bison hunting scene dominated by equestrian motifs. Many of the sites dated to the Proto-historic period are large campsites, which perhaps indicates a shift in areal utilization compared to preceding periods. Proto-historic sites tend to be concentrated in the southwest portion of the project area along a now permanent section of drainage (Figure 11). Lithic assemblages from Proto-historic sites exhibit a decrease in siltstone utilization accompanied by an increase in chert, quartzite and obsidian occurrence, which contributes to the overall changes in lithic material dominance noted for the major drainage systems (Figure 12). A more detailed discussion of Proto-historic period utilization of the T-M-E study area is contained on pages 194-202.

The CPHD inventory recorded only two historic Euroamerican sites within the entire District. In contrast, 18 historic resources (12) or historic components within multicomponent sites (six) have been recorded in the T-M-E study area. It is difficult to interpret this variation in frequency of historic remains between the two areas. It seems most likely that differences in historic resource types and frequencies have resulted from the use of different historic

resource definitions in the two studies. It seems likely in light of the known historic activity in the region (see Gordon, Kranzush, and Knox 1979 for a discussion of historic activity in certain adjacent/nearby areas), that minor trash scatters, historic graffiti, etc. were omitted from the CPHD inventory. Conclusions based upon historic data comparisons will therefore not be attempted.

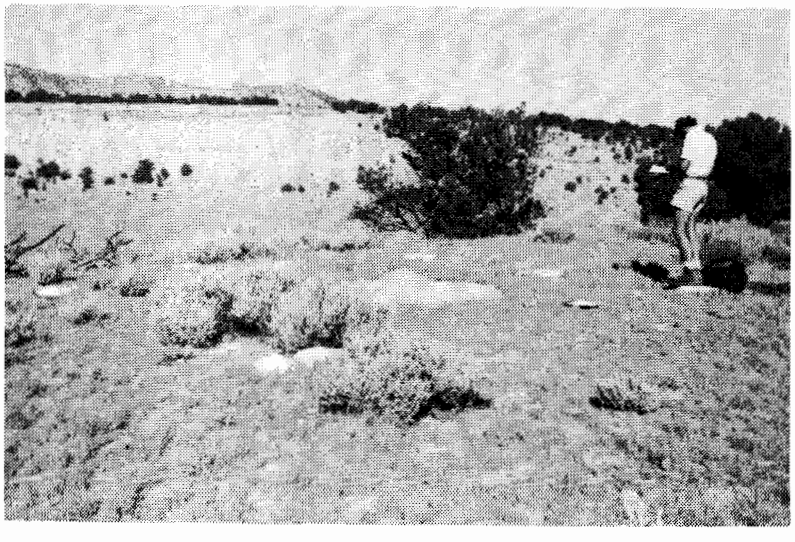
Overall resource density for CPHD is roughly one resource per 61.9 acres, as compared to one resource per 32.8 acres for the T-M-E study area. The higher resource density recorded in the T-M-E area is attributed to the suitability of the area in terms of general hunting/gathering subsistence strategies and the immediate availability of a utilizable lithic material. Occupation of the CPHD appears to begin during the Late Desert Archaic period (2750 BC-AD 375) and builds to its peak during the Fremont period (AD 375-1210), after which a marked reduction in sites is noted (Creasman 1979:VI-9). T-M-E utilization begins in the Paleoindian period and, in all likelihood, increases steadily through Protohistoric times. While the Douglas Creek area may have been conducive to the development and florescence of the Fremont Culture, the archaeological resources of the T-M-E study area seem to reflect the continuous exploitation of a generalized resource base that proved consistently reliable in terms of economic and subsistence carrying capacity throughout prehistoric and historic times.

PLATE I: Campsites

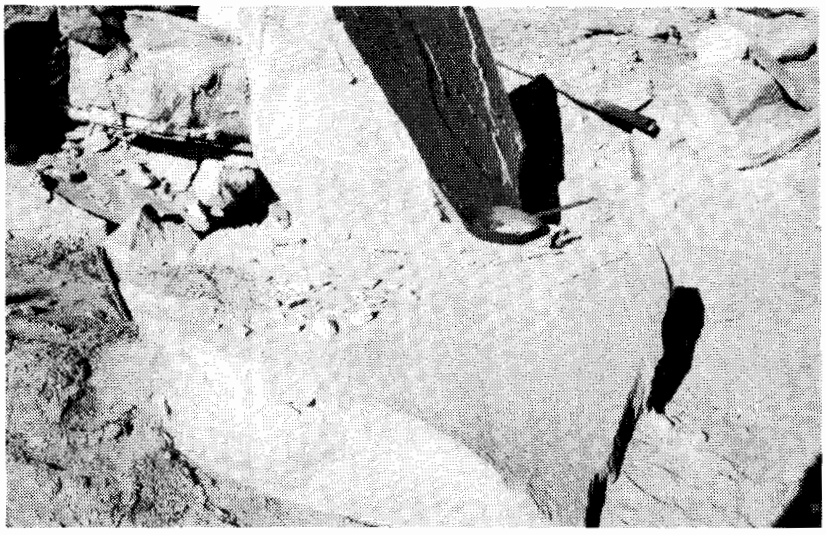


a. 5 RB956 - Shot S into rock shelter from uneroded floodplain along N side of drainage.

b. 5 RB1565 - Shot W of Feature 1, a circular pattern in vegetation.



c. 5 RB1566 - Shot W of Feature 1, a stone alignment (center) to rim of ridge.

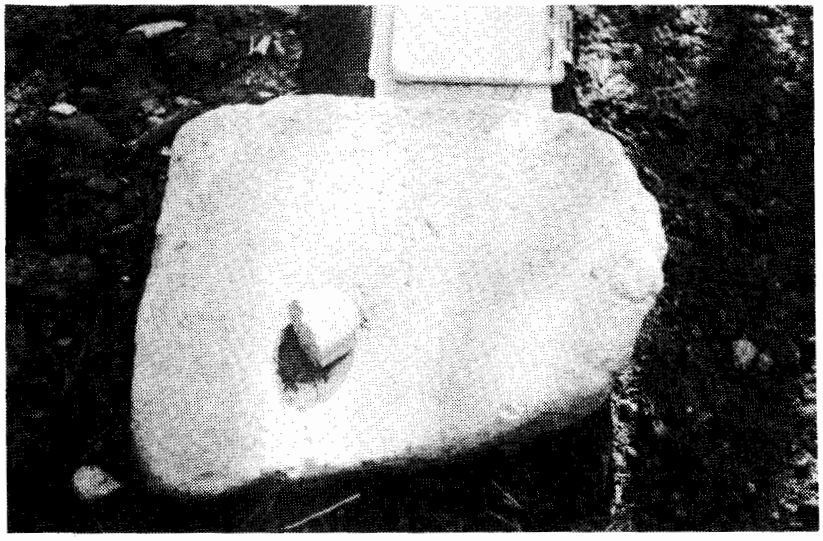


a. 5 RB1579 - Shot NW of evidence of vandalism of site. Note pipe in hearth area, frying pan & pile of lithic artifacts.

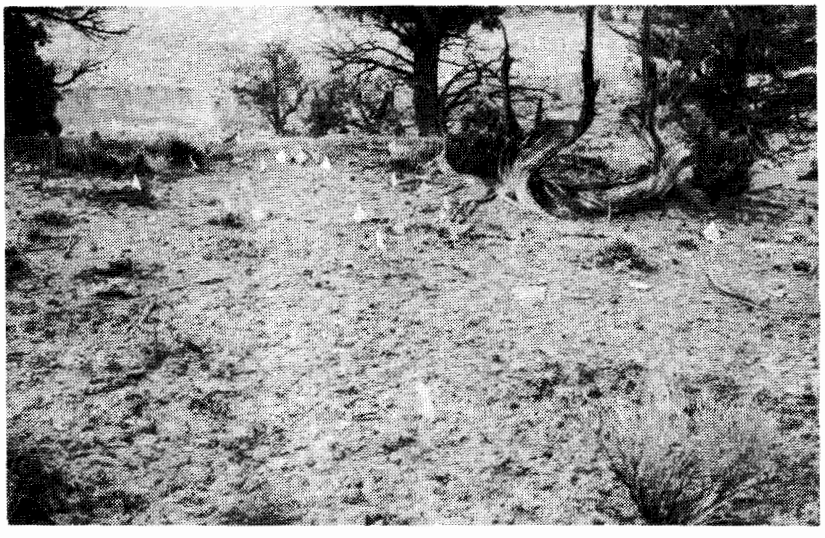
b. 5 RB1579 - Petrograph panel overview, shot NW.

c. 5 RB1786 - Shot NE of mound and probed area.

PLATE III: Groundstone Artifacts/Campsite

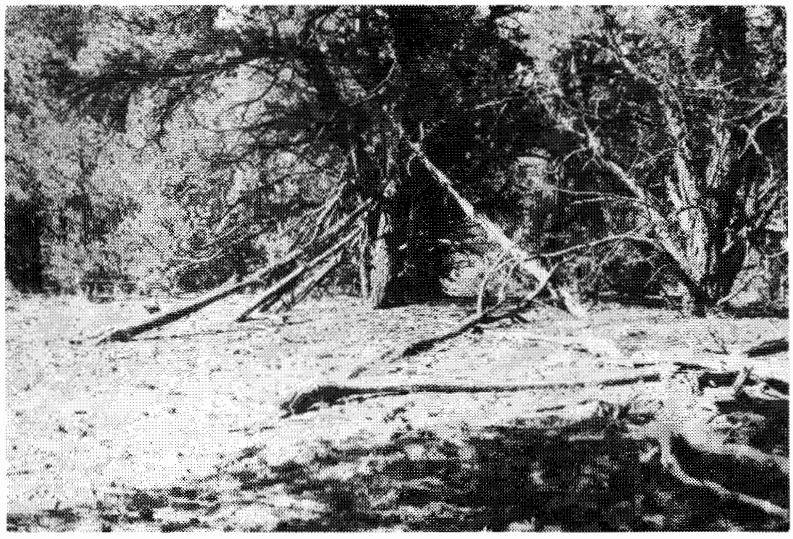


a. 5 RB1553 - Closeup of metate with mano in situ. Clipboard and notebook for scale.



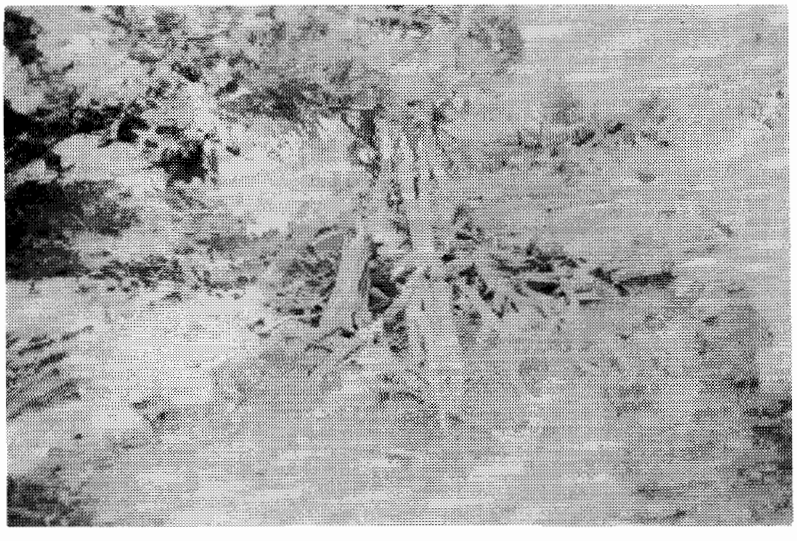
b. 5 RB1569 - Closeup of metate fragment. Lens cap for scale.

c. 5 RB1797 - Shot W of finishing and hearth area at S end of site. Pinflags indicate artifact distribution.

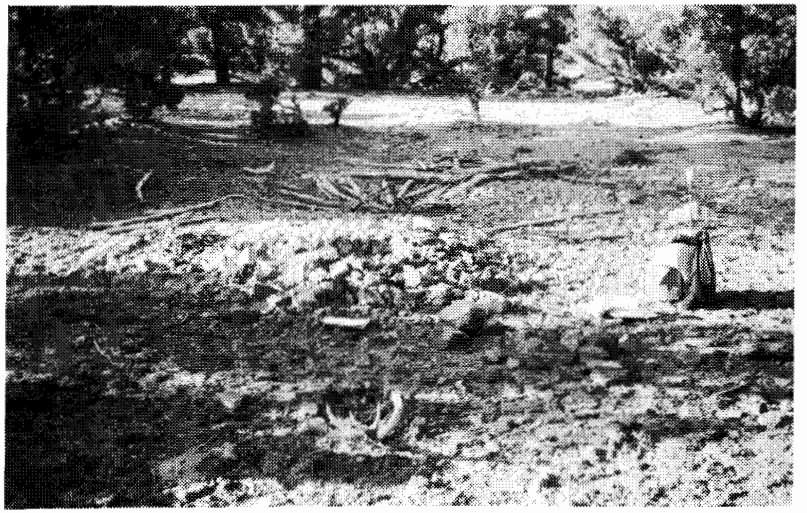


a. 5 RB1570 - Shot E to wickiup structural remains among trees.

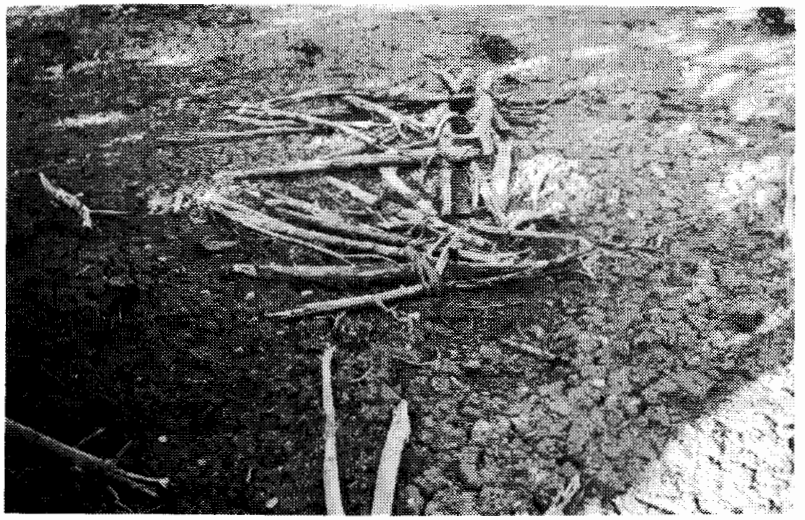
b. 5 RB1806 - Shot N of remains of juniper pole structure.



c. 5 RB1808 - Possible structure built over log, found E of little concentration.



a. Shot W of sweatlodge remains and fire-cracked rock pile.



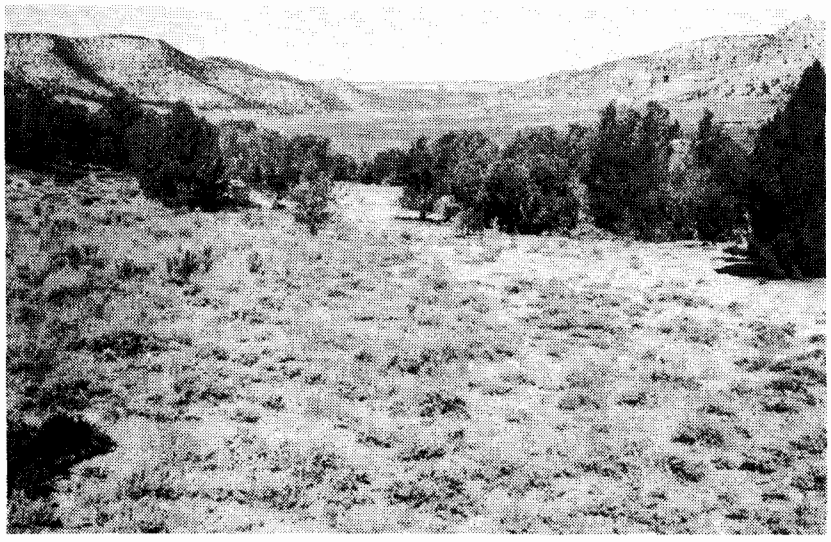
b. Shot NW of sweatlodge remains.

c. Shot W, closeup of fire-reddened & cracked stone rubble pile.

d. Closeup of sweatlodge poles.

a. 5 RB1/32 - Pile of flakes within site. Camera lens & pinflag for scale. Representative of dense concentrations (piles) of flakes common in sites throughout the study area.

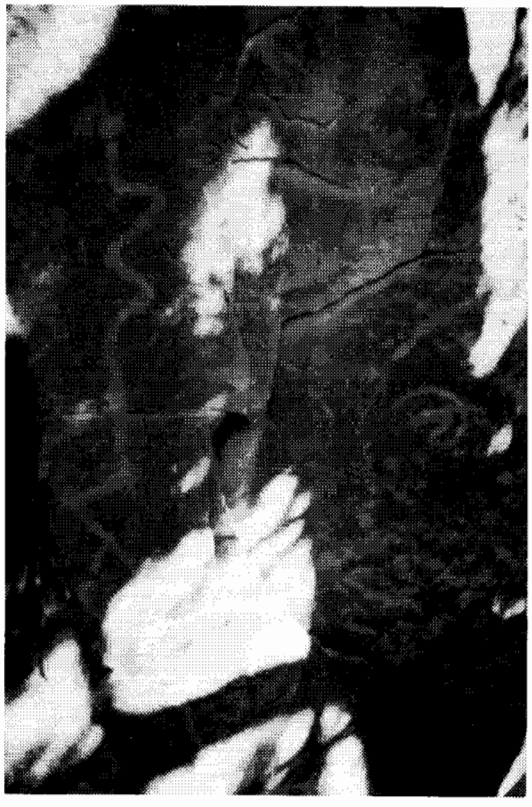
PLATE VII: Lithic Scatters



a. 5 RB968 - Shot W through linear scatter.

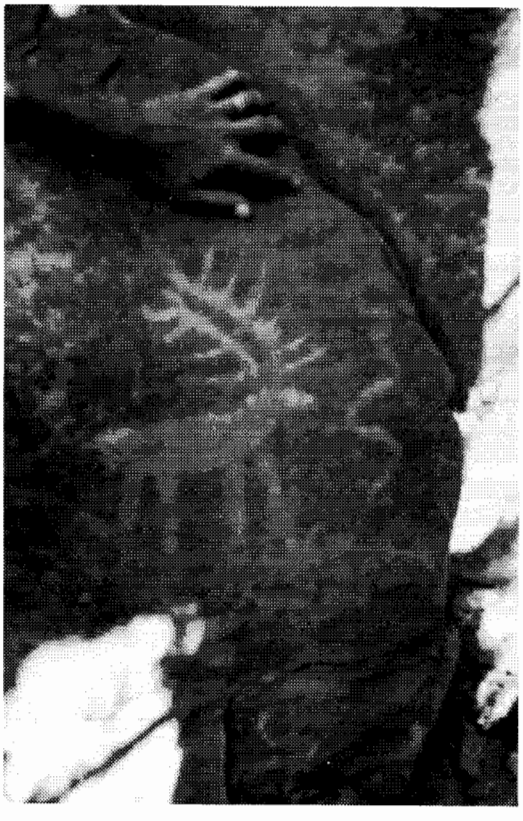
b. 5 RB1540 - Shot N of subconcentration area within site. Pinflags indicate distribution of artifacts.

c. 5 RB1542 - Shot N throug datum area of site.



a. Snake motif.

b. Anthropomorphs



c. Cervine zoomorph and snake motif.

d. Bear claw? motif.

## REFERENCES CITED


Aikens, C. Melvin
1966 Fremont-Promontory-Plains Relationships. Anthropological Papers No. 82. University of Utah, Salt Lake City.

Anderson, Jane L. and Ruth A. Henss
n.d. Final Report on the Cultural Resource Survey of Core Holes and Access Roads in Three Lease Areas in the Moon Lake Project Area. Unpublished ms. Pioneer Archaeological Consultants, Longmont, Colorado.

Annand, Richard E.
1967 A Description and Analysis of Surface Collected Pottery from the Collbran Region, Colorado. Southwestern Lore 33(2):47-60.

Athearn, Frederic J.
1976 An Isolated Empire: A History of Northwest Colorado. Cultural Resource Series No. 2 - Historical. Bureau of Land Management. Colorado State Office, Denver.

1980 Determination of Eligibility: The Uintah Railway, Mesa, Garfield, and Rio Blanco Counties, Colorado. Unpublished ms. Bureau of Land Management. Colorado State Office, Denver.

Babcock, Thomas J. and James V. Sciscenti
1980 Archaeological Monitor of the Mapco Rocky Mountain Liquid Hydrocarbon Pipeline, BLM Craig District, Colorado. Unpublished ms. Report No. 8056, Grand River Consultants, Grand Junction, Colorado.

Bender, Henry E, Jr.
1970 Uintah Railway, The Gilsonite Route. Howell-North Books, Berkeley.

Berge, Dale L.
1980 Simpson Springs Station, Historical Archaeology in Western Utah, 1974-1975. Cultural Resource Series No. 6. Bureau of Land Management. Utah State Office, Salt Lake City.

Breternitz, David A. (Assembler)
1970 Archaeological Excavations in Dinosaur National Monument, Colorado-Utah, 1964-1965. University of Colorado Studies, Series in Anthropology No. 17. University of Colorado, Boulder.

Buckles, William Gayle
1964 An Analysis of Primitive Rock Art at Medicine Creek Cave, Wyoming and its Cultural and Chronological Relationships to the Prehistory of the Plains. Unpublished M.A. thesis. Department of Anthrology, University of Colorado, Boulder.

1971 The Uncompahgre Complex: Historic Ute Archaeology and Prehistoric Archaeology on the Uncompahgre Plateau in West Central Colorado. Unpublished Ph.D. dissertation. Department of Anthropology, University of Colorado, Boulder.

Bureau of Land Management
1978 Unit Resource Analysis - Rangely Planning Unit. Craig District Office, Craig.

1980 Draft Green River-Hams Fork Environmental Impact Statement - Coal. Part 1. Colorado State Office, Denver.

Burton, Robert Jordan
1971 The Pictographs and Petroglyphs of Dinosaur National Monument. Unpublished M.A. thesis. Department of Anthropology, University of Colorado, Boulder.

Carlson, Roy L.
1965 Eighteenth Century Navajo Fortresses of the Gobernador District. The Earl Morris Papers No. 2. University of Colorado Studies, Series in Anthropology. University of Colorado, Boulder.

Chandler, Susan M. and Paul R. Nickens
1979a Archaeological Investigations of Two Power Plant Sites and Water Pipeline Corridors for the Moon Lake Project, Rio Blanco County, Colorado and Uintah County, Utah. Unpublished ms. Moon Lake Project Report 79-4. Centuries Research Inc., Montrose, Colorado.

1979b Archaeological Investigations of the Coal Development Areas and Coal Transport Corridors for the Moon Lake Project, Rio Blanco County, Colorado and Uintah County, Utah. Unpublished ms. Moon Lake Project Report 79-5. Centuries Research Inc., Montrose, Colorado.

Clint, David K., et al.
1976 Colorado Historical Bottles and Et cetera, 1859-1915. Antique Bottle Collectors of Colorado, Inc. Johnson Publishing Co., Boulder.

Colorado Preservation Office
1981 Site Inventory Files. AREMS Summary Module. Denver.

1882 Congressional Record, 47th Congress: First Session 1882, XIII(1): 247. Government Printing Office, Washington, D.C.

Copp, Henry N.
1894 The American Settler's Guide. Nineteenth Edition, Washington.

Creasman, Steven D.
1979 Archaeological Investigations in the Canyon Pintado Historic District, Rio Blanco County, Colorado - Phase I: Inventory and Test Excavations. Unpublished ms. Reports of the Laboratory of Public Archaeology No. 34. Colorado State University, Fort Collins.

Dick, Everett
1970 The Lure of the Land. University of Nebraska Press, Lincoln.

Fontana, Bernard L., et al.
1962 Johnny Ward's Ranch: A Study on Historic Archaeology. The Kiva 28(1-2).

Fritz, Percy Stanley
1941 Colorado, the Centennial State. Prentice Hall Inc., New York.

Gebhard, David
1966 The Shield Motif in Plains Rock Art. American Antiquity 31(5-1): 721-732.

Gordon, E.K., K.J. Kranzush, and D.J. Knox
1979 Final Cultural Resource Inventory Report - 1978 Taiga/Coseka Drilling Program - 1978 Northwest Pipeline West Foundation Creek Gathering System, Rio Blanco/Garfield Counties, Colorado. Unpublished ms. Gordon & Kranzush, Inc., Boulder.

Gunnerson, James H. and Dolores A. Gunnerson
1971 Apachean Culture: A Study in Unity and Diversity. In Apachean Culture History and Ethnology, Keith H. Basso and Morris E. Opler, eds. Anthropological Papers No. 21. University of Arizona, Tucson.

Hamblin, W.K. and J.D. Howard
1970 Physical Geology Laboratory Manual. Burgess Publishing Co., Minneapolis.

Hodder, Ian and Clive Orton
1976 Spatial Analysis in Archaeology. In New Studies in Archaeology, David L. Clarke, ed. Cambridge University Press, Cambridge, England.

Holmer, Richard N. and Dennis G. Weder
1980 Common Post-Archaic Projectile Points of the Fremont Area. Antiquities Section Selected Papers VII(6):55-68. Utah Division of State History, Salt Lake City.

Hughes, Donald J.
1977 American Indians in Colorado. Pruett Press Publishing Co., Boulder.

Hunt, Alice B.
1953 Archaeological Survey of the La Sal Mountain Area, Utah. Anthropological Papers No. 14. University of Utah, Salt Lake City.

Hunt, Charles B.
1959 Dating of Mining Camps. Geotimes III(8):8-10.

Hurlbett, Robert E.
1976 Environmental Constraint and Settlement Predictability, Northwestern Colorado. Cultural Resource Series No. 3 - Archeological. Bureau of Land Management. Colorado State Office, Denver.

Jennings, Jesse D.
1968 Prehistory of North America. McGraw Hill Book Company, New York.

Kendrick, Grace
1967 Bottle Fragments Betray Age of Historical Sites. El Palacio 74(2): 19-24.

Knox, Donna J.
1981 Final Cultural Resource Report - Coseka Well #3-14-4-104 and Access. Unpublished ms. Cultural Resources Inventory Report Series No. 81-7. Gordon & Kranzush, Inc., Boulder.

Kranzush, K.J., et al.
1979 The Archaeological Survey of the Hansen Project, Vol. I. Unpublished ms. Cultural Resources Inventory Report Series No. 79-18. Gordon & Kranzush, Inc., Boulder.

La Point, Halcyon
1980 Letter Report of Findings of Archaeological Reconnaissance of the Proposed Mapco and Arco Pipeline Right-of-Way. Sent to Beth Walton, Bureau of Land Management, Craig District Office. Unpublished letter. Laboratory of Public Archaeology, Colorado State Universtiy, Fort Collins.

Madsen, David B. and Michael S. Berry
1975 A Reassessment of Northeastern Great Basin Prehistory. American Antiquity 40(4):3-1-405.

Nelson, F.W. and R.D. Holmes
1979 Trace Element Analysis of Obsidian Sources and Artifacts from Western Utah. Antiquities Section Selected Papers No. 14. Utah Division of State History, Salt Lake City.

Norman, Georgina Emily F.
1957 The White Settlement of the Ute Reservation, 1880-1885. Unpublished M.A. thesis. Department of Anthropology, University of Colorado, Boulder.

Olson, Alan, et al.
1975 An Archaeological Survey for the Assessment for the Rio Blanco Oil Shale Project: Report for Gulf Oil Company. Unpublished ms. Department of Anthropology, University of Denver, Denver.

O'Neill, Floyd A.
1973 A History of the Ute Indians of Utah Until 1890. Unpublished Ph.D. dissertation. Department of Anthropology, University of Utah, Salt Lake City.

Peffer, E. Louise
1951 The Closing of the Public Domain: Disposal and Reservation Policies, 1900-1950. Stanford University Press, Stanford.

Sabatka, Edward F. (Ed.)
1964 Guidebook to the Geological and Mineral Resources of the Uintah Basin, Utah's Hydrocarbon Storehouse. Intermountain Association of Petroleum Geologists 13th Annual Field Conference. Humble Oil and Refining Company, Salt Lake City.

Schaafsma, Polly
1971 The Rock Art of Utah. Papers of the Peabody Museum of Archaeology and Ethnology, Vol. 65. Harvard University Press, Boston.

Sharrock, Floyd W.
1966 Prehistoric Occupation Patterns in Southwestern Wyoming and Cultural Relationships with the Great Basin and Plains Culture Areas. Anthropological Papers No. 77. University of Utah, Salt Lake City.

Smith, Anne M.
1974 Ethnography of the Northern Utes. Papers in Anthropology No. 17. Museum of New Mexico Press, Albuquerque.

Spiva, Agnes Elizabeth
1927 The Utes in Colorado, 1863-1880. Unpublished M.A. thesis. Department of History, University of Colorado, Boulder.

Steward, Julian H.
1974 Ute Indian I. Garland Publishing Inc., New York.

Toulouse, Julian Harrison
1971 Bottle Makers and Their Marks. Thomas Nelson Publishing Co., New York.

1972 A Collector's Manual - Fruit Jars. Thomas Nelson Inc., Nashville.

Weber, David, et al.
1977 Archaeological Reconnaissance of Nine In Situ Oil Shale Lease Tracts, Colorado-Utah. Unpublished ms. Laboratory of Public Archaeology, Colorado State University, Fort Collins.

Wormington, H. Marie
1955 A Reappraisal of the Fremont Culture. Proceedings No. 1. Denver Museum of Natural History, Denver.

Wormington, H. Marie and Robert H. Lister
1956 Archaeological Investigations on the Uncompahgre Plateau in West Central Colorado. Proceedings No. 2. Denver Museum of Natural History, Denver.

## Personal Communications

| | |
|---|---|
| Firebaugh, Gail<br>1981 | Staff Archaeologist, Pioneer Archaeological Consultants<br>RE: Historic industrial artifact identification and Navajo sweatlodges |
| Fowler, Robert<br>1980 | Range Conservationist, Bureau of Land Management-Craig<br>RE: Weather conditions in the T-M-E study area |
| Gentry, Allen<br>1980-1981 | Local Resident, Rio Blanco County, Colorado<br>RE: Historic ruins and activity, and weather patterns in the T-M-E study area |

| | |
|---|---|
| Jennings, Calvin H.<br>1981 | Director, Laboratory of Public Archaeology<br>RE: Ceramic analysis and sweatlodge features |
| Maxwell, John<br>1981 | Colorado Railroad Museum<br>RE: Western Railway Equipment Company artifact analysis |
| Maxwell, Martha<br>1981 | Public Affairs, Bureau of Land Management-Denver<br>RE: Stock driveway in the T-M-E study area |
| Montoya, J.<br>1981 | Public Affairs, Bureau of Land Managment-Denver<br>RE: Oil and gas permits in the T-M-E study area |
| Walton, Beth<br>1980 | Craig District Archaeologist, Bureau of Land Management<br>RE: Toolstone source areas in northwest Colorado |
| Wheat, Joe Ben<br>1980 | Archaeological Curator, University of Colorado Museum<br>RE: Artifact analysis |

# APPENDIX A:

# COLLECTED CULTURAL REMAINS

## Collected Cultural Remains

Despite the vast quantities of lithic remains tabulated for prehistoric resource areas in the Texas-Missouri-Evacuation (T-M-E) Creeks study area (see Tables 3-5 in "Prehistory Results" section of report), actual collection of artifacts for laboratory study was minimized at the request of the Bureau of Land Management. Only those artifacts, totalling 425 in number, thought to be of potential use in defining resource area functions, ages, or cultural affiliations were collected.

Of these items, projectile points, ceramics, and a few unusual types constitute the only classes of artifacts that were subjected to 100% collection. Projectile points have long been recognized by archaeologists as sensitive chronological and cultural indicators due to their widespread uniformity of styles and forms through time and space. If styles of projectile points are found in stratified sites which can be scientifically dated, such temporal associations can frequently be extrapolated from the dated site to surface occurrences of those styles in the general region. Ceramics also frequently exhibit high degrees of intra-type homogeneity of construction and appearance that allow for inferences of cultural and temporal affiliations of resources areas in which they are found.

In addition to points and ceramics, certain representative specimens of other general artifact classes were also collected for use-wear analysis and comparative study. These classes include flaked stone tools and other rare or unique lithic, bone, and glass artifacts. Only one ground stone artifact was collected; other complete specimens were photographed *in situ*

(Plate III, report) and described in the field. Also, a random sample of 32 (52%) of the 62 aboriginal localities recorded in the study area were 100% collected in order to conduct wear and functional analyses pursuant to determining the function(s) of this ubiquitous resource type. No perishable remains such as worked wood (other than structural wood), basketry, or fabric were observed during the Gordon and Kranzush, Inc. (G&K) survey of the T-M-E study area.

In this Appendix, all collected finished artifacts are grouped into types on the bases of morphology, intended primary function as interpreted from wear patterns and forms, and method of manufacture. All wear analysis was conducted both macroscopically and with a 10X hand lens. Stereoscopic micro-wear analysis studies were not possible due to contract limitations. Projectile point types are compared with collections from other areas of Colorado, Wyoming, and Utah in an effort to gain insight into possible temporal and/or cultural affiliations for the T-M-E cultural resources. As no stratified prehistoric sites have been excavated in the immediate T-M-E area, the following prehistoric sites which share certain regional or geographic similarities with the T-M-E study area are of prime importance for the current comparative study of the collected artifacts discussed herein:

Dinosaur National Monument Sites, north of Dinosaur, Colorado,
Moon Lake Project Sites, north of T-M-E area, Utah-Colorado,
Pine Spring Site, southwestern Wyoming,
Hogup Cave, northwestern Utah

See Figure A-1, below, for these and other key cultural resource sites and areas utilized in the cultural and chronological analysis of the T-M-E study area remains. Most of the areas used in comparisons are located at moderate to great distances from the study area; therefore, any cultural or chrono-

logical associations inferred for the T-M-E materials from comparisons with these other areas must be viewed as extremely tentative and general for the present.

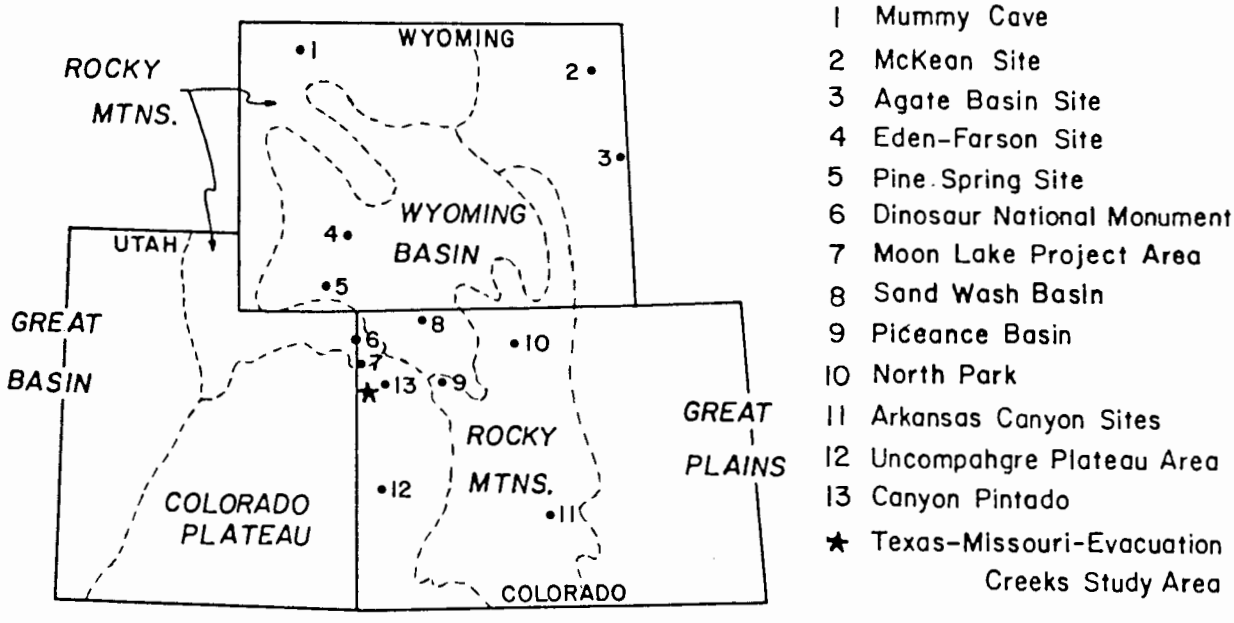



FIGURE A-1: Key Prehistoric Resource Areas

Another factor influencing the reliability of any current temporal inferences for the T-M-E aboriginal resources stems from the nature of the archaeological investigations conducted in the area to date. The T-M-E investigations were a Class III surface inventory, restricted to the recordation of exposed components of cultural resources. Since all collections come from surface contexts, their interpretive potentials may be reduced due to the mixing of distinct chronological components at a single site (through lack of stratification of sequential deposits and/or erosion) and the vulnerability of surface remains to radical alterations through the collection of finished artifacts by amateur collectors. Also, though numerous surface hearths and pole structural remains were recorded, contract

limitations prevented the sampling of these features for radiometric and/or dendrochronological dating.

In order to stress the tenuous nature of any cultural or temporal associations inferred for the T-M-E cultural resources through comparison with other cultural sites located outside of the T-M-E geographic zones, all tentative assignments of dates to artifacts have been made employing intentionally broad terms that loosely define equally broad prehistoric and historic periods or traditions. Definitions for these terms as used in this study are as follow:

Paleoindian (aka Early Desert Archaic): pre-dating 5000 BC (ca. 7000 BP) -small bands of nomadic hunters and gatherers; big game based economy; large, well-made lanceolate, and sometimes fluted, projectile points

Early Archaic: 5000-3000 BC (ca. 7000-5000 BP) -nomadic bands of hunters and gatherers; broad based subsistence; large side-notched points common

Middle Archaic: 3000-1000 BC (ca. 5000-3000 BP) -same as Early Archaic with increasing groundstone; large to medium stemmed points common (McKean Technocomplex)

Late Archaic: 1000 BC - AD 400 (ca. 3000-1450 BP) -same as Middle Archaic with incipient horticulture; medium corner-notched points common; introduction of bow and arrow and ceramics

Fremont: AD 400-1250 (ca. 1450-700 BP) -semi-sedentary to nomadic small groups of hunters, gatherers, and horticulturalists; ceramics, distinctive rock art motifs, and small corner-notched points

Proto-historic (Numic): AD 1250-1880 (ca. 700-100 BP) - nomadic hunters and gatherers; small game based subsistence with big game adaptations; ceramics and small side-notched points; in T-M-E study area, thought to be Numic-speaking Utes (historically documented), Shoshoni and possibly Apache (Athabascan language stock); horse and equestrian rock art motifs (late); wickiups; European trade goods; increased use of obsidian

Historic: AD 1880-1930 (ca. 100-50 BP) -end of Ute occupation and introduction of Euroamerican settlement; homesteads; Uintah Railway transportation corridor; stock driveway; limited ranching and hay farming; mineral development

FLAKED STONE TOOLS

## Projectile Points

A total of 76 projectile point specimens were collected from the 356 cultural resource areas recorded during the inventory of the T-M-E study area. Of these, 56 (74%) are made of various forms of cryptocrystalline silicates (cherts, chalcedonies, etc.), 12 (16%) of siltstone, 5 (6%) of quartzite, 2 (3%) of quartz crystal, and 1 (1%) of obsidian. Twenty of the total are too fragmentary to allow for classification into types; the remaining 56 specimens have been grouped into 18 types with some intra-type subdivisions. Point types will be more thoroughly described than other lithic artifact classes to aid in future comparisons with other remains from the general area. For ease of reference, cryptocrystalline silicate materials are divided into two main categories: "cherts" (including tiger chert) and chalcedony. See Table A-1 for a summary of point provenience and temporal data.

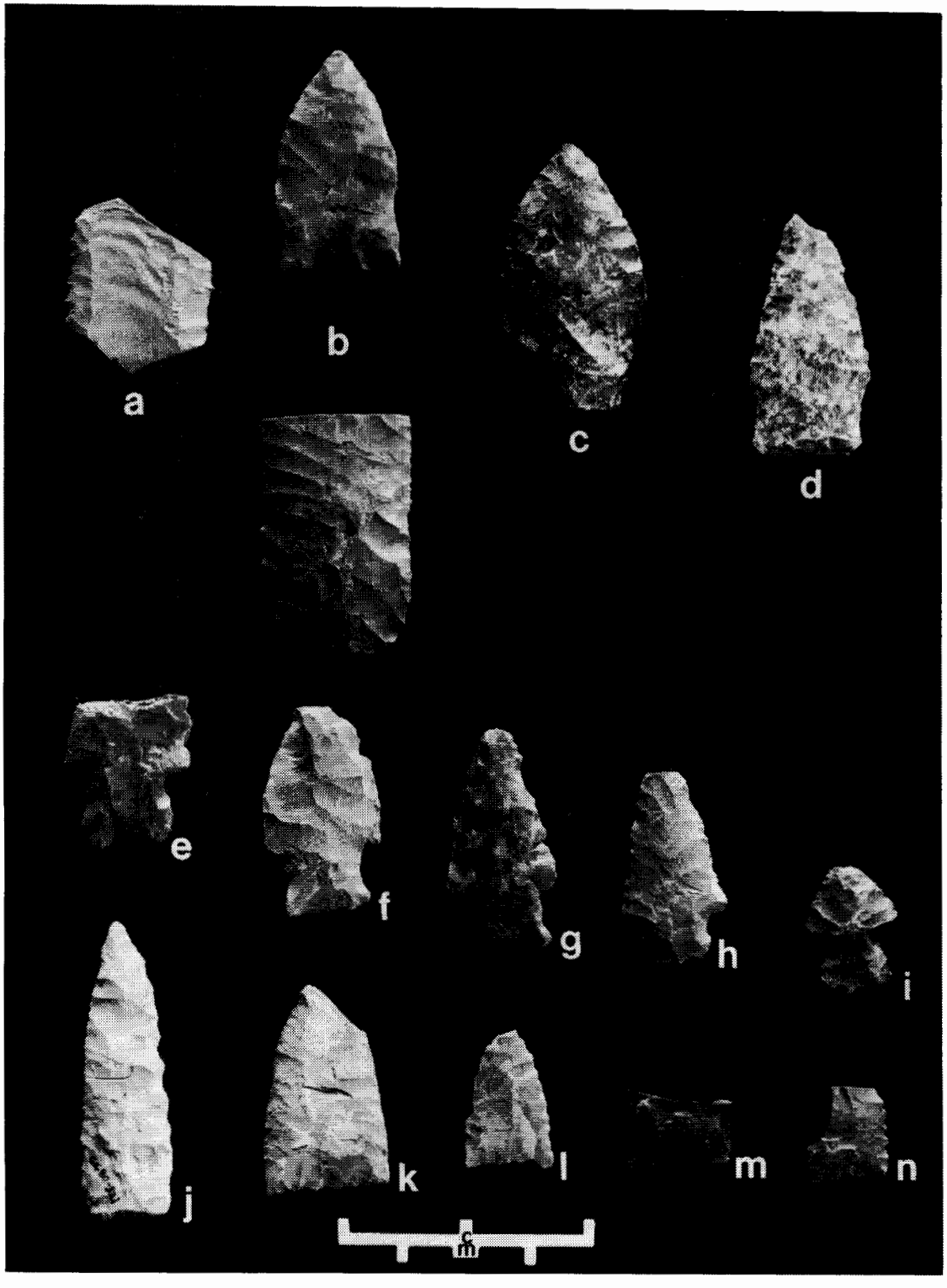
TME-1 (Plate A-1.a)

No. of Specimens: 1
Designation: 5 RB1544 (#106)
Blade: leaf-shaped; straight edges
Shoulder: none
Stem: straight
Base: unknown
Special Features: bifacially fluted
Material: siltstone
Length: fragmentary
Width: 23 mm
Thickness: 2 mm in flute, 3 mm at edge
Comparisons: Folsom point resembling specimens from the Plains and eastern foothills, dating to ca. 8800-8600 BC (Wheat, personal communication)
Associations: Paleoindian

TME-2 (Plate A-1.b)

No. of Specimens: 1 (in two fragments)

# PLATE A-1



Designation: 5 RB1539-B (#80-81)
Blade: lanceolate
Shoulder: none
Stem: slightly constricted
Base: unfinished, straight striking platform
Special Features: It appears that this specimen was broken during finishing and that the tip fragment was reworked into a constricted-stem projectile point, while the base fragment was discarded. The close proximity of the two fragments, the similarity of material and flaking style, and the clear reworking of the proximal end of the tip fragment support the hypothesis that the fragments represent a single specimen. The specimen exhibits fine parallel, oblique flaking, and the reworked tip is basally ground.
Material: chert
Length: original, 90 mm (est.); tip, 35 mm
Width: basal fragment, 24 mm; tip, 20 mm
Thickness: basal fragment, 5 mm; tip, 4 mm
Comparisons: Similar to Angostura or Frederick points from the Hell Gap site (6400-6000 BC), and to Agate Basin points from the Green River Basin, Wyoming (Frison, Wilson and Wilson 1974:120). Resembles specimens from Occupation 1 (7745 BC) at Pine Spring (Sharrock 1966:21-22, 53) and from Moon Lake Project Area (Chandler and Nickens 1979a:108, 114).
Associations: Paleoindian

TME-3 (Plate A-1.c)

No. of Specimens: 1
Designation: 5 RB1736 (#223)
Blade: leaf-shaped
Shoulder: none
Stem: constricted
Base: unknown
Special Features: exhibits parallel transverse flaking on one face, random flaking on the other face
Material: chert
Length: fragmentary
Width: 23 mm
Thickness: 6.5 mm
Comparisons: Strongly resembles Hell Gap points from the Plains and Rocky Mountains (Frison, Wilson and Wilson 1974:110, 113, 120), and a specimen from Cultural Layer 31 (ca. 6800+ BC) at Mummy Cave (McCracken 1978:82, 128). J.B. Wheat concurs with a Hell Gap identity for this point (personal communication).
Associations: Paleoindian

TME-4 (Plate A-1.d)

No. of Specimens: 1
Designation: 5 Rb1534 (#79)
Blade: triangular

Shoulder: oblique
Stem: straight
Base: straight
Special Features: stem and base are ground; tip exhibits impact fracture
Material: chert
Length: 40 mm (est)
Width: 19 mm
Thickness: 4.5 mm
Comparisons: No specimens resembling this type were uncovered during research of the literature for this region. It somewhat resembles the Darl type (AD 1-1000) found in Texas, but may be of Early Archaic age (Wheat, personal communication).
Associations: unknown, possibly Early Archaic

TME-5 (Plate A-1.e-i)

No. of Specimens: 5
Designations: 5 RB1539-A (#84a, 84b), 5 RB1569 (#197), 5 RB1756 (#330), 5 RB1788 (#312)
Blade: leaf-shaped to triangular; straight to concave edges
Shoulder: abrupt
Stem: straight to slightly expanding
Base: straight to concave
Special Features: Two specimens are basally ground; three specimens have been reworked and/or resharpened (after breakage?), perhaps reflecting a secondary use as knives for some of this type.
Material: 3 chert (60%), 2 siltstone (40%)
Length: Range 19-34 mm, Av. 26.5 (2 complete specimens)
Width: Range 16-20 mm, Av. 17.8
Thickness: Range 4.5-5.5 mm, Av. 5 mm
Comparisons: Similar to specimens from Occupations 2-3 (Late Archaic?) at Pine Spring (Sharrock 1966:25-26, 60-62), from the Fremont 42UN49 in northeast Utah (Breternitz 1970:36), from the Piceance Basin (Weber et. al. 1977:151-153), and from Cultural Layer 9 (2455 BC) at Mummy Cave (McCracken 1978:109); also resemble Pinto series points from Hogup Cave (Aikens 1970:42) and McKean Technocomplex Duncan and Hanna points (ca. 5000-3000 BC) (Frison, Wilson and Wilson 1974:123). This type is somewhat similar to specimens from Canyon Pintado as well (Creasman 1979:III-70), including one dated to before 1550 BC from 5 RB148 (Ibid.:VI-3).
Associations: probably Middle Archaic through Fremont

TME-6 (Plate A-1.j-n)

No. of specimens: 5
Designations: 5 RB1554 (#109), RB1615 (#175), Rb1693 (#345), RB1797 (#383), 5 RB1782 (#321)
Blade: triangular; slightly convex edges
Shoulder: none
Stem: expanding
Base: straight

Special Features: 4 of the specimens are unifacially thinned; 4 have slightly serrated blade edges; 2 have tip fractures; 1 has a unilateral basal tang; the longer specimen exhibits lateral wear and a transverse fracture that imply use of this artifact for cutting purposes.
Material: 4 chert (80%), 1 siltstone (20%)
Length: Range 22-46 mm, Av. 34 mm (2 complete specimens)
Width: Range 13-20 mm, Av. 15.7 mm
Thickness: Range 2-3.5 mm, Av. 2.6 mm
Comparisons: These unnotched points are very similar to Cottonwood series points from the Rangely, Colorado area (Chandler and Nickens 1979b:134-135, Anderson and Henss n.d.:103-105), Type Ia specimens from Canyon Pintado (Ibid.:III-67), points from Cultural Layers 1 (AD 1594) and 2 (AD 1114) at Mummy Cave (McCracken 1978:51-52, 85), specimens from the Eden-Farson Site (AD 1720) in Southwestern Wyoming (Frison 1971:258, 271), points from the Brown-Weiser Site in the Bighorn Mts. (AD 1500) (Frison, Wilson, and Wilson 1974:121), and specimens from Late Fremont sites in Dinosaur National Monument (Breternitz 1970:163).
Associations: Late Fremont through Proto-historic (Numic)

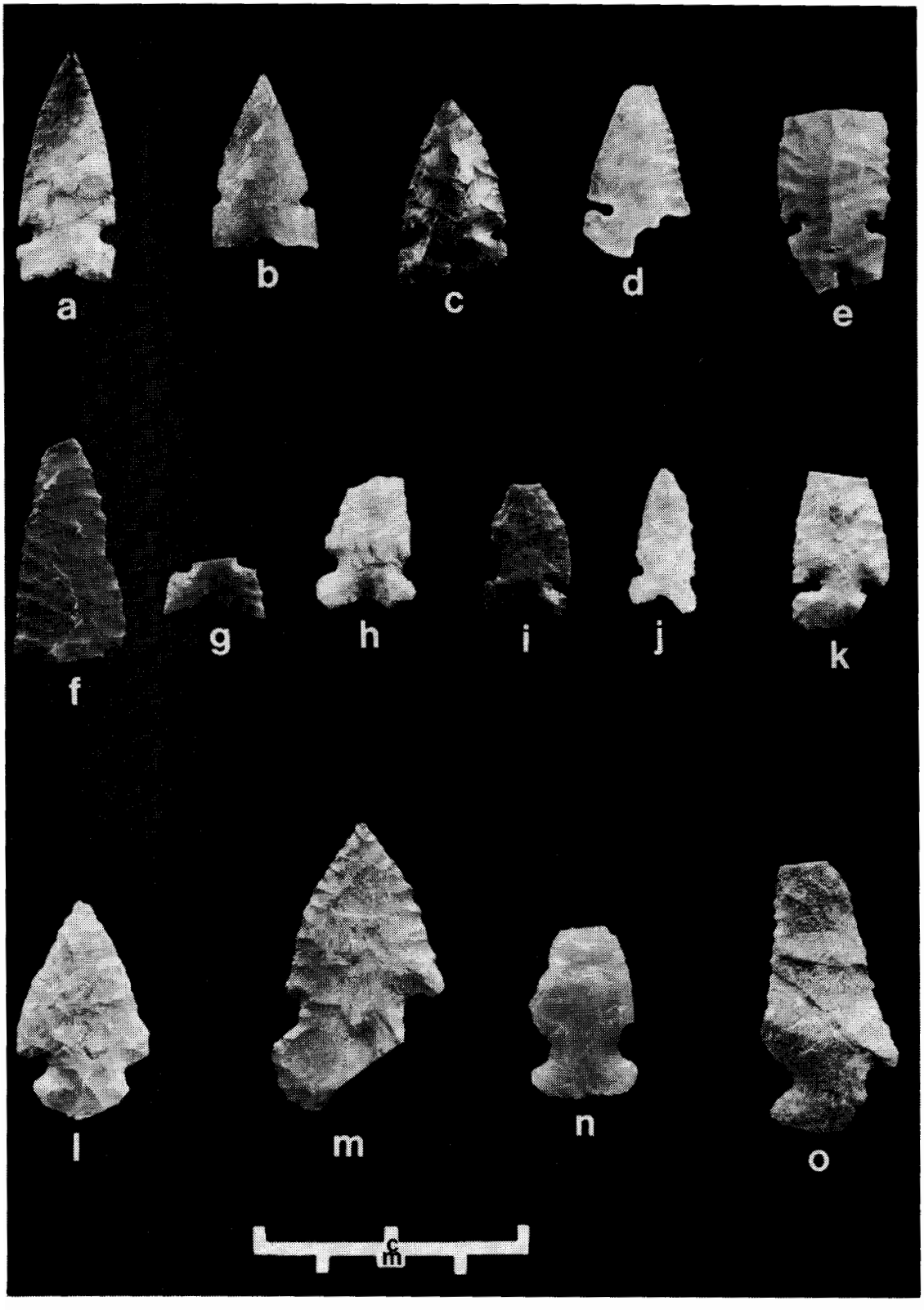
TME-7 (Plate A-2.a-g)

No. of Specimens: 7
Designations: 5 RB962 (#53), RB1553 (#107), RB1554 (#162), RB1570 (#198), RB1771 (#259), RB1776 (#308), RB1787 (#364)
Blade: triangular; edges straight to slightly convex
Shoulder: abrubt
Stem: expanding with moderate to deep U-shaped side-notches
Base: straight to concave with single central V- or U-shaped notch
Special Features: 2 specimens are plano-convex in cross-section; 1 has a tip impact fracture; 1 is asymmetrical
Material: 5 chert (71.4%), 1 quartz (14.3%), 1 chalcedony (14.3%)
Length: Range 25-33 mm, Av. 28 mm (4 complete specimens)
Width: Range 14-16.5 mm, Av. 15.3 mm
Thickness: 2-5 mm, Av. 3 mm
Comparisons: Desert Side-Notched points thought to have first appeared ca. AD 1150 in the study region and to be of Shoshonean origins (Holmer and Weder 1980:60). Similar specimens have been reported for Occupation 3 (AD 950-1200), co-occurring with Fremont ceramics, at Pine Spring (Sharrock 1966:59-60), in Cultural Layer 1 (AD 1594) at Mummy Cave (McCracken 1978:85), at the Shoshonean Eden-Farson Site (AD 1720± 100) (Frison 1971:271), and in Canyon Pintado Sites (Creasman 1979:III-71, 72, 81).
Associations: L. Fremont through Proto-historic - Numic(?)

TME-8 (Plate A-2.h-j)

No. of Specimens: 3
Designations: 5RB1553 (#108), RB1581 (#172), RB1804 (#362)
Blade: leaf-shaped to triangular; edges weakly convex

# PLATE A-2



Shoulder: abrupt
Stem: widely expanding with deep U-shaped lateral to oblique side-notches
Base: strongly convex with central concavity approaching a broad U-shaped notch
Special Features: 2 specimens have tip impact fractures
Material: 1 chert (33%), 1 quartzite (33%), 1 chalcedony (33%)
Length: 20 mm (1 complete specimen)
Width: Range 10-14.5 mm, Av. 12.5 mm
Thickness: Range 2.5-4 mm, Av. 3.5 mm
Comparisons: May be a variant of TME-7, but earred tangs of this type led to separation from TME-7. Similar specimens are rare in the literature, this type somewhat resembles a specimen from the Eden-Farson Site (Frison 1971:27), some specimens from Cultural Layer 12 (3290 BC) at Mummy Cave, though these TME-8 points are much smaller (McCracken 1978:117). This type co-occurs with a TME-7 specimen at 5 RB1553, suggesting contemporaenity of these two types.
Associations: unknown, likely Proto-historic

TME-9 (Plate A-2.k)

No. of Specimens: 1
Designation: 5 RB958 (#61)
Blade: triangular; edges straight
Shoulder: abrupt to oblique
Stem: expanding with deep, constricted U-shaped side-notches
Base: straight
Special Features: exhibits tip and stem fractures
Material: chert
Length: fragmentary
Width: 14 mm
Thickness: 3 mm
Comparisons: This specimen fits the description of the Uinta Side-Notched Fremont type (AD 800-1200) (Holmer and Weder 1980: 60), which are common throughout the T-M-E region in Fremont period sites. Similar specimens have been reported from the Wardell site (AD 780-990) in Wyoming (Frison, Wilson, and Wilson 1974:123), from Canyon Pintado (Creasman 1979: III-71, 81), various sites in Dinosaur National Monument (Breternitz 1970), sites in the Moon Lake Project area (Anderson and Henss n.d.:105), (Chandler and Nickens 1979a: 102), (Chandler and Nickens 1979b:118), sites in the Piceance Basin (Weber et al 1977:165), and in Occupation Level 3 (Fremont, AD 950-1200) at Pine Spring (Sharrock 1966:26, 60)
Associations: Fremont

TME-10a (Plate A-2.l-m)

No. of Specimens: 2
Designations: 5 RB956 (#58), RB1547 (#104)
Blade: broad leaf-shaped; convex edges
Shoulder: abrupt to oblique

Stem: expanding with broad, deep U-shaped lateral notches
Base: Strongly convex
Special Features: 1 specimen has slightly serrated blade edges and an oversized stem
Material: 1 chert (50%), 1 siltstone (50%)
Length: Range 31-35 mm, Av. 33 mm
Width: Range 19.5-23 mm, Av. 21.3 mm
Thickness: Range 4.5-5.5 mm, Av. 5 mm
Comparisons: Similar to Great Basin Rocker Side-Notched points (4850-3350 BC) from Sudden Shelter in Utah (Holmer 1978:55, 68) and to an Elko-like specimen from Canyon Pintado (1310 BC?) (Creasman 1979:III-80), and to a specimen from the Piceance Basin (Weber et al 1977:157, 161), and points from the Uncompahgre Plateau (Wormington and Lister 1956:72)
Associations: possibly Middle to Late Archaic

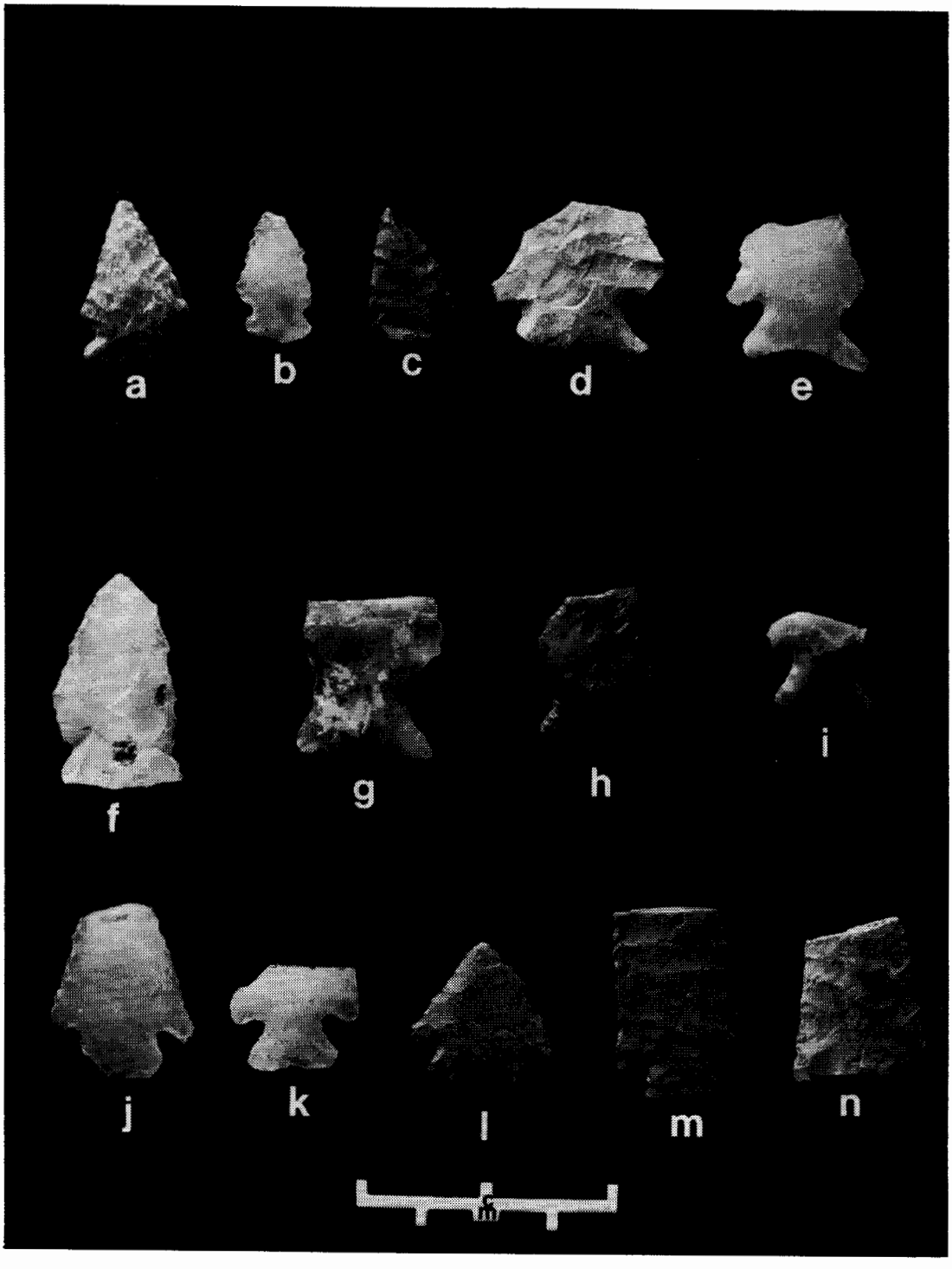
TME-10b (Plate A-2.n-o)

No. of Specimens: 2
Designations: 5 RB1554 (#163), RB1735 (#230)
Blade: triangular; edges straight to concave
Shoulder: abrupt
Stem: widely expanding with very broad U-shaped lateral notches
Base: convex
Special Features: both specimens exhibit tip impact fractures; the smaller specimen shows evidence of resharpening along one lateral edge
Material: 1 quartzite (50%), 1 chert (50%)
Length: fragmentary
Width: Range 15.5-20 mm, Av. 17.75 mm
Thickness: 5 mm
Comparisons: Similar to TME-10a, but has a triangular blade and a "rocker" shaped base. They resemble, but are smaller than, Rocker Side-Notched styles from the Great Basin (4850-3350 BC) (Holmer 1978:55, 68), Archaic specimens from the Piceance Basin and Uncompahgre Plateau (Weber et al 1977:169, 173), specimens from the Sand Wash Basin (Stucky 1977:42-43), Archaic(?) specimens from Occupation 2 at Pine Spring (Sharrock 1966:62), and a Fremont specimen from the Wagon Run site in Dinosaur National Monument (Breternitz 1970:36-37)
Associations: possibly Late Archaic-Fremont

TME-11 (Plate A-3.a-c)

No. of Specimens: 3
Designations: 5 RB1583 (#165), Rb1624 (#294), RB1754 (#222)
Blade: triangular; straight to convex edges
Shoulder: abrupt to rounded
Stem: expanding with broad to constricted U-shaped lateral notches
Base: weakly concave to weakly convex
Special Features: 1 specimen has a tip impact fracture; 1 specimen is asymmetrical and has either an unfinished or broken base with some evidence of bilateral double side-notching

# PLATE A-3



Material: 2 chert (67%), 1 chalcedony (33%)
Length: Range 20.5-24.5 mm, Av. 22 mm
Width: Range 12-17 mm, Av. 14.7 mm
Thickness: Range 2-5.5 mm, Av. 3.7 mm
Comparisons: Similar to specimens recorded in Cultural Layer 1 (AD 1594) at Mummy Cave (McCraken 1978:85), from Level 4 (Archaic?) at Deer Lodge Midden in Dinosaur National Monument (Breternitz 1970:97-98), from Levels 3-4 (Archaic-Historic?) at Serviceberry Shelter (Ibid.:140-141), and from Caldwell Village in Utah (Ambler 1966:100)
Associations: unknown; possibly Late Archaic through Historic

TME-12 (Plate A-3.d-e)

No. of Specimens: 2
Designations: 5 RB1561 (#210), Rb1696 (#328)
Blade: broad triangular(?)
Shoulder: strongly oblique
Stem: widely expanding (earred) with very deep oblique lateral notches
Base: concave
Special Features: 1 specimen exhibits some resharpening of 1 lateral edge
Material: 1 chalcedony (50%), 1 quartzite (50%)
Length: fragmentary
Width: fragmentary
Thickness: Range 4.5-5 mm, Av. 4.75 mm
Comparisons: Strongly resemble Early Archaic(?) specimens from 48 UT60 in southwestern Wyoming (Metcalf and Zier 1978), specimens from the Arkansas Canyon area (Kranzush, Gordon, Engleman and Knox 1979:263-264), a specimen from Level D at the Baker Cabin Spring site in Dinosaur National Monument (Breternitz 1970:110), points from Levels 3-4 at Serviceberry Shelter (Ibid.:140-141), and a specimen from Pine Spring (Sharrock 1966:60-61)
Associations: Archaic(?)

TME-13 (Plate A-3.f-i)

No. of Specimens: 4
Designations: 5 RB1547 (#105), RB1716 (#242), RB1775 (#316), RB1776 (#309)
Blade: broad triangular(?)
Shoulder: oblique
Stem: widely expanding with broad deep oblique corner notches
Base: straight
Special Features: 1 specimen has an unfinished base and evidence of blade-edge resharpening, and may be a preform or a knife
Material: 3 chert (75%), 1 chalcedony (25%)
Length: 32 mm (1 complete specimen)
Width: fragmentary
Thickness: Range 4-6 mm, Av. 5.25 mm
Comparisons: Compares well with a specimen from the Sand Wash Basin (4050 BC-AD 450) (Stucky 1977:43-45), and a specimen from Occupation Level 3 (AD 900-1330?) at Pine Spring (Sharrock 1966:26, 47)
Associations: possibly Late Archaic-Fremont

TME-14 (Plate A-3.j-l)

No. of Specimens: 3
Designations: 5 RB968 (#90, 91), 5 RB1781-7 (#302)
Blade: broad triangular; straight to convex edges
Shoulder: abrupt to strongly oblique
Stem: expanding with deep U-shaped corner notches
Base: straight
Special Features: 1 specimen has portions of the original flake surface preserved (unmodified) on both faces and is asymmetrical
Material: 2 chalcedony (67%), 1 siltstone (33%)
Length: fragmentary
Width: Range 20-22 mm, Av. 21.3 mm
Thickness: Range 3-4 mm, Av. 3.7 mm
Comparisons: Similar to a Late Plains Archaic(?) specimen from North Park, Colorado (Metcalf, Waitkus and Bradley 1980:11-12), points from the Moon Lake Project Area (Chandler and Nickens 1979a: 102, 104-105, Chandler and Nickens 1979b:130, 132-133), specimens from Occupation Level 3 (AD 900-1200?) at Pine Spring (Sharrock 1966:64), and to specimens from the Piceance Basin (Weber et al 1977:161-163), from Cultural Layer 5 (87 BC) at Mummy Cave (McCracken 1978:105), from the Sand Wash Basin (Stucky 1977:41-44), from the La Sal Mountains in Utah (Hunt 1953:35), and from sites (one of them Fremont) in Dinosaur National Monument (Breternitz 1970:98, 150). This type also resembles Elko Corner-Notched styles which span a 7000 year period in the Great Basin (Holmer 1978:37, 62-65)
Associations: L. Archaic through Fremont, and possibly into Proto-historic times. 1 co-occurs at RB1781-7 with TME-37 and 42 ceramics

TME-15 (Plate A-3.m-n)

No. of Specimens: 2
Designations: 5 rb1642 (#216), RB1763 (#275)
Blade: triangular; straight edges
Shoulder: strongly oblique
Stem: straight with deep diagonal corner notches
Base: straight
Special Features: the larger (more complete) specimen exhibits fine bi-facial parallel transverse flaking; both have slight basal grinding
Material: 1 chert (50%), 1 siltstone (50%)
Length: fragmentary
Width: Range 20-21 mm, Av. 20.5 mm
Thickness: 3.5 mm
Comparisons: Similar to specimens from Occupation 2 (Archaic?) at Pine Spring (Sharrock 1966:57, 62), a specimen from Canyon Pintado (Connors 1977:79), several points from the Piceance Basin (Weber et al 1977:162-164), specimens from the La Sal Mountains (Hunt 1953:37), and from the Uncompahgre Plateau area (Wormington and Lister 1956:72)
Associations: unknown

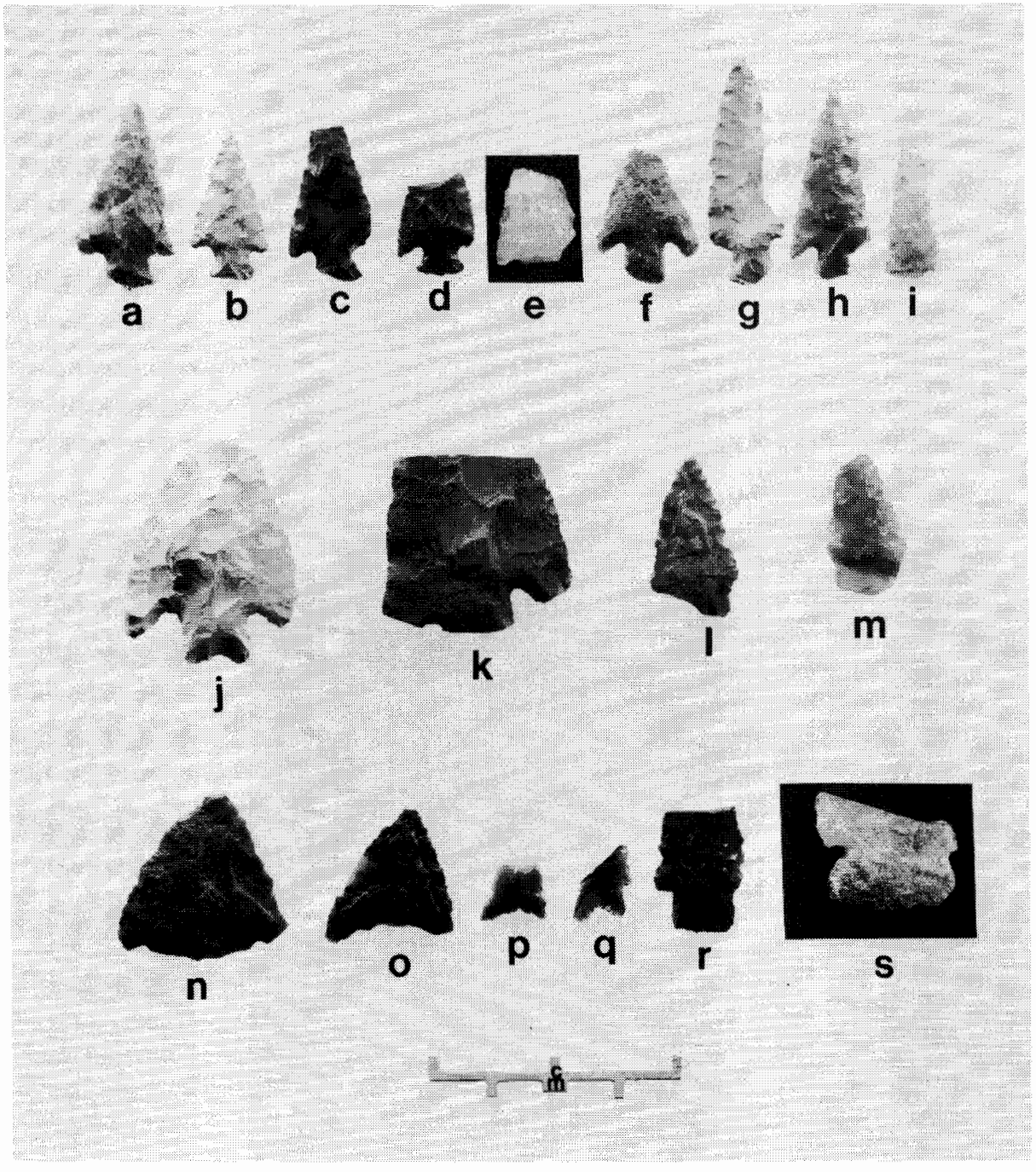
TME-16 (Plate A-4.a-i)

No. of Specimens: 9
Designations: 5 RB1579 (#181), RB1590 (#164), rb1660 (#296), Rb1666 (#227), RB1735 (#231, 232), RB1799 (#355), RB1802 (#349, 350)
Blade: triangular; edges straight to excurvate
Shoulder: oblique
Stem: straight to expanding with deep U-shaped corner/basal notches
Base: straight to slightly convex
Special Features: while several specimens exhibit subtle blade-edge serration, 1 tip specimen is distinctly and finely serated (Plate A-4.i)
Material: 1 quartzite (11%), 1 chalcedony (11%), 1 siltstone (11%), 6 chert (67%)
Length: Range 23-35 mm, Av. 29.5 mm (4 complete specimens)
Width: Range 12-16 mm, Av. 13.4 mm (8 specimens)
Thickness: Range 2.5-5 mm, Av. 3.4 mm
Comparisons: This type appears to be representative of the Rose Springs point type (AD 300-900) found in many sites in the Great Basin and northern Colorado Plateau area (Holmer and Weder 1980:56-60). Such specimens have also been recorded in Canyon Pintado (Creasman 1979:III-75-77, 80-81 and Connor 1977:79), Cub Creek Phase (AD 1000-1200?) sites in Dinosaur National Monument (Breternitz 1970:162-164), Piceance Basin Fremont and Historic sites (Weber et al 1977:155-160), Moon Lake Project Area sites (Chandler and Nickens 1979a:107-108, 1979b:130), Pine Springs Occupation 2 level (Sharrock 1966: 58-59), Cultural Layer 3 (AD 734) at Mummy Cave (McCracken 1978:86), and Uncompahgre Complex sites (Wormington and Lister 1956:13, 54)
Associations: probably Late Archaic-Fremont

TME-17 (Plate A-4.j-k)

No. of Specimens: 2
Designations: 5 RB956 (#57), rb1667 (#262)
Blade: broad leaf-shaped to triangular; edges straight to convex
Shoulder: strongly oblique
Stem: straight
Base: convex(?) with deep U-shaped notches
Special Features: 1 specimen is poorly thinned and somewhat asymmetrical; the other specimen has asymmetrical notching and is lacking tip, base and tangs
Material: 1 chert (50%), 1 siltstone (50%)
Length: fragmentary
Width: Range 28-30 mm, Av. 29 mm
Thickness: 6 mm
Comparisons: These specimens are basically similar to each other only by virtue of their deep basal notching, and neither compares directly to any previously recorded types encountered during research. They are generally similar to specimens recorded in the Sand Wash Basin (Stucky 1977:41-44, 47), a site in Dinosaur National Monument (Breternitz 1970:121), Occupation Levels 2 and 3 at Pine Spring (Sharrock 1966:62, 64-65), and Cultural Layers 23-24 (1568 BC) at Mummy Cave (McCracken 1978:126)

# PLATE A-4



# TABLE A-1: Collected Projectile Points and Ceramics Distributions

| | TYPE | ASSOCIATIONS? | RB956 | RB958 | RB962 | RB968 | Rb1486 | Rb1534 | RB1539-A | RB1539-B | RB1544 | RB1547 | RB1553 | RB1554 | RB1559 | RB1561 | RB1569 | RB1570 | RB1579 | RB1581 | RB1583 | RB1590 | RB1615 | Rb1624 | rb1642 | rb1660 | Rb1666 | rb1667 | Rb1693 | Rb1696 | RB1716 | RB1735 | RB1736 | RB1754 | RB1756 | RB1763 | RB1770 | RB1771 | RB1775 | RB1776 | RB1779 | RB1781-7 | RB1782 | RB1787-1 | RB1787-2 | RB1788 | RB1797 | RB1799 | RB1802 | Rb1804 | Rb1837 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROJECTILE POINTS | TME-1 | Paleoindian Folsom | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TME-2 | Paleoindian | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TME-3 | Paleoindian Hell Gap | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TME-4 | Early Archaic? | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TME-5 | M.Archaic-Fremont Pinto/McKean | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| | TME-6 | L.Fremont-Numic Cottonwood Series | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | 1 | - | - | - | - | - |
| | TME-7 | L.Fremont-Numic Desert SideNotched | - | - | 1 | - | - | - | - | - | - | - | 1 | 1 | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | - |
| | TME-8 | Numic | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - |
| | TME-9 | Fremont Uinta SideNotched | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TME-10a | M.-L. Archaic? Rocker SideNotched | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TME-10b | L.Archaic-Fremont | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TME-11 | L.Archaic-Numic | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | 1 | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TME-12 | Archaic | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TME-13 | L.Archaic-Fremont? | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - |
| | TME-14 | Archaic-Numic? | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - |
| | TME-15 | ? | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TME-16 | L.Archaic-Fremont Rose Springs Series | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | 1 | - | - | - | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 2 | - | - |
| | TME-17 | ? | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | TME-18 | ? | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CERAMICS | | | | | | | | | | | | | | | | | | | | | | | | * | * | * | * | * | * | * | * | | | | | | | | | | | | | | | | | | | | | |
| | TME-37 | Fremont-Numic | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 25 | - | - | - | - | - | - | - | - | - |
| | TME-38 | Numic | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - |
| | TME-39 | Numic? | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 33 | - | - | - | - | - | - | - | - | - | - |
| | TME-40 | Numic (Ute?) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4 | - | - | - | - |
| | TME-41 | Apache?-Numic | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 12 | - | - | - | - | - | - | - |
| | TME-42 | Apache? | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - |
| | TME-43 | L.Fremont-Numic? | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| | TME-44 | Fremont | - | - | - | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Associations: unknown, possibly Late Archaic-Fremont

TME-18 (Plate A-4.l-m)

No. of Specimens: 2
Designations: 5 RB1559 (#77), RB1716 (#241)
Blade: triangular; edges straight
Shoulder: rounded
Stem: straight
Base: straight
Special Features: 1 specimen has slight lateral edge serrations, and the other has an asymmetrical medial ridge on each face and may be a preform
Material: 1 siltstone (50%), 1 chert (50%)
Length: 25.5 mm (1 complete specimen)
Width: Range 13-14 mm, Av. 13.5 mm
Thickness: 3.5-4.5 mm, Av. 4 mm
Comparisons: Not directly comparable to any specimens found in the research materials. One specimen occurs with a point (TME-13) at 5 RB1716 which may date to Late Archaic-Fremont times
Associations: unknown

FRAGMENTS (Plate A-4.n-s)

No. of Specimens: 20
Designations: 5 RB961 (#56), RB962 (#54), rb1512 (#76), RB1537 (#95, 96), RB1558 (#239), RB1567 (#160), RB1570 (#199), Rb1627 (#250), rb1650 (#237), rb1674 (#245), RB1721 (#178), RB1747 (#244), RB1775 (#315, 317), RB1780 (#320), RB1802 (#351), RB1769 (#280), RB1770 (#258), RB1797 (#381)
Material: 1 quartzite (5%), 1 obsidian (5%), 2 siltstone (10%), 5 chalcedony (25%), 1 quartz (5%), 10 chert (50%)
Description: These specimens are too fragmentary to allow for their classification at this time. Seven are midsection fragments, five are tips, six are bases, and two are unusual body fragments. Eight may be dart points, while the remaining twelve are small enough to suggest that they were utilized as arrow points. Some of the more complete fragments are illustrated (Plate A-4) for comparison by future researchers in this area.

## Unifacial Artifacts

A total of 37 primarily unifacially worked lithic tools and tool fragments were collected from the T-M-E study area. These are grouped into 4 types, with several intra-type subdivisions, on the basis of form and/or intended function. Of the collected remains in this general artifact

class, 27 (73%) are made of chert, 8 (22%) of siltstone, and 1 each (2.5%) of obsidian and quartzite. Three of the collected specimens are too fragmentary to be classified at this time. Table A-2 summarizes the resource provenience and frequency data for unifacially and bifacially flaked collected artifacts (excluding points, see Table A-1).

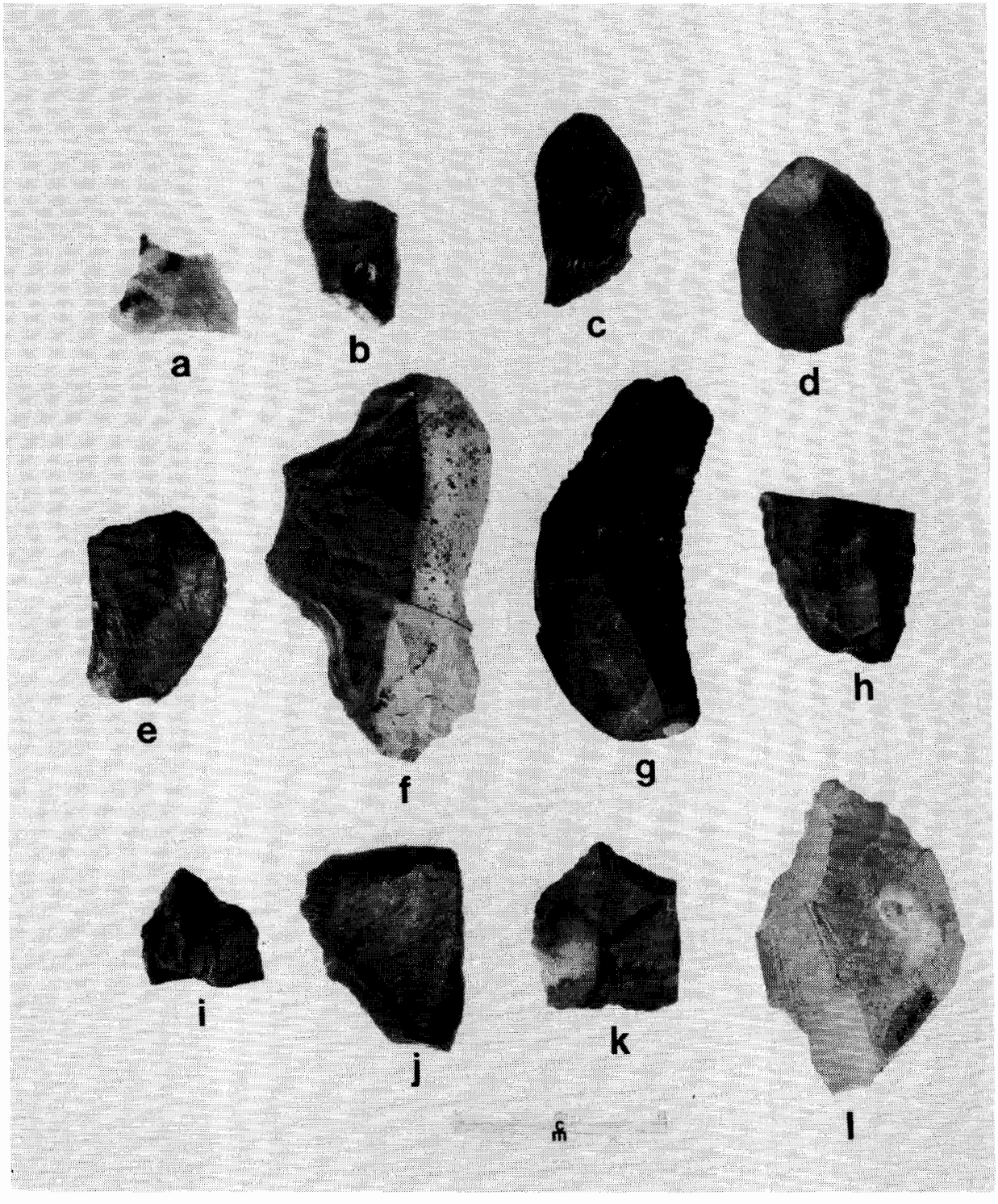
TME-19: Gravers (Plate A-5.a-b)

No. of Specimens: 2
Designations: 5 RB1799 (#353), 5 RB1570 (#201)
Description: Though these two specimens are not morphologically similar, they are grouped together on the basis of specific features and intended function. One specimen is made on a tabular flake fragment with the graving spur formed by steep unifacial edge retouch. The dorsal side of the flake is thinned and two lateral edges are intentionally blunted. The spur of this specimen exhibits rough pitting and attrition, suggestive of use against a resistant material. The other specimen is made from a very thin, broken spall. The spur has been delicately retouched on the end of a linear projection formed by a break. The spur shows slight polish suggestive of use against relatively pliant materials. Both specimens were probably utilized for graving or incising functions, or for scoring certain materials in preparation for their further reduction or manipulation.
Material: 2 chert (100%)
Length: Range 21-38 mm, Av. 29.5 mm
Width: Range 18.5-25 mm, Av. 21.8 mm
Thickness: Range 4-5 mm, Av. 4.5 mm
Associations: one specimen occurs at 5 RB1799 with a TME-16 projectile point that may date to Late Archaic-Fremont times; the other specimen occurs at 5 RB1570 with a TME-7 point and a wickiup structure, suggesting Numic associations

TME-20a: Side Scraper - Single Bit (Plate A-5.e)

No. of Specimens: 1
Designation: 5 RB1781-4 (#340)
Description: This specimen is made on a thin tabular flake fragment and has a convex bit formed by steep dorsal unifacial retouch along one lateral edge. The resultant edge angle is steep ($70^{o}$) and exhibits some evidence of resharpening. The present bit edge is not worn and may indicate that the tool was lost or discarded after the final resharpening.
Material: chert
Length: 37 mm
Width: 26 mm
Thickness: 5 mm

# PLATE A-5



Associations: none

TME-20b: Side Scrapers - Double Bit (Plate A-5.f-h)

No. of Specimens: 7
Designations: 5 Rb1491 (#41), 5 RB954 (#59), RB1540 (#100), RB1569 (#189, 192), RB1714 (#270), RB1850 (#367)
Description: This class of scraper is made on generally plano-convex to prismatic percussion flakes and exhibits steep unifacial retouch on both parallel, long lateral edges, and occassionally on distal and/or proximal edges as well. In 2 instances, lateral retouch is wholly use-caused, incurred on a natural flake edge by a unidirectional scraping motion. Edge angles range from 40-80$^{o}$, and the most common wear patterns observed include bit edge rounding and minor bifacial nibbling through the removal of small scalar flakes. Two specimens show evidence of resharpening of portions of their working edges. Two specimens have cortex on their dorsal surfaces, and 1 specimen has 2 worked concavities which may have served a "spokeshave" function. Three specimens exhibit some intentional thinning of the percussion bulb, possibly as an aid to hafting. It is likely that this tool type was utilized for light to moderate duty scraping and/or whittling tasks involving pliant to somewhat resistant materials.
Material: 6 chert (86%), 1 siltstone (14%)
Length: Range 69-72 mm, Av. 70.5 mm (2 complete specimens)
Width: Range 14-40 mm, Av. 26 mm
Thickness: Range 3-11 mm, Av. 6.6 mm
Associations: one specimen occurs with a TME-5 (Middle Archaic-Fremont?) projectile point specimen at 5 RB1569

TME-20c: Side Scrapers - "Spokeshaves" (Plate A-5.c-d)

No. of Specimens: 2
Designations: 5 RB1566 (#233), 5 RB1781-7 (#300)
Description: These 2 specimens are notable for their steeply, unifacially retouched convex edges with pronounced concavities retouched into the worked edges. One specimen is a split pebble fragment and the other is a tabular flake. Worked edge angles are between 60-70$^{o}$. Both specimens are resharpened in the concavities, and 1 exhibits heavy rounding of all worked edges. It is likely that these tools were utilized to shape or smooth arrow/spear shafts or similar artifacts. There is no evidence that this tool type was hafted.
Material: 2 chert (100%)
Length: 35 mm (1 complete specimen)
Width: Range 29.5-36.5 mm, Av. 33 mm
Thickness: Range 7-10 mm, Av. 8.5 mm
Associations: one specimen occurs at 5 RB1781-7 with a TME-14 projectile point type and with TME-37 and TME-42 type ceramics, implying Numic or Apache associations

TME-21a: Pointed Bit End Scrapers (Plate A-5.i-l)

No. of Specimens: 5
Designations: 5 RB1567 (#180), RB1569 (#193), rb1870 (#356), RB1797 (#380), RB1850 (#368)
Description: This tool type is characterized by broad pointed bits formed by 2 converging lateral edges. One specimen has been resharpened, and 2 others exhibit bit rounding. One of the worn specimens exhibits edge retouch all along the 2 converging edges and is worn along those edges as well, suggesting use of more than just the pointed bit. These specimens were probably utilized as gouges or creasers.
Materials: 3 chert (60%), 1 siltstone (20%), 1 obsidian (20%)
Length: Range 22-59 mm, Av. 34.1 mm
Width: Range 17-43 mm, Av. 30.2 mm
Thickness: Range 6-20 mm, Av. 9.7 mm
Associations: 1 specimen occurs with a TME-5 (Middle Archaic-Fremont?) point at 5 RB1569, and 1 occurs at 5 RB1797 with a TME-6 point and TME-40 (Ute) type ceramics, as well as with a possible wickiup, suggesting Numic associations.

TME-21b: Heavy Keeled End Scraper (Plate A-6.a)

No. of Specimens: 1
Designation: 5 RB1581 (#171)
Description: This specimen is made on a massive plano-convex percussion flake that has a prominent dorsal ridge (keel) which is highest at the distal end of the tool. The bit is convex with a straight end facet caused by resharpening of this bit portion which has resulted in a $90^{o}$ edge angle. The tool has some lateral retouch and is slightly constricted at the proximal end. Some attempt was made to reduce or blunt the dorsal keel by removal of a narrow flake. There is heavy wear in the form of rounded step fractures on both lateral edges near the distal bit, but the resharpened bit exhibits only edge rounding. It is likely that this tool was utilized in heavy scraping or chopping tasks against resistant materials.
Material: chert
Length: 60 mm
Width: 34 mm
Thickness: 26 mm
Associations: it occurs at 5 RB1581 with a TME-8 projectile point of possible Proto-historic association

TME-21c: Tapered End Scrapers (Plate A-6.b-k)

No. of Specimens: 15
Designations: 5 RB957 (#62), RB1558 (#238), RB1560 (#236), RB1569 (#188), RB1583 (#166), Rb1676 (#247), RB1746 (#246), RB1762 (#284, 285), RB1772 (#268), RB 1789 (#327) RB1797 (#379), RB1784 (#269), Rb1837 (#372), RB1850 (#366)
Description: This group of end scrapers is characterized by convex bits, retouched lateral edges, constricted proximal ends, and steep ($60-110^{o}$) bit edge angles. All are made on plano-convex to tabular percussion flakes. Eight exhibit dorsal thinning, 4

# PLATE A-6

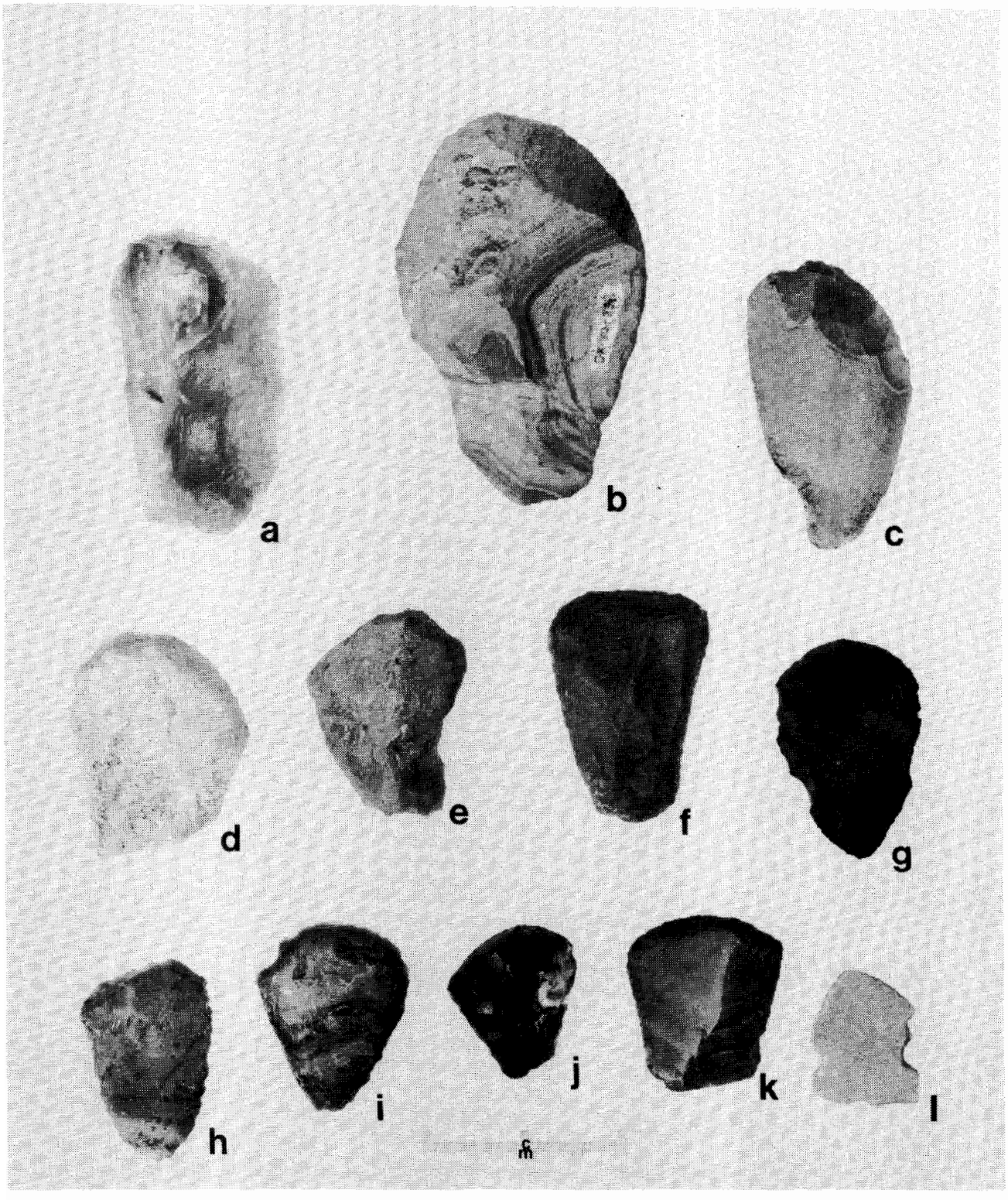


exhibit bulbar thinning, and 14 are manufactured with the platform end serving as the proximal end of the tool. Nine have been resharpened along bit edges, resulting in obtuse edge angles and (frequently) straight faceted bits. Wear patterns most frequently noted include edge faceting and rounding. Bulbar thinning, lateral and proximal edge blunting, proximal tapering, and dorsal thinning all imply a likelihood that this tool group was hafted, possibly in a socketed handle. Wear patterns reflect use in a unidirectional scraping or adze-like chopping motion, against moderately resistant surfaces (or pliant materials with resistant backing). Fleshing and hide preparation are likely tasks performed with this artifact class.

Material: 10 chert (67%), 5 siltstone (33%)
Length: Range 30.5-78 mm, Av. 43.7
Width: Range 26-49 mm, Av. 32 mm
Thickness: Range 5.5-12.5 mm, Av. 8.4 mm
Associations: 1 specimen occurs at 5 RB1797 with point type TME-6, with ceramic type TME-40 (Ute), and with a possible wickiup, suggesting Numic associations; another specimen occurs at 5 RB1569 with a TME-5 projectile point of possible Middle Archaic-Fremont, or later associations; a third specimen occurs with a TME-11 point that may date to Late Archaic-Proto-historic times at 5 RB1583; and a fourth specimen occurs with a TME-43 ceramic type at 5 Rb1837, suggesting an indirect Anasazi relationship during Late Fremont or Proto-historic times

TME-22: Mock Point (Plate A-6.1)

No. of Specimens: 1
Designation: 5 RB1616 (#173)
Description: This unique specimen is a small primary decortication percussion flake that has been unifacially retouched along the dorsal edges to form a shape roughly similar to Desert Side-Notched (TME-7) projectile points. The platform of the flake forms the "tip" of the "point", and the terminal hinge fracture forms the "base". It is unlikely that this item was utilized, hence its designation of "mock point".
Length: 27.5 mm
Width: 22 mm
Thickness: 3 mm
Associations: if the shape was intended to simulate a TME-7 projectile point, the specimen may be of Numic origin

FRAGMENTS

No. of Specimens: 3
Designations: 5 RB1569 (#194), 5 RB1583 (#167), RB1805 (#360)
Description: These tool fragments are too fragmentary to allow for comparative analysis. One specimen was recovered in 2 pieces and has fine retouch along its intact, low-angle ($40^{o}$) working edge; no use wear was observed. Another specimen has similar retouch along a part of 1 lateral edge of a spall flake, and exhibits no wear. The third specimen is more steeply flaked

# TABLE A-2: Other Collected Artifact Distributions

(Resources marked with an asterisk "*" have other temporally diagnostic artifacts, see Table A-1 for possible cultural periods.)

| TYPE | CLASS | RB952 | RB953 | RB954 | RB957 | RB962* | RB968* | RB969 | Rb1491 | rb1494 | rb1514 | Rb1534* | RB1537 | RB1539-A* | RB1539-B* | RB1540 | RB1558 | RB1560 | RB1561* | RB1566* | RB1567 | RB1568 | RB1569* | RB1570* | Rb1573 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THE-19 | Unifacial | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - |
| THE-20a | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-20b | " | - | - | 1 | - | - | - | - | 1 | - | - | - | - | - | - | 1 | - | - | - | - | - | - | 2 | - | - |
| THE-20c | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| THE-21a | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | 1 | - | - |
| THE-21b | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-21c | " | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | 1 | - | - |
| THE-22 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-23a | Bifacial | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - |
| THE-23b | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-23c | " | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | 1 | - | - | - | - | - | - | - | - | - |
| THE-24 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - |
| THE-25 | " | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| THE-26 | " | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-27 | " | - | 1 | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-28a | " | - | - | - | - | - | - | - | - | - | - | 1 | - | 1 | - | 2 | - | - | 1 | - | - | - | - | 1 | 1 |
| THE-28b | " | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | 2 | - | - | - | - | - | - | - | 1 | - | - |
| THE-28c | " | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | 1 | - | - |
| THE-29 | " | - | 1 | - | - | - | - | - | - | 1 | - | - | 1 | 1 | - | - | - | - | - | - | - | - | 1 | - | - |
| THE-30 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - |
| | Core | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-31 | Mano | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-32 | Hammerstone | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-33 | Pipebowl | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-34 | Bone | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - |
| THE-35a | Glass | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-35b | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-36 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

| TYPE | CLASS | RB1579* | RB1581* | RB1583* | RB1584 | RB1587 | RB1615* | RB1616 | RB1618 | rb1659 | RB1664 | RB1668 | Rb1676 | rb1697 | rb1698 | RB1714 | RB1732 | RB1733 | RB1734 | RB1735* | RB1736* | RB1746 | RB1759 | RB1761 | RB1762 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THE-19 | Unifacial | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-20a | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-20b | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - |
| THE-20c | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-21a | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-21b | " | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-21c | " | - | - | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | 1 | - | - | 2 |
| THE-22 | " | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-23a | Bifacial | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - |
| THE-23b | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-23c | " | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-24 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-25 | " | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-26 | " | - | - | - | 1 | - | - | - | - | - | - | - | - | - | 1 | - | - | 1 | - | 1 | - | - | - | - | - |
| THE-27 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-28a | " | 1 | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - |
| THE-28b | " | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - |
| THE-28c | " | - | - | - | - | - | 1 | - | - | - | 1 | - | - | - | - | - | - | - | - | 1 | 1 | - | - | 3 | - |
| THE-29 | " | - | - | 1 | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | 1 | - | - | - | - |
| THE-30 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - |
| | Core | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-31 | Mano | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| THE-32 | Hammerstone | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-33 | Pipebowl | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-34 | Bone | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-35a | Glass | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-35b | " | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-36 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

| TYPE | CLASS | RB1771* | RB1772 | RB1773 | RB1776* | RB1777 | RB1778 | RB1779* | RB1781-4 | RB1781-7* | RB1781-9 | RB1782* | RB1783 | RB1784 | RB1785 | RB1787-1* | RB1789 | RB1797* | RB1799 | rb1835 | Rb1837* | RB1850 | Rb1869 | rb1870 | RB1564* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THE-19 | Unifacial | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - |
| THE-20a | " | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-20b | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - |
| THE-20c | " | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-21a | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | 1 | - | 1 | - |
| THE-21b | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-21c | " | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 | - | - | 1 | 1 | - | - | 1 | 1 | - | - | - |
| THE-22 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-23a | Bifacial | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-23b | " | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | 1 | - | - | - | - | - | - |
| THE-23c | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-24 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-25 | " | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-26 | " | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - |
| THE-27 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-28a | " | - | - | - | 1 | - | 1 | 1 | - | 1 | 1 | - | 1 | - | - | - | 2 | 2 | - | - | - | - | - | - | 1 |
| THE-28b | " | - | - | - | - | - | - | - | 1 | - | - | - | 1 | - | - | - | - | 1 | - | 1 | - | - | - | - | - |
| THE-28c | " | 1 | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | - |
| THE-29 | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | 1 | - | - | - | - | - | - |
| THE-30 | " | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Core | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-31 | Mano | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-32 | Hammerstone | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - |
| THE-33 | Pipebowl | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-34 | Bone | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-35a | Glass | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-35b | " | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| THE-36 | " | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

on all intact edges ($60^{o}$), and exhibits heavy rounding.
Material: 2 chert (67%), 1 quartzite (33%)
Length: fragmentary
Width: fragmentary
Thickness: Range 5-8 mm, Av. 6.7 mm
Associations: 1 specimen occurs at 5 RB1805, thought to be a Numic sweat-lodge site; 1 occurs at 5 RB1569 with a TME-5 point of possible Middle Archaic-Fremont or later affiliations; 1 occurs at RB1583 with a TME-11 point that may date between Late Archaic and Historic times

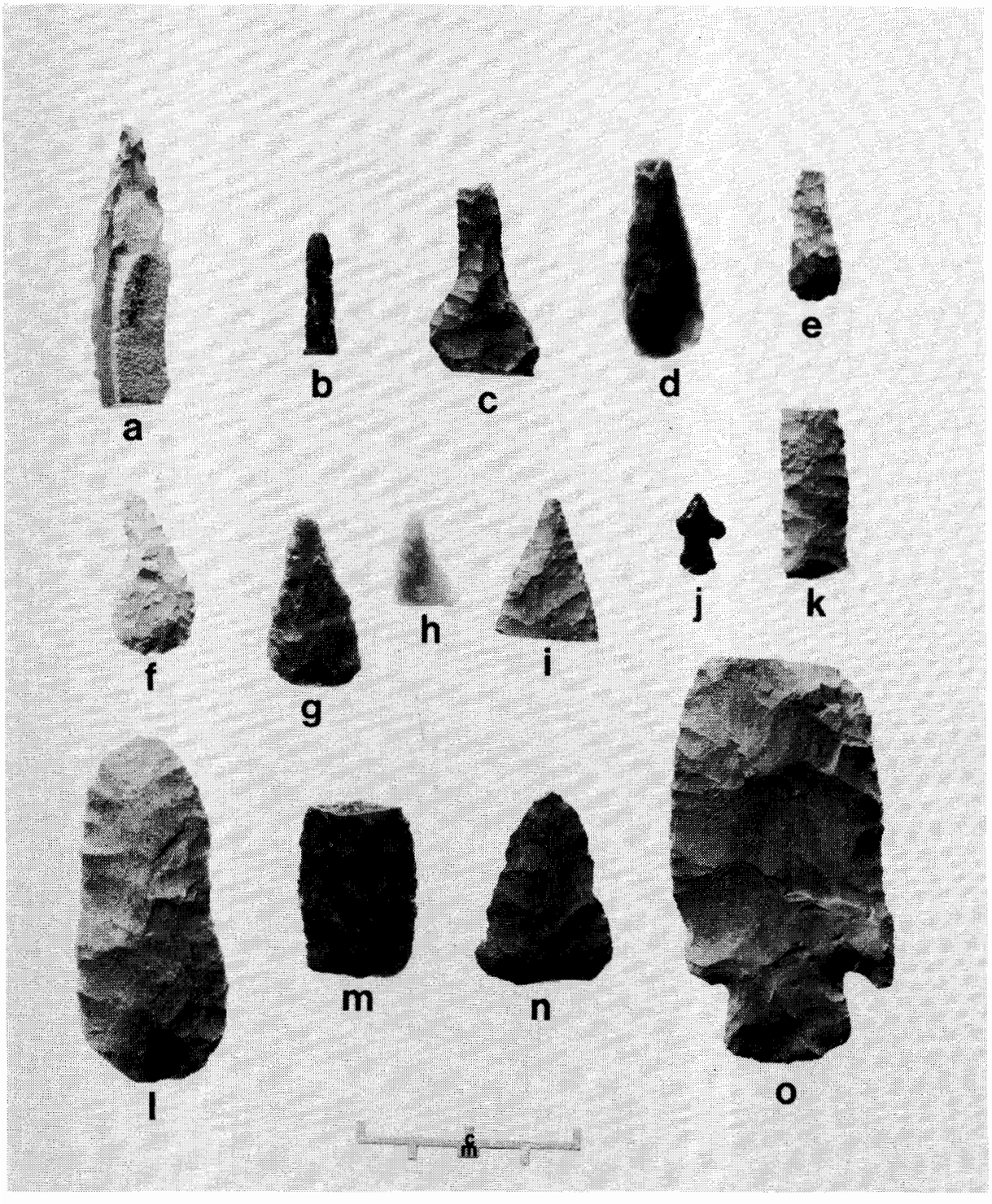
## Bifaces

A total of 88 primarily bifacially worked tools (excluding points) were collected from the T-M-E study area. These remains are grouped into 8 types with several intra-type subdivisions, based on morphology and/or intended function. Four of the collected bifaces are too fragmentary to allow for their classification into types. Of the collected remains in this tool class, 39 (44%) are made of cryptocrystalline silicates (cherts or chalcedonies), 39 (44%) of siltstone, 8 (9%) of quartzite, and 2 (3%) of obsidian. See Table A-2 for summary of resource provenience and frequency data for bifaces.

TME-23a: Flanged Drills (Plate A-7.1-c)

No. of Specimens: 3
Designations: 5 RB1568 (#161), RB1732 (#272), RB1759 (#276)
Description: This tool type is characterized by a narrow, parallel-sided, bifacially flaked bit with a shouldered flange, and 2 specimens exhibit alternate bevelling of the bit. All specimens are biconvex in cross-section, one has an intentionally shaped flange, and 1 has a generally unmodified spall base. The base is missing on the third specimen. Wear patterns on 2 specimens indicate a clockwise twist/bore action, suggesting their use for drilling or boring through resistant materials. The third specimen does not exhibit any use-wear patterns (at 10X) and may be unfinished.
Material: 2 siltstone (67%), 1 chert (33%)
Length: fragmentary
Width: Bit Range 5-8 mm, Bit Av. 6.3 mm
Base Range 15-19.5 mm, Base Av. 17.3 mm (2 complete specimens)
Thickness: Bit Range 2.5-4 mm, Bit Av. 3 mm
Base Range 6-7 mm, Base Av. 6.5 mm (2 complete specimens)
Associations: none

# PLATE A-7



TME-23b: Tapered Drills (Plate A-7.d-e)

No. of Specimens: 2
Designations: 5 RB1799 (#354), RB1782 (#322)
Description: This type is characterized by long, narrow, bifacially thinned specimens with rounded bases and tapering bits. Cross-sections range from weakly to strongly biconvex and the larger specimen exhibits alternately bevelled bit edges and wear reflecting a clockwise twist motion. The smaller specimen is unbevelled, has irregular unilateral serrations, and exhibits no visible (10X) wear. Both specimens are lacking their bit tips. The larger specimen was probably intended for heavy drilling or boring functions, while the smaller specimen may have served for lighter duty drilling or perforating functions. Hafting is implied for these tools from their morphology, size, and edge treatment.
Material: 2 chert (100%)
Length: fragmentary
Width: Bit Range 5.5-7 mm, Bit Av. 6.3 mm
Base Range 10-15 mm, Base Av. 12.5 mm
Thickness: Bit Range 2-5 mm, Bit Av. 3.5 mm
Base Range 2-7 mm, Base Av. 4.5 mm
Associations: one specimen occurs at 5 RB1782 with a TME-6 (Numic?) point, and the other specimen occurs with a TME-16 (Late Archaic-Fremont) point at 5 RB1799

TME-23c: Triangular Perforators (Plate A-7.f-i)

No. of Specimens: 4
Designations: 5 RB962 (#55), RB1537 (#94), RB1540 (#103), RB1579 (#182)
Description: All of these specimens are made on thin flakes that have been bifacially thinned, and have widely expanding, convex bases, and working tips formed by the converging lateral edges. Cross-sections are weakly biconvex, and the upper one-third to one-fourth of the lateral edges are slightly bevelled. Two specimens are symmetrical and 2 are asymmetrical; two of the 4 are missing their bases. Wear patterns indicate use in a bidirectional twisting mode against pliant to slightly resistant materials. The tip wear noted (rounding and polish) may also imply use in puncturing or graving tasks. It is possible that some of this artifact type were utilized as unnotched projectile points as well. Hafting is considered likely due to the general size of the specimens, but would not have been necessary if the tasks for which these artifacts were used required finesse rather than force.
Material: 2 siltstone (50%), 1 chert (25%), 1 quartzite (25%)
Length: 30 mm (2 complete specimens)
Width: Range 15-17mm, Av. 16 mm (2 complete specimens)
Thickness: Range 2.5-4 mm, Av. 3.6 mm
Associations: one specimen occurs at 5 RB1579 with a TME-16 (Rose Springs, Late Archaic-Fremont) point, and 1 occurs with a TME-7 (Desert Side-Notched Numic?) point at 5 RB962

TME-24: Notched Drill (Plate A-7.j)

No. of Specimens: 1
Designation: 5 RB1570 (#199)
Description: This artifact is a small, corner-notched, triangular bladed specimen with concave blade edges, abrupt shoulders, an expanding stem, and a convex base. The tip has been reworked to a fine point that exhibits wear reflective of bidirectional twisting against a moderately resistant surface. It is possible that this is a reworked arrow point (cf Plate A-4.p-q) that was open-socket hafted onto a shaft and propelled by bimanual rolling of the shaft for use in drilling small holes. A fossil bone bead preform, with partially drilled, bifacial central holes, was recovered from within 1 meter of this drill.
Material: chert
Length: 14.5 mm
Width: 9 mm
Thickness: 2.5 mm
Associations: this item was recovered from 5 RB1570 where a TME-7 projectile point and wickiup remains were recorded, suggesting Numic associations

TME-25: Point Preforms

No. of Specimens: 3
Designations: 5 RB1539-A (#85), rb1659 (#207), RB1781-7 (#301)
Description: This group of artifacts are all roughly thinned flakes with strongly biconvex cross-sections and little or no edge retouch. All three are vaguely ovate in outline, though 1 specimen appears stemmed. None exhibit any use-wear, and their general size and stage of reduction imply an early stage of projectile point manufacture.
Material: 2 chert (67%), 1 chalcedony (33 )
Length: Range 25-27 mm, Av. 26 mm (2 complete specimens)
Width: Range 18-22.5 mm, Av. 20.7 mm
Thickness: Range 6.5-7.5 mm, Av. 7 mm
Associations: one specimen occurs with TME-5 points (Middle Archaic-Fremont?) at 5 RB1539, and 1 occurs at 5 RB1781-7 with a TME-14 point and TME-37 and TME-42 ceramics that suggest Fremont, Numic or Apache associations

TME-26: Parallel-Sided Blades (Plate A-7.k-m)

No. of Specimens: 7
Designations: 5 RB1537 (#99), RB1584 (#169), rb1698 (#337), RB1733 (#271), RB1735 (#229), RB1781-9 (#304), Rb1869 (#363)
Description: This tool type is classed together on the basis of general shape, and characterized by long, narrow, elliptical to subrectangular outlines. Sizes range from small (13 mm wide) to medium (28 mm wide), and all specimens have bifacial thinning and at least some edge retouch. Wear in the form of edge rounding is visible (10X) on only 1 of the specimens, suggesting that other members of the type may be tool blanks or projectile point fragments.
Material: 4 chert (57%), 2 quartzite (29%), 1 siltstone (14%)
Length: Range 41-61 mm, Av. 51 mm (2 complete specimens)

Width: Range 12.5-27.5 mm, Av. 19.8 mm
Thickness: Range 4-9.5 mm, Av. 5.6 mm
Associations: one specimen occurs at 5 RB1735 with a TME-10b point and and 2 TME-14 points, suggesting possible Late Archaic-Fremont, or even later, associations

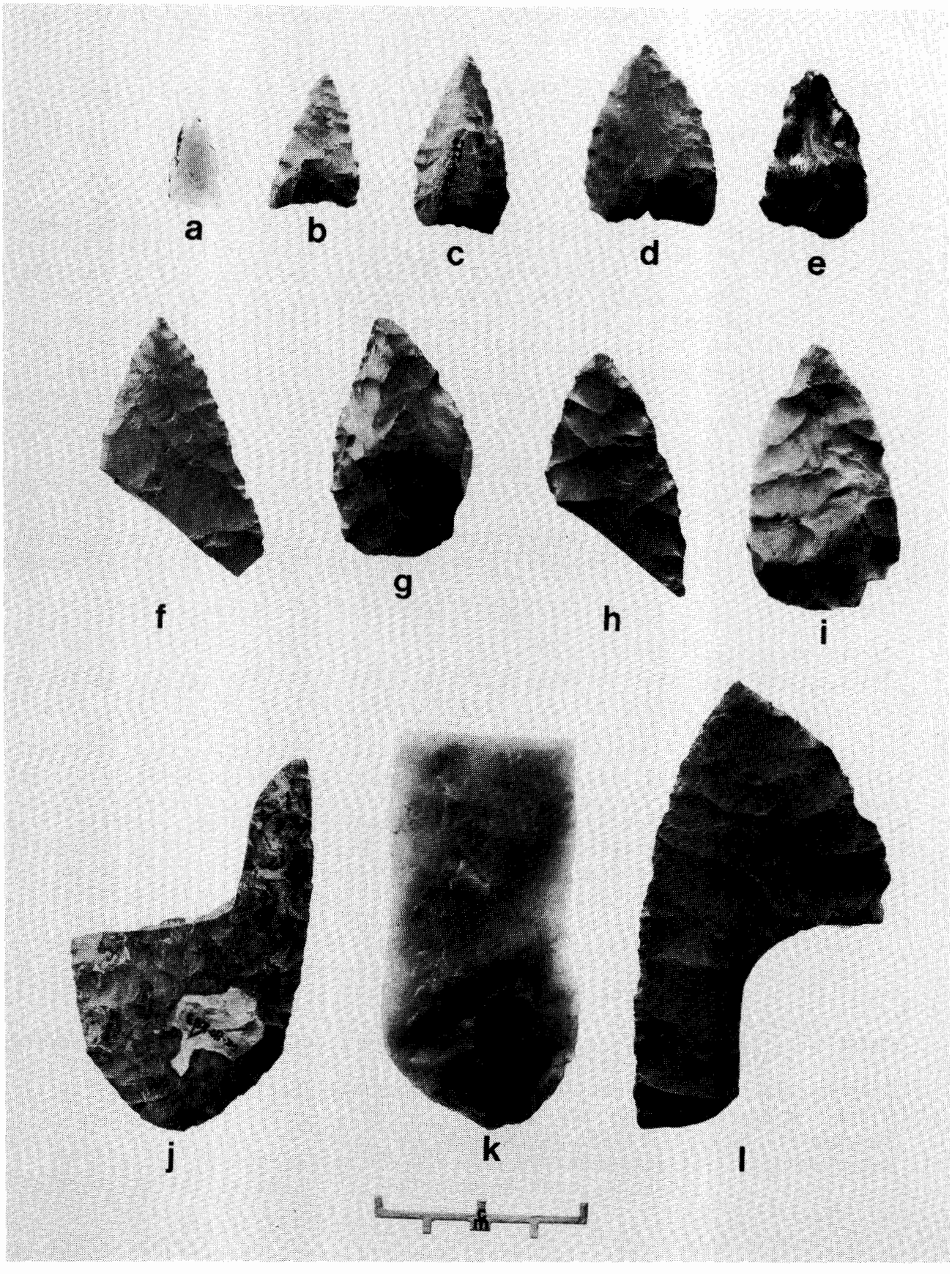
TME-27: Notched Bifaces (Plate A-7.n-o)

No. of Specimens: 2
Designations: 5 RB953 (#60), RB968 (#92)
Description: These 2 specimens are made on large flakes thinned to biconvex cross-sections. The blades range from triangular to spatulate with convex edges, abrupt to oblique shoulders, and one specimen is side-notched while the other is corner-notched. The stem is missing on one specimen, and is straight with a weakly convex base on the other. The tip of the larger specimen is missing. Both specimens have suffered edge attrition from use (scalar and step flaking), and both have been resharpened. It is suspected that these specimens were hafted for use as knives, though their use as projectile points cannot be ruled out.
Material: 2 siltstone (100%)
Length: Range 45-90 (est) mm, Av. 67.5 mm
Width: Range 25-38.5 mm, Av. 31.7 mm
Thickness: 5-7 mm, Av. 6 mm
Associations: 1 specimen occurs with a TME-14 projectile point at 5 RB968, indicating possible Archaic through Fremont temporal affiliations

TME-28a: Small Triangular-Elliptical Bifaces (Plate A-8.a-e)

No. of Specimens: 22
Designations: 5 RB1570 (#200), RB1781-7 (#299), RB1781-9 (#303), RB1783 (#314), 5 RB1539-A (#86), Rb1534 (#79b), RB1540 (#101, 103), RB 1561 (#209), RB1564 (#179), RB1579 (#183), RB1618 (#211, 212), Rb1573 (#110), RB1732 (#273), RB1776 (#310), RB1778 (#278), RB1779 (#341), RB1789 (#325, 326), RB1797 (#332, 384)
Description: These specimens are made on generally thin, plano-convex flakes that exhibit either unifacial or bifacial thinning, and are triangulo id to ellipsoid in outline. Cross-sections range from concave-convex to biconvex, and all specimens exhibit some edge retouch. Several specimens exhibit basal thinning suggestive of hafting, and observed wear includes edge crushing, rounding, and nibbling. Only 1 specimen exhibits clear evidence of edge rejuvenation, and several of the specimens may have been used as projectile points (TME-6 variants?).
Material: 10 chert (45%), 8 siltstone (36%), 2 obsidian (9%), 1 chalcedony (5%), 1 quartzite (5%)
Length: Range 17-33.5 mm, Av. 28 mm (5 complete specimens)
Width: Range 10-27.5 mm, Av. 20.5 mm
Thickness: Range 2-7.5 mm, Av. 4.6 mm
Associations: 1 specimen occurs with TME-39 type ceramics at 5 RB1779, suggesting Numic associations, 1 occurs at 5 RB1561 with a

# PLATE A-8



TME-12 (Archaic) point; 2 occur at 5 RB1797 with a TME-6 point, TME-40 ceramics (Ute), and a possible wickiup, suggesting Numic associations, 1 occurs at 5 RB1579 with a TME-16 (Late Archaic-Fremont?) point; 1 occurs at 5 RB1539-A with a TME-5 (Archaic-Fremont) point; 1 occurs at 5 RB1781-7 with a TME-14 point and TME-37 and TME-42 ceramics of possible Numic, Late Fremont, or Apache associations; 1 occurs at 5 RB1570 with a TME-7 point and a wickiup, implying Numic affiliations; 1 occurs at 5 Rb1534 with a TME-4 point of unknown temporal affiliations, and 1 co-occurs at 5 RB1776 with a TME-7 and a TME-13 point (Late Fremont-Proto-historic).

TME-28b: Medium Triangular-Elliptical Bifaces (Plate A-8.f-i)

No. of Specimens: 13
Designations: 5 RB969 (#93), RB1664 (#221), RB1539-B (#82, 83), RB952 (#28), RB1539-A (#87a), RB1569 (#191), RB1587 (#213), RB1734 (#243), RB1781-4 (#338), RB1783 (#313), RB1797 (#382), rb1835 (#206)
Description: This group exhibits virtually the same morphological and functional characteristics as TME-28a, but is larger in overall size (minimum width, 27 mm). One specimen has minimal edge retouch and may be an early stage blank. Another specimen exhibits heavy edge damage (step fractures) and evidence of repeated resharpening. This evidence, combined with the fact that all but 3 of the specimens are broken fragments (3 tips, 3 bodies, 4 bases), implies use of these tools for cutting or scraping of resistant materials. It is also likely that some of these tools were proximally hafted.
Material: 8 siltstone (62%), 3 chert (23%), 2 quartzite (15%)
Length: Range 44-66 mm, Av. 52.5 mm (4 complete specimens)
Width: Range 27-39 mm, Av. 30.6 mm (9 complete specimens)
Thickness: Range 4.5-9.5 mm, Av. 6.7 mm
Associations: 2 specimens occur at 5 RB1539-B with a TME-2 (Paleoindian) projectile point; 1 occurs at 5 RB1539-B with 1 TME-2 (Paleoindian) point; 1 occurs with TME-5 Point at 5 RB1569; and 1 occurs at 5 RB1797 with a TME-6 point and a possible wickiup, implying Numic associations

TME-28c: Large Triangular-Leaf-Shaped Blades (Plates A-8.j-l, A-9.a-c)

No. of Specimens: 13
Designations: 5 RB1537 (#98), RB1539-A (#88), RB1569 (#187), RB1615 (#176), RB1733 (#287), RB1735 (#289), RB1736 (#225), RB1761 (#281, 282, 283), RB1771 (#260), RB1785 (#311), RB1787 (#391)
Description: This group of blades is made on generally thin, large percussion flakes delicately thinned to biconvex cross-sections and shaped to yield triangular to leaf-shaped outlines. All exhibit bifacial thinning with fine edge retouch. One specimen has a unilateral shoulder that may represent a hafting element, and 4 others have small unilateral concavities that exhibit wear patterns. Two specimens exhibit basal edge blunting through crushing and grinding. All but 1 of these blades exhibits some edge wear ranging from polish to crushing, but usually involving varying degrees of rounding. These implements may represent tool blanks used for chopping, cutting, and/or scraping tasks. Some may have also served as spear tips. Edge angles for this artifact type fall between 40-55$^{o}$.
Material: 6 siltstone (46%). 5 chert (39%), 2 quartzite (15%)
Length: Range 126.5-154 mm, Av. 140.3 mm (2 complete specimens)
Width: Range 33.5-71.5 mm, Av. 51.3 mm
Thickness: Range 7-14 mm, Av. 9.2 mm
Associations: 1 specimen occurs at 5 RB1771 with a TME-7 (Numic?) point; 1 occurs at 5 RB1539-A with TME-5 (Archaic-Fremont) points; 1 occurs at 5 RB1736 with a TME-3 (Hell Gap, Paleoindian) point; 1 occurs with TME-10b and TME-16 (Late Archaic-Fremont) points at 5 RB1735; 1 occurs at the Numic 5 RB1797 with a TME-6 piint, TME-40 ceramics, and a possible wickiup; 1 occurs at 5 RB1569 with a TME-5 (Archaic-Fremont) point; and one occurs at 5 RB1615 with a TME-6 (Numic?) point

TME-29: Flake "Knives"

No. of Specimens: 10
Designations: 5 RB953 (#67), RB1537 (#97), RB1539-A (#89), RB1569 (#190), RB1583 (#168), rb1494 (#51), rb1697 (#323), RB1736 (#224), RB1789 (#324), RB1799 (#352)
Description: This type is a group of flakes and flake fragments which have bifacial retouch along at least one edge, and little or no thinning or shaping. No 2 are morphologically similar with regard

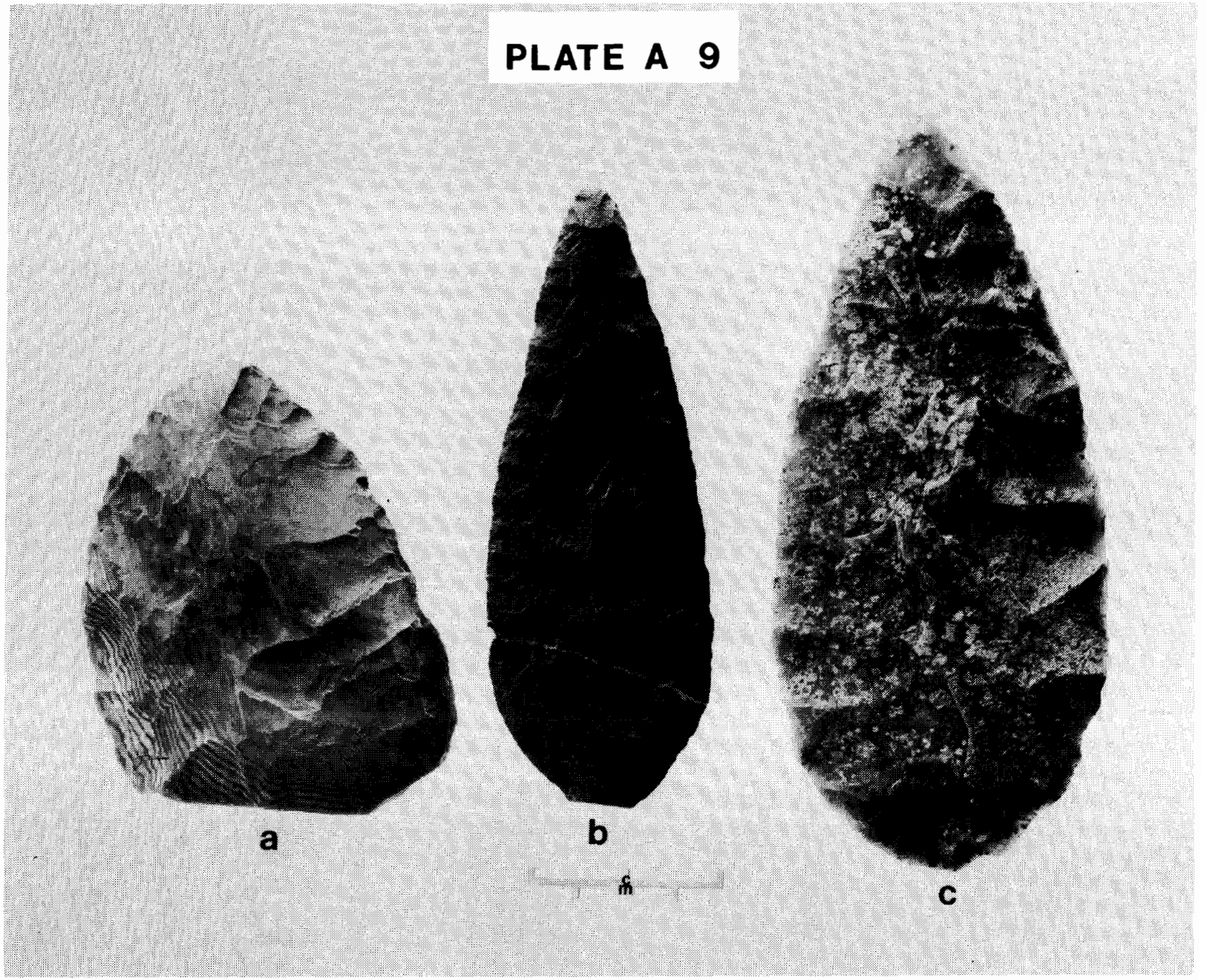


PLATE A 9
a
b
c
cm

to outline or cross-section. Wear, which ranges from rounding to battering, is often confined to projecting portions of the worked edges. It is thought that these tools were opportunistically manufactured and utilized in a variety of tasks. A general absence of evidence of resharpening of edges suggests that these specimens were discarded after short periods of use.
Material: 6 chert (60%), 4 siltstone (40%)
Length: Range 22-115 mm
Width: Range 14.5-54.5 mm
Thickness: Range 2-18.5 mm
Associations: 1 occurs at 5 RB1799 with a TME-16 (Late Archaic-Fremont) point; 1 occurs at 5 RB1583 with a TME-11 (Late Archaic-Proto-historic?) point; 1 specimen occurs at 5 RB1539-A with 2 TME-5 (Archaic-Fremont) points; 1 occurs at 5 RB1736 with a TME-3 (Paleoindian) Hell Gap point; and 1 occurs with a TME-5 (Archaic-Fremont) point at 5 RB1569

TME-30: Rough Blanks

No. of Specimens: 4
Designations: 5 RB1569 (#196), RB1732 (#274), RB1779 (#342), RB1781-4 (#339)
Description: These 4 artifacts are thick, roughly thinned flakes with irregular cross-sections. They are generally elliptical in outline. Two specimens have some secondary edge retouch, and 1 of these exhibits some edge rounding. The other 3 specimens exhibit no use wear patterns at 10X. It is thought that these items are quarry blanks roughly trimmed for transport and subjected to incidental use for heavy cutting or scraping tasks.
Material: 4 siltstone (100%)
Length: Range 39.5-128.5 mm, Av. 84 mm (2 complete specimens)
Width: Range 23-45 mm, Av. 31 mm (3 complete specimens)
Thickness: Range 8-24 mm, Av. 13.8 mm
Associations: 1 specimen occurs at 5 RB1779 with TME-39 ceramics and may be of Numic associations; another specimen occurs with a TME-5 (Archaic-Fremont) point at 5 RB1569

FRAGMENTS

No. of Specimens: 4
Designations: 5 RB1556 (#159), RB1569 (#195), rb1681 (#305), RB1724 (#279)
Description: These specimens are bifacially thinned and/or edge retouched, but are too fragmentary to allow for determination of their intended shape or functions. Slight wear in the form of edge rounding is noted on 2 of the specimens.
Material: 2 siltstone (50%), 2 chert (50%)

OTHER FLAKED STONE

Core

No. of Specimens: 1
Designation: 5 RB1773 (#288)

Description: This is a large, roughly ovoid fragment with random flake scars (with negative bulbs of percussion) and platforms prepared by chipping. Portions of the cortex are still present on the core. This core, along with 7 flakes of similar material, were collected from 1 site area in hopes of reconstructing the flaking pattern. Four of the flakes were matched with their negative scars and glued into place. Three other flakes have not been clearly traced to this core. The core does not appear to be in an exhausted state.
Material: chert (petrified wood?)
Length: 85 mm (reconstructed)
Width: 72 mm
Thickness: 39 mm
Associations: none

Flakes

A total of 125 flakes and utilized and/or retouched flakes were collected, primarily from localities, in hopes of conducting certain function studies. Contract limitations have required the deletion of those efforts in this study. These items will be available for further study at the University of Colorado Museum in Boulder.

NON-FLAKED STONE TOOLS

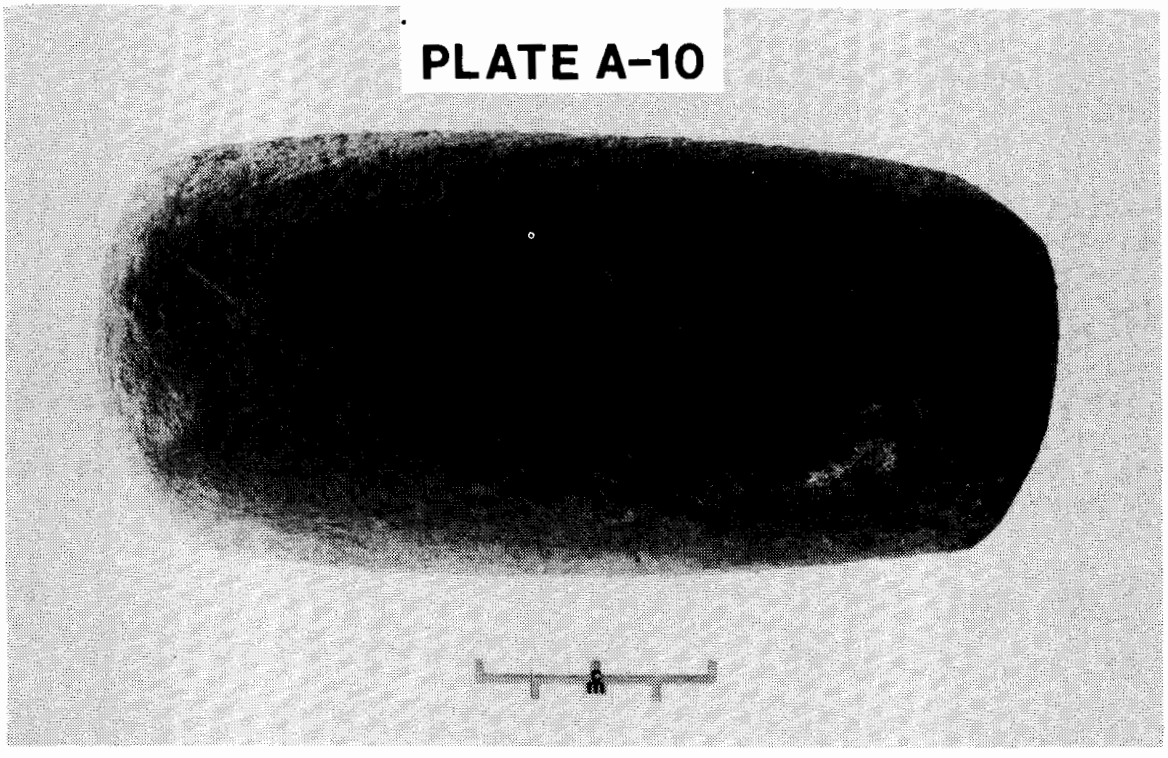
TME-31: Mano (Plate A-10)

No. of Specimens: 1
Designation: 5 RB1762 (#286)
Description: This is a loaf-shaped piece of ground and pecked stone with a plano-convex cross-section. The specimen was shaped by pecking, and is ground on its convex surface. The ends show some battering and there are several irregular gouges (caused by inadvertent grinding of a foreign object with the materials being processed?) on the convex surface.
Material: sandstone
Length: 155 mm
Width: 71 mm
Thickness: 42 mm
Associations: similar to mano specimens from Fremont sites in Dinosaur National Monument (Breternitz 1970:38)

TME-32: Hammerstone

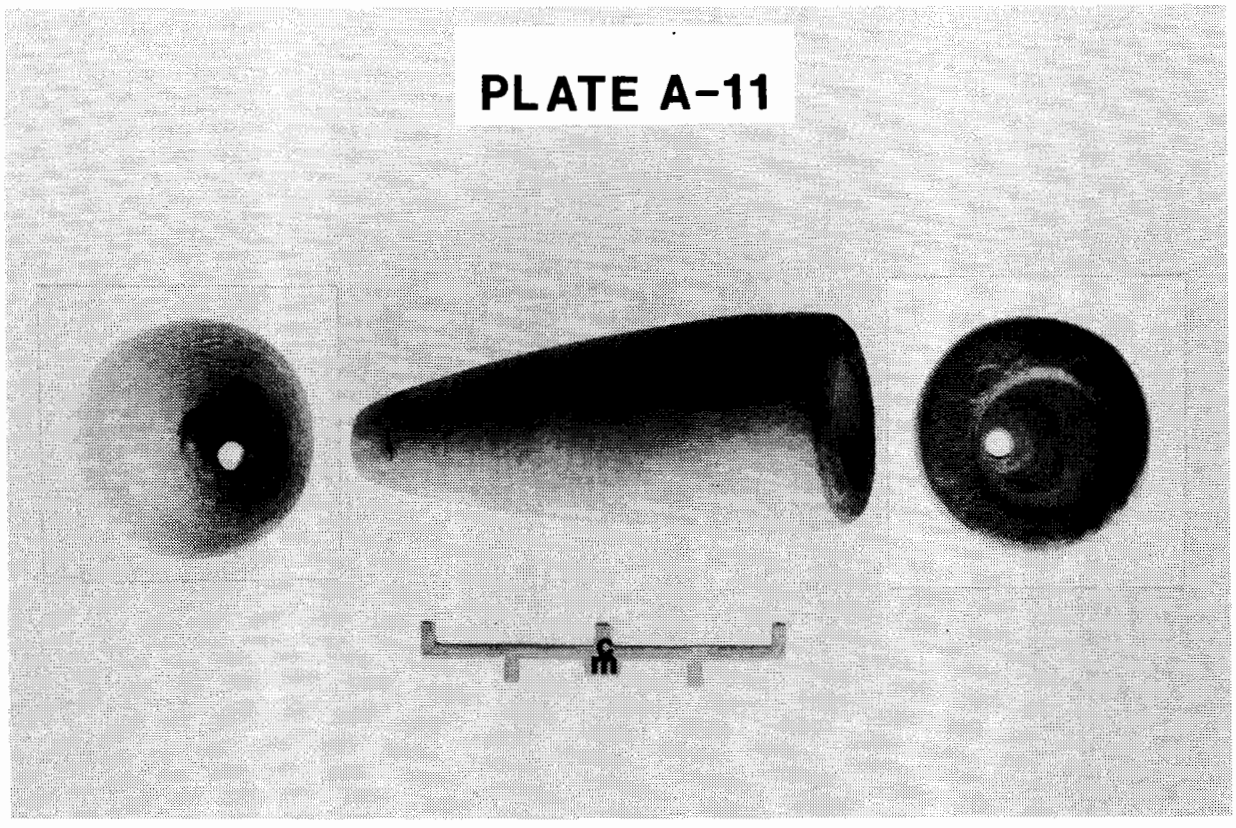
No. of Specimens: 1
Designation: 5 RB1799 (#369)
Description: This is a broken flat, oval stream cobble with slight pitting on one end. There may be some minor grinding on both faces, but the cobble cortex surface is naturally smoothed and this confounds accurate interpretation of any possible cultural grinding. It is most likely that this artifact was utilized as a hammer against other resistant materials.
Material: granite

Length: ?
Width: 83.5 mm
Thickness: 32 mm
Associations: this specimen was recovered from 5 RB1799 and occurred with a TME-16 (Later Archaic-Fremont) point




TME-33: Pipebowl (Plate A-11)

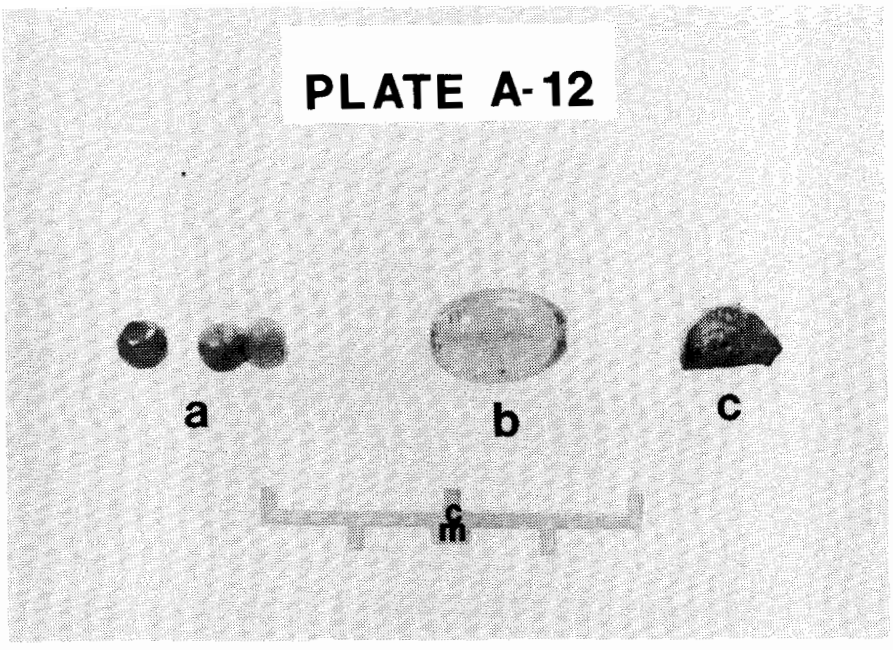
No. of Specimens: 1
Designation: 5 rb1514 (#52)
Description: This unique specimen is a hollowed conical piece of stone that has been smoothed and polished on all interior and exterior surfaces. The interior has been drilled out, leaving a small diameter (2 mm) hole at the apex of the cone (stem end), and widening to a larger (7.5 mm) opening at the bowl end of the cone. The interior opening is off-center, and the wide end of the artifact consists of smooth (waterworn?) cortex. Though the function of this tool is questionable, the shape is suggestive of a pipebowl, or possibly a shaman's sucking tube (Wheat, personal communication).
Material: quartzite
Length: 55 mm
Diameter: Stem Opening 7.5 mm o.d., 2 mm i.d.
Bowl Opening 22 mm o.d., 7.5 mm i.d.
Associations: found near a recent can, may be out of aboriginal context




BONE ARTIFACTS

TME-34: Bead Preform (Plate A-12.c)

No. of Specimens: 1
Designation: 5 RB1570 (#202)
Description: This is a thin disc of fossilized reptile bone that has been naturally discolored by copper or uranium deposits to a brilliant turquoise blue on one side, and to a fainter blue on the other side. The disc has been shaped by carving and/or abrasion to a roughly circular outline, and has a small segment missing. The beginnings of drilled stringing holes near the center of the disc are present on both faces and are approximately .5 mm deep.
Diameter: 11 mm
Thickness: 2.5 mm
Associations: this specimen occurs with a TME-7 projectile point and a wickiup at 5 RB1570, suggesting Numic origins; a tiny flaked stone drill (TME-24) was recovered from within 1 meter of this bead preform, and may have been the implement utilized to drill the holes observed in this specimen




GLASS ARTFACTS

TME-35a: Small Globular Beads (Plate A-12.a)

No. of Specimens: 3
Designation: 5 RB1668 (#266)
Description: These are small, hand-formed beads that are generally globular in shape. One is red translucent glass, 1 is aquamarine opaque glass, and one is apple green opaque glass. The red and aquamarine beads are roughly faceted (5 facets), and the green one is spherical. The aquamarine and green beads are fused together. All three specimens have surface irregularities, some of which may be due to weathering.
Length: Range 4.5-5 mm, Av. 4.8 mm
Diameter: Bead - 5 mm, Hole - .5-1 mm, Av .7 mm
Comparisons: The red bead is very similar to Type II specimens dated by Carlson (1966:91-92) to AD 1730-1800 for trade beads in the Southwest. It is also somewhat similar to, though smaller than, beads from 5 RB922 in the Moon Lake Project Area (Anderson and Henss n.d.:131-132). The aquamarine bead is similar to Carlson's Type VIII (1966:93), dated to the same period as the Type II beads. The green bead could possibly be a color variant of the same group as the aquamarine bead. As they all occurred together, it is likely that they are of similar temporal and industrial origins. Their occurrence with a lithic flake implies Proto-historic aboriginal affiliations, rather than Euroamerican

TME-35b: Large Ellipsoid Bead (Plate A-12.b)

No. of Specimens: 1
Designation: 5 RB1668 (#266b)
Description: This bead is made of translucent pale blue glass that was handwrapped to form the stringer hole, and has an irregularly smoothed surface.
Length: 14 mm
Diameter: Bead - 9.5 mm, Hole - 1 mm
Associations: This specimen may be similar to "egg-shaped, wire-wound" beads, "usually quite large", from the Middle Historic (AD 1670-1760) period (Quimby 1966:86-87). The fact that it occurs at 5 RB1668 with TME-35a glass beads, thought to date to AD 1730-1800, may indicate contemporaenity of manufacture for TME-35a and -35b beads between AD 1730 and 1760, though they may have been collected from different sources (and time periods) and strung together by 2nd, 3rd, or later generation owners. The occurrence of this specimen with a lithic flake, as noted for TME-35a, implies Protohistoric aboriginal associations

TME-36: Bottle

No. of Specimens: 1
Designation: 5 RB1777 (#388)
Description: This specimen is a large, complete alcoholic beverage(?) bottle with a single-ball neck, a subrectangular body, offset mold seams that continue through the neck ball and are smoothed from the ball up by the use of a lipping tool, and an embossed circle (for a lable?) on 1 side. The glass is amethyst, with bubbles, vertical flow marks, "whittle" marks on the shoulders, and is heavy with a fairly uniform thickness. The panel type base is ringed by a mold seam at the heel, is slightly concave with an internal push-up, and is thick, with more glass on one side than the other.
Height: body - 170 mm
neck - 17 mm
lip - 21 mm
collar - 4 mm
total -212 mm
Width: body - 78 mm
Diameter: lip 24.5 mm o.d., 15 mm i.d.
neck 26 mm o.d.
Thickness: body 51 mm
Wall Thickness (at lip): 6.5 mm
Comparisons: The base is similar to flask specimens from the Simpson Spring Station site in western Utah (Berge 1980:134-35), some of which date to 1880-1915. The neck and lip finish resemble Brandy finishes noted at the same site (Ibid.: 124-125). The color reflects a manganese additive used only prior to 1917 (Ibid.:77). The refinished lips suggest a pre-1903 date of manufacture (Ibid.). It is likely that this specimen's date of manufacture falls between 1880 and 1917.

## CERAMICS

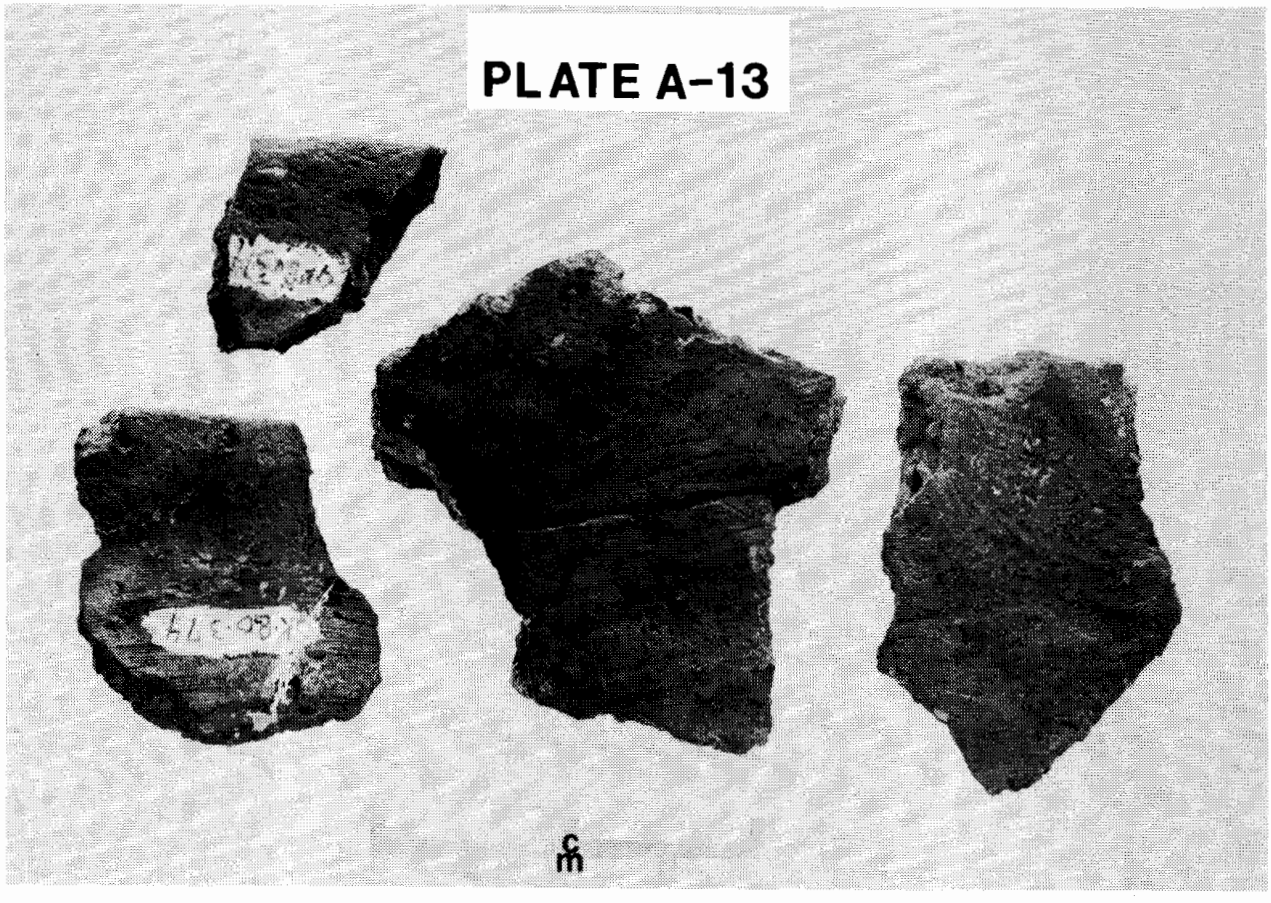
A total of 89 pottery sherds were collected from six resource areas recorded during the T-M-E inventory. At least eight pottery types are represented by the collected sample, but the results of comparative analysis by several ceramicists proved inconclusive as to cultural and temporal affiliations of these sherds. The analysis was disappointing, as ceramic types often can be utilized to pinpoint periods of cultural activity for the resource areas in which they are found. Due to the unclear and often conflicting cultural/temporal inferences drawn for these artifacts during analysis, and the lack of time and funds available for continuing analysis efforts, most of the ceramic interpretive data is considered extremely tentative, and the temporal and/or cultural associations for the resources in which they occur remain unclear. The following descriptive data were prepared primarily by Priscilla Ellwood of the University of Colorado Museum Ceramic Laboratory, and the associations are suggested by Gordon & Kranzush. See Table A-1 for a summary of ceramic distributions.

TME-37 (Plate A-13)

No. of Specimens: 25 (2 rim sherds, 23 body sherds)
Designation: 5 RB1781-7 (#374-375)
Description: This pottery probably represents a single vessel with an excurvate, smooth rim with a tapered lip.
Construction Method: coil and scrape
Paste: friable
Core Color: dark grey
Temper: coarse, weathered, rounded to sub-angular quartz grains with large fragments of calcite
Firing: reducing atmosphere, low temperature, incomplete firing
Surface Color: exterior - tan to dark grey
interior - dark grey
Surface Finish: exterior - uneven scrape marks; handling of wet clay left a dimpled effect; chunks of temper protrude
interior - deep, irregular scrape marks, with some polish

Wall Thickness: 5-7 mm

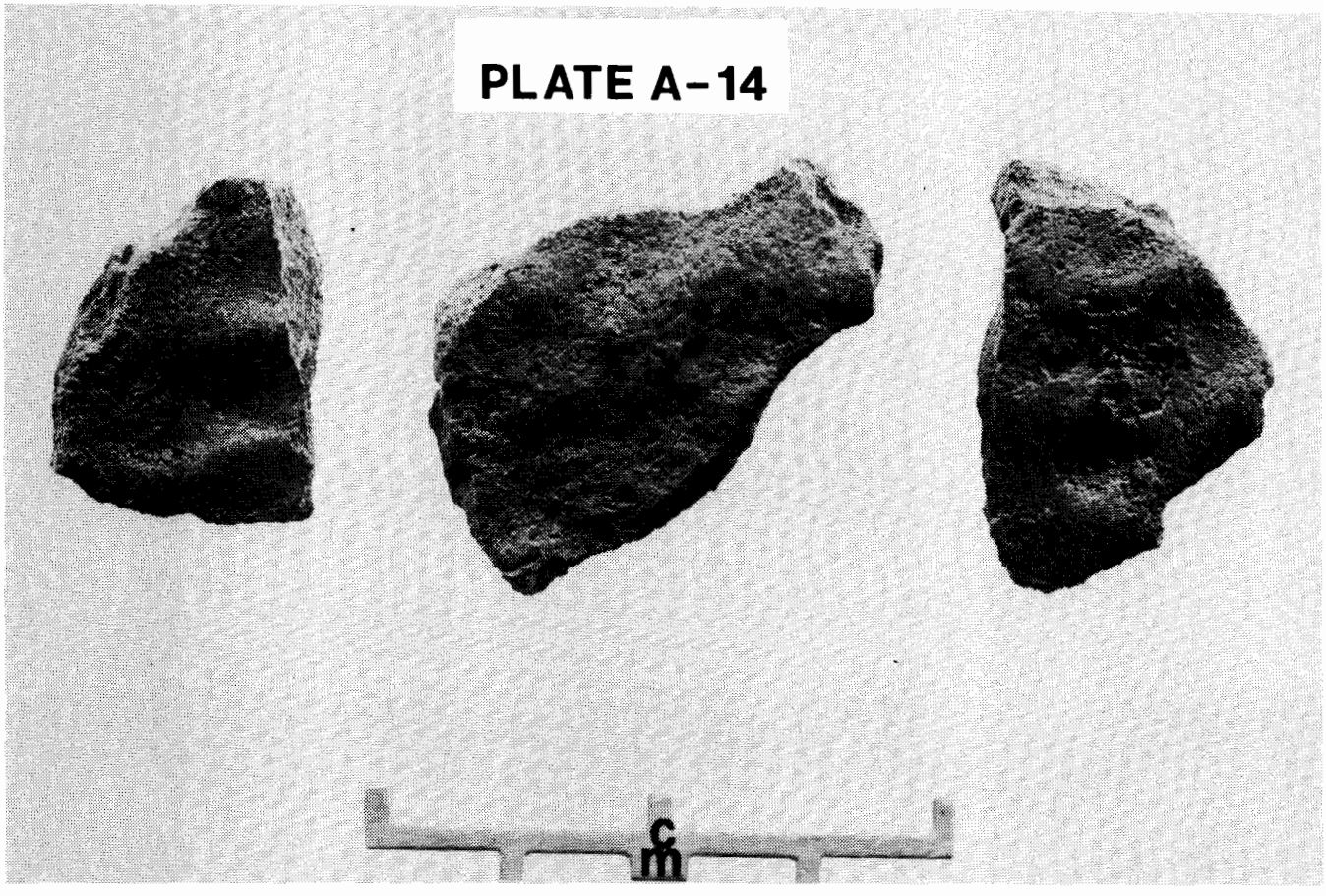
Associations: Generally resembles Fremont Uinta Gray Wares that date to ca. AD 650-1200 (Creasman 1979:III-57), but could also be of Numic origin. These sherds occur with a TME-14 point and TME-42 ceramics (Jicarilla? Picuris?)




TME-38 (Plate A-14)

No. of Specimens: 7 (1 rim sherd, 6 body sherds)
Designation: 5 RB1787-2 (#395)
Description: These sherds appear to represent one vessel (a jar?) with a tapered, excurvate rim.
Construction Method: coil and scrape
Paste: coarse, friable, uneven fracture
Core Color: light tan
Temper: small quantity of crushed rock
Firing: oxidizing atmosphere
Surface Color: exterior - light tan
interior - dark grey
Surface Finish: exterior - rippled or dimpled effect caused by roughly smoothing the coils
interior - unevenly smoothed
Wall Thickness: 5-7 mm

Associations: Occurs with a TME-7 (Numic) point and generally resembles Emery Gray Ware (Ad 700-1200) (Madsen 1977), but could be Numic



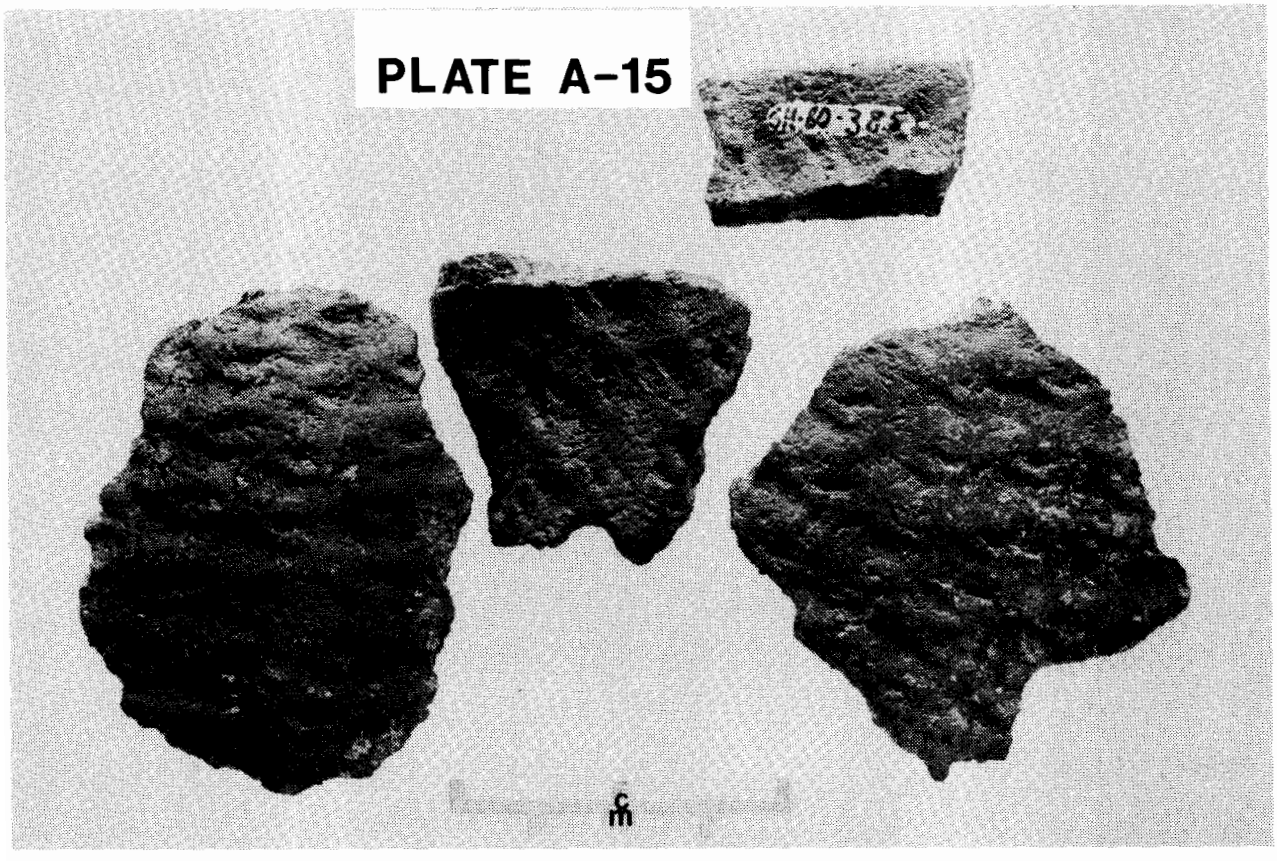

TME-39 (Plate A-15)

No. of Specimens: 33 (2 rim sherds, 31 body sherds)
Designation: 5 RB1779 (#385-387)
Description: These sherds probably represent a single vessel with a tapered, excurvate rim, and possibly a flower pot shape.
Construction Method: coiling, uneven scraping
Paste: coarse, friable, rough-textured
Core Color: wide carbon streak, grey to dark grey
Temper: very coarse, crushed angular quartz
Firing: only the surface is fired; oxidizing atmosphere(?)
Surface Color: exterior - reddish tan to light grey
interior - tan
Surface Finish: exterior - surface has been lightly smoothed, but coils are not completely obliterated, leaving a textured surface; some sherds appear finger-impressed
interior - scraped smooth, but uneven; some indications of a small rock anvil;

some curvature may indicate a flat-bottomed vessel shape

Wall Thickness: 5-7 mm

Associations: Generally resembles Emery Gray Ware (AD 700-1200?) (Ibid.) The flower pot shape may indicate Numic origin (post-AD 1100?)




TME-40 (Plate A-16)

No. of Specimens: 4 (body sherds)

Designation: 5 RB1797 (#376)

Description: The sherds appear to be from the same vessel, and the surface finish (if intentional) may be indicative of a bowl shape.

Construction Method: possible coil and scrape

Paste: friable, but fairly fine

Core Color: greyish tan

Temper: large quantities of fine-grained sand

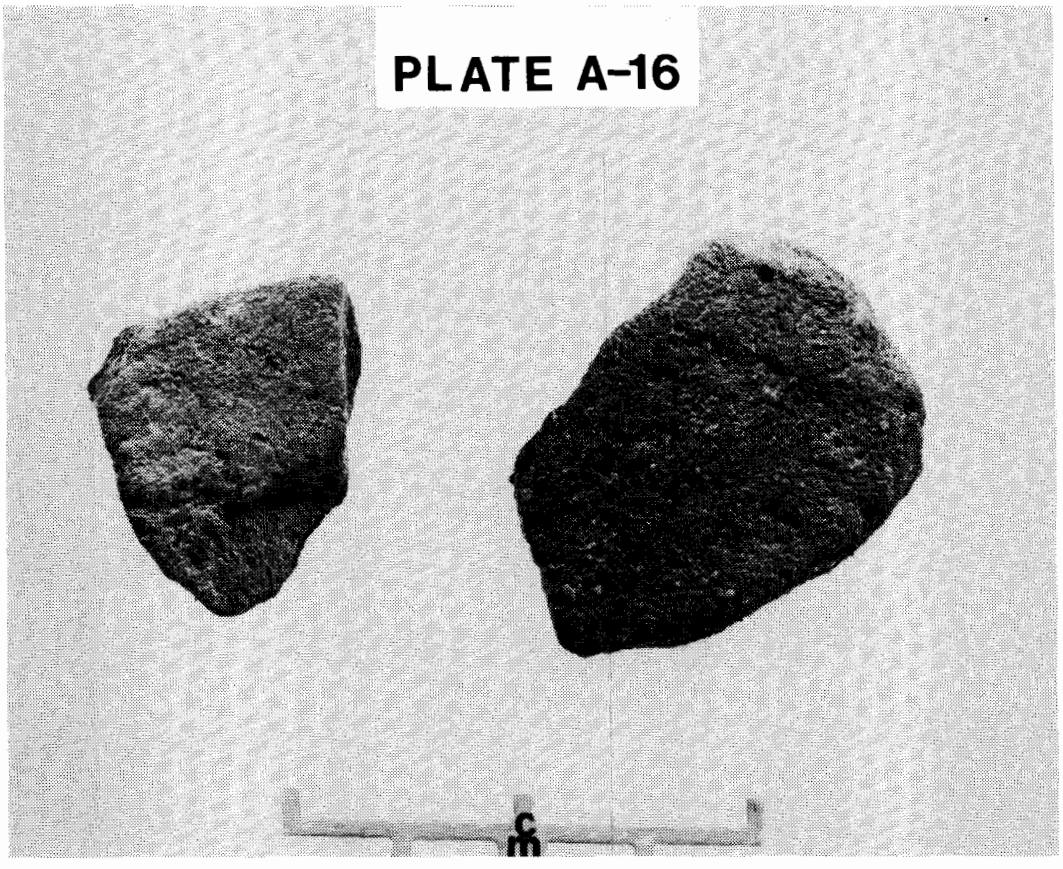
Firing: uneven, some evidence of refiring; oxidizing atmosphere; 2 sherds have heavily smudged interiors

Surface Color: exterior - tannish grey
interior - light grey to black

Surface Finish: exterior - grainy (possibly due to weathering)
interior - smoothed

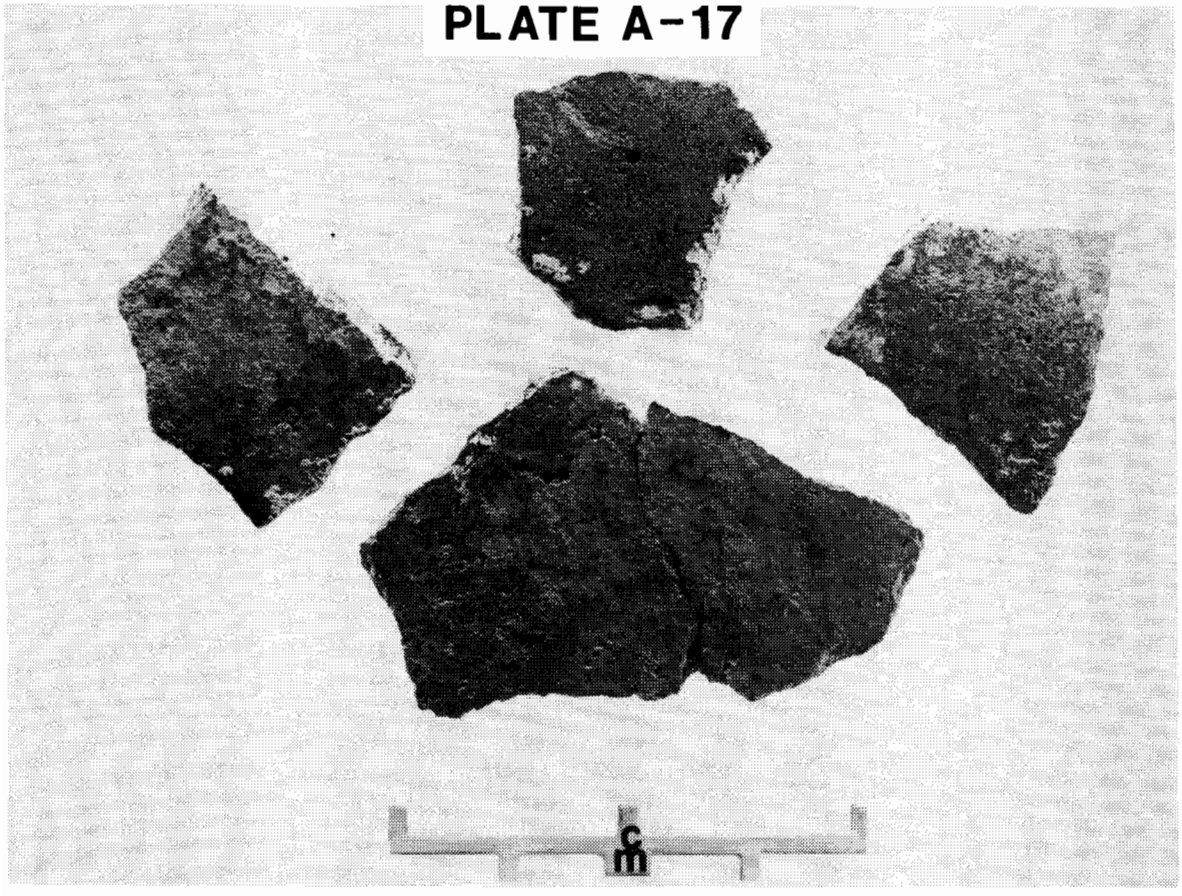
Wall Thickness: 5-7 mm

Associations: resembles Ute Uncompahgre Brown Ware (Annand 1967); occurs with a TME-6 (Numic) point, possible wickiups, and obsidian debitage



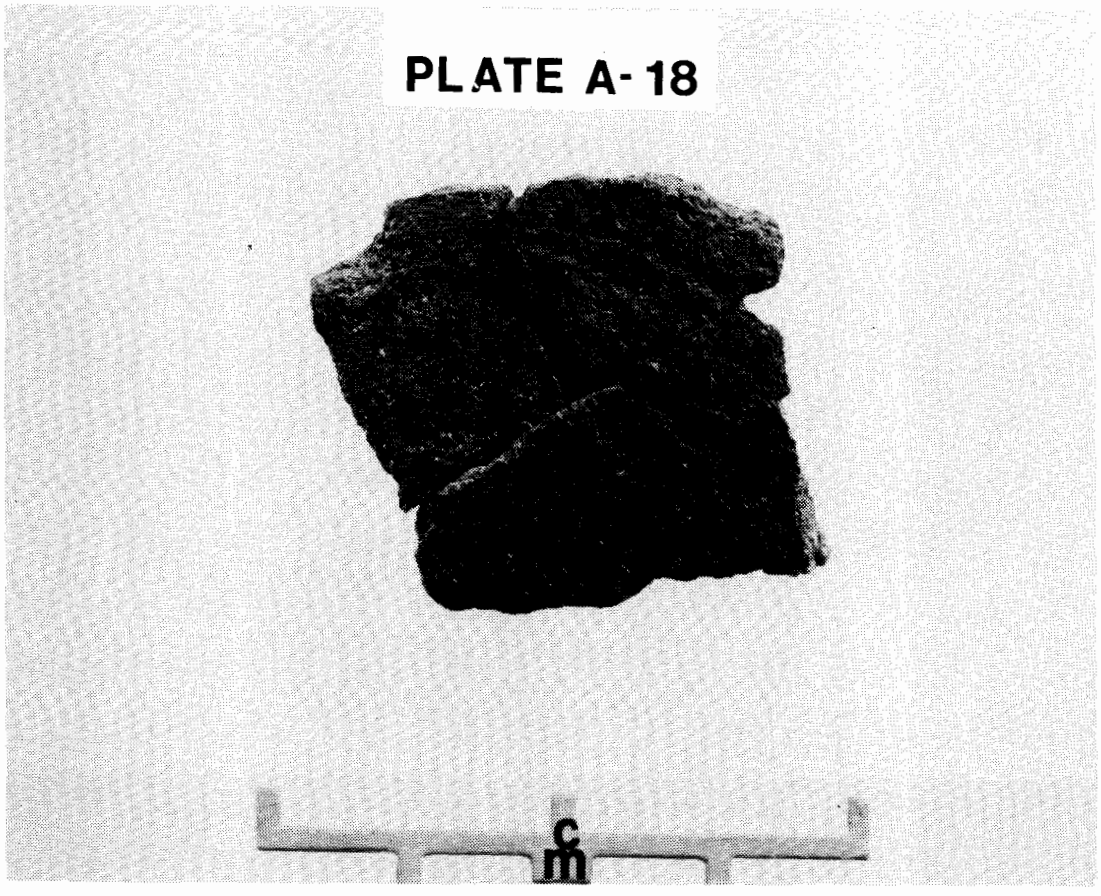

TME-41 (Plate A-17)

No. of Specimens: 12 (body sherds)
Designation: 5 RB1787-1 (#365)
Description: These sherds appear to represent a single vessel, perhaps a jar.
Construction Method: no evidence of coiling, but sherds seem too thin for lump modeling
Paste: medium fine
Core Color: tan
Temper: none visible - clay homogeneity and plasticity may have eliminated a need for temper
Firing: oxidizing atmosphere
Surface Color: exterior - tannish grey, some sooting
interior - greyish orange
Surface Finish: exterior - scraped smooth, some polish
interior - scraped, grass(?) wiped?
Wall Thickness: 3-6 mm
Associations: Resembles Dismal River Apache (AD 1700) wares (Gunnerson 1960), or could possibly be an example of Faraon (ca. AD 1650) Apache plainware from northern New Mexico (Gunnerson and Gunnerson 1971)



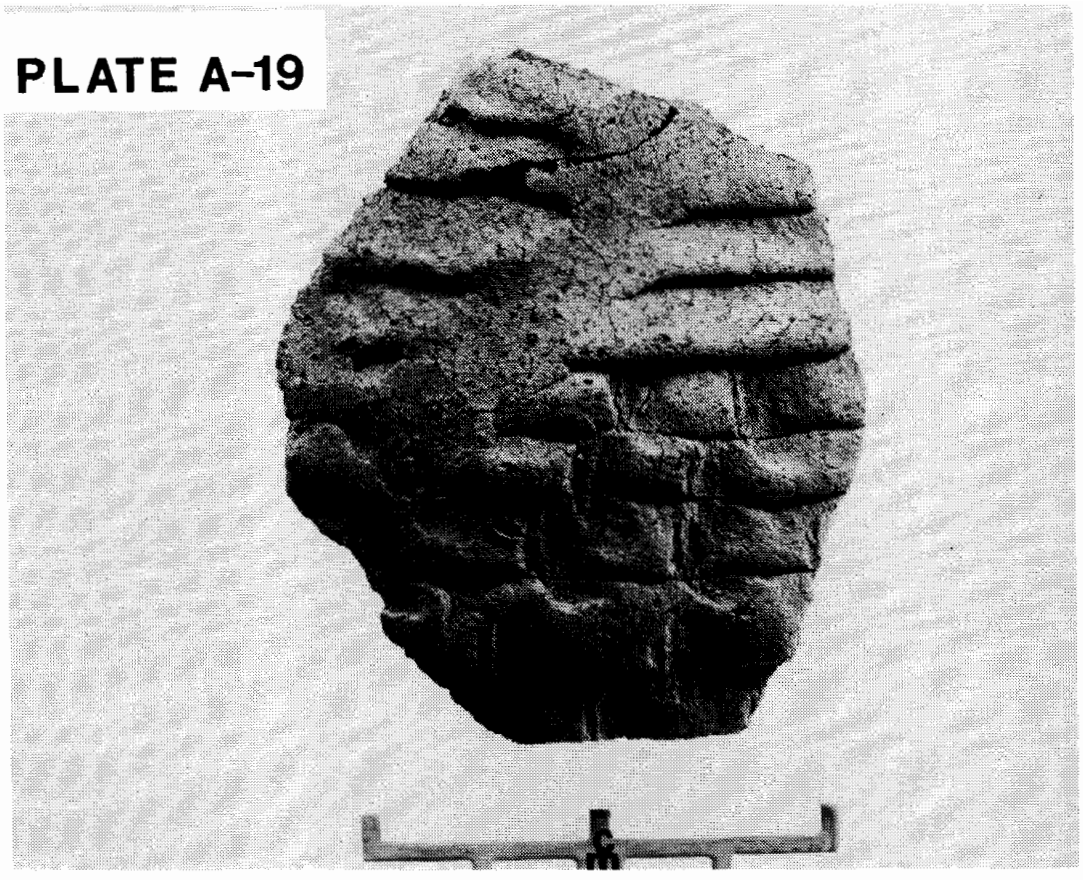

TME-42 (Plate A-18)

No. of Specimens: 1 (reconstructed from 3 body sherds)
Designation: 5 RB1781-7 (#373)
Description: The three reconstructed sherds may be a jar fragment.
Construction Method: none visible; possibly coil and scrape
Paste: very fine, compact
Core Color: carbon streak, light tan to light grey
Temper: crushed mica, quartz, and sherd
Firing: oxidizing atmosphere
Surface Color: exterior - greyish orange
interior - light tan
Surface Finish: exterior - some form of parallel marking (corncob?) that has been partially obliterated by smoothing; some surface vitrification
interior - scraped smooth
Wall Thickness: 4 mm
Associations: Generally resembles micaceous wares from the Taos/Picuris (post AD 1700) area of Northern New Mexico, but thinner than Picuris wares (Ellis and Brody 1964); could be Jicarrilla Apache ware from the same area (Gunnerson and Gunnerson 1971:9-10). Occurs with TME-37 (Fremont or Numic?) ceramics and a TME-14 point




TME-43 (Plate A-19)

No. of Specimens: 1 (body sherd)
Designation: 5 Rb1837 (#371)
Description: This is a corrugated utility ware sherd reconstructed from two fragments.
Construction Method: coil
Paste: friable, medium fine
Core Color: carbon streak, grey
Temper: crushed quartz and sherd (?)
Firing: reducing atmosphere
Surface Color: exterior - light tan
interior - light tan
Surface Finish: exterior - corrugated with fairly wide, even coils, with shallow nail-impressions visible; a single diagonal wipe obliterates some of the corrugation
interior - smoothed
Wall Thickness: 5-6 mm
Associations: Tusayan (Kayenta) Corrugated? (AD 950-1300) (Creasman 1979), Fremont-Numic?-Anasazi Trade Ware?




TME-44 (Plate A-20)

No. of Specimens: 4 (body sherds)
Designation: 5 Rb1486 (#70-73)
Description: These 4 sherds were found together, and various ceramic analysts contacted cannot agree on the number of vessels represented or the possible cultural associations. It is possible that the sherds represent 4 different vessels (probably jars), at least one of which had a handle (Plate A-20.c). All 4 are described below using their Plate A-20 letter references as identifiers.

Construction Method: coiled and scraped
Paste: a-d fine, compact (limestone)
Core Color: a- light grey, b-d- carbon streak, light to medium grey
Temper a-d- crushed rock and sherd
Firing: a-d- reducing atmosphere
Surface Color: exterior - a white (slipped)
b white, grey, black
c-d black and grey
interior - a-d light grey
Surface Finish: exterior - a heavy white slip, unevenly applied
b very smooth, polished except where carbon paint (in geometric design) has etched into surface

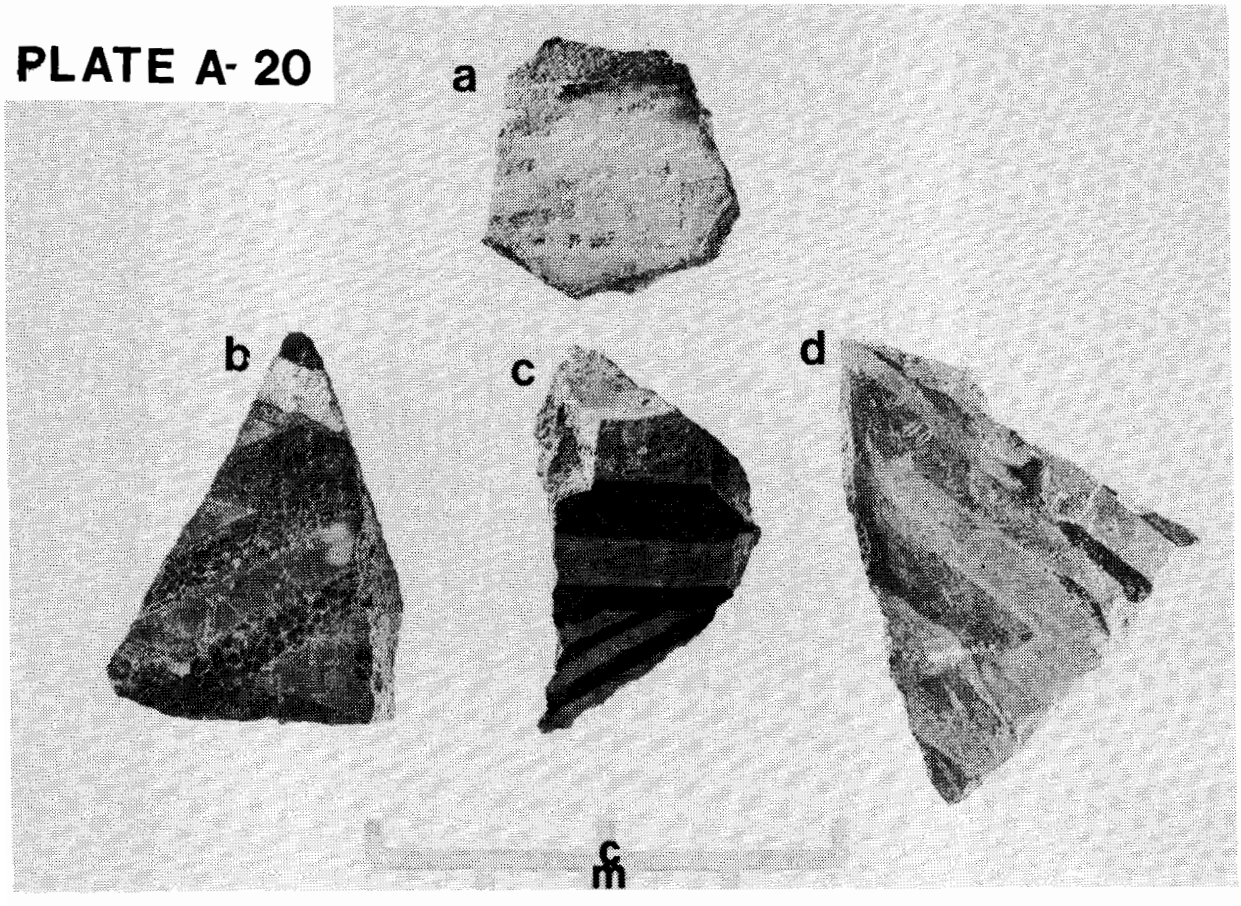
c grey slip, highly polished, then painted in a geometric design with black carbon (with some mineral?) paint

d grey slip, polished then painted in a geometric design (obscured by fire-clouding) with a black carbon (?) paint

interior - a-d- scraped

Wall Thickness: a 6.5 mm
b 6.2 mm
c 6-8.5 mm
d 5.5 mm

Associations: Similar to either Kayenta (Ellwood, personal communication) or Mesa Verde (Jennings, personal communication) black-on-white/gray wares (ca. AD 110-1300?) that may be imported Anasazi Trade Wares from the Southwest, though there is some evidence that the clays are local; all are probably either Pueblo II (AD 1050-1150) or Pueblo III (AD 1150-1250) period ceramics, suggesting Fremont affiliations in the T-M-E study area



## APPENDIX A REFERENCES


Ambler, John Richard
1966 Caldwell Village and Fremont Prehistory. Unpublished Ph.D. dissertation. Department of Anthropology, University of Colorado, Boulder.

Aikens, C. Melvin
1970 Hogup Cave. University of Utah Anthropological Papers No. 93. Salt Lake City.

Anderson, Jane L. and Ruth A. Henss
n.d. Final Report on the Cultural Resources Survey of Core Holes and Access Roads in the Moon Lake Project Area. Unpublished ms. Pioneer Archaeological Consultants, Longmont, Colorado.

Annand, Richard E.
1967 A Description and Analysis of Surface Collected Pottery from the Collbran Region, Colorado. Southwestern Lore 33(2):47-60.

Berge, Dale L.
1980 Simpson Springs Station - Historical Archaeology in Western Utah, 1974-1975. Cultural Resource Series No. 6. Utah State Office, Bureau of Land Management, Salt Lake City.

Breternitz, David A. (Assembler)
1970 Archaeological Excavations in Dinosaur National Monument, Colorado-Utah, 1964-1965. University of Colorado Studies, Series in Anthropology No. 17. University of Colorado, Boulder.

Carlson, Roy L.
1965 Eighteenth Century Navajo Fortresses of the Gobernador District. The Earl Morris Papers, No. 2. University of Colorado Studies, Series in Anthropology No. 10. University of Colorado, Boulder.

Chandler, Susan M. and Paul R. Nickens
1979a Archaeological Investigations of Two Power Plant Sites and Water Pipeline Corridors for the Moon Lake Project, Rio Blanco County, Colorado and Uintah County, Utah. Unpublished ms. Moon Lake Project Report 79-4. Centuries Research Inc. Montrose, Colorado.

1979b Archaeological Investigations of the Coal Development Areas and Coal Transport Corridors for the Moon Lake Project, Rio Blanco County, Colorado and Uintah County, Utah. Unpublished ms. Moon Lake Project Report 79-5. Centuries Research Inc., Montrose, Colorado.

Connor, Carl E.
1977 Antiquities Inventory for Chandler & Associates: The North Douglas Creek Project. Unpublished ms. Antiquities Research Division, Historical Museum and Institute of Western Colorado, Grand Junction.

Creasman, Steven D.
1979 Archaeological Investigations in the Canyon Pintado Historic District, Rio Blanco County, Colorado (Draft), Phase I - Inventory and Test Excavations. Unpublished ms. Reports of the Laboratory of Public Archaeology No. 34. Colorado State University, Fort Collins.

Ellis, Florence H. and J.J. Brody
1964 Ceramic Stratigraphy and Tribal History at Taos Pueblo. American Antiquity 29:339-381.

Frison, George C.
1971 Shoshonean Antelope Procurement in the Upper Green River Basin, Wyoming. Plains Anthropologist 16(54):258-283.

Frison, G.C., Michael Wilson and Diane J. Wilson
1974 The Holocene Stratigraphic Archaeology of Wyoming: An Introduction in Applied Geology and Archaeology. In The Holocene History of Wyoming, Michael Wilson, ed. The Geological Survey of Wyoming, Report of Investigations No. 10. Laramie.

Gunnerson, James H.
1960 Dismal River Apache. Bulletin of American Ethnography No. 173.

Gunnerson, James H. and Dolores A. Gunnerson
1971 Apachean Culture: A Study in Unity and Diversity. In Apachean Culture History and Ethnology, Keith H. Basso and Morris E. Opler, eds. Anthropological Papers of the University of Arizona, No. 21. University of Arizona Press, Tucson.

Holmer, Richard N.
1978 A Mathematical Typology for Archaic Projectile Points of the Eastern Great Basin. Unpublished Ph.D. dissertation. Department of Anthropolgy, University of Utah, Salt Lake City.

Holmer, Richard N. and Dennis G. Weder
1980 Common Post-Archaic Projectile Points of the Fremont Area. Antiquities Section Selected Papers VII(16):55-68. Utah Division of State History, Salt Lake City.

Hunt, Alice B.
1953 Archeological Survey of the La Sal Mountain Area. University of Utah Anthropological Papers No. 14. Department of Anthropology, University of Utah, Salt Lake City.

Kranzush, K.J., E.K. Gordon, C.A. Engleman, and D.J. Knox
1979 The Archaeological Survey of the Hansen Project. Unpublished ms. Cultural Resources Inventory Report Series No. 79-18. Gordon & Kranzush, Inc., Boulder, Colorado.

Madsen, Rex E.
1977 Emery Gray. In Prehistoric Ceramics of the Fremont, Watson Smith, ed. Museum of Northern Arizona Ceramic Series No. 6. Museum of Northern Arizona, Flagstaff.

McCracken, Harold (ed.)
1978 The Mummy Cave Project in Northwestern Wyoming. The Buffalo Bill Historical Center, Cody, Wyoming.

Metcalf, Michael D., Brian R. Waitkus, and John E. Bradley
1980 A Summary of Cultural Resource Investigations, Kerr Coal Company, Jackson Coutny, Colorado. Unpublished ms. Metcalf-Zier Archaeologists Inc., Eagle, Colorado.

Metcalf, Michael D. and Christian J. Zier (eds.)
1978 Archaeological Investigations of the Proposed South Haystack Mine, Uinta County, Wyoming, 1976-1977. Unpublished ms. Western Wyoming College, Rock Springs.

Quimby, George Irving
1966 Indian Culture and European Trade Goods. University of Wisconsin Press, Madison.

Sharrock, Floyd W.
1966 Prehistoric Occupation Patterns in Southwestern Wyoming and Cultural Relationships with the Great Basin and Plains Culture Areas. Anthropological Papers No. 77. Department of Anthropology, University of Utah, Salt Lake City.

Stucky, Richard Keith
1977 Archaeological Survey of the Sand Wash Basin, Northwestern Colorado. Unpublished M.A. thesis. Department of Anthropology, University of Colorado, Boulder.

Weber, David A., et al.
1977 Archaeological Reconnaissance of Nine In Situ Oil Shale Lease Tracts, Colorado-Utah. Unpublished ms. Reports of the Laboratory of Public Archaeology No. 3. Colorado State University, Fort Collins.

Wormington, H. Marie and Robert H. Lister
1956 Archaeological Investigations on the Uncompahgre Plateau in West Central Colorado. Proceedings No. 2, Denver Museum of Natural History, Denver.

## Personal Communications

| | |
|---|---|
| Ellwood, Priscilla<br>1980-1981 | Ceramic Analyst, University of Colorado Museum<br>RE: Ceramic identifications |
| Jennings, Calvin H.<br>1981 | Director, Laboratory of Public Archaeology<br>RE: Ceramic and Artifact identifications; sweatlodge interpretations |
| Wheat, Joe Ben<br>1980-1981 | Archaeological Curator, University of Colorado Museum<br>RE: Artifact identification and temporal associations |

# APPENDIX B:

# SUPPORTING STATISTICAL DATA

## KEY TO TABLE B-1

RN - Resource Number
SM - Size (in 100's of square meters)
NA - Number of Artifacts
  0 = transect tally, or incomplete tally
AD - Artifact Density
  Calculated only for sites for which complete tally was undertaken
NL - Number of Lithic Materials
NSH - Number of Ceramic Sherds
NP - Number of Pottery Types
NF - Number of Features
NS - Number of Structures
DNS - Distance to Nearest Site
  Not entered for resources which are closer to the project area boundary than to a site
EL - Elevation (meters)
SL - Slope (degrees)
TF - Topographic Feature

1) Floodplain
2) Terrace
3) Rock Face
4) Edge/Rim of Upland Feature
5) Interior of Upland Feature
6) Ridge Slope
7) Top/Edge of Ridge Finger
8) Ledge, Overhang, Shelter
9) Bench (Upland Feature)
10) Combination (Large Sites)

AS - Aspect
  Recorded for sites only; 0-9=Multiple, N, NE, E, SE, S, SW, W, NW, Not recor

VG - Vegetation

1) Riparian Woodland (bottomland)
2) Big Sagebrush shrubland ( " )
3) Greasewood shrubland ( " )
4) Shad-scale shrubland
5) Hillside fringed sage and grassland
6) Low elevation big sagebrush shrubland
7) Mid elevation big sagebrush shrubland
8) High elevation big sagebrush shrubland
9) Big sagebrush on cliffs/rocky breaks
10) Mixed mountain shrub
11) Oakbrush shrubland
12) Serviceberry shrubland
13) Low elevation pinon/juniper
14) High elevation pinon/juniper
15) Pinon/juniper on cliffs/brea
16) High elevation grassland
17) Douglas fir forest
18) Aspen forest

MD - Major Drainage

1) Texas
2) Missouri
3) Evacuation
4) East Evacuation
5) West Evacuation
6) Whiskey
7) Davis

DDH - Distance to Nearest Drainage (Horizontal, in meters)
DDV - Distance to Nearest Drainage (Vertical, meters)
TNW - Type - Nearest Water Source

1) Small gully/wash
2) Intermittent/seasonal
3) Semi-permanent
4) Permanent
5) Spring

SPW - Site's Position on Drainage or Water Source

1) At head
2) At confluence
3) Within $\frac{1}{2}$ mi. of head
4) Within $\frac{1}{2}$ mi. of confluence
5) Within $\frac{1}{4}$ mi. of spring
6) None of the above
7) More than one of the above

NND - Nature of Nearest Drainage

1) Major (see MD)
2) Primary tributary
3) Secondary tributary
4) Other

IT - Intervening Topography

1) Floodplain
2) Slope/floodplain
3) Cliff/floodplain
4) All (1,2,3,7)
5) Other
6) Cross-slope (head of drng)
7) Slope

RA - Resource Affiliation

1) Historic
2) Prehistoric
3) Multi-component (historical-industrial/aboriginal)

RT - Resource Type

1) Isolated find
2) Locality
3) Open lithic
4) Quarry/mining
5) Campsite
6) Architectural
7) Other

NN - Type - Nearest Neighbor ; rejected if closer to border than nearest resource (0)

1) Isolated find
2) Locality
3) Site

TABLE B-1: RESOURCE CHARACTERISTICS

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 480 | 24.15 | 4 | .16 | 0 | 0 | 0 | 0 | 1 | 366 | 1853 | 1.3 | 7 | 9 | 13 | 3 | 213 | 25 | 2 | 4 | 3 | 2 | 1 | 6 | 1 |
| 952 | 136.50 | 0 | 0 | 4 | 0 | 0 | 3 | 0 | 0 | 1822 | .9 | 7 | 0 | 13 | 1 | 91 | 30 | 2 | 4 | 2 | 2 | 2 | 5 | 0 |
| 953 | 1.44 | 73 | 50.69 | 3 | 0 | 0 | 0 | 0 | 213 | 1890 | 1.3 | 4 | 1 | 10 | 1 | 335 | 49 | 2 | 3 | 3 | 4 | 2 | 3 | 2 |
| 954 | 23.79 | 295 | 12.40 | 5 | 0 | 0 | 0 | 0 | 396 | 1859 | 1.3 | 5 | 0 | 13 | 1 | 183 | 18 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| 955 | 11.25 | 11 | .98 | 3 | 0 | 0 | 0 | 0 | 0 | 1829 | .9 | 7 | 0 | 13 | 1 | 73 | 6 | 2 | 4 | 2 | 2 | 2 | 3 | 0 |
| 956 | .60 | 31 | 51.67 | 4 | 0 | 0 | 1 | 0 | 91 | 1822 | .9 | 8 | 2 | 6 | 1 | 30 | 12 | 2 | 2 | 1 | 4 | 2 | 5 | 3 |
| 957 | .03 | 8 | 266.67 | 3 | 0 | 0 | 0 | 0 | 0 | 1829 | 2.2 | 7 | 3 | 13 | 1 | 30 | 18 | 2 | 4 | 2 | 4 | 2 | 3 | 0 |
| 958 | 18.81 | 81 | 4.19 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2.7 | 5 | 1 | 13 | 1 | 243 | 30 | 2 | 4 | 2 | 2 | 2 | 3 | 0 |
| 959 | 39.69 | 49 | 1.23 | 4 | 0 | 0 | 0 | 0 | 0 | 1832 | 2.7 | 7 | 0 | 13 | 1 | 60 | 33 | 2 | 4 | 2 | 5 | 2 | 3 | 0 |
| 960 | 3.56 | 6 | .52 | 6 | 0 | 0 | 0 | 0 | 91 | 1829 | .9 | 4 | 1 | 6 | 1 | 122 | 293 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |
| 961 | 34.20 | 187 | 5.47 | 3 | 0 | 0 | 0 | 0 | 213 | 1841 | 1.8 | 5 | 1 | 13 | 1 | 427 | 24 | 2 | 3 | 2 | 6 | 2 | 3 | 2 |
| 962 | 376.76 | 191 | .51 | 3 | 0 | 0 | 0 | 0 | 152 | 1870 | 1.8 | 5 | 6 | 13 | 2 | 274 | 19 | 2 | 3 | 2 | 2 | 2 | 3 | 1 |
| 963 | 69.88 | 326 | 4.67 | 3 | 0 | 0 | 0 | 0 | 152 | 1822 | 2.2 | 4 | 6 | 13 | 2 | 183 | 12 | 2 | 3 | 3 | 2 | 2 | 3 | 3 |
| 964 | .02 | 6 | 300.00 | 1 | 0 | 0 | 0 | 0 | 152 | 1847 | 3.6 | 7 | 7 | 13 | 2 | 61 | 2 | 2 | 7 | 3 | 7 | 2 | 3 | 1 |
| 965 | .76 | 65 | 85.52 | 5 | 0 | 0 | 0 | 0 | 0 | 1871 | 1.3 | 9 | 8 | 13 | 1 | 198 | 15 | 2 | 6 | 3 | 6 | 2 | 3 | 0 |
| 966 | .65 | 56 | 86.15 | 1 | 0 | 0 | 0 | 0 | 305 | 1823 | .9 | 7 | 3 | 13 | 1 | 46 | 6 | 2 | 7 | 2 | 7 | 2 | 3 | 2 |
| 967 | 6.20 | 31 | 5.00 | 1 | 0 | 0 | 0 | 0 | 0 | 1822 | 1.3 | 5 | 0 | 6 | 1 | 152 | 24 | 2 | 4 | 3 | 2 | 2 | 3 | 0 |
| 968 | 1233.27 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1786 | 1.8 | 10 | 0 | 13 | 2 | 61 | 24 | 2 | 4 | 1 | 2 | 2 | 3 | 0 |
| 969 | 44.89 | 140 | 3.11 | 5 | 0 | 0 | 1 | 0 | 0 | 1804 | 1.8 | 9 | 4 | 13 | 1 | 274 | 0 | 2 | 6 | 2 | 2 | 2 | 5 | 0 |
| 970 | 1.78 | 10 | 5.62 | 1 | 0 | 0 | 0 | 0 | 122 | 1792 | 1.8 | 7 | 5 | 13 | 1 | 76 | 12 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |
| 971 | 13.23 | 74 | 5.59 | 4 | 0 | 0 | 0 | 0 | 122 | 1804 | 1.8 | 7 | 4 | 13 | 1 | 91 | 12 | 2 | 4 | 2 | 2 | 2 | 3 | 1 |
| 1485 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1822 | .9 | 5 | 9 | 13 | 1 | 122 | 18 | 2 | 4 | 2 | 2 | 2 | 2 | 0 |
| 1486 | 0 | 4 | 0 | 0 | 4 | 4 | 0 | 0 | 366 | 1810 | .9 | 1 | 9 | 2 | 1 | 61 | 12 | 2 | 4 | 1 | 2 | 2 | 2 | 3 |
| 1487 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1834 | 1.3 | 5 | 9 | 13 | 1 | 122 | 24 | 2 | 4 | 2 | 4 | 2 | 2 | 1 |
| 1488 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1822 | .9 | 2 | 9 | 13 | 1 | 30 | 6 | 2 | 4 | 2 | 3 | 2 | 2 | 0 |
| 1489 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 0 | 91 | 1839 | .9 | 6 | 2 | 13 | 1 | 76 | 17 | 2 | 4 | 2 | 2 | 2 | 2 | 3 |
| 1490 | .07 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 30 | 1853 | .9 | 5 | 9 | 13 | 1 | 213 | 12 | 2 | 3 | 2 | 6 | 1 | 2 | 3 |
| 1491 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 274 | 1847 | 1.3 | 5 | 0 | 13 | 1 | 76 | 9 | 2 | 3 | 2 | 6 | 2 | 2 | 1 |



TABLE B-1: RESOURCE CHARACTERISTICS

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1492 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 152 | 1841 | 3.1 | 5 | 9 | 6 | 1 | 427 | 6 | 2 | 3 | 2 | 6 | 2 | 2 | 1 |
| 1493 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 107 | 1865 | 1.3 | 4 | 9 | 13 | 1 | 427 | 12 | 2 | 7 | 2 | 6 | 2 | 2 | 3 |
| 1494 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1850 | 2.2 | 5 | 9 | 13 | 1 | 152 | 9 | 1 | 4 | 2 | 2 | 2 | 1 | 0 |
| 1495 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | 1834 | 1.3 | 5 | 9 | 13 | 1 | 198 | 24 | 2 | 4 | 2 | 4 | 1 | 1 | 3 |
| 1496 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1817 | 2.7 | 6 | 9 | 3 | 1 | 122 | 12 | 2 | 4 | 2 | 2 | 2 | 1 | 0 |
| 1497 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1851 | 1.8 | 6 | 9 | 13 | 1 | 243 | 11 | 2 | 3 | 2 | 7 | 2 | 1 | 2 |
| 1498 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1841 | .9 | 6 | 9 | 13 | 1 | 23 | 6 | 2 | 3 | 2 | 7 | 2 | 1 | 2 |
| 1499 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 549 | 1835 | .9 | 4 | 9 | 13 | 1 | 64 | 6 | 2 | 7 | 2 | 2 | 2 | 1 | 1 |
| 1500 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 213 | 1841 | .5 | 5 | 9 | 6 | 1 | 390 | 6 | 2 | 3 | 2 | 7 | 2 | 1 | 2 |
| 1501 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 167 | 1828 | .5 | 4 | 7 | 13 | 1 | 183 | 6 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1502 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 137 | 1834 | 4.5 | 6 | 9 | 9 | 1 | 168 | 12 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1503 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1834 | 1.3 | 5 | 9 | 13 | 1 | 137 | 12 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1504 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 98 | 1847 | 2.2 | 6 | 9 | 13 | 2 | 97 | 6 | 2 | 1 | 3 | 7 | 2 | 1 | 3 |
| 1505 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1795 | 2.7 | 6 | 9 | 6 | 1 | 213 | 15 | 2 | 4 | 2 | 2 | 2 | 2 | 3 |
| 1506 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1877 | .9 | 7 | 9 | 6 | 1 | 457 | 12 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1507 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1890 | .9 | 6 | 9 | 13 | 1 | 183 | 18 | 2 | 7 | 2 | 2 | 2 | 1 | 3 |
| 1508 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 274 | 1817 | .9 | 2 | 9 | 6 | 1 | 91 | 24 | 2 | 3 | 2 | 2 | 2 | 1 | 2 |
| 1509 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1792 | 2.2 | 6 | 9 | 13 | 1 | 30 | 12 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1510 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 427 | 1817 | .9 | 7 | 9 | 13 | 2 | 549 | 36 | 2 | 4 | 1 | 2 | 2 | 1 | 2 |
| 1511 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 396 | 1877 | 1.8 | 4 | 9 | 13 | 1 | 366 | 97 | 2 | 4 | 1 | 2 | 2 | 1 | 3 |
| 1512 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1868 | 1.3 | 5 | 9 | 5 | 2 | 213 | 40 | 2 | 7 | 1 | 6 | 2 | 1 | 3 |
| 1513 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 107 | 1853 | .9 | 4 | 9 | 13 | 2 | 366 | 49 | 2 | 7 | 2 | 2 | 2 | 1 | 2 |
| 1514 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 152 | 1859 | .9 | 7 | 9 | 13 | 1 | 122 | 6 | 2 | 7 | 3 | 2 | 2 | 1 | 3 |
| 1523 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 274 | 1878 | .9 | 4 | 9 | 5 | 2 | 30 | 36 | 2 | 1 | 2 | 6 | 2 | 1 | 3 |
| 1524 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 152 | 1877 | 1.3 | 4 | 9 | 13 | 2 | 274 | 61 | 2 | 4 | 2 | 7 | 2 | 1 | 3 |
| 1525 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 0 | 366 | 1828 | .9 | 4 | 9 | 13 | 2 | 457 | 30 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1526 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 305 | 1835 | .5 | 7 | 9 | 13 | 1 | 137 | 30 | 2 | 7 | 3 | 2 | 2 | 2 | 2 |

TABLE B-1

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1528 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1804 | 1.3 | 7 | 9 | 13 | 1 | 198 | 12 | 2 | 3 | 3 | 3 | 2 | 2 | 0 |
| 1529 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1822 | 1.3 | 7 | 9 | 13 | 1 | 168 | 24 | 2 | 4 | 2 | 2 | 2 | 2 | 3 |
| 1530 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1792 | 2.2 | 5 | 9 | 6 | 1 | 182 | 12 | 2 | 4 | 2 | 2 | 2 | 2 | 0 |
| 1531 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 0 | 106 | 1804 | 1.3 | 5 | 9 | 13 | 1 | 167 | 12 | 2 | 6 | 2 | 2 | 2 | 2 | 3 |
| 1532 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1868 | .9 | 5 | 9 | 13 | 2 | 213 | 64 | 2 | 7 | 2 | 2 | 2 | 2 | 3 |
| 1533 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 503 | 1908 | .9 | 4 | 9 | 13 | 2 | 244 | 79 | 2 | 3 | 2 | 3 | 2 | 2 | 2 |
| 1534 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 46 | 1853 | 1.3 | 5 | 9 | 13 | 2 | 335 | 49 | 2 | 7 | 2 | 3 | 2 | 2 | 3 |
| 1535 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1816 | .9 | 5 | 9 | 6 | 2 | 91 | 24 | 2 | 4 | 2 | 2 | 2 | 2 | 3 |
| 1536 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 122 | 1828 | .9 | 5 | 9 | 6 | 2 | 183 | 213 | 2 | 4 | 2 | 2 | 2 | 2 | 3 |
| 1537 | 117.00 | 295 | 2.56 | 3 | 0 | 0 | 0 | 0 | 0 | 1792 | 2.2 | 4 | 9 | 6 | 1 | 46 | 15 | 2 | 4 | 2 | 2 | 2 | 3 | 2 |
| 1538 | .80 | 18 | 22.50 | 2 | 0 | 0 | 0 | 0 | 0 | 1792 | .9 | 5 | 0 | 6 | 1 | 137 | 0 | 2 | 4 | 2 | 7 | 2 | 3 | 0 |
| 1539 | 2696.20 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 46 | 1798 | 2.7 | 10 | 0 | 13 | 2 | 91 | 13 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |
| 1540 | 93.33 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 335 | 1847 | 1.8 | 4 | 5 | 13 | 2 | 320 | 28 | 2 | 4 | 1 | 2 | 2 | 3 | 3 |
| 1541 | .65 | 110 | 69.23 | 2 | 0 | 0 | 0 | 0 | 335 | 1841 | 1.3 | 4 | 6 | 13 | 2 | 198 | 85 | 2 | 4 | 1 | 2 | 2 | 3 | 3 |
| 1542 | 6.21 | 22 | 3.54 | 2 | 0 | 0 | 0 | 0 | 610 | 1889 | .9 | 5 | 6 | 13 | 2 | 274 | 73 | 2 | 3 | 2 | 6 | 2 | 3 | 2 |
| 1543 | 7.68 | 9 | 1.17 | 3 | 0 | 0 | 0 | 0 | 152 | 1878 | .9 | 5 | 5 | 13 | 2 | 167 | 73 | 2 | 7 | 2 | 2 | 2 | 3 | 2 |
| 1544 | 12.55 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 244 | 1840 | 1.3 | 4 | 8 | 13 | 2 | 381 | 36 | 2 | 6 | 2 | 2 | 2 | 3 | 2 |
| 1545 | .09 | 31 | 344.44 | 1 | 0 | 0 | 0 | 0 | 244 | 1817 | 1.3 | 9 | 4 | 13 | 2 | 350 | 49 | 2 | 4 | 2 | 2 | 2 | 3 | 2 |
| 1546 | 3.60 | 50 | 13.88 | 1 | 0 | 0 | 0 | 0 | 152 | 1877 | 1.3 | 5 | 8 | 13 | 2 | 183 | 61 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| 1547 | 39.08 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1810 | 2.7 | 2 | 0 | 6 | 2 | 122 | 12 | 2 | 4 | 2 | 2 | 2 | 3 | 2 |
| 1548 | 30.66 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1865 | 1.3 | 9 | 3 | 13 | 2 | 167 | 36 | 2 | 3 | 2 | 2 | 2 | 3 | 1 |
| 1549 | 103.32 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1823 | 2.7 | 7 | 2 | 13 | 2 | 61 | 18 | 2 | 4 | 2 | 2 | 2 | 3 | 2 |
| 1550 | 2.48 | 9 | 3.62 | 1 | 0 | 0 | 0 | 0 | 152 | 1828 | 1.3 | 2 | 0 | 6 | 2 | 183 | 12 | 2 | 4 | 2 | 2 | 2 | 3 | 2 |
| 1551 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 244 | 1807 | .9 | 7 | 9 | 4 | 2 | 76 | 12 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1552 | 1.50 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 182 | 1786 | 3.6 | 7 | 0 | 6 | 2 | 91 | 18 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |
| 1553 | 4.80 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 366 | 2023 | .9 | 9 | 2 | 10 | 2 | 106 | 49 | 2 | 4 | 2 | 4 | 2 | 5 | 2 |
| 1554 | 4.50 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 106 | 1999 | 1.3 | 9 | 8 | 10 | 2 | 152 | 36 | 2 | 4 | 1 | 2 | 2 | 3 | 3 |
| 1555 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 335 | 1841 | 1.8 | 7 | 0 | 13 | 3 | 61 | 12 | 2 | 7 | 3 | 2 | 1 | 2 | 3 |

TABLE E-1

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1556 | 2.08 | 10 | 4.80 | 3 | 0 | 0 | 0 | 0 | 244 | 1859 | 1.3 | 7 | 6 | 13 | 2 | 61 | 18 | 2 | 7 | 2 | 3 | 2 | 3 | 3 |
| 1557 | 16.00 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 244 | 1865 | .9 | 7 | 5 | 13 | 2 | 183 | 18 | 2 | 7 | 2 | 3 | 2 | 3 | 3 |
| 1558 | 38.50 | 28 | .72 | 2 | 0 | 0 | 0 | 0 | 0 | 1840 | .9 | 7 | 4 | 13 | 2 | 167 | 18 | 2 | 7 | 2 | 4 | 2 | 3 | 0 |
| 1559 | 35.00 | 43 | 1.22 | 2 | 0 | 0 | 0 | 0 | 152 | 1829 | 1.8 | 7 | 7 | 13 | 2 | 122 | 36 | 2 | 4 | 2 | 2 | 2 | 3 | 2 |
| 1560 | .18 | 14 | 77.77 | 3 | 0 | 0 | 0 | 0 | 228 | 1952 | .9 | 4 | 6 | 13 | 2 | 183 | 105 | 2 | 3 | 3 | 5 | 2 | 3 | 2 |
| 1561 | 26.79 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 213 | 1853 | .9 | 4 | 3 | 13 | 2 | 122 | 36 | 2 | 3 | 2 | 2 | 2 | 3 | 1 |
| 1562 | .40 | 17 | 42.50 | 1 | 0 | 0 | 0 | 0 | 76 | 1840 | 1.3 | 7 | 0 | 13 | 2 | 182 | 49 | 2 | 6 | 2 | 2 | 2 | 3 | 1 |
| 1563 | 6.00 | 23 | 3.83 | 3 | 0 | 0 | 0 | 0 | 366 | 1792 | 2.7 | 2 | 2 | 13 | 2 | 122 | 24 | 2 | 4 | 2 | 2 | 2 | 3 | 1 |
| 1564 | 24.75 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 38 | 1828 | 2.2 | 4 | 2 | 13 | 2 | 137 | 36 | 2 | 6 | 2 | 2 | 2 | 3 | 3 |
| 1565 | 557.54 | 38 | .27 | 1 | 0 | 0 | 2 | 0 | 46 | 1810 | 2.2 | 2 | 0 | 13 | 2 | 30 | 30 | 2 | 4 | 2 | 2 | 2 | 5 | 3 |
| 1566 | 59.20 | 16 | .33 | 3 | 0 | 0 | 1 | 0 | 91 | 1816 | 1.8 | 4 | 6 | 13 | 2 | 30 | 36 | 2 | 4 | 2 | 2 | 2 | 5 | 1 |
| 1567 | 1041.88 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1829 | 3.6 | 4 | 7 | 13 | 2 | 60 | 24 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |
| 1568 | 6.30 | 23 | 3.65 | 1 | 0 | 0 | 0 | 0 | 61 | 1822 | 2.7 | 5 | 3 | 13 | 2 | 274 | 30 | 1 | 4 | 1 | 2 | 2 | 3 | 3 |
| 1569 | 4.37 | 53 | 12.58 | 4 | 0 | 0 | 0 | 0 | 76 | 1804 | 4.5 | 9 | 3 | 13 | 2 | 107 | 12 | 1 | 4 | 1 | 2 | 2 | 5 | 3 |
| 1570 | 35.67 | 0 | 0 | 4 | 0 | 0 | 1 | 1 | 0 | 1962 | 1.3 | 7 | 2 | 13 | 2 | 122 | 24 | 1 | 4 | 1 | 2 | 2 | 5 | 0 |
| 1571 | .32 | 14 | 42.42 | 2 | 0 | 0 | 0 | 0 | 259 | 1994 | .5 | 9 | 1 | 13 | 2 | 152 | 18 | 2 | 7 | 1 | 2 | 2 | 3 | 3 |
| 1572 | 14.98 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 168 | 1987 | .9 | 9 | 0 | 13 | 2 | 61 | 12 | 1 | 7 | 1 | 2 | 2 | 3 | 2 |
| 1573 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 122 | 1999 | .9 | 9 | 9 | 13 | 2 | 91 | 24 | 2 | 4 | 1 | 2 | 2 | 2 | 1 |
| 1574 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1999 | 1.8 | 9 | 9 | 13 | 2 | 97 | 24 | 2 | 4 | 1 | 2 | 2 | 1 | 2 |
| 1575 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2023 | .5 | 9 | 9 | 13 | 2 | 219 | 36 | 2 | 4 | 2 | 3 | 2 | 1 | 0 |
| 1576 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1804 | 1.3 | 9 | 9 | 13 | 1 | 244 | 18 | 2 | 7 | 1 | 2 | 2 | 2 | 0 |
| 1577 | 8.53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 259 | 1987 | .9 | 3 | 4 | 13 | 2 | 91 | 24 | 2 | 4 | 1 | 2 | 2 | 7 | 3 |
| 1578 | 7.02 | 8 | 1.13 | 1 | 0 | 0 | 0 | 0 | 305 | 1839 | 1.8 | 4 | 1 | 13 | 2 | 352 | 85 | 2 | 4 | 3 | 3 | 2 | 3 | 3 |
| 1579 | 118.34 | 500 | .42 | 3 | 0 | 0 | 8 | 0 | 244 | 1911 | .9 | 4 | 0 | 15 | 2 | 259 | 55 | 2 | 3 | 3 | 7 | 2 | 5 | 1 |
| 1580 | 100.08 | 9 | .08 | 1 | 0 | 0 | 0 | 0 | 183 | 1840 | .9 | 4 | 0 | 13 | 2 | 61 | 12 | 2 | 4 | 3 | 3 | 2 | 3 | 3 |
| 1581 | 6.40 | 39 | 6.09 | 5 | 0 | 0 | 0 | 0 | 229 | 1871 | .9 | 5 | 0 | 13 | 2 | 76 | 43 | 1 | 3 | 3 | 2 | 2 | 3 | 1 |
| 1582 | 11.25 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 167 | 1816 | 2.9 | 2 | 8 | 13 | 2 | 61 | 0 | 1 | 4 | 2 | 2 | 2 | 3 | 3 |
| 1583 | 12.50 | 14 | 1.12 | 3 | 0 | 0 | 0 | 0 | 122 | 1853 | 2.7 | 2 | 1 | 13 | 2 | 59 | 12 | 1 | 4 | 3 | 2 | 2 | 3 | 3 |

TABLE D-1

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1584 | 36.00 | 113 | 3.16 | 3 | 0 | 0 | 0 | 0 | 198 | 1829 | 2.7 | 4 | 7 | 13 | 2 | 366 | 96 | 2 | 4 | 3 | 3 | 2 | 3 | 3 |
| 1585 | 230.00 | 16 | .06 | 2 | 0 | 0 | 0 | 0 | 46 | 1914 | 1.3 | 5 | 7 | 13 | 2 | 152 | 36 | 2 | 3 | 3 | 2 | 2 | 3 | 3 |
| 1586 | 7.87 | 24 | 3.04 | 1 | 0 | 0 | 0 | 0 | 122 | 1829 | 5.8 | 6 | 2 | 13 | 2 | 213 | 49 | 1 | 4 | 1 | 2 | 2 | 3 | 3 |
| 1587 | 72.00 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 198 | 1878 | 1.3 | 4 | 0 | 13 | 2 | 61 | 37 | 1 | 4 | 3 | 2 | 2 | 3 | 3 |
| 1588 | 1.25 | 14 | 11.20 | 1 | 0 | 0 | 0 | 0 | 122 | 1878 | .9 | 2 | 0 | 13 | 2 | 61 | 12 | 2 | 3 | 3 | 2 | 2 | 3 | 3 |
| 1589 | 2.88 | 102 | 37.21 | 2 | 0 | 0 | 0 | 0 | 76 | 1760 | 2.7 | 7 | 1 | 13 | 2 | 122 | 12 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |
| 1590 | 10.62 | 13 | 1.22 | 2 | 0 | 0 | 0 | 0 | 91 | 1891 | .9 | 4 | 3 | 13 | 2 | 122 | 26 | 2 | 3 | 3 | 2 | 2 | 3 | 3 |
| 1614 | 5.49 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1841 | 1.8 | 7 | 0 | 13 | 2 | 274 | 36 | 2 | 4 | 2 | 2 | 2 | 3 | 1 |
| 1615 | 148.84 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1817 | 2.2 | 2 | 7 | 13 | 2 | 183 | 18 | 2 | 4 | 2 | 2 | 2 | 3 | 0 |
| 1616 | 3.64 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1804 | 3.6 | 2 | 7 | 13 | 2 | 30 | 12 | 1 | 4 | 2 | 2 | 2 | 3 | 0 |
| 1617 | .59 | 8 | 13.55 | 2 | 0 | 0 | 0 | 0 | 122 | 1999 | 1.8 | 7 | 4 | 13 | 4 | 15 | 3 | 1 | 7 | 2 | 7 | 2 | 3 | 2 |
| 1618 | .26 | 26 | 100.00 | 2 | 0 | 0 | 0 | 0 | 91 | 1853 | .9 | 7 | 8 | 13 | 2 | 61 | 6 | 2 | 7 | 2 | 2 | 2 | 3 | 1 |
| 1619 | .40 | 62 | 155.00 | 1 | 0 | 0 | 0 | 0 | 305 | 1871 | .5 | 7 | 6 | 15 | 2 | 152 | 12 | 1 | 7 | 3 | 2 | 2 | 3 | 3 |
| 1620 | .45 | 41 | 91.11 | 4 | 0 | 0 | 0 | 0 | 91 | 1859 | 1.3 | 4 | 7 | 15 | 2 | 30 | 6 | 1 | 7 | 2 | 2 | 2 | 3 | 3 |
| 1621 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 274 | 1804 | 3.6 | 7 | 9 | 13 | 2 | 91 | 12 | 2 | 4 | 2 | 2 | 2 | 2 | 1 |
| 1622 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 152 | 1829 | 2.7 | 9 | 9 | 13 | 2 | 365 | 37 | 2 | 6 | 4 | 2 | 2 | 2 | 1 |
| 1623 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1804 | 1.8 | 9 | 9 | 13 | 2 | 76 | 12 | 2 | 6 | 2 | 2 | 2 | 2 | 1 |
| 1624 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 198 | 1841 | 0 | 5 | 9 | 6 | 2 | 366 | 37 | 2 | 6 | 2 | 2 | 2 | 2 | 1 |
| 1625 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1829 | 1.8 | 5 | 9 | 13 | 2 | 351 | 37 | 2 | 6 | 2 | 2 | 2 | 2 | 1 |
| 1626 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 213 | 1792 | 3.0 | 5 | 9 | 6 | 2 | 183 | 24 | 2 | 4 | 2 | 2 | 2 | 2 | 3 |
| 1627 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 0 | 107 | 1993 | 2.7 | 2 | 9 | 13 | 2 | 30 | 6 | 2 | 7 | 2 | 5 | 2 | 2 | 3 |
| 1628 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 0 | 122 | 1890 | 4.5 | 7 | 9 | 13 | 2 | 122 | 12 | 2 | 3 | 3 | 2 | 2 | 2 | 3 |
| 1629 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 427 | 1835 | 5.4 | 6 | 9 | 13 | 2 | 30 | 6 | 2 | 7 | 4 | 2 | 2 | 2 | 1 |
| 1630 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 671 | 1841 | 4.5 | 7 | 9 | 13 | 2 | 73 | 6 | 2 | 7 | 4 | 2 | 2 | 2 | 1 |
| 1631 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 91 | 1853 | 0 | 7 | 9 | 13 | 2 | 152 | 12 | 2 | 7 | 4 | 2 | 2 | 2 | 3 |
| 1632 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1780 | 2.7 | 4 | 9 | 13 | 2 | 30 | 4 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1633 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 366 | 2024 | 2.2 | 4 | 9 | 13 | 2 | 244 | 61 | 1 | 7 | 4 | 3 | 2 | 1 | 3 |
| 1634 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1841 | 2.7 | 4 | 9 | 13 | 2 | 152 | 37 | 2 | 4 | 2 | 3 | 2 | 1 | 3 |

TABLE B-1

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1635 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 152 | 1835 | 4.5 | 7 | 9 | 13 | 2 | 213 | 30 | 2 | 6 | 2 | 2 | 2 | 1 | 1 |
| 1636 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 76 | 1817 | 4.5 | 6 | 9 | 13 | 2 | 183 | 12 | 2 | 6 | 2 | 2 | 2 | 1 | 1 |
| 1637 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 198 | 1826 | 9.9 | 6 | 9 | 13 | 2 | 305 | 21 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1638 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 549 | 1914 | 1.8 | 4 | 9 | 13 | 2 | 243 | 61 | 2 | 3 | 2 | 6 | 2 | 1 | 1 |
| 1639 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1945 | 0 | 4 | 9 | 13 | 2 | 213 | 91 | 2 | 7 | 3 | 3 | 2 | 1 | 3 |
| 1640 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1835 | 3.6 | 7 | 9 | 13 | 2 | 335 | 30 | 1 | 7 | 4 | 2 | 2 | 1 | 3 |
| 1641 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1853 | 0 | 7 | 9 | 15 | 2 | 335 | 30 | 1 | 7 | 4 | 2 | 2 | 1 | 3 |
| 1642 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1795 | .9 | 5 | 9 | 3 | 2 | 152 | 15 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1643 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 30 | 1829 | 3.6 | 1 | 9 | 13 | 2 | 15 | 6 | 1 | 7 | 4 | 1 | 2 | 1 | 3 |
| 1644 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1823 | 4.5 | 7 | 9 | 13 | 2 | 183 | 18 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1645 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 46 | 1841 | 3.6 | 1 | 9 | 13 | 2 | 229 | 18 | 2 | 3 | 4 | 1 | 2 | 1 | 3 |
| 1646 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 30 | 1939 | 1.8 | 4 | 9 | 13 | 1 | 259 | 88 | 2 | 3 | 3 | 3 | 2 | 1 | 3 |
| 1647 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 53 | 1804 | 9.9 | 6 | 9 | 4 | 2 | 91 | 12 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1648 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1817 | 5.4 | 7 | 9 | 13 | 2 | 91 | 18 | 2 | 6 | 1 | 2 | 2 | 1 | 3 |
| 1649 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 640 | 2036 | 3.6 | 7 | 9 | 13 | 2 | 6 | 0 | 2 | 1 | 4 | 6 | 2 | 1 | 1 |
| 1650 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1908 | .9 | 5 | 9 | 13 | 2 | 122 | 12 | 2 | 7 | 2 | 7 | 2 | 1 | 0 |
| 1651 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1911 | .5 | 5 | 9 | 13 | 1 | 152 | 3 | 2 | 7 | 2 | 6 | 2 | 1 | 0 |
| 1652 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1902 | .9 | 4 | 9 | 13 | 2 | 335 | 61 | 2 | 4 | 2 | 3 | 2 | 1 | 3 |
| 1653 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 152 | 1920 | 2.2 | 9 | 9 | 13 | 2 | 427 | 91 | 2 | 7 | 3 | 2 | 2 | 1 | 1 |
| 1654 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 244 | 1847 | .9 | 2 | 9 | 13 | 2 | 61 | 0 | 2 | 7 | 3 | 2 | 2 | 1 | 2 |
| 1655 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1923 | .9 | 5 | 9 | 13 | 2 | 381 | 12 | 2 | 3 | 3 | 2 | 2 | 1 | 1 |
| 1656 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 213 | 1835 | 1.8 | 5 | 9 | 6 | 2 | 168 | 6 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1657 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 137 | 1864 | 2.2 | 2 | 9 | 4 | 2 | 137 | 11 | 2 | 3 | 3 | 2 | 2 | 1 | 2 |
| 1658 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 76 | 1835 | .9 | 7 | 9 | 13 | 2 | 122 | 6 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1659 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 259 | 1841 | 1.3 | 7 | 9 | 13 | 2 | 91 | 12 | 2 | 4 | 3 | 2 | 2 | 1 | 1 |
| 1660 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 244 | 1847 | 1.3 | 5 | 9 | 13 | 2 | 122 | 12 | 2 | 7 | 3 | 2 | 2 | 1 | 1 |
| 1661 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1847 | .9 | 7 | 9 | 13 | 2 | 61 | 6 | 2 | 7 | 3 | 2 | 2 | 1 | 3 |
| 1662 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1816 | 1.3 | 9 | 9 | 13 | 2 | 244 | 12 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |

TABLE E-1

TABLE E-1

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1663 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1847 | .9 | 7 | 9 | 6 | 2 | 61 | 6 | 2 | 7 | 3 | 2 | 2 | 1 | 1 |
| 1664 | 24.48 | 8 | .32 | 2 | 0 | 0 | 0 | 0 | 183 | 1853 | 2.9 | 6 | 0 | 13 | 2 | 46 | 12 | 2 | 4 | 3 | 2 | 2 | 3 | 3 |
| 1665 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 274 | 2072 | 1.3 | 5 | 9 | 13 | 2 | 274 | 36 | 2 | 3 | 3 | 3 | 2 | 2 | 2 |
| 1666 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 244 | 2085 | 3.1 | 4 | 9 | 13 | 2 | 244 | 49 | 2 | 3 | 3 | 3 | 2 | 2 | 2 |
| 1667 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 137 | 1878 | 1.3 | 7 | 9 | 13 | 3 | 30 | 6 | 2 | 7 | 3 | 2 | 2 | 1 | 3 |
| 1668 | .12 | 4 | 33.33 | 1 | 0 | 0 | 1 | 0 | 61 | 1853 | .9 | 8 | 6 | 6 | 3 | 61 | 0 | 2 | 4 | 2 | 1 | 3 | 5 | 3 |
| 1669 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 259 | 1841 | 2.2 | 9 | 9 | 13 | 2 | 76 | 12 | 1 | 7 | 3 | 2 | 2 | 1 | 2 |
| 1670 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 213 | 1896 | .9 | 9 | 9 | 13 | 3 | 213 | 30 | 2 | 3 | 3 | 7 | 2 | 1 | 1 |
| 1671 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 152 | 1841 | 1.3 | 7 | 9 | 13 | 3 | 146 | 12 | 3 | 7 | 2 | 2 | 2 | 1 | 3 |
| 1672 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1865 | 1.8 | 5 | 9 | 13 | 3 | 268 | 24 | 2 | 7 | 3 | 2 | 2 | 1 | 3 |
| 1673 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 213 | 1853 | .9 | 9 | 5 | 13 | 3 | 122 | 24 | 2 | 4 | 3 | 2 | 2 | 1 | 3 |
| 1674 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 274 | 1853 | 1.8 | 9 | 9 | 13 | 3 | 122 | 24 | 2 | 7 | 3 | 2 | 2 | 1 | 1 |
| 1675 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 259 | 1841 | .9 | 9 | 9 | 13 | 3 | 76 | 12 | 2 | 4 | 3 | 2 | 2 | 2 | 1 |
| 1676 | 0 | 2 | 0 | 1 | .0 | 0 | 0 | 0 | 91 | 1835 | 1.3 | 4 | 9 | 13 | 3 | 304 | 18 | 2 | 7 | 3 | 2 | 2 | 2 | 3 |
| 1677 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1828 | .9 | 4 | 9 | 13 | 3 | 274 | 24 | 3 | 7 | 1 | 2 | 2 | 2 | 0 |
| 1678 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1871 | .9 | 7 | 9 | 13 | 3 | 137 | 18 | 2 | 7 | 3 | 2 | 2 | 1 | 0 |
| 1679 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1816 | 1.3 | 2 | 9 | 4 | 3 | 61 | 12 | 2 | 4 | 2 | 2 | 2 | 1 | 0 |
| 1680 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1865 | .9 | 4 | 9 | 13 | 2 | 244 | 24 | 2 | 4 | 3 | 2 | 2 | 1 | 3 |
| 1681 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1926 | .5 | 4 | 9 | 13 | 3 | 579 | 73 | 2 | 3 | 2 | 7 | 2 | 1 | 3 |
| 1682 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1841 | .9 | 5 | 9 | 15 | 2 | 244 | 24 | 2 | 7 | 2 | 2 | 2 | 1 | 3 |
| 1683 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1905 | 3.6 | 6 | 8 | 13 | 2 | 259 | 21 | 2 | 7 | 3 | 2 | 2 | 2 | 0 |
| 1684 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1834 | .9 | 2 | 9 | 13 | 2 | 46 | 6 | 2 | 6 | 2 | 3 | 2 | 1 | 0 |
| 1685 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 106 | 1890 | 2.7 | 7 | 9 | 13 | 2 | 182 | 37 | 2 | 6 | 3 | 2 | 2 | 1 | 1 |
| 1686 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1890 | .9 | 7 | 2 | 13 | 2 | 366 | 42 | 2 | 6 | 3 | 2 | 2 | 1 | 1 |
| 1687 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1865 | .5 | 2 | 9 | 13 | 2 | 122 | 12 | 2 | 6 | 3 | 2 | 2 | 1 | 1 |
| 1688 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 305 | 1938 | 0 | 4 | 7 | 13 | 3 | 305 | 61 | 2 | 3 | 2 | 2 | 2 | 1 | 1 |
| 1689 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1926 | 2.2 | 5 | 9 | 13 | 3 | 411 | 49 | 2 | 3 | 2 | 2 | 2 | 1 | 3 |
| 1690 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 182 | 1865 | .9 | 2 | 9 | 13 | 3 | 152 | 12 | 2 | 7 | 2 | 2 | 2 | 2 | 2 |

TABLE E-1

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1691 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1902 | 4.5 | 9 | 9 | 13 | 3 | 518 | 36 | 2 | 6 | 3 | 2 | 1 | 1 | 0 |
| 1692 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1853 | 2.2 | 7 | 1 | 13 | 3 | 152 | 24 | 2 | 3 | 2 | 2 | 2 | 2 | 3 |
| 1693 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 305 | 1884 | .9 | 5 | 1 | 13 | 3 | 396 | 18 | 2 | 3 | 2 | 2 | 2 | 2 | 1 |
| 1694 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1878 | .9 | 1 | 9 | 3 | 3 | 122 | 3 | 3 | 4 | 2 | 1 | 2 | 1 | 3 |
| 1695 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1926 | .9 | 9 | 9 | 13 | 3 | 457 | 61 | 3 | 3 | 3 | 2 | 2 | 1 | 0 |
| 1696 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1853 | 1.3 | 5 | 9 | 13 | 3 | 183 | 24 | 3 | 4 | 2 | 2 | 2 | 2 | 3 |
| 1697 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 168 | 1878 | 2.7 | 5 | 9 | 13 | 3 | 305 | 6 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1698 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 244 | 1874 | .3 | 5 | 9 | 6 | 3 | 457 | 22 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1699 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 1884 | 2.7 | 6 | 9 | 13 | 3 | 61 | 12 | 2 | 4 | 3 | 2 | 1 | 2 | 1 |
| 1700 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 1878 | 1.3 | 9 | 0 | 13 | 3 | 152 | 12 | 2 | 4 | 3 | 2 | 1 | 2 | 3 |
| 1701 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 228 | 1865 | 1.8 | 7 | 9 | 13 | 3 | 61 | 50 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1702 | 2.00 | 46 | 23.00 | 1 | 0 | 0 | 0 | 0 | 107 | 1853 | .9 | 2 | 7 | 13 | 3 | 152 | 6 | 2 | 3 | 2 | 2 | 2 | 3 | 3 |
| 1703 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 244 | 1853 | .5 | 7 | 9 | 13 | 3 | 152 | 12 | 2 | 7 | 2 | 2 | 2 | 2 | 3 |
| 1704 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1900 | .5 | 4 | 9 | 13 | 3 | 335 | 53 | 2 | 3 | 2 | 2 | 2 | 1 | 3 |
| 1705 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1877 | 2.2 | 5 | 9 | 13 | 3 | 335 | 24 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1706 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 289 | 1877 | 2.2 | 6 | 9 | 13 | 3 | 396 | 12 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1707 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 152 | 1822 | 3.6 | 6 | 9 | 3 | 3 | 61 | 6 | 3 | 4 | 1 | 2 | 2 | 1 | 3 |
| 1708 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1890 | 1.3 | 7 | 9 | 13 | 7 | 76 | 12 | 2 | 4 | 1 | 2 | 2 | 1 | 0 |
| 1709 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1890 | 1.3 | 7 | 2 | 13 | 7 | 61 | 12 | 2 | 4 | 1 | 2 | 2 | 2 | 0 |
| 1710 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1889 | .5 | 7 | 9 | 13 | 7 | 152 | 12 | 2 | 4 | 1 | 2 | 2 | 1 | 0 |
| 1711 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 244 | 1908 | .9 | 5 | 9 | 13 | 3 | 137 | 30 | 2 | 7 | 2 | 2 | 2 | 2 | 3 |
| 1712 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1865 | 2.2 | 7 | 9 | 13 | 3 | 122 | 27 | 3 | 7 | 1 | 3 | 2 | 1 | 3 |
| 1714 | 3.20 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 213 | 1828 | .9 | 7 | 0 | 13 | 2 | 122 | 12 | 2 | 4 | 3 | 2 | 2 | 3 | 2 |
| 1715 | 2.38 | 21 | 8.82 | 1 | 0 | 0 | 0 | 0 | 107 | 1841 | .9 | 7 | 7 | 13 | 2 | 152 | 12 | 2 | 4 | 3 | 2 | 2 | 3 | 3 |
| 1716 | 172.92 | 69 | .40 | 2 | 0 | 0 | 0 | 0 | 46 | 1902 | 2.7 | 5 | 8 | 13 | 2 | 91 | 12 | 2 | 3 | 3 | 6 | 2 | 3 | 3 |
| 1717 | 6.00 | 36 | 6.00 | 2 | 0 | 0 | 0 | 0 | 91 | 1868 | 2.7 | 2 | 0 | 13 | 2 | 152 | 0 | 2 | 3 | 3 | 1 | 2 | 3 | 3 |
| 1718 | 28.12 | 14 | .49 | 1 | 0 | 0 | 0 | 0 | 107 | 1865 | 2.2 | 7 | 1 | 6 | 2 | 106 | 0 | 1 | 2 | 3 | 2 | 2 | 3 | 2 |
| 1719 | 15.25 | 8 | .52 | 1 | 0 | 0 | 0 | 0 | 213 | 1890 | 1.8 | 7 | 2 | 13 | 2 | 45 | 6 | 2 | 3 | 3 | 7 | 2 | 4 | 2 |

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1720 | 40.01 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 91 | 1865 | 1.3 | 7 | 3 | 12 | 2 | 61 | 12 | 1 | 3 | 3 | 2 | 2 | 5 | 3 |
| 1721 | 1.33 | 53 | 39.84 | 2 | 0 | 0 | 0 | 0 | 137 | 1890 | 2.2 | 7 | 8 | 13 | 2 | 152 | 36 | 2 | 3 | 2 | 1 | 2 | 3 | 1 |
| 1722 | 6.74 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1868 | 2.2 | 7 | 1 | 13 | 2 | 50 | 15 | 2 | 7 | 3 | 2 | 2 | 3 | 0 |
| 1723 | 3.96 | 9 | 2.27 | 1 | 0 | 0 | 0 | 0 | 137 | 1865 | 1.8 | 7 | 2 | 6 | 2 | 183 | 12 | 2 | 3 | 2 | 6 | 2 | 4 | 1 |
| 1724 | 76.80 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 244 | 1865 | 2.2 | 2 | 0 | 6 | 2 | 122 | 6 | 2 | 7 | 2 | 2 | 2 | 3 | 1 |
| 1725 | 1.64 | 13 | 7.92 | 1 | 0 | 0 | 0 | 0 | 183 | 1853 | 4.5 | 6 | 3 | 6 | 2 | 335 | 0 | 2 | 7 | 3 | 7 | 2 | 3 | 2 |
| 1726 | 78.75 | 15 | .19 | 1 | 0 | 0 | 0 | 0 | 76 | 1829 | 2.2 | 2 | 0 | 6 | 2 | 213 | 12 | 2 | 7 | 2 | 2 | 2 | 4 | 3 |
| 1727 | .58 | 11 | 18.96 | 1 | 0 | 0 | 0 | 0 | 91 | 1838 | 2.7 | 7 | 0 | 13 | 2 | 275 | 9 | 2 | 4 | 2 | 2 | 2 | 3 | 1 |
| 1728 | 44.80 | 45 | 1.00 | 2 | 0 | 0 | 0 | 0 | 129 | 1875 | 2.2 | 7 | 2 | 13 | 2 | 335 | 9 | 2 | 3 | 3 | 7 | 2 | 3 | 1 |
| 1729 | 69.75 | 19 | .27 | 1 | 0 | 0 | 0 | 0 | 122 | 1877 | 1.3 | 7 | 3 | 13 | 2 | 122 | 0 | 2 | 3 | 3 | 7 | 2 | 4 | 2 |
| 1730 | 4.75 | 10 | 2.10 | 1 | 0 | 0 | 0 | 0 | 122 | 1908 | 2.7 | 7 | 8 | 13 | 2 | 61 | 6 | 2 | 3 | 3 | 2 | 2 | 4 | 3 |
| 1731 | 2.97 | 9 | 3.03 | 1 | 0 | 0 | 0 | 0 | 122 | 1926 | 1.8 | 9 | 2 | 13 | 2 | 152 | 12 | 2 | 3 | 3 | 7 | 2 | 3 | 1 |
| 1732 | 59.74 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 152 | 1914 | .9 | 7 | 2 | 13 | 2 | 91 | 24 | 2 | 3 | 2 | 7 | 2 | 5 | 3 |
| 1733 | 155.00 | 10 | .06 | 2 | 0 | 0 | 0 | 0 | 122 | 1847 | 1.3 | 9 | 7 | 13 | 2 | 213 | 12 | 2 | 7 | 2 | 2 | 2 | 3 | 2 |
| 1734 | 543.64 | 116 | 0 | 3 | 0 | 0 | 0 | 0 | 30 | 1871 | 1.3 | 10 | 6 | 15 | 2 | 427 | 15 | 2 | 7 | 2 | 4 | 2 | 3 | 3 |
| 1735 | 99.75 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 122 | 1889 | 1.3 | 5 | 6 | 13 | 2 | 244 | 24 | 2 | 7 | 3 | 7 | 2 | 3 | 2 |
| 1736 | 70.52 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 23 | 1865 | 1.3 | 7 | 0 | 15 | 2 | 366 | 49 | 2 | 7 | 1 | 3 | 2 | 3 | 3 |
| 1737 | 5.13 | 28 | 5.45 | 3 | 0 | 0 | 0 | 0 | 214 | 1865 | .9 | 7 | 7 | 13 | 2 | 335 | 24 | 2 | 3 | 2 | 2 | 2 | 3 | 1 |
| 1738 | 1.67 | 10 | 5.98 | 2 | 0 | 0 | 0 | 0 | 30 | 1871 | .9 | 5 | 5 | 15 | 2 | 366 | 24 | 2 | 7 | 1 | 3 | 2 | 3 | 3 |
| 1739 | 2.43 | 12 | 4.93 | 1 | 0 | 0 | 0 | 0 | 122 | 1859 | 1.3 | 7 | 6 | 13 | 2 | 213 | 42 | 1 | 7 | 1 | 3 | 2 | 3 | 3 |
| 1740 | 8.16 | 7 | .85 | 3 | 0 | 0 | 1 | 0 | 0 | 1865 | 1.3 | 7 | 6 | 13 | 2 | 121 | 6 | 2 | 7 | 2 | 3 | 2 | 5 | 0 |
| 1741 | 7.80 | 20 | 2.56 | 1 | 0 | 0 | 0 | 0 | 457 | 2073 | .9 | 7 | 3 | 13 | 2 | 152 | 36 | 2 | 3 | 3 | 5 | 2 | 3 | 2 |
| 1742 | 8.89 | 9 | 1.01 | 0 | 0 | 0 | 0 | 0 | 0 | 1841 | 3.3 | 9 | 0 | 13 | 2 | 122 | 6 | 2 | 4 | 1 | 2 | 2 | 3 | 0 |
| 1743 | 1.32 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1841 | .5 | 4 | 4 | 13 | 3 | 91 | 24 | 2 | 7 | 2 | 2 | 2 | 3 | 0 |
| 1744 | 13.00 | 80 | 6.15 | 3 | 0 | 0 | 0 | 0 | 213 | 1853 | 1.3 | 7 | 7 | 13 | 2 | 182 | 12 | 2 | 4 | 3 | 2 | 2 | 3 | 1 |
| 1745 | 12.00 | 83 | 6.91 | 1 | 0 | 0 | 0 | 0 | 533 | 1975 | .9 | 4 | 1 | 13 | 2 | 152 | 73 | 2 | 3 | 3 | 7 | 2 | 3 | 1 |
| 1746 | 3.11 | 10 | 3.21 | 2 | 0 | 0 | 0 | 0 | 434 | 1865 | 1.3 | 7 | 5 | 13 | 3 | 244 | 24 | 2 | 7 | 2 | 2 | 2 | 3 | 3 |
| 1747 | 69.76 | 70 | 1.00 | 1 | 0 | 0 | 0 | 0 | 335 | 1865 | .9 | 4 | 5 | 13 | 3 | 15 | 12 | 2 | 7 | 3 | 2 | 2 | 3 | 2 |

TABLE B-1

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1748 | .10 | 13 | 1.30 | 1 | 0 | 0 | 0 | 0 | 46 | 1865 | 1.3 | 5 | 0 | 13 | 3 | 248 | 36 | 2 | 7 | 2 | 2 | 2 | 3 | 3 |
| 1749 | 24.15 | 250 | 67.50 | 1 | 0 | 0 | 0 | 0 | 46 | 1865 | 1.8 | 4 | 5 | 13 | 3 | 122 | 49 | 2 | 7 | 2 | 2 | 2 | 3 | 3 |
| 1750 | 18.00 | 125 | 100.00 | 1 | 0 | 0 | 0 | 0 | 0 | 1829 | 1.3 | 7 | 6 | 13 | 3 | 91 | 24 | 3 | 7 | 2 | 2 | 2 | 3 | 0 |
| 1751 | 1.02 | 12 | 11.76 | 3 | 0 | 0 | 0 | 0 | 198 | 1847 | .9 | 4 | 6 | 13 | 3 | 274 | 30 | 1 | 7 | 2 | 2 | 2 | 3 | 2 |
| 1752 | 170.00 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1887 | 3.3 | 6 | 0 | 15 | 2 | 20 | 12 | 2 | 7 | 3 | 7 | 2 | 3 | 0 |
| 1753 | 2.02 | 27 | 13.37 | 1 | 0 | 0 | 0 | 0 | 0 | 1835 | 1.3 | 9 | 6 | 13 | 2 | 122 | 12 | 2 | 3 | 2 | 2 | 2 | 3 | 0 |
| 1754 | 2.06 | 20 | 9.70 | 2 | 0 | 0 | 0 | 0 | 213 | 1853 | .9 | 5 | 0 | 13 | 3 | 244 | 36 | 2 | 7 | 2 | 2 | 2 | 3 | 1 |
| 1755 | 1.65 | 15 | 9.09 | 2 | 0 | 0 | 0 | 0 | 518 | 1963 | 1.3 | 4 | 5 | 13 | 3 | 426 | 110 | 2 | 3 | 2 | 3 | 2 | 3 | 1 |
| 1756 | 10.46 | 17 | 1.62 | 4 | 0 | 0 | 0 | 0 | 198 | 1853 | .9 | 4 | 0 | 13 | 3 | 243 | 12 | 2 | 4 | 3 | 2 | 2 | 3 | 1 |
| 1757 | 13.45 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 183 | 1853 | .9 | 5 | 1 | 13 | 2 | 91 | 12 | 2 | 4 | 3 | 2 | 2 | 3 | 1 |
| 1758 | .19 | 67 | 352.63 | 2 | 0 | 0 | 0 | 0 | 122 | 1926 | .9 | 4 | 0 | 13 | 2 | 366 | 48 | 2 | 7 | 3 | 2 | 2 | 3 | 3 |
| 1759 | 250.00 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 152 | 1902 | 2.2 | 5 | 7 | 13 | 2 | 152 | 24 | 2 | 7 | 3 | 2 | 2 | 3 | 3 |
| 1760 | 20.37 | 75 | 3.68 | 1 | 0 | 0 | 0 | 0 | 137 | 1902 | .9 | 4 | 8 | 13 | 2 | 244 | 48 | 2 | 3 | 3 | 2 | 2 | 3 | 3 |
| 1761 | 13.50 | 115 | 8.51 | 3 | 0 | 0 | 0 | 0 | 152 | 1889 | .9 | 4 | 4 | 13 | 2 | 213 | 24 | 2 | 3 | 3 | 2 | 2 | 5 | 1 |
| 1762 | 28.80 | 53 | 1.87 | 2 | 0 | 0 | 1 | 0 | 244 | 1901 | 3.1 | 10 | 8 | 13 | 3 | 23 | 12 | 2 | 7 | 2 | 7 | 2 | 5 | 3 |
| 1763 | .45 | 53 | 117.77 | 1 | 0 | 0 | 0 | 0 | 61 | 1926 | 1.8 | 9 | 8 | 13 | 3 | 396 | 36 | 2 | 7 | 2 | 7 | 2 | 3 | 3 |
| 1764 | 10.74 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 61 | 1914 | 1.3 | 9 | 0 | 13 | 2 | 457 | 36 | 2 | 3 | 2 | 7 | 2 | 3 | 3 |
| 1765 | 10.08 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 91 | 1914 | 1.3 | 7 | 0 | 13 | 2 | 335 | 24 | 2 | 3 | 2 | 5 | 2 | 5 | 3 |
| 1766 | 51.81 | 43 | .83 | 2 | 0 | 0 | 0 | 0 | 76 | 1901 | 1.3 | 2 | 2 | 13 | 3 | 91 | 24 | 3 | 7 | 1 | 2 | 2 | 3 | 3 |
| 1767 | 5.13 | 59 | 11.50 | 2 | 0 | 0 | 0 | 0 | 107 | 1926 | .9 | 4 | 7 | 13 | 2 | 366 | 49 | 2 | 7 | 1 | 2 | 2 | 3 | 3 |
| 1768 | 6.10 | 75 | 12.30 | 3 | 0 | 0 | 0 | 0 | 137 | 1902 | .9 | 4 | 0 | 13 | 2 | 274 | 24 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |
| 1769 | 3.75 | 32 | 8.53 | 2 | 0 | 0 | 0 | 0 | 76 | 1865 | .9 | 2 | 0 | 13 | 3 | 30 | 0 | 3 | 7 | 1 | 2 | 2 | 3 | 3 |
| 1770 | 196.08 | 144 | .73 | 1 | 0 | 0 | 0 | 0 | 152 | 1934 | .9 | 4 | 6 | 13 | 3 | 152 | 103 | 3 | 4 | 1 | 2 | 2 | 3 | 3 |
| 1771 | 23.18 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 122 | 1914 | .9 | 5 | 0 | 13 | 3 | 305 | 49 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |
| 1772 | 7.00 | 113 | 16.14 | 3 | 0 | 0 | 0 | 0 | 152 | 1889 | .9 | 7 | 4 | 13 | 2 | 305 | 37 | 2 | 3 | 2 | 2 | 2 | 3 | 1 |
| 1773 | 147.00 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 144 | 1852 | 1.3 | 4 | 2 | 13 | 3 | 122 | 0 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |
| 1774 | 27.31 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1865 | .9 | 5 | 5 | 13 | 3 | 213 | 24 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |
| 1775 | 1.17 | 10 | 8.54 | 3 | 0 | 0 | 0 | 0 | 122 | 1853 | .9 | 7 | 2 | 13 | 3 | 30 | 24 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |

TABLE E-1

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1776 | 170.50 | 48 | .28 | 4 | 0 | 0 | 0 | 0 | 198 | 1853 | 1.3 | 7 | 2 | 6 | 3 | 31 | 15 | 2 | 4 | 2 | 2 | 2 | 3 | 3 |
| 1777 | 304.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 167 | 1853 | 1.3 | 10 | 6 | 13 | 3 | 122 | 24 | 2 | 4 | 2 | 2 | 1 | 7 | 2 |
| 1778 | 34.50 | 220 | 6.37 | 4 | 0 | 0 | 2 | 0 | 243 | 1865 | 1.3 | 4 | 5 | 15 | 3 | 152 | 49 | 3 | 7 | 1 | 3 | 2 | 5 | 1 |
| 1779 | 6.40 | 0 | 0 | 3 | 33 | 1 | 1 | 0 | 122 | 1926 | .9 | 4 | 0 | 13 | 3 | 244 | 73 | 2 | 4 | 3 | 2 | 2 | 5 | 1 |
| 1780 | 36.90 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 183 | 1878 | .9 | 7 | 3 | 13 | 3 | 61 | 12 | 2 | 4 | 3 | 2 | 3 | 3 | 2 |
| 1781 | 1386.84 | 0 | 0 | 5 | 30 | 2 | 0 | 0 | 213 | 1871 | 2.2 | 7 | 0 | 13 | 7 | 30 | 6 | 2 | 2 | 3 | 2 | 3 | 5 | 3 |
| 1782 | 8.00 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 213 | 1828 | 2.7 | 10 | 7 | 13 | 3 | 33 | 12 | 2 | 4 | 2 | 2 | 2 | 5 | 1 |
| 1783 | 22.50 | 42 | 1.86 | 2 | 0 | 0 | 0 | 0 | 91 | 1853 | .9 | 2 | 2 | 13 | 3 | 30 | 0 | 2 | 3 | 2 | 2 | 2 | 3 | 3 |
| 1784 | 4.31 | 8 | 1.85 | 8 | 0 | 0 | 0 | 0 | 183 | 1853 | 1.8 | 7 | 1 | 13 | 3 | 213 | 24 | 3 | 4 | 2 | 2 | 2 | 3 | 2 |
| 1785 | 498.68 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | 1859 | 1.8 | 7 | 0 | 13 | 7 | 30 | 9 | 2 | 2 | 1 | 2 | 3 | 3 | 3 |
| 1786 | .96 | 16 | 16.66 | 4 | 0 | 0 | 1 | 0 | 61 | 1853 | 1.3 | 9 | 0 | 13 | 3 | 366 | 0 | 3 | 7 | 3 | 2 | 2 | 5 | 3 |
| 1787 | 526.89 | 0 | 0 | 5 | 11 | 2 | 3 | 0 | 15 | 1871 | 1.8 | 10 | 0 | 13 | 3 | 121 | 18 | 2 | 7 | 3 | 2 | 3 | 5 | 3 |
| 1788 | 5.78 | 39 | 6.74 | 2 | 0 | 0 | 0 | 0 | 579 | 1902 | .9 | 4 | 1 | 13 | 3 | 244 | 49 | 2 | 3 | 2 | 4 | 2 | 3 | 1 |
| 1789 | 6.56 | 31 | 4.72 | 3 | 0 | 0 | 0 | 0 | 366 | 1883 | .9 | 7 | 6 | 13 | 3 | 182 | 30 | 2 | 4 | 2 | 4 | 2 | 3 | 3 |
| 1790 | 2.40 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 213 | 1865 | .9 | 7 | 7 | 13 | 3 | 107 | 36 | 3 | 4 | 1 | 4 | 2 | 3 | 3 |
| 1791 | .60 | 13 | 21.66 | 1 | 0 | 0 | 0 | 0 | 46 | 1853 | .9 | 7 | 7 | 13 | 3 | 122 | 24 | 3 | 4 | 1 | 2 | 2 | 3 | 3 |
| 1792 | 8.25 | 45 | 5.45 | 2 | 0 | 0 | 0 | 0 | 46 | 1865 | 1.3 | 7 | 6 | 15 | 3 | 91 | 36 | 3 | 4 | 1 | 2 | 2 | 3 | 3 |
| 1793 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1823 | 1.3 | 2 | 9 | 15 | 2 | 122 | 9 | 2 | 4 | 3 | 2 | 2 | 2 | 1 |
| 1794 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 213 | 1820 | .9 | 2 | 9 | 15 | 2 | 152 | 6 | 2 | 4 | 3 | 2 | 2 | 1 | 2 |
| 1795 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1847 | 1.8 | 2 | 9 | 13 | 2 | 122 | 18 | 2 | 4 | 3 | 2 | 2 | 1 | 0 |
| 1796 | .50 | 29 | 58.00 | 1 | 0 | 0 | 0 | 0 | 0 | 1917 | 1.3 | 7 | 0 | 13 | 3 | 122 | 27 | 2 | 7 | 2 | 7 | 2 | 3 | 0 |
| 1797 | 69.75 | 98 | 1.40 | 5 | 4 | 1 | 9 | 1 | 305 | 1868 | 1.3 | 4 | 7 | 13 | 3 | 76 | 40 | 3 | 7 | 1 | 2 | 2 | 5 | 1 |
| 1798 | 5.76 | 41 | 7.11 | 2 | 0 | 0 | 0 | 0 | 396 | 1880 | .9 | 9 | 5 | 13 | 3 | 152 | 27 | 2 | 7 | 2 | 2 | 2 | 3 | 2 |
| 1799 | 10.04 | 53 | 5.27 | 5 | 0 | 0 | 1 | 0 | 214 | 1893 | 1.3 | 4 | 4 | 13 | 3 | 168 | 15 | 2 | 7 | 2 | 2 | 2 | 5 | 1 |
| 1800 | .51 | 14 | 27.45 | 2 | 0 | 0 | 1 | 0 | 213 | 1902 | 2.4 | 5 | 0 | 13 | 3 | 396 | 36 | 2 | 7 | 2 | 2 | 2 | 5 | 1 |
| 1801 | 4.01 | 32 | 7.98 | 2 | 0 | 0 | 0 | 0 | 91 | 1890 | 1.3 | 5 | 6 | 13 | 3 | 290 | 36 | 2 | 7 | 2 | 2 | 2 | 3 | 1 |
| 1802 | 57.75 | 59 | 1.02 | 4 | 0 | 0 | 1 | 0 | 76 | 1884 | 2.2 | 5 | 8 | 13 | 3 | 152 | 18 | 2 | 7 | 2 | 2 | 2 | 5 | 1 |
| 1803 | 10.05 | 21 | .47 | 2 | 0 | 0 | 1 | 0 | 91 | 1884 | 2.2 | 5 | 4 | 13 | 3 | 152 | 24 | 3 | 4 | 1 | 3 | 2 | 5 | 3 |

TABLE E-1

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1804 | 11.20 | 46 | 4.11 | 6 | 0 | 0 | 0 | 0 | 61 | 1853 | 2.2 | 7 | 8 | 13 | 7 | 61 | 12 | 2 | 4 | 2 | 2 | 3 | 3 | 3 |
| 1805 | 1.44 | 24 | 16.66 | 4 | 0 | 0 | 1 | 1 | 15 | 1865 | .9 | 5 | 3 | 13 | 3 | 518 | 36 | 2 | 4 | 1 | 2 | 2 | 5 | 3 |
| 1806 | 10.53 | 18 | 1.70 | 4 | 0 | 0 | 2 | 1 | 61 | 1865 | 2.2 | 7 | 0 | 13 | 3 | 198 | 24 | 3 | 4 | 1 | 2 | 3 | 5 | 3 |
| 1807 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 91 | 1884 | 2.2 | 7 | 9 | 13 | 3 | 213 | 24 | 2 | 7 | 2 | 3 | 2 | 2 | 3 |
| 1808 | 55.23 | 29 | .52 | 4 | 0 | 0 | 0 | 1 | 167 | 1865 | 1.8 | 7 | 2 | 13 | 3 | 274 | 12 | 2 | 7 | 2 | 2 | 2 | 5 | 1 |
| 1809 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1867 | 4.5 | 6 | 9 | 13 | 3 | 122 | 20 | 2 | 7 | 3 | 2 | 2 | 1 | 3 |
| 1810 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1841 | 1.3 | 5 | 9 | 13 | 2 | 152 | 21 | 2 | 4 | 3 | 2 | 2 | 1 | 3 |
| 1811 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1817 | 1.8 | 2 | 9 | 13 | 2 | 183 | 12 | 2 | 4 | 2 | 2 | 2 | 1 | 1 |
| 1812 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1878 | .3 | 7 | 9 | 13 | 2 | 61 | 12 | 2 | 3 | 3 | 2 | 2 | 2 | 1 |
| 1813 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 152 | 1905 | 1.3 | 5 | 9 | 13 | 2 | 213 | 15 | 2 | 3 | 3 | 7 | 2 | 1 | 3 |
| 1814 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1896 | .5 | 5 | 9 | 6 | 2 | 396 | 6 | 2 | 3 | 3 | 2 | 2 | 1 | 3 |
| 1822 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 213 | 1890 | .9 | 7 | 9 | 13 | 2 | 183 | 12 | 2 | 3 | 3 | 2 | 2 | 2 | 1 |
| 1823 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1902 | 5.0 | 6 | 9 | 13 | 2 | 15 | 12 | 2 | 3 | 2 | 7 | 2 | 1 | 3 |
| 1824 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 213 | 1963 | 5.4 | 6 | 4 | 13 | 2 | 305 | 67 | 2 | 3 | 3 | 5 | 2 | 1 | 2 |
| 1825 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1890 | 4.5 | 6 | 9 | 13 | 2 | 107 | 6 | 2 | 3 | 3 | 7 | 2 | 1 | 3 |
| 1826 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1871 | 2.2 | 6 | 9 | 6 | 2 | 46 | 3 | 2 | 3 | 3 | 7 | 2 | 2 | 3 |
| 1827 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1908 | 4.5 | 6 | 9 | 13 | 2 | 91 | 12 | 2 | 3 | 3 | 7 | 2 | 1 | 3 |
| 1828 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 76 | 1878 | 2.2 | 7 | 9 | 13 | 2 | 152 | 30 | 2 | 7 | 2 | 7 | 2 | 2 | 1 |
| 1829 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 213 | 1841 | .9 | 5 | 9 | 6 | 2 | 381 | 6 | 2 | 7 | 2 | 2 | 2 | 1 | 1 |
| 1830 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1859 | 1.8 | 4 | 9 | 13 | 2 | 122 | 9 | 2 | 4 | 3 | 7 | 2 | 1 | 3 |
| 1831 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1878 | 3.1 | 6 | 9 | 13 | 2 | 122 | 24 | 2 | 3 | 2 | 2 | 2 | 1 | 3 |
| 1832 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 244 | 1847 | 1.3 | 5 | 9 | 6 | 2 | 411 | 0 | 2 | 7 | 2 | 2 | 2 | 1 | 1 |
| 1833 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1853 | 1.8 | 5 | 9 | 6 | 2 | 396 | 6 | 2 | 7 | 3 | 2 | 2 | 2 | 3 |
| 1834 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1841 | 1.3 | 5 | 9 | 6 | 2 | 396 | 24 | 2 | 7 | 3 | 2 | 2 | 1 | 3 |
| 1835 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1841 | 1.3 | 5 | 9 | 13 | 2 | 305 | 12 | 2 | 4 | 3 | 2 | 2 | 1 | 0 |
| 1836 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1847 | 1.3 | 5 | 9 | 13 | 2 | 350 | 18 | 2 | 4 | 3 | 2 | 2 | 2 | 0 |
| 1837 | 0 | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 182 | 1871 | 2.2 | 9 | 9 | 15 | 2 | 122 | 12 | 2 | 7 | 3 | 7 | 2 | 2 | 3 |
| 1838 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 61 | 1884 | .9 | 9 | 9 | 15 | 2 | 350 | 12 | 2 | 7 | 3 | 2 | 2 | 2 | 0 |

TABLE F-1

TABLE E-1

| RN | SM | NA | AD | NL | NSH | NP | NF | NS | DNS | EL | SL | TF | AS | VG | MD | DDH | DDV | TNW | SPW | NND | IT | RA | RT | NN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1839 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1838 | 1.3 | 7 | 9 | 13 | 2 | 213 | 21 | 2 | 7 | 1 | 2 | 2 | 2 | 0 |
| 1840 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 228 | 1847 | .9 | 7 | 9 | 15 | 2 | 152 | 12 | 2 | 7 | 2 | 2 | 2 | 1 | 3 |
| 1841 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 183 | 1853 | .9 | 7 | 9 | 13 | 2 | 152 | 21 | 2 | 7 | 2 | 3 | 2 | 1 | 3 |
| 1842 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1865 | 1.3 | 7 | 9 | 13 | 2 | 91 | 30 | 2 | 4 | 1 | 3 | 2 | 1 | 0 |
| 1843 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1847 | .5 | 1 | 9 | 3 | 2 | 30 | 12 | 2 | 4 | 1 | 1 | 2 | 1 | 0 |
| 1844 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1835 | 2.7 | 2 | 9 | 13 | 2 | 15 | 3 | 2 | 4 | 1 | 2 | 2 | 2 | 0 |
| 1845 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1850 | .9 | 2 | 9 | 13 | 2 | 61 | 9 | 2 | 7 | 2 | 2 | 2 | 2 | 0 |
| 1846 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 274 | 2109 | .9 | 5 | 9 | 14 | 3 | 274 | 158 | 2 | 3 | 3 | 3 | 2 | 2 | 2 |
| 1847 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 549 | 2121 | .9 | 5 | 9 | 14 | 2 | 305 | 170 | 2 | 3 | 3 | 3 | 1 | 2 | 2 |
| 1848 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2091 | .5 | 5 | 9 | 14 | 3 | 457 | 140 | 2 | 3 | 2 | 3 | 2 | 1 | 0 |
| 1849 | 15.60 | 157 | 10.06 | 1 | 0 | 0 | 0 | 0 | 0 | 1817 | 2.7 | 7 | 1 | 13 | 1 | 168 | 36 | 2 | 7 | 1 | 2 | 2 | 3 | 0 |
| 1850 | 32.50 | 106 | 3.26 | 4 | 0 | 0 | 0 | 0 | 61 | 1871 | 2.2 | 7 | 0 | 13 | 3 | 182 | 30 | 2 | 7 | 2 | 2 | 2 | 3 | 3 |
| 1864 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1914 | .9 | 4 | 9 | 13 | 3 | 198 | 36 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1865 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 61 | 1884 | 1.3 | 5 | 9 | 13 | 3 | 183 | 18 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1866 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 122 | 1899 | .5 | 5 | 9 | 13 | 3 | 244 | 33 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1867 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 213 | 1893 | .5 | 4 | 9 | 13 | 3 | 137 | 24 | 2 | 4 | 2 | 2 | 2 | 1 | 3 |
| 1868 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 244 | 1902 | .5 | 5 | 9 | 13 | 3 | 213 | 36 | 2 | 4 | 3 | 2 | 2 | 1 | 1 |
| 1869 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1893 | .9 | 4 | 9 | 13 | 3 | 107 | 27 | 2 | 4 | 2 | 2 | 2 | 2 | 0 |
| 1870 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 91 | 1881 | .9 | 5 | 9 | 13 | 3 | 137 | 3 | 2 | 7 | 2 | 2 | 2 | 1 | 3 |
| 1939 | 27.36 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 198 | 1826 | 3.6 | 7 | 0 | 13 | 3 | 150 | 15 | 3 | 4 | 1 | 2 | 3 | 3 | 3 |
| 9999 | ******* | 9999 | ****** | 9 | 99 | 9 | 9 | 9 | 999 | 9999 | *** | 99 | 9 | 99 | 9 | 999 | 999 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |

# APPENDIX C:

# MANAGEMENT SUMMARY

## MANAGEMENT SUMMARY

### Significance Assessments

Significance assessments for the 356 cultural resources recorded within the Texas-Missouri-Evacuation Creeks Study Area have been formulated on the basis of individual resource or resource group eligibility for nomination to the National Register of Hsitoric Places (NRHP). Evaluation of National Register eligibility is herein based upon a number of assumptions regarding the quality and quantity of information available from individual resources or groups of resources. These assumptions are listed below:

1. Isolated finds are considered individually ineligible for nomination to the National Register of Historic Places. A truly isolated artifact can yield an extremely limited body of data regarding prehistoric or historic behavioral patterns. Recordation of locational data and artifact collection are the best methods currently available to preserve information available from isolated finds.

2. Localities are considered individually ineligible for nomination to the NRHP for similar reasons. The single exception to this rule occurs when a locality is believed to represent a site in the preliminary stages of exposure through erosion.

3. National Register eligibility cannot be accurately evaluated when the resource cannot be fully examined, recorded and analyzed. This limitation applies to the majority of resources considered potentially eligible for nomination to the NRHP, and indicates that due to natural factors (e.g., site burial), analytical limitation (e.g. failure to recognize, record or analyze certain types of data), or practical constraints (e.g., specialized methods not within the scope of the study are required to adequately record and evaluate data), an accurate assessment of the importance of a resource to the history or prehistory of the area cannot be reached.

4. Certain resources considered individually ineligible for nomination to the NRHP can, through proximity to or association with other resources, be considered eligible as components or members of a group of resources within a defined area that has been demonstrated to contain information of importance to the understanding of areal history or prehistory. Most often in this instance, the relationships between individual resources or the resource density is recognized as significant, but analytical limitations or practical constraints have resulted in a failure to obtain all important information from the significant area.

To adequately justify eligibility or ineligibility for nomination to the NRHP, assessments must be based upon the National Register Criteria for Evaluation 36 CFR 60.6. These considerations are briefly presented below:

> "The quality of significance in American Cultural Resource management is present in districts, sites, regions, buildings, structures, and objects of National, State and local importance that possess integrity of location, design, setting, material, workmanship, feeling and association, and:
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method or construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history."

In addition to National Register significance, sites that hold religious, mythological, spiritual or other symbolic importance to a distinct group of people may be considered ethnically significant. No sites of known ethnic significance were recorded during the T-M-E study, nor have any sites protected under the Native American Religious Freedom Act of 1979 been identified. However, Native American opinion regarding the T-M-E sites has not been solicited.

For the purpose of National Register eligibility assessment, a district is considered to be a geographically definable area, possessing a significant concentration, linkage, or continuity of sites, buildings, structures or objects which are united by past events or aesthetically by plan or physical development. A district also may be comprised of individual elements which are separated geographically but are linked by association or history. When a group of individual sites is recommended as eligible for nomination to the NRHP as a unit, careful consideration must be given to the establishment of district boundaries.

It must be demonstrated that an important relationship exists between individual components while justifying the exclusion of neighboring resources. Furthermore, a district may be designed to include the intervening area between components (site "environment", which is also protected under Section 106 of the National Historic Preservation Act) or to include only the actual areas encompassed by the component sites (noncontiguous district). Since site environment is usually considered integral to the understanding of prehistoric exploitation patterns, archaeological districts generally include the intervening areas between component sites.

The two areas recommended as potentially eligible for nomination to the NRHP as archaeological districts have been defined on the basis of similarities between components, apparent degree of site preservation, lack of vandalism/disturbance, and resource density. Unfortunately, both areas are located very close to study area boundaries and therefore, it is impossible at present to firmly delineate boundaries of significant areas on the basis of resource occurrence. The current, tentatively established district boundaries are proposed to include those resources and intervening areas which appear on the basis of T-M-E survey data to constitute intensively exploited areas which will provide considerable information regarding at least one period of prehistoric occupation of the area.

The "West End Canyon Cluster" of archaeological resources, as currently defined, is comprised of eight sites, two localities and two isolated finds (Figure 13). Of the eight sites included in the area, two, 5 RB1570 (campsite) and 1577 (rock art), are considered to be individually eligible for nomination to the NRHP. One site within this area which was recorded prior to the T-M-E study, 5 RB820 (Gordon, Kranzush and Knox 1979:125), is currently listed on the NRHP. The West End Canyon Cluster includes almost all resources recorded during this study in the Upper Missouri Creek geographic region, and encompasses an

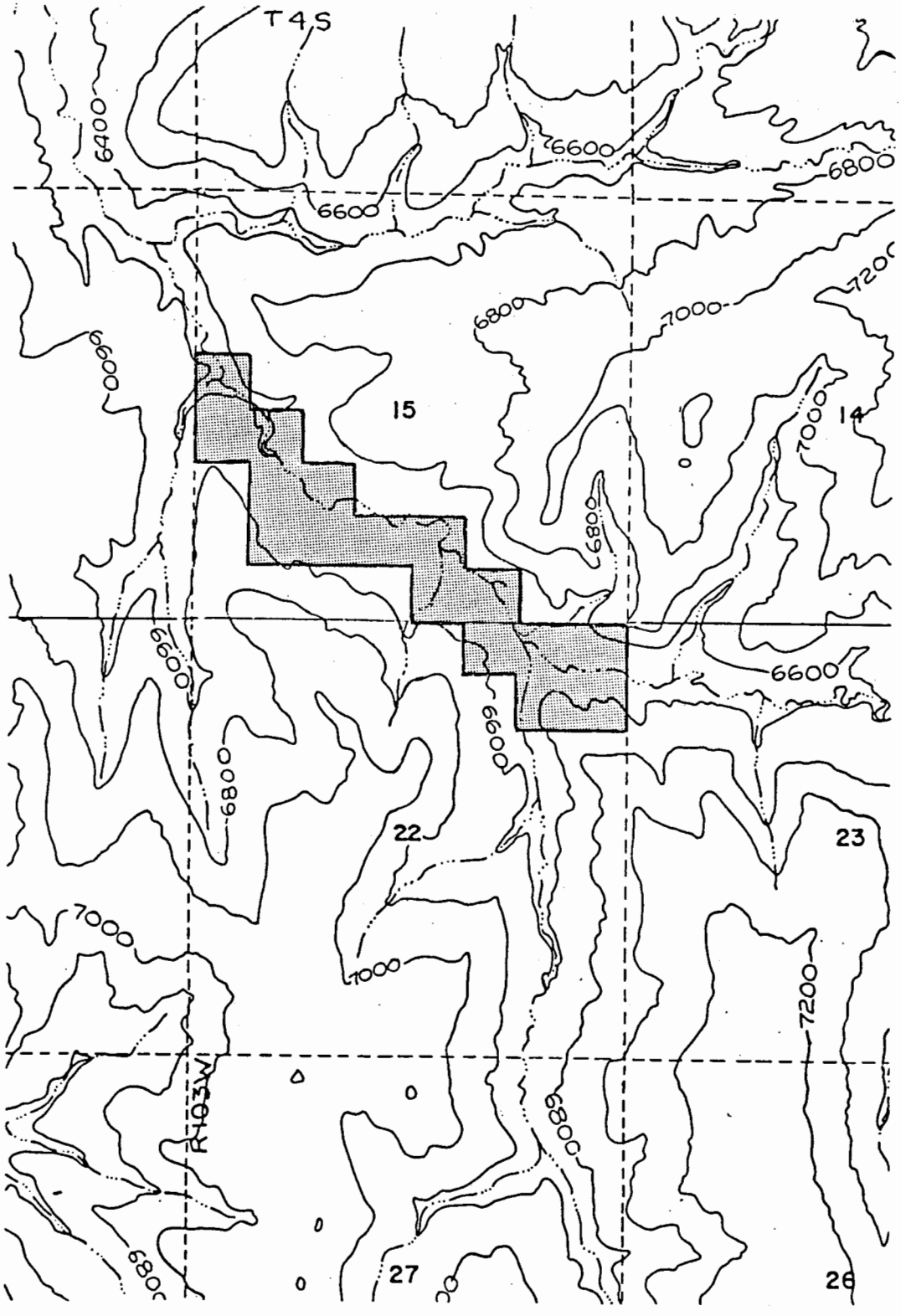



Figure 13: West End Canyon Cluster

T4S, R103W, SW¼ SW¼ NW¼, N½ NW¼ SW¼, SE¼ NW¼ SW¼, SW¼ NE¼ SW¼, NE¼ SW¼ SW¼, N½ SE¼ SW¼, NW¼ SW¼ SE¼, S½ SW¼ SE¼ Section 15; NE¼ NE¼, NE¼ NW¼ NE¼ Section 22.

area of approximately 160 acres. Resource density within the proposed district is roughly one resource per 13.3 acres.

Boundaries of the West End Canyon Cluster have been established on the basis of legally definable subdivisions of the two sections of investigated area in the Upper Missouri Creek geographic region. Due to the restricted survey in this area, it is considered highly probable that the West End Canyon Cluster extends both northwest and southeast of the current boundaries. Northeastern and southwestern margins were established to include open and forested floodplain, terrace, and ridge topography - the probable area of intensive exploitation - and to be easily definable on the topographic quadrangle for the purposes of resource management. Figure 13 depicts the tentative West End Canyon Cluster boundaries.

The West End Canyon area is believed to be significant as a group of well-preserved sites representing Fremont/Numic period areal exploitation. Diagnostic artifacts from the area believed to indicate Late Fremont through Numic period exploitation include Desert Side-Notched and Cottonwood Series projectile points (Appendix A). Rock art sites recorded in the West End Canyon area, 5 RB820 and 1577, are believed to represent Fremont and Proto-historic, and a mixed variety of Fremont and possibly Paiute-Shoshonian motifs, respectively. The possibility that this network of well-preserved cultural remains represents the Fremont-Numic transition period is considered extremely significant in terms of its applicability to the study of cultural development in northwest Colorado.

The Davis Confluence Cluster of sites consists of eight sites and two isolated finds (Figure 14). Two of the sites, 5 RB1787 and 1805, are considered individually eligible for nomination to the NRHP. The area contains a concentration of resources containing structural remains, ceramics, hearths and diagnostic artifacts which may represent Proto-historic utilization of the area.

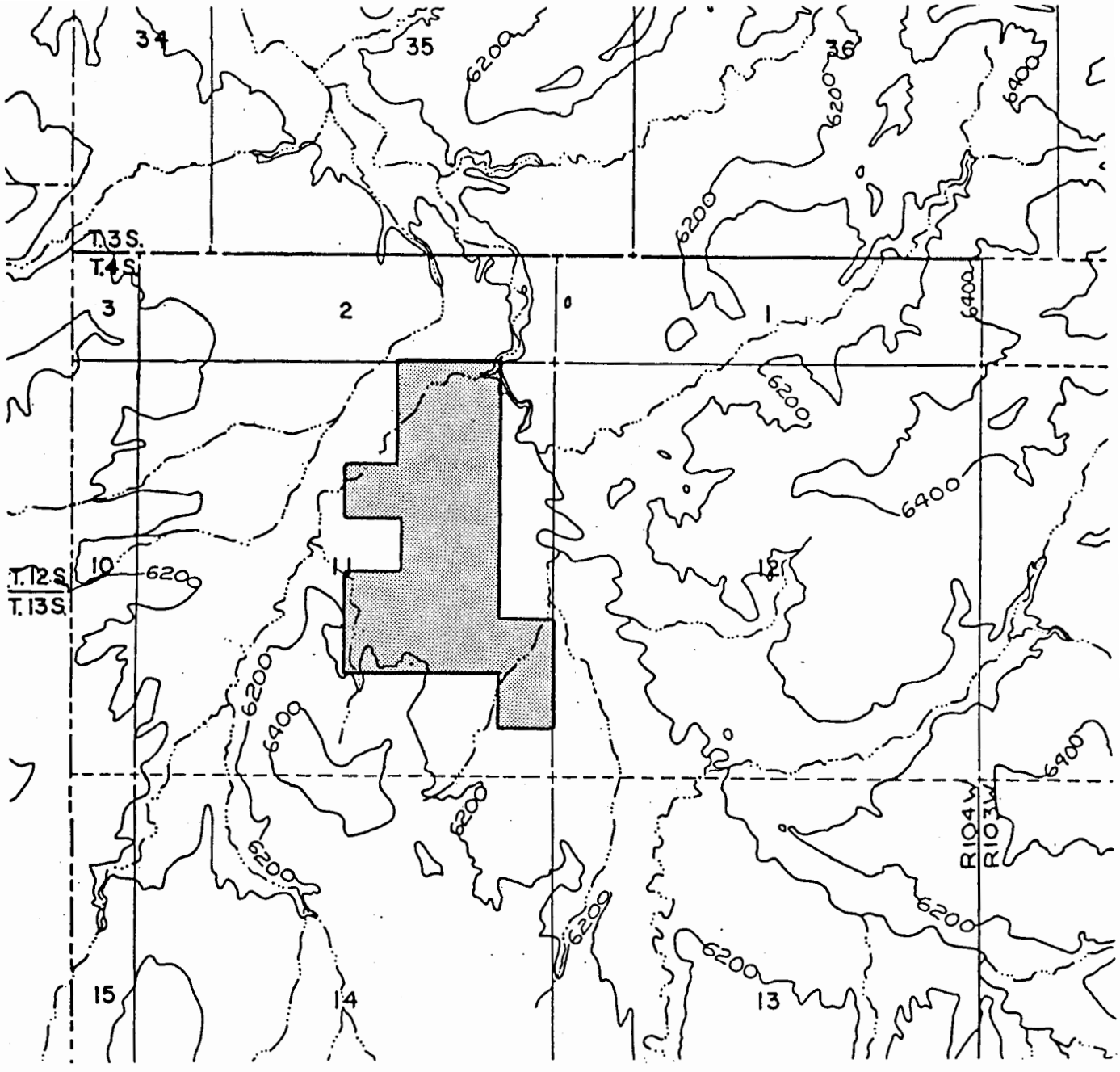



Figure 14: Davis Confluence Cluster

T4S, R104W, E½ NW¼ NE¼, W½ NE¼ NE¼, NW¼ SW¼ NE¼, NE¼ SW¼ NE¼, SE¼ SW¼ NE¼, W½ SE¼ NE¼, NW¼ SE¼, NW¼ NE¼ SE¼, SW¼ NE¼ SE¼, SE¼ NE¼ SE¼, NE¼ SE¼ SE¼, Section 11.

Diagnostic artifacts include pottery sherds of types TME-38 and TME-41 believed to be of Numic (possibly Ute) and Athabaskan origin, and a projectile point (type TME-8) believed to have been manufactured during the Proto-historic period. The proposed district encompasses an area of approximately 170 acres and exhibits a resource density of one resource per 17 acres. Boundaries were established to coincide with legally definable subdivisions of a section of land.

The significance of the Davis Canyon area stems from its potential ability to add to the understanding of post-Fremont period utilization of northwest Colorado. It is currently virtually impossible to distinguish between the archaeological manifestations of the various groups that may have inhabited the T-M-E study area during the Proto-historic period. Scientific investigations of a complex of resources which appear to date to this period in an area of documented historic Ute ownership may serve to clarify the similarities and differences between the archaeological remains of the late aboriginal inhabitants, as well as to document a poorly understood period in the cultural development of the region.

In assessing eligibility, it is considered equally important to demonstrate the reasons a particular site fails to meet eligibility criteria as to demonstrate how a site meets eligibility criteria. It is only through the thorough documentation of this decision-making process that future researchers will be able to understand and refine the practical problems of assessing site significance.

Sites within the study area were considered ineligible for nomination to the NRHP when it was determined that the quality and/or quantity of data available from the site is limited in respect to the major research thrusts for northwest Colorado, the Great Basin, and the Colorado Plateau. Sites recommended as ineligible for nomination to the NRHP are generally small and have little or no potential for associated buried deposits. Surface components may or may not have been disturbed, and artifact assemblages are limited in terms of cultural, tem-

poral, or functional variation. Most of these sites are lithic scatters lacking culturally or temporally diagnostic artifacts. It is believed that thorough recordation of site contents, environmental contents, and locations results in the retrieval of all data currently recognized as important from the site.

Eligible and potentially eligible sites, on the other hand, are seen as possible sources of information pertinent to the currently recognized research concerns for the region. Furthermore, due to structure, preservation, size, complexity, or depth, they are anticipated to be the sites that might lend themselves most easily to the pursuit of future research concerns. Of course, it is impossible to fully anticipate the types of data that will become meaningful in the future, but the current feeling is that preservation of those sites with maximum internal variation and integrity heightens the chances of retaining pertinent data for future study.

At present, the Northwest Colorado Research Design Committee of the Colorado Council of Professional Archaeologists has tentatively identified a series of research concerns for the region, among which are chronology, paleoenvironment, hearth form/type classification, horizontal stratification of sites, Paleoindian areal utilization, seasonality of site occupation, and social organization. Objectives of data retrieval include identification of the major cultural groups to inhabit the area and the chronology of these occupations, and determination of the relative effects of trade, migration, and diffusion upon *in situ* cultural development. Table 11 lists those sites and areas identified during the T-M-E survey which G&K feels have the best potential for addressing current research concerns as well as for being potential sources for data of importance to future analysis. The reader is referred to the Site Inventory Record forms filed with the BLM and the Colorado Preservation Office for additional details regarding individual site eligibility or ineligibility for nomination

to the NRHP.

Sites considered "potentially eligible" for nomination to the NRHP occupy an intermediate position between sites recommended as ineligible and eligible for this consideration. Technically, a site may be considered eligible if it "may be likely to yield information important in prehistory or history" (36 CFR 60.6(d)) (emphasis added). Therefore, a site must merely exhibit the potential for contributing to the study of history or prehistory to be considered eligible. It follows that each site classified herein as potentially or possibly eligible could be recommended as eligible for nomination to the NRHP under current eligibility criteria.

It is, however, recognized that a certain number of sites which appear from surface indications to be significant will not contain the amount or quality of information anticipated on the basis of survey data. Such sites could, after limited additional investigation, be reclassified as ineligible for nomination to the NRHP. If this is indeed the case,it is considered wasteful to concentrate management/preservation efforts on sites which may be of limited value to research concerns. The "potentially eligible" category is therefore used to designate those sites which may or may not through further investigation prove to be a major source of significant data. All such sites should be treated as eligible until final significance assessments are made.

Table 11 indicates the basis upon which certain sites have been classified as potentially eligible for nomination to the NRHP. It will be necessary to ascertain the presence or absence and/or the nature and extent of suspected significant site components (e.g. subsurface deposits, possible Paleoindian components, etc.) prior to final assessment of National Register eligibility for these sites. Individual site recommendations listed on the Colorado Site Inventory Record Forms and in Table 12 should be consulted prior to commencement of additional data recovery strategies.

TABLE 11

Significance Assessments

| Site Number | Status | Criterion 36 CFR 60.6 | Comments |
|---|---|---|---|
| 954 | Potentially eligible | (d) | Potential for significant subsurface deposits |
| 956 | Potentially eligible | (d) | Rock shelter - ca. 130 cm. of deposits bearing lithics and charcoal; severely eroded |
| 958 | Potentially eligible | (d) | Potential for significant subsurface deposits |
| 959 | Potentially eligible | (d) | Potential for significant subsurface deposits |
| 961 | Potentially eligible | (d) | Potential for shallow subsurface deposits |
| 962 | Potentially eligible | (d) | Potential for shallow subsurface deposits |
| 965 | Potentially eligible | (d) | Potential for significant subsurface deposits; horizontal extent obscured by deadfall |
| 968 | Potentially eligible | (d) | Large site with unusually high percentage of finished tools; potential for shallow subsurface deposits |
| 969 | Potentially eligible | (d) | Possible hearth and potential for significant subsurface deposits |
| 1539 | Potentially eligible | (d) | Potential for significant subsurface deposits; possible Paleo-Indian component |
| 1540 | Potentially eligible | (d) | Potential for significant subsurface deposits |
| 1542 | Potentially eligible | (d) | Potential for shallow subsurface deposits |
| 1544 | Potentially eligible | (d) | Potential for shallow subsurface deposits; possible Paleo-Indian component |
| 1546 | Potentially eligible | (d) | Potential for shallow subsurface deposits |
| 1547 | Potentially eligible | (d) | Potential for shallow subsurface deposits; surface finds suggest site may be multi-component |

Table 11 cont.

| Site Number | Status | Criterion 36 CFR 60.6 | Comments |
|---|---|---|---|
| 1565 | Potentially eligible | (d) | Circular vegetation patterns of undetermined origin; potential for subsurface component |
| 1566 | Potentially eligible | (d) | Rock alignment of undetermined function/origin; may contain subsurface deposits |
| 1569 | Potentially eligible | (d) | High percentage of finished tools; campsite with potential for shallow subsurface remains |
| 1570 | Eligible | (d) | Structural remains, hearth(s), undisturbed surface and subsurface deposits; distinct activity areas within site |
| 1577 | Eligible | (c) (d) | Excellent example of unusual rock art; rock art is rare in this area; may have associated subsurface deposits |
| 1579 | Potentially eligible | (c) (d) | Severely disturbed campsite with associated rock art; potential for undisturbed subsurface deposits must be evaluated |
| 1581 | Potentially eligible | (d) | Potential for shallow subsurface deposits |
| 1615 | Potentially eligible | (d) | Potential for shallow subsurface deposits |
| 1668 | Potentially eligible | (d) | Potential for subsurface deposits of unknown depth |
| 1720 | Potentially eligible | (d) | Potential for radiometric dating of hearth deposits; potential for subsurface artifactual remains |
| 1732 | Potentially eligible | (d) | Potential for significant subsurface remains |
| 1740 | Potentially eligible | (d) | Rock alignment of undetermined origin/function; may contain subsurface deposits |
| 1761 | Potentially eligible | (d) | Ash stains and unusual artifacts; potential for subsurface deposits |
| 1762 | Potentially eligible | (d) | Possible hearth area(s) with potential for subsurface remains |

Table 11 cont.

| Site Number | Status | Criterion 36 CFR 60.6 | Comments |
|---|---|---|---|
| 1770 | Potentially eligible | (d) | Extensive surface component and potential subsurface deposits require additional evaluation |
| 1778 | Potentially eligible | (d) | Ash stain; potential for significant subsurface deposits |
| 1779 | Potentially eligible | (d) | Extensive campsite with possible hearth; may contain subsurface deposits |
| 1781 | Potentially eligible | (d) | Campsite with potential for subsurface deposits; additional recordation of surface and subsurface components required |
| 1782 | Potentially eligible | (d) | Hearth area with potential for radiometric dating |
| 1785 | Potentially eligible | (d) | Vegetation patterns of undetermined origin; potential for significant subsurface deposits |
| 1786 | Potentially eligible | (d) | Features with potential for significant subsurface remains |
| 1787 | Eligible | (d) | Extensive campsite with hearths, structural remains, and potential for significant subsurface deposits; may be associated with 1805 |
| 1797 | Eligible | (d) | Multiple surface hearths, structural remains, and probable subsurface component(s) |
| 1799 | Potentially eligible | (d) | Campsite with hearth and potential for significant subsurface deposits |
| 1802 | Potentially eligible | (d) | Hearth area indicates potential for radiometric dating |
| 1803 | Potentially eligible | (d) | Possible hearth area and potential for significant subsurface deposits |
| 1805 | Eligible | (d) | Sweat lodge - unique to area; hearth area(s) suitable for radiometric dating |
| 1806 | Potentially eligible | (d) | Two hearths may yield radiocarbon data; possible wickiup structure; may be associated with 1805 |
| 1850 | Potentially eligible | (d) | Activity area could yield important tool manufacturing behavior data; possible stone axe cut stump may indicate association with 1805 or previous existence of structure(s) within site |

Table 11 cont.

WEST END CANYON CLUSTER

| Site Number | Status | Criterion 36 CFR 60.6 | Comments |
|---|---|---|---|
| **820<br>1553<br>1554<br>*1570<br>1571<br>1572<br>LOC 1573<br>IF 1574<br>IF 1575<br>*1577<br>1617<br>LOC 1627 | Potentially eligible as archaeological district; boundaries tentative | (d) | Higher site density than recorded to date in surrounding areas; may be source of site selection criteria data; multiple site types containing at least one hearth, rock art, structural remains, rool manufacturing areas, diagnostic artifacts; largely undisturbed; possible source of important data concerning Fremont-Numic transitional period areal utilization |

DAVIS CONFLUENCE CLUSTER

| Site Number | Status | Criterion 36 CFR 60.6 | Comments |
|---|---|---|---|
| 1785<br>1786<br>*1787<br>1804<br>*1805<br>1806<br>1808<br>IF 1809<br>1850<br>IF 1870 | Potentially eligible as archaeological district; boundaries tentative | (d) | Concentration of sites with structural remains, ceramics, hearths, diagnostic artifacts; may represent late utilization of area; possible source of important data concerning Ute-Shoshonean cultural differences/similarities |

* indicates that site is individually eligible for nomination to NRHP
** indicates that site is currently listed on NRHP

## Impact Assessments and Recommendations

Impacts noted during site recordation in the Texas-Missouri-Evacuation Creeks study area have been classified as industrial, transportation-related, natural, livestock management-related, recreational, and as stemming from apparently deliberate site vandalism. While the former two types of impact can be limited by the implementation of resource managment strategies, the latter types of impact, in many cases as serious in terms of potential damage to site integrity as are road construction or energy mineral development activities, are extremely difficult to regulate.

Industrial impacts common to the T-M-E study area include oil and gas well construction and operation and pipeline construction and maintenance. Strictly speaking, impact is site-specific to a proposed area subject to approval by the BLM. Therefore, limitation of this type of impact to cultural resources can be effected through careful scrutiny of locations of proposed developments in relation to recorded sites.

The major types of unforeseen site damage stemming from industrial development are unauthorized disturbance of sites during facility construction, and exposure of heretofore unrecorded cultural materials during ground disturbance. Unauthorized site disturbance can be somewhat limited by enforcing strict distance limits between proposed impact areas and significant sites. It is therefore recommended that a minimum separation of 61 m (200 ft.) be maintained between construction areas and sites that have been determined eligible or potentially eligible for nomination to the NRHP.

Pipeline and well location construction on the major floodplains and floodplain margins of the study area are considered to pose the biggest threat of exposure and destruction of formerly buried cultural deposits. Although BLM

places standard stipulations on operators regarding such situations, failure to recognize and/or report exposure of cultural materials may be a frequent occurrence. At present, due to a lack of resources recorded within the study area floodplains, data are insufficient to substantiate the need for additional standard stipulations regarding study area floodplain disturbance. It is therefore recommended that BLM endeavor to require pipeline/well location monitor procedures on a limited basis until such time that the need for more extensive excavation monitor becomes apparent. It is suggested that floodplain disturbance in areas with high peripheral site density, to be designated by BLM, be subjected to construction surveillance.

The two areas considered potentially eligible for nomination to the NRHP as archaeological districts, the Davis Confluence and West End Canyon Clusters, should be regarded as extremely sensitive to the effects of ground disturbing construction, at least until a final assessment of eligibility and boundary determinations are made. It is considered preferable at present to disallow any disturbance of these areas. If this management strategy is found imprudent or infeasible, it is recommended that all disturbance of the Davis Confluence and West End Canyon areas be stringently monitored by a qualified archaeologist.

Disturbance stemming from the construction and maintenance of roads or other transportation facilities poses a moderate threat to significant cultural resources in the T-M-E study area. Several sites (5 RB954, 887, 1747, and 1762 of which 5 RB954, 887, and 1762 are considered potentially eligible for nomination to the NRHP) are currently either bisected or bounded by roads which will presumably be regularly maintained. At present, the investigators see no need to require surveillance of maintenance of existing roads or to provide for regular examination of existing road surfaces to assess the effects of normal road use upon the sites. However, if widening or major improvement (e.g. culvert instal-

lation, realignment, etc.) of existing roads in the vicinity of 5 RB954, 887 or 1762 boundaries is proposed, it is recommenced that provisions for construction surveillance and/or test excavation (depending on the degree of proposed impact) be made. 5 RB887 was recorded prior to the T-M-E study and is fully discussed in the 1978 Taiga/Coseka/Northwest Pipeline Project report (Gordon, Kranzush, and Knox 1979). Regarding the construction of new access, the BLM should attempt to avoid all eligible or potentially eligible sites, and it is recommended that a distance of at least 30.5 m (100 ft.) be maintained between proposed road right-of-ways and eligible or potentially eligible sites or areas. In the event that these recommendations are impossible or infeasible to follow, site specific recommendations (Table 12, below, or individual Site Inventory Record Forms) should be followed. With regard to road construction, the Davis Confluence and West End Canyon areas should be treated as outlined above.

Natural impact includes erosion of soil deposits by either wind or water. Although this process can be aggravated or accelerated by artificial disturbance of the ground surface in the vicinity of a cultural resource, erosion is considered a natural process for the purposes of this study. Most of the sites recorded during the T-M-E study exhibit evidence of deflation and/or sheet- or gully-washing. Therefore, this discussion will be confined to the nature of such impacts to eligible or potentially eligible sites.

All five sites considered eligible for nomination to the NRHP (5 RB1570, 1577, 1787, 1797, 1805), and 35 of the 39 sites considered potentially eligible to the NRHP, are subject to the effects of on-going erosion (Table 12). In almost all cases, impact appears to be relatively minor and does not pose a serious or severe threat to site integrity in the immediate future. However, 5 RB956, already seriously damaged by gullying and slumping of rockshelter fill, may be totally destroyed by the continuous action of water upon the exposed strata.

Immediate action to channel run-off away from the site and stabilize the remaining portions of site deposits is recommended. An alternate, less desirable course of action would be to totally excavate the remaining portion of the site to salvage artifactual stratigraphic and radiocarbon data.

Immediate action is not recommended to slow or minimize the effects of erosion upon other sites in the T-M-E study area. With regard to eligible/potentially eligible sites listed on Table 12 and the West End and Davis Confluence areas, however, the BLM is advised to periodically assess the cumulative effects of erosion upon the sites in terms of changes in the qualities or characteristics which rendered them eligible or potentially eligible for nomination to the NRHP. If erosion appears to be seriouly affecting the condition of any of these sites, provisions to seek final eligibility determinations and mitigate adverse impacts should be made. It is possible that in some cases, continuing erosion will result in the exposure of sufficient materials to allow final site eligibility assessments to be made. That is, if it becomes apparent as a result of topsoil erosion that a site contains deep homogeneous or stratified remains, it may be possible to assess eligibility for nomination to the NRHP without further investigations. Periodic inspection of these sites should allow regularly updated assessments of the severity of natural impacts upon the sites.

Continued use of the study area for livestock grazing will result in an undefinable amount of damage to cultural sites in the T-M-E study area. Although measures can be implemented to reduce the amount of such impact to significant sites, to a large degree, disturbance of cultural resources by domestic livestock is unavoidable if grazing is allowed to continue in the study area. Obviously, fence, reservoir and check dam construction sites must be planned so as to avoid significant cultural resources. In the case of water storage facilities, a more extended area than the actual construction site should be subject to review for

acceptability, since livestock will tend to congregate near water sources, thus increasing potential for site surface disturbance.

Certain sites recorded during this study were noted to occur in, or appear to have potential for use as, livestock congregation areas due to location in forest vegetation adjacent to water sources. Such impact could seriously affect the integrity of eligible/potentially eligible sites 5 RB961, 962, 969, 1539, 1540, 1542, 1544, 1566, 1569, 1570, 1577, 1579, 1581, 1615, 1740, 1761, 1762, 1770, 1778, 1779, 1781, 1785, 1786, 1797, 1799, 1802, 1805, 1806 and 1850.

It is therefore recommended that BLM fence these sites if grazing is to continue in the study area. Fencing of the entire West End Canyon and Davis Condluence areas is considered infeasible. However, if it becomes apparent that livestock disturbance is severly affecting the condition of either area, fencing of component sites subject to the most severe damage should be considered.

Site damage due to recreational use of the study area or intentional vandalism of cultural sites is extremely difficult to prevent, especially in such a large and isolated region. Constant patrol of the area, clearly impractical in this case, is the only method through which some amount of vandalism control can be effected. Fencing and/or posting of sites can act more as an invitation than as a deterrant to site vandals and is discouraged. It is therefore recommended that BLM periodically assess the condition of the significant cultural sites in the area and, should it be found that site vandalism is causing major or serious damage, data retrieval measures should be implemented. Site specific recommendations are discussed below and are listed in Table 12.

Perhaps the best means by which to provide for the continued protection of significant cultural remains within the T-M-E study area is to periodically assess the integrity of the eligible/potentially eligible sites within the region. Although it is impractical to recommend that a program for site integrity as-

sessment be implemented, it is possible that site conditions can be assessed during the course of other BLM activities in the area. When a BLM agent is in the vicinity of significant cultural sites as a part of on-site inspections, compliance evaluations, etc., an attempt should be made to verify site integrity. In the event that the integrity of a specific site is being compromised in any of the manners discussed herein, data recovery or site protection measures, if necessary, can be implemented. If it becomes apparent or can be inferred that a large percentage of sites in the T-M-E study area are being damaged or destroyed, large scale data recovery procedures may be proposed.

The general recommendations advanced for the study area and resource base as a whole have been supplemented with additional site specific recommendations formulated for sites considered to be eligible and potentially eligible for nomination to the NRHP. Whereas general recommendations advise the BLM on the minimization of impact to the cultural resources recorded in the study area, the site specific recommendations outline preferable courses of action should impact be unavoidable.

Avoidance of significant sites during ground disturbing activity is currently considered the best alternative in the management of cultural resources, and therefore, avoidance is recommended for all sites considered eligible or potentially eligible for nomination to the NRHP. In the event that a site cannot be avoided, however, several methods of data retrieval have been suggested as means by which to make final National Register eligibility assessments for potentially eligible sites.

Test Excavation: Where site eligibility is contingent upon the existence of undisturbed subsurface cultural deposits, test excavation to determine the nature and extent of buried cultural materials has been recommended. Precise test pit locations have not been suggested at this time and should be determined

in accordance with the research design proposed for any additional evaluative studies in the area. On the basis of survey and limited test excavation data, final NRHP eligibliity assessments should be made. Test excavation is not considered to constitute mitigation of any proposed adverse effect to a National Register eligible site and should always be limited in scope in order to preserve site integrity for future studies.

Ancillary Data Sample Collection: Where date(s) of site occupation is a major consideration in determination of National Register eligibility and where hearths or hearth areas have been recorded within a site, carbon sample collection has been recommended either alone or in conjunction with other investigative methods. Since documentation and understanding of areal chronology is currently an important research goal, carbon sample collection has been recommended for all sites containing identifiable hearth deposits. Dendrochronology may be applicable to sites containing juniper pole structural components, and collection of wood samples for dendro-dating could prove valuable.

Mapping, Collection, Additional Recordation, Etc.: Occasionally, a site was encountered that was too large or complex to adequately record and evaluate using conventional survey methods. Most often, these are large sites with one or more dense artifact concentration which, depending upon contents and orientation, could comprise distinct work areas or possibly separate sites. In many instances, dense vegetation and/or complex terrain added to problems in site recordation with limited survey equipment. Such sites must be carefully mapped in order to determine the nature of their internal composition and, ultimately, National Register eligibility. Until additional information is analyzed, the issue of eligibility assessment cannot be adequately addressed.

Table 12 summarizes individual recommendations for each site considered eligible or potentially eligible for nomination to the National Register of

Historic Places.

It is strongly recommended that the BLM seek eligibility determinations from the Keeper of the Register for all sites recommended as eligible or potentially eligible for nomination to the NRHP. As the land managing agency, it is BLM's responsibility to provide for nomination of any sites that are determined eligible through consultations with the State Historic Preservation Officer and the Keeper of the National Register. Completion of the eligibility determination process, and, if necessary, site nomination, is recommended to provide maximum protection for significant cultural resources.

In the event that it is impossible to avoid sites that are eligible for nomination to the NRHP, mitigation strategies sufficient to allow a determination of No Adverse Effect must be devised and implemented. Mitigation strategies must be devised in response to specific impacts and should be proposed on the basis of a research design applicable to the area.

TABLE 12

Impact Assessments and Recommendations

| Site No. | Real Impact | Threatened Impact | Recommendations |
|---|---|---|---|
| 954 | Recreation/ vandalism | Vandalism<br>Transportation | Avoid; test if threatened to determine horizontal and vertical extent; final NR assessment needed. |
| 956 | Water erosion | Vandalism<br>Erosion | Avoid; test to determine NR eligibility; if eligible, deposits should be salvaged. |
| 958 | Water erosion<br>Vandalism | Erosion<br>Vandalism | Avoid; test if threatened by construction to determine vertical extent; final NR assessment needed. |
| 959 | Water/wind erosion<br>Vandalism | Vandalism<br>Erosion | Avoid; test if threatened to determine vertical extent; final NR assessment needed. |
| 961 | Water/wind erosion<br>Vandalism<br>Animal disturbance | Vandalism<br>Erosion | Avoid; test if threatened to determine vertical extent; final NR assessment needed. |
| 962 | Water/wind erosion<br>Animal disturbance<br>Recreation/ vandalism | Erosion<br>Vandalism<br>Animal disturbance | Avoid; test if threatened to determine vertical extent; final NR assessment needed. |
| 965 | None | Recreation/ vandalism<br>Animal disturbance | Avoid; test if threatened to determine vertical and horizontal extent; final NR assessment needed. |
| 968 | Water/wind erosion<br>Vandalism | Erosion<br>Vandalism | Avoid; test if threatened to determine vertical extent; final NR assessment needed. |

Table 12, cont.

| Site No. | Real Impact | Threatened Impact | Recommendations |
|---|---|---|---|
| 969 | Water/wind erosion<br>Animal disturbance | Erosion<br>Vandalism<br>Animal disturbance | Avoid; test if threatened to retrieve $C_{14}$ samples and to determine vertical extent of site; final NR assessment needed. |
| 1539 | Water/wind erosion<br>Animal disturbance | Erosion<br>Animal disturbance<br>Vandalism | Avoid areas of artifact concentration; test concentrations if threatened to determine vertical extent; final NR assessment needed. |
| 1540 | Water erosion<br>Animal disturbance<br>Recreation/ vandalism | Erosion<br>Animal disturbance<br>Vandalism | Avoid; test if threatened to determine vertical extent; final NR assessment needed. |
| 1542 | Water/wind erosion<br>Animal disturbance | Erosion<br>Animal disturbance<br>Vandalism | Avoid; test if threatened to determine vertical extent; final NR assessment needed. |
| 1544 | Water/wind erosion | Erosion<br>Vandalism | Avoid; test if threatened to determine vertical extent; final NR assessment needed. |
| 1546 | Water/wind erosion | Erosion<br>Vandalism | Avoid; test if threatened to determine vertical extent; final NR assessment needed. |
| 1547 | Water erosion | Erosion<br>Vandalism | Avoid; test if threatened to determine vertical extent; final NR assessment needed. |
| 1565 | Water/wind erosion<br>Vandalism | Erosion<br>Vandalism | Avoid; test feature and artifact concentrations to determine vertical extent; final NR assessment needed. |
| 1566 | Animal disturbance<br>Vandalism | Vandalism<br>Animal disturbance | Avoid; test rock alignment to determine presence/absence and depth of subsurface deposits; final NR assessment needed. |

Table 12, cont.

| Site No. | Real Impact | Threatened Impact | Recommendations |
|---|---|---|---|
| 1569 | Water/wind erosion<br>Animal disturbance | Erosion<br>Animal disturbance<br>Vandalism | Avoid; map, surface collect and test to determine vertical extent if site is threatened; final NR assessment needed. |
| 1570 | Water/wind erosion<br>Animal disturbance | Vandalism<br>Animal disturbance | Avoid; site is individually eligible for nomination to the NRHP; mitigation plan needed; if vandalism becomes apparent, excavate to retrieve cultural and ancillary data. |
| 1577 | Water/wind erosion<br>Animal disturbance<br>Vandalism | Erosion<br>Animal disturbance<br>Vandalism | Avoid; deposits at base of cliff should be tested to determine accurate site function prior to completion of NR nomination forms. |
| 1579 | Water/wind erosion<br>Animal disturbance<br>Recreation/ vandalism | Recreation/ vandalism<br>Animal disturbance<br>Erosion | Avoid; test to determine presence/absence of undisturbed subsurface deposits; map entire site and conduct sample surface collection; final NR assessment needed. |
| 1581 | Water/wind erosion<br>Animal disturbance<br>Vandalism | Vandalism<br>Animal disturbance<br>Erosion | Avoid; test to determine vertical extent of site before on-going vandalism completely destroys it; final NR assessment needed. |
| 1615 | Water erosion<br>Animal disturbance | Erosion<br>Animal disturbance<br>Vandalism | Avoid; test to determine vertical extent if site is threatened; final NR assessment needed. |
| 1668 | Water/wind erosion<br>Recreation/ vandalism | Erosion<br>Vandalism | Avoid; test to determine presence/absence of undisturbed subsurface component before on-going vandalism destroys it; final NR assessment needed. |

Table 12, cont.

| Site No. | Real Impact | Threatened Impact | Recommendations |
|---|---|---|---|
| 1720 | Water/wind erosion<br>Vandalism | Erosion<br>Vandalism | Avoid; test if threatened to determine presence/absence of subsurface materials; hearth area should be tested for carbon sample; site should be thoroughly mapped; final NR assessment needed. |
| 1732 | Water/wind erosion<br>Vandalism | Erosion<br>Vandalism | Avoid; test if threatened to determine presence/absence of subsurface materials; final NR assessment needed. |
| 1740 | Water/wind erosion<br>Animal disturbance<br>Vandalism | Erosion<br>Animal disturbance<br>Vandalism | Avoid; test feature area if site is threatened; final NR assessment needed. |
| 1761 | Water/wind erosion<br>Animal disturbance | Erosion<br>Animal disturbance | Avoid; test ash-stained areas for presence of datable deposits; test to determine vertical extent of site; final NR assessment needed. |
| 1762 | Water erosion<br>Animal disturbance<br>Recreation<br>Construction/ development | Erosion<br>Transportation<br>Animal disturbance<br>Construction/ development | Avoid; test if threatened by continued erosion or road construction; hearth area should be tested for radiocarbon sample; final NR assessment needed. |
| 1770 | Water/wind erosion<br>Animal disturbance<br>Recreation/ vandalism | Erosion<br>Animal disturbance<br>Vandalism | Avoid; map site surface and test for subsurface deposits if site is threatened; final NR assessment needed. |
| 1778 | Water/wind erosion<br>Animal disturbance | Erosion<br>Animal disturbance | Avoid; test if integrity is threatened; final NR assessment needed. |

Table 12, cont.

| Site No. | Real Impact | Threatened Impact | Recommendations |
|---|---|---|---|
| 1779 | Water/wind erosion<br>Animal disturbance | Erosion<br>Animal disturbance | Avoid; test if site integrity is threatened with additional disturbance; hearth area should be tested; final NR assessment needed. |
| 1781 | Water/wind erosion<br>Animal disturbance<br>Recreation/ vandalism | Erosion<br>Animal disturbance<br>Vandalism | Avoid; map site surface and test if site integrity is threatened by further disturbance; hearth areas should be tested; final NR assessment needed. |
| 1782 | Water/wind erosion | Erosion | Avoid; test hearth area if threatened for the presence of datable charcoal deposits; final NR assessment needed. |
| 1785 | Water/wind erosion<br>Animal disturbance<br>Vandalism<br>Construction/ development | Erosion<br>Animal disturbance<br>Vandalism<br>Construction/ development | Avoid; test to determine nature and extent of subsurface deposits if site integrity is threatened; final NR assessment needed. |
| 1786 | Water/wind erosion<br>Animal disturbance<br>Recreation/ vandalism | Erosion<br>Animal disturbance<br>Vandalism | Avoid; test if site integrity is threatened to determine nature of features and extent of associated subsurface remains; final NR assessment needed. |
| 1787 | Water erosion | Erosion<br>Vandalism | Avoid; site is individually eligible for nomination to the NRHP; test if site is threatened to determine nature and extent of subsurface cultural deposits. |
| 1797 | Water/wind erosion<br>Animal disturbance | Erosion<br>Animal disturbance<br>Vandalism | Avoid; site is individually eligible for nomination to NRHP; mitigation plan must be devised; ancillary data samples should be collected |

Table 12, cont.

| Site No. | Real Impact | Threatened Impact | Recommendations |
|---|---|---|---|
| 1799 | Water erosion<br>Animal disturbance | Erosion<br>Animal disturbance<br>Vandalism | Avoid; test to determine nature and extent of subsurface cultural deposits and retrieve charcoal samples if integrity is threatened; final NR assessment needed. |
| 1805 | Water/wind erosion<br>Animal disturbance<br>Neglect<br>Recreation<br>Construction/ development | Erosion<br>Animal disturbance<br>Neglect<br>Recreation<br>Construction/ development | Avoid; site is individually eligible for nomination to the NRHP; mitigation plan must be devised if site integrity is threatened; ancillary data sample collection is advised. |
| 1806 | Water/wind erosion<br>Animal disturbance<br>Recreation/ vandalism | Erosion<br>Animal disturbance<br>Vandalism | Avoid; test to determine nature of structures and extent of associated subsurface deposits, and to retrieve ancillary data samples; final NR assessment needed. |
| 1850 | Water/wind erosion<br>Animal disturbance | Erosion<br>Animal disturbance<br>Vandalism | Avoid; test to examine activity areas and to determine extent of possible subsurface artifact deposits if site integrity is threatened; final NR assessment needed. |
| West End Canyon | Vandalism<br>Wind/water erosion<br>Animal disturbance<br>Neglect | Vandalism<br>Erosion<br>Animal disturbance<br>Neglect<br>Construction/ development | Avoid with all planned disturbance until boundaries can be finalized and final NR eligibility assessment is made; monitor all planned ground disturbance in non-site areas if avoidance is impossible; follow individual site recommendations where applicable; periodically monitor site/area |

Table 12, cont.

| Site No. | Real Impact | Threatened Impact | Recommendations |
|---|---|---|---|
| | | | condition and implement protective/data recovery measures if on-going data loss due to erosion, vandalism or animal disturbance is severe. |
| Davis Confluence | Vandalism<br>Wind/water erosion<br>Animal disturbance<br>Neglect<br>Construction/ development | Vandalism<br>Erosion<br>Animal disturbance<br>Neglect<br>Construction/ development<br>Transportation | Avoid with all planned disturbance until boundaries can be finalized and final NR eligiblity assessment is made; monitor all planned ground disturbance in non-site areas if avoidance is impossible; follow individual site recommendations where applicable; periodically monitor site/area condition and implement protective/data recovery measures if on-going data loss due to erosion, vandalism or animal disturbance is severe. |



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