Archaeological Investigations at Site 5ME5997 and 5ME6144:
Evaluative Test Excavations as part of the
Griffith Land Exchange
in Mesa County, Colorado,
for the
Bureau of Land Management Grand Junction Area Office

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Abstract

In response to a request by the Grand Junction Area Office of the Bureau of Land Management (BLM), Grand River Institute undertook a review of artifacts collected and documents generated from test excavations conducted at prehistoric sites 5ME5997 and 5ME6144. These evaluative tests were part of the Griffith Land Exchange cultural resources inventory conducted during 1988 and 1989. Fieldwork for the test excavations were conducted between 24 May and 14 June 1989 by BLM personnel. Michael Piontkowski, then Area Archaeologist, supervised the testing. He was assisted by Carl E. Conner and Loralie Thompson.

Site 5ME5997 Locus I, an open camp, was tested by excavating seven 1m x 1m units. This procedure yielded diagnostic projectile points and radiocarbon dates that indicate it was occupied as a short-term camp ca. AD 1410. Based on the recovery of a utilized bison scapula, bison processing appears to be the primary function of the camp. This locus of 5ME5997 is unlikely to contribute additional information, but the remainder of the 450m long and 100m wide site that lies along the rim of Clark Wash contains numerous artifact concentrations that will undoubtable yield additional significant data concerning the Archaic and Late Prehistoric period occupations of the region.

Site 5ME6144, a rock shelter, was tested by the excavation of three 1m x 1m units. Surface and excavated diagnostics including Plain Grayware ceramics and a Pueblo I projectile point, and a radiocarbon date of ca. AD 880, indicate the shelter was occupied by an Ancestral Puebloan group. Little of the shelter was disturbed by the testing and there remains considerable buried cultural deposits that require preservation.

Based on these finds, the sites are considered likely to yield additional significant information concerning subsistence, technology, settlement, land use, social organization, and external relations patterns of its prehistoric occupants. Accordingly, they are field evaluated as eligible for listing on the NRHP.

Table of Contents

List of Figures, Tables and Plates

Introduction

Grand River Institute, in response to a request by the Grand Junction Area Office of the Bureau of Land Management (BLM), undertook a review of artifacts collected and documents generated from test excavations conducted at prehistoric sites 5ME5997 and 5ME6144. These evaluative tests were part of the Griffith Land Exchange cultural resources inventory conducted during 1988 and 1989. Fieldwork for the test excavations was conducted between 24 May and 14 June 1989 by BLM personnel. Michael Piontkowski, then Area Archaeologist, supervised the testing. He was assisted by Carl E. Conner and Loralie Thompson.

This work was done to meet requirements of the National Historic Preservation Act (NHPA) of 1966 (as amended, 16 U.S.C. 470 et seq.), the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321), Executive Order 11593 (36 F.R. 8921), the Historical and Archaeological Data-Preservation Act (AHPA) of 1974 (16 U.S.C. 469), the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701), and the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa et seq., as amended). All work was performed according to guidelines set forth by the Office of Archaeology and Historic Preservation (OAHP) of the Colorado Historical Society.

Location

Sites 5ME5997 and 5ME6144 are located on Glade Park approximately 5.2 miles southwest of the Glade Park Store, in Mesa County (Figure 1). Site location data is presented in Appendix F (Figure 15). Site 5ME5997 is a large open camp that follows the rim of Clark Wash and measures approximately 450m (E-W) by 100m (N-S); the tested area is within Locus I, located on the east end of the site. Site 5ME6144 is a small sheltered camp situated in a ledge overhang below the rim of Clark Wash.

Effective Environment

The project area is on the north end of the Uncompahgre Plateau, a southeast-to-northwest structural uplift on the northeast margin of the Colorado Plateau physiographic province. The Colorado Plateau is characterized by nearly horizontal geologic formations, deeply incised vertical-walled canyons, high elevations and sedimentary rock formations (Fenneman 1931). The Uncompahgre Plateau is a remnant of a late Paleozoic mountain range, the Uncompahgria, which covered most of western Colorado. It reached its present elevation after several reactivations, the last of which occurred during the Cenozoic Era. The geologic formations were deposited on the resistant Precambrian gneiss, schist, granite and

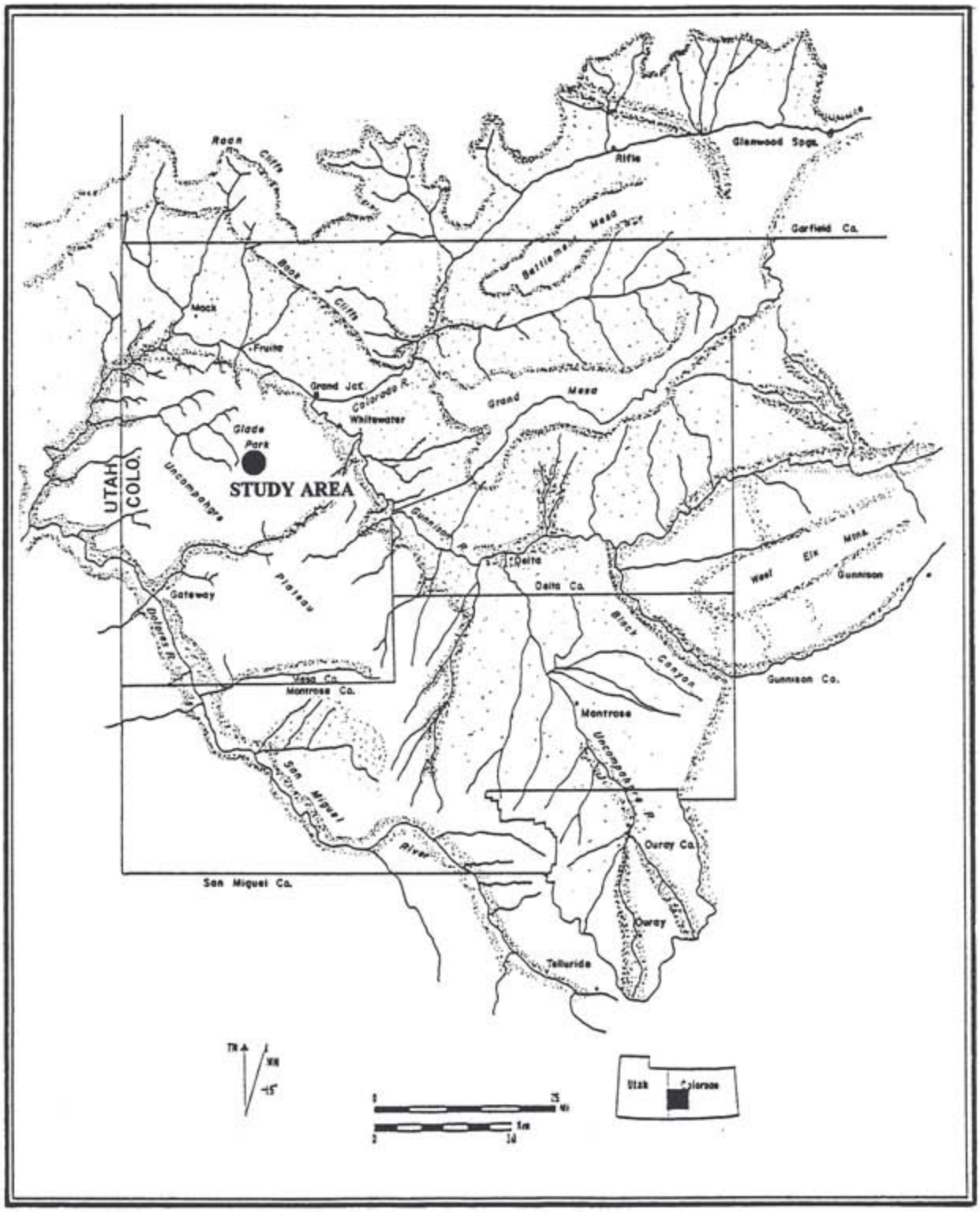


Figure 1. Map showing general location of project area in Mesa County, Colorado. [GRI Project No. 9809, 7/20/98]

pegmatite (Young and Young 1977:61-63). In the study area, erosion has removed the overlying rocks down to the Jurassic-age Morrison Formation/Summerville Formation/ Entrada Sandstone and the Triassic-age Kayenta Formation. The excavated portion of open site 5ME5997 lies on top of a Kayenta bench near the base of an Entrada cliff. Site 5ME6144 is a camp sheltered by a south-facing ledge within the Kayenta bench.

In this part of the Uncompahgre Plateau, many streams have cut deep, narrow canyons into the hard Kayenta Formation benchland. Clark Wash drains the study area and joins Little Dolores River 12.0 miles northwest. Soils formed on the sandstone bedrock are generally shallow (15-30 inches), reddish-brown, loamy sands, and primarily occur as pockets on top of the bench.

The sites lie between 7720 and 7800 feet in elevation. This is a contact belt between the Upper Sonoran and Transitional plant zones. Presently, the vegetation is pinyon-juniper forest mixed with mountain shrub communities (oakbrush, serviceberry). Mule deer, elk, coyote, and black bear are common, as are cottontail rabbits, beavers, and various rodents. Mountain lion, bobcat, fox, skunk, badger, and weasel are also likely inhabitants of the surrounding area. Bird species observed in the area include the jay, raven, red-shafted flicker, long-eared owl, golden eagle and various other raptors. Present land use in the area includes livestock grazing, big-game hunting, and wood cutting.

There were no environmental factors that constrainted the test excavations at either 5ME5997 or 5ME6144. There were no lasting or unusual effects of erosion or other environmental impacts on these sites.

Paleoclimate

Presently, the project area has a cool semiarid climate where temperatures can drop to -10 degrees F during the winters and summer temperatures may reach 90 degrees F; there is a maximum of 110-125 frost-free days and the annual precipitation is about 14 inches (USDA SCS 1978: 6). Relatively small changes in past climatic conditions altered the exploitative potential of an area and put stress upon aboriginal cultures by requiring adjustments in their subsistence patterns. Therefore, reconstruction of paleoenvironmental conditions is essential to the understanding of population movement and cultural change in prehistoric times (Euler et al. 1979). To interpret whatever changes are seen in the archaeological record, an account of fluctuations in past climatic conditions must be available or inferences must be made from studies done in surrounding area. Generally, only gross climatic trends have been established for western North America prior to 2000 B.P. (Antevs 1955; Mehringer 1967; Madsen 1982; Wendlund and Bryson 1974; Peterson 1981). Scientific data derived from investigations of prehistoric cultures and geoclimatic and bioclimatic conditions on the southern Colorado Plateau over the past two millennia have achieved a much greater degree of resolution (Dean et al. 1985).

A study by Berry and Berry (1986:311-314) summarizes the gross climatic episodes of the Colorado Plateau and Basin and Range provinces over the past 13,000 years, as determined from radiocarbon-dated pollen samples. Between 11,000 and 8,000 BC, conditions shifted from glacial to non-glacial; i.e., there was an overall decrease in effective moisture and an increase in temperature. The ensuing pre-Boreal/Boreal period (8000-6500 BC) brought cooler, drier conditions to the region. The Atlantic period (6500-3100 BC) was one of complexity. In large part, it corresponds to Antev's Altithermal, but evidences two comparatively short phases (6500-5500 and 4750-3950 BC) of increased coolness. Between 3100 and 800 BC, the Sub-Boreal episode saw an increase in effective moisture and, on the Plateau, a corresponding increase in pinyon pine forest.

The Sub-Atlantic period (800 BC-AD 400) was mainly a time of drying and warming and, on the Plateau, contraction of the pinyon forest, although warm wet conditions prevailed toward the end of this period. A brief, cool dry phase occurred early (AD 350-450) in the Scandic/ Neo-Atlantic (AD 400-1100), but the remainder of this episode is characterized as warm and wet. A period of cool, dry conditions--the Pacific episode--followed and lasted approximately 600 years.

Research Background

Sites 5ME5997 and 5ME6144 were recorded by BLM personnel as part of the Griffith Land Exchange Inventory conducted during the 1988 and 1989 field seasons. Site 5ME6144 is a sheltered camp located on a sandstone ledge just below site 5ME5997 and above the headwater area of Clark Wash. Plates 1 and 2 provide overviews of the two sites.

Site 5ME5997 is a large open campsite that extends for approximately 450 meters along the north side of Clark Wash in a corridor that ranges from 50m to 150m wide (Figure 2). The site elevation ranges from 7720 to 7780 feet and vegetation is mixed pinyon/juniper and oakbrush. An artifact concentration (Locus I) was recorded on the east end of the site that measured approximately 50 meters (NE-SW) by 40 meters (NW-SE). Within this locus, surface mapped artifacts included four biface fragments, a scraper, a pumpkin chert flake, a slab metate and a mano (Figure 3). A tight cluster of artifacts, 6m diameter, was identified within the locus that had two of the biface fragments, 20+ flakes and an ashstain, In addition to this cluster, a hearth feature was identified by a deposit of ash and burnt bone in a small wash along the fence line (shown in the location of TP #3, Figure 3). Based on the find of the pumpkin chert flake, a material type that is commonly found by this author in Early Numic sites, the period of occupation was estimated to be ca. AD 1300 - 1550. This locus was also thought to contain a second component when three sherds of corrugated pottery were recorded about 20m south along a fence line that runs N-S on the west edge of this locus. The pottery was identified as Pueblo II-III ceramics originating from the Southwest. Accordingly, this locus was selected for testing.

Plate 1. Overview of Locus I, site 5ME5997, view northwest.

Plate 2. Overview of site 5ME6144, view is to the northeast.

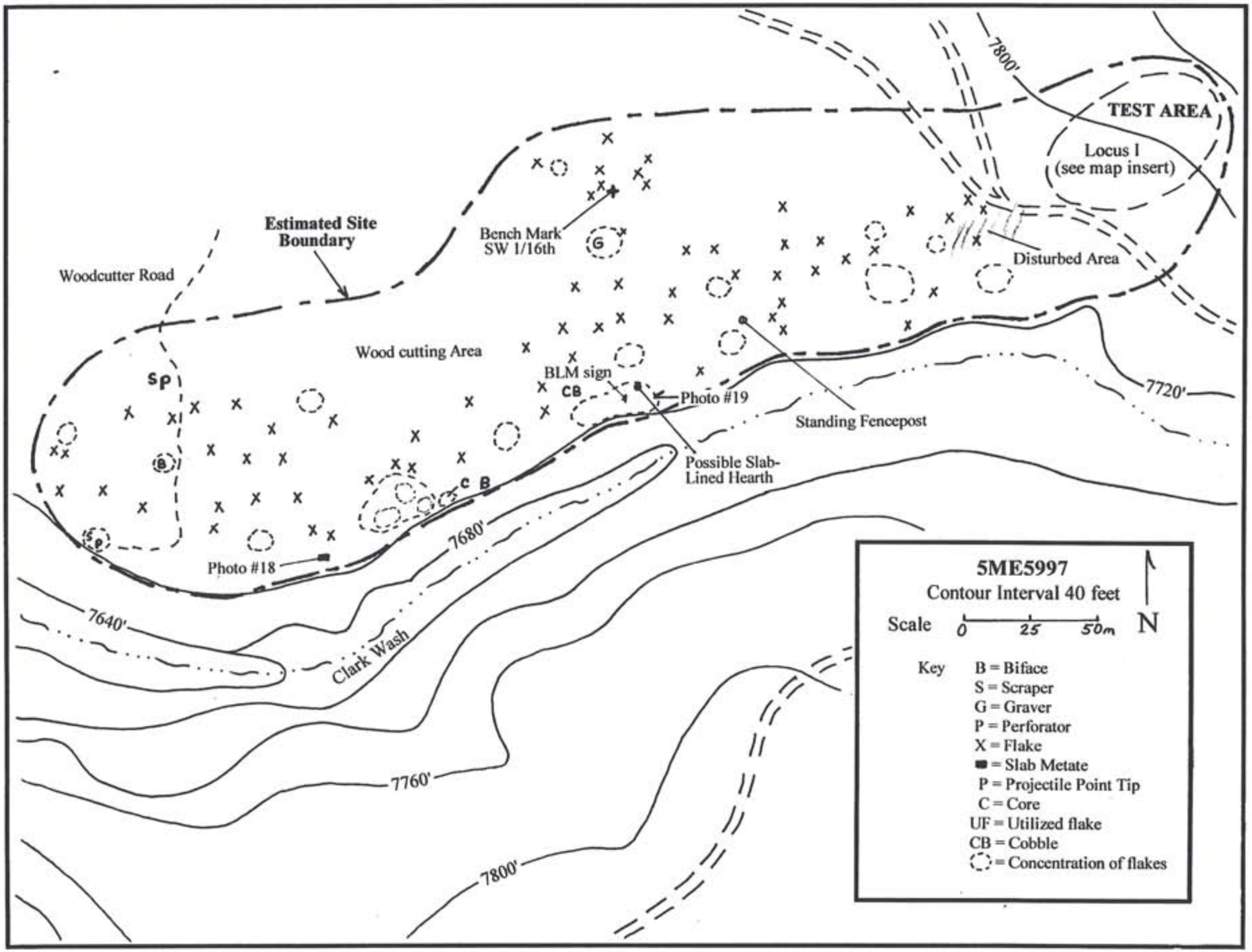


Figure 2. Site map of 5ME5997 showing Locus I in relation to the remainder of the site.

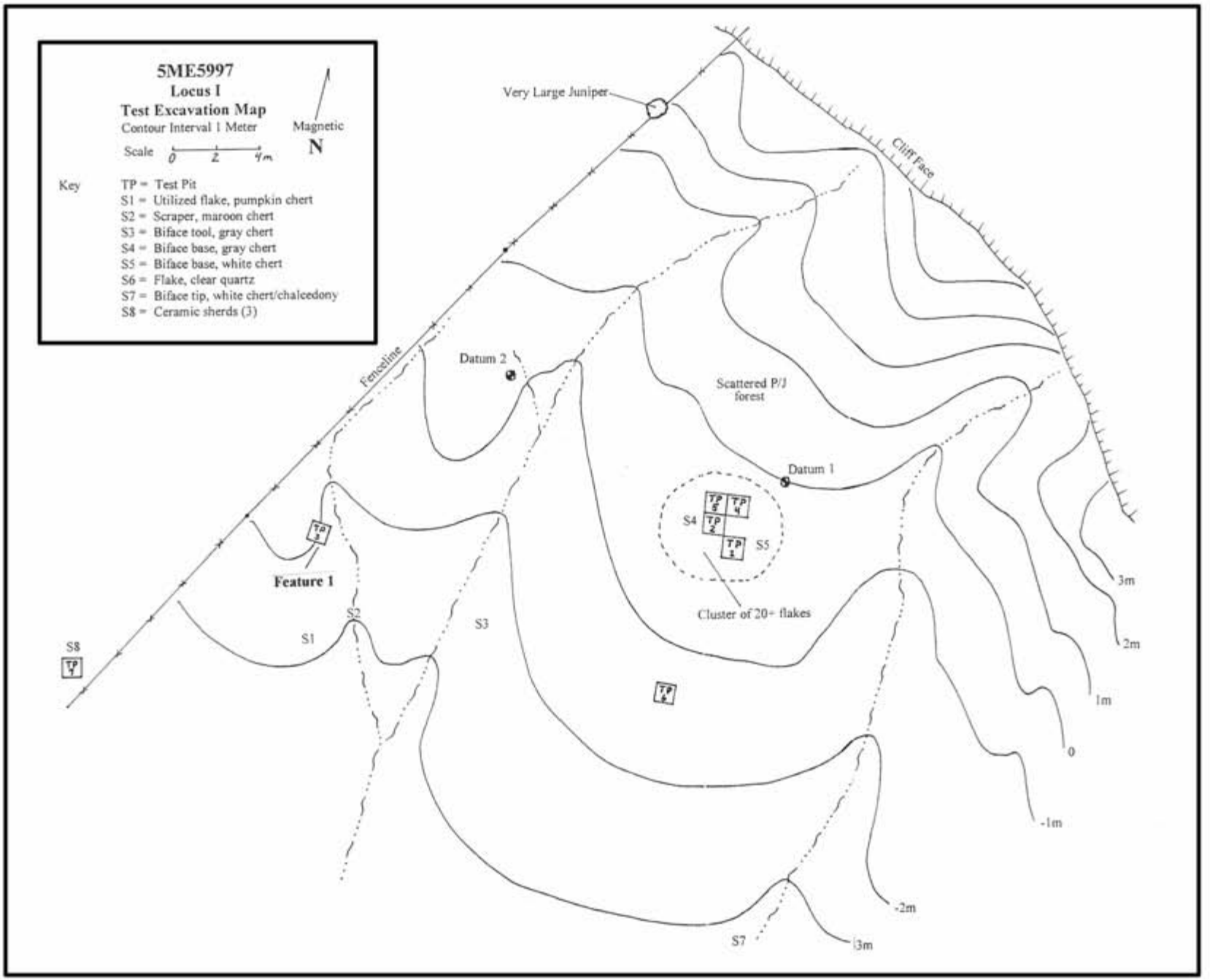


Figure 3. Plane table drawing of Locus I, site 5ME5997.

Site 5ME6144 is a rockshelter that measures approximately 24m (SW-NE) long and 10m (NW-SE) at its widest dimension. Elevation is 7710 feet and vegetation is pinyon/juniper, oak brush, Indian rice grass and prickly pear. Soils are tan/gray sandy loams, with distinct areas of charcoal and ash-stain on the surface under the shelter. Two large sandstone boulders are present on the ledge. Surface artifacts consisted of six, plain gray-ware ceramic sherds, burned and unburned bone, a biface fragment, a core fragment, a utilized blade, two utilized flakes , and a large obsidian flake (Figure 4). The edges of a grass mat–designated Feature #1--were located near the back wall of the overhang in the northeast portion of the site (shown within the area of TP#1 and TP#2, Figure 4). Since the surface finds included the grayware ceramics, at least one cultural component of the shelter was expected to date ca. AD 500-900. Based on these finds, the site was selected for testing.

Research Orientation

The nature of the investigations at site 5ME5997 and 5ME6144, as at other sites, is divided into three parts. The first consists of archaeological and environmental data recovery and description. Excavated artifactual and architectural data form the base from which temporal information--from C-14 samples, artifact seriation and cross-dating--is acquired. Paleoenvironmental data are derived from the excavation of pollen, macrofloral and faunal remains and are compared with the present day environment.

The second phase of an investigation requires the synthesis and interpretation of the recovered archaeological materials. Here, the cultural affiliation of the site occupants is determined and contextual concerns, such as the identification of spatial and temporal variability and functions of artifactual and architectural classes, are examined. The final phase of analysis involves further synthesis and leads to the formation of a diachronic, cultural ecological model. The adaptive strategies--as reflected by changes and continuity in subsistence, technology, settlement, land use, social organization, and external relations patterns--of the prehistoric occupants of the site are compared and contrasted to the regional data base.

Research Objectives

The objectives of this archaeological investigation were to conduct testing for evaluative purposes in the areas of the two sites that contained suspected features; to excavate and recover the scientific data; and, to evaluate the sites' potential depth of cultural fill and likelihood of yielding additional significant information. Research domains that can be approached in any investigation include cultural affiliation, site function, seasonality, subsistence, social organization, technology, extra-regional relationships, site formation and transformation, and paleoenvironment. The method, scope, and report of the testing were designed to satisfy requirements of the BLM and the OAHP.

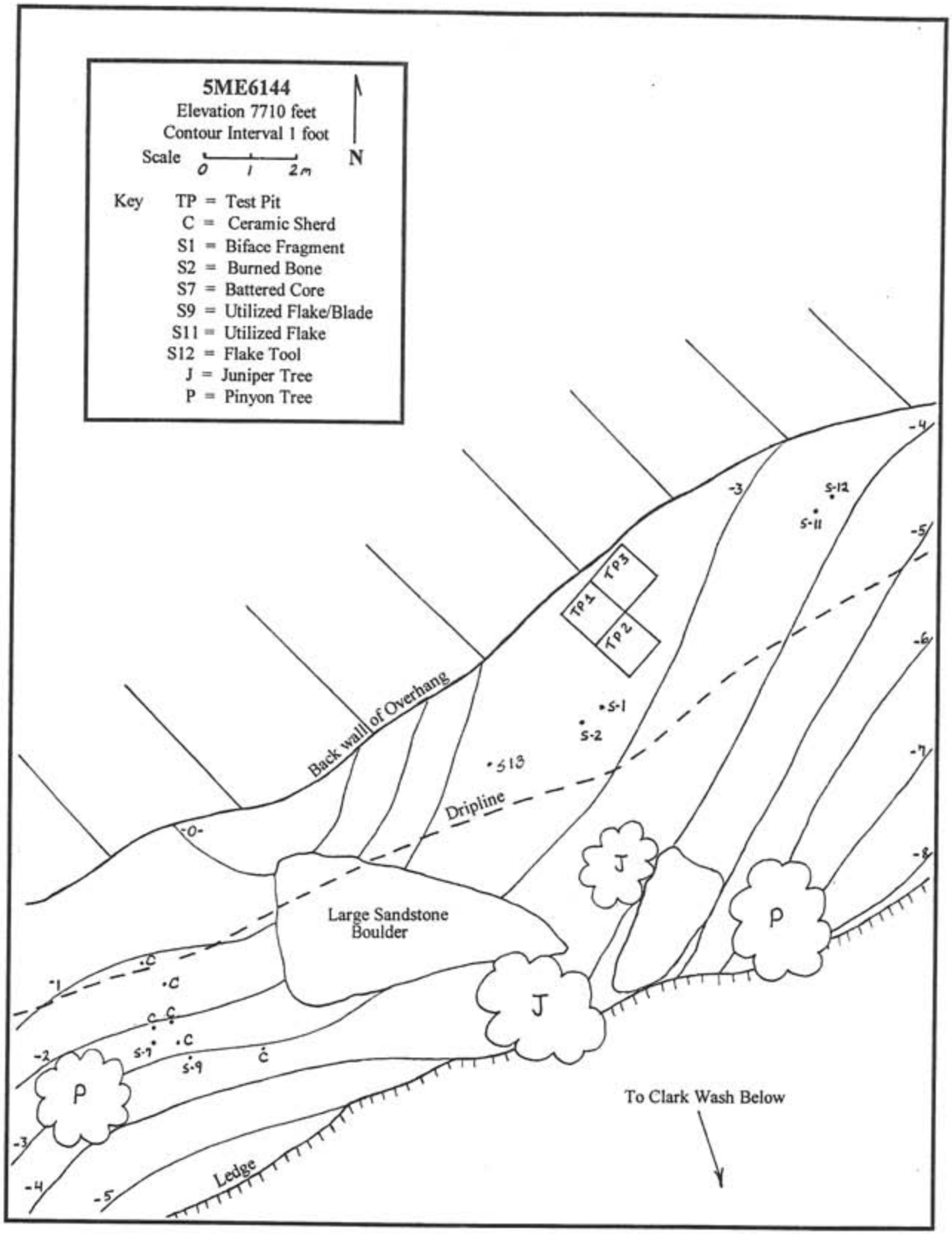


Figure 4. Plane table drawing of rockshelter site 5ME6144.

Field and Laboratory Methods

The field and analytic methods were selected to meet the maximum data recovery requirements. Hand tools were used to excavate 1m x 1m test units: seven were opened in 5ME5997 and three in 5ME6144. Hand tools were used to excavate each pit. After clearing surface vegetation in a test unit, excavation proceeded in either 5cm levels, or along stratigraphic or cultural levels if they were well defined. Most soil was screened through 1/8th-inch screen; although hearth contents that were not collected as carbon, flotation or pollen samples were sifted through 1/16th-inch screen.

Surface artifacts were point-plotted and collected within and surrounding the test areas. Chipped stone and groundstone tools found *in-situ* during excavation were provenienced by coordinates and level from the southwest corner of their grid unit, and bagged separately. Other artifacts and ancillary specimens were bagged in aggregate, and labeled by grid and level below ground surface. Flotation and carbon samples were collected from each feature. The observable chemical make-up, texture, and color of the soils encountered throughout the excavated grids and within the features were noted and recorded. Finally, features were photographed, and plan and profile views were drawn.

In the laboratory, the artifacts were sorted according to a classificatory scheme of chipped stone and groundstone categories, and inspected for use-wear. Chipped stone categories include projectile points, other bifaces, unifaces, flake and blade tools, hammerstones, cores, and debitage (primary, secondary, interior and shatter). Groundstone categories include manos (grinding stones), metates (nether milling stones), and other groundstone. The ancillary specimens were to be processed by outside laboratories. Recovered artifacts are curated at the Museum of Western Colorado, a BLM sponsored curation facility in Grand Junction.

Results of Testing at 5ME5997 and 5ME6144

Seven 1m x 1m units were opened during the testing of 5ME5997. The selection of the placement of these units was based on the distribution of surface artifacts and the exposure of ash-stained soils (Figure 3). Four units (TP1, TP2, TP4 and TP5) were clustered within a 6m diameter ash-stained area containing two biface fragments and 20+ flakes. Test unit TP6 was positioned about 6.5m south of the original cluster to determine the extent of the cultural deposits near the main concentration. Unit TP3 was positioned over the exposed hearth feature (Feature #1) located on the side of a small drainage approximately 17m southwest of the main cluster of units. Unit TP7 was positioned adjacent to the surface collected corrugated ceramics. Table 1 provides a list of these units, their excavated depth and summarizes findings. Figure 5 is a plan view of the main cluster of test pits and their relevant findings. Figure 6 is a plan and profile view of Feature #1 found in TP3.

Table 1. Summary of excavated materials from site 5ME5997.

Test Unit	Excavation Depth	Findings
#1	0-5cm 5-20cm	--11 flakes --Sterile
#2	0-5cm 5-20cm	--biface frag., end scraper, and 186 flakes; C-14 sample --Sterile
#3	0-5cm 5-35cm	--Feature #1, shallow hearth; C-14 sample, burnt bone sample; 2 pollen samples–from inside and outside of feature --Sterile
#4	0-5 5-7 7-20	--Surface exposed Feature #2 in northeast corner --Desert Side-notched projectile point at 6.5cm bpgs --Sterile
#5	0-7 7-20	--Utilized bison scapula; 3 flakes (1 obsidian, source analyzed); C-14 sample (dated 510 ± 70 BP) from Feature #2, eroded hearth, in northeast corner (1-3cm); organic sample --Sterile
#6	0-20	--Sterile
#7	0-20	--Sterile

During excavation, two projectile points were recovered from surface contexts, east of TP #2 in an eroded area. Both are Desert Side-notched type. The FS-3 specimen, made of obsidian, was found 2.4mE / 0.2mS of the NE corner of TP #2. The FS-4 specimen, made of opaque chalcedony, was found 3.1mE / 0.65mS of the NE corner of TP #2. A third point of this type was recovered from excavated contexts in TP #4 at 6.5cm bpgs. This point, FS-9, is made of quartzite.

Soils excavated from the locus were sandy and silty and contained organic materials in the upper 5cm to 8cm of fill. Below this level was hard-packed soil.

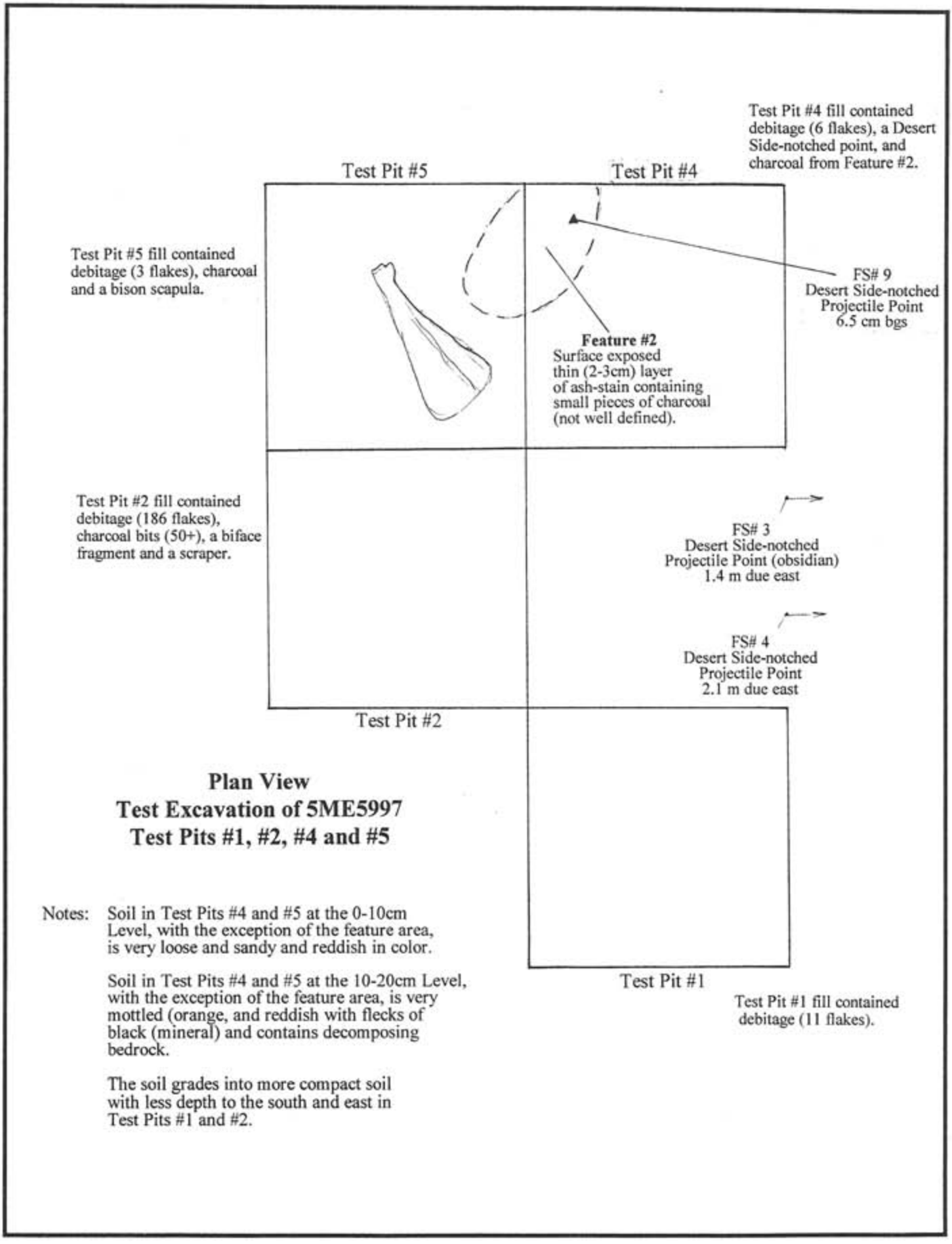
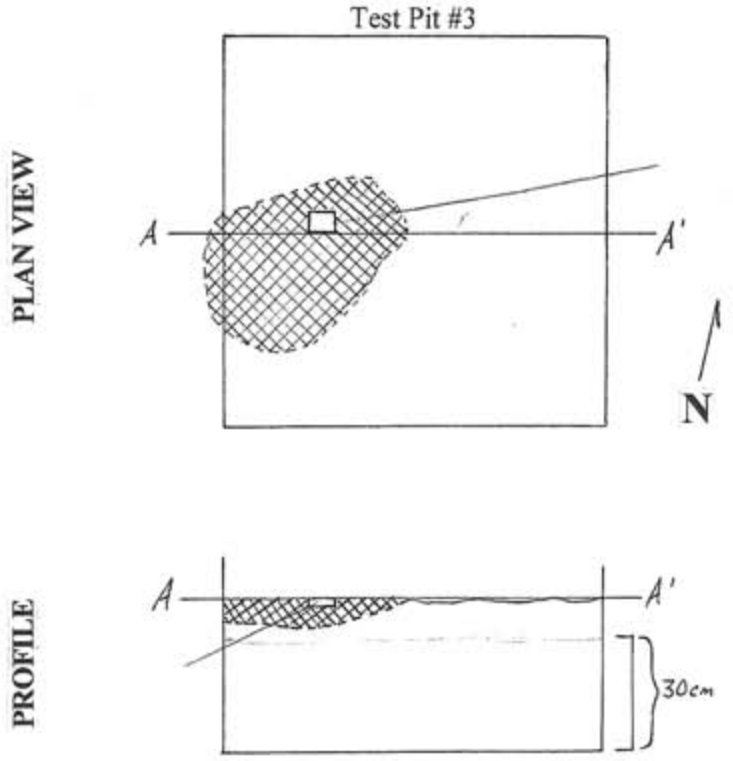


Figure 5. Plan view of the main cluster of test units in site 5ME5997.



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Plan and Profile View, and Photo of Feature #1, Test Excavation of 5ME5997

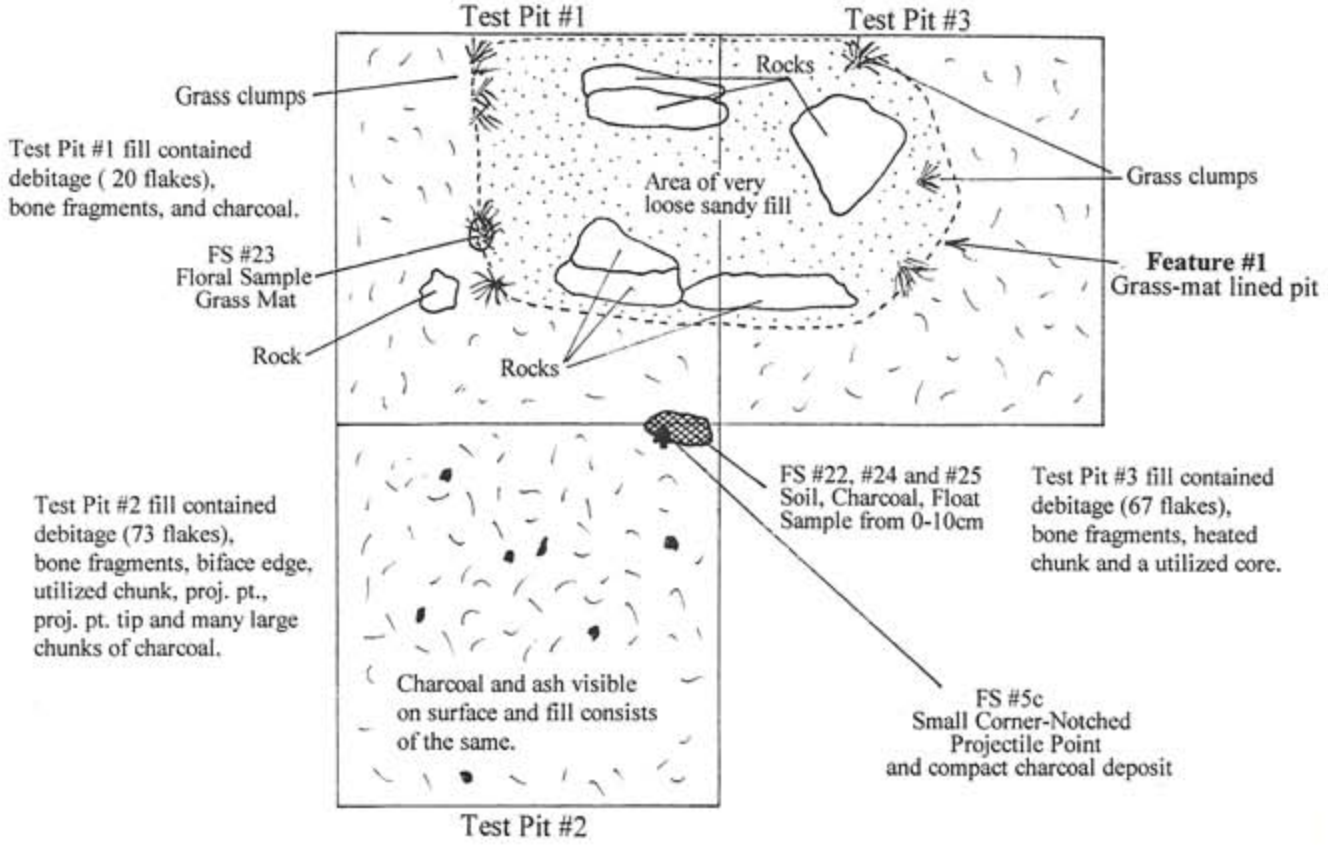
Figure 6. Plan and profile view of Feature #1, hearth, 5ME5997.

Within site 5ME6144, a grass-mat, noted as Feature #1, was located at the backwall of the overhang toward the northeast portion of the site (Figure 3). Initially, only a few pieces of the mat were present on the surface of the shelter. Three 1m x 1m test units were laid out in the area of this feature, and excavation revealed a pit-like area had been dug into the original fill of the overhang and was then lined with bundles of grass (Figures 7 and 8). These grass clumps were 15-30 cm in length and some contained oak leaves. The shorter bundles appeared at the incline of the pit on the west end and the longer ones were laid flat throughout the pit area. This excavation yielded a small, corner notched projectile point, a projectile point fragment, biface fragments, utilized flakes, bone fragments, and debitage (160 flakes). Charcoal, pollen, and float samples were also extracted. Test unit #1 was excavated to a depth of 20cm, while units #2 and #3 were dug to only 10cm. Depth of fill at the site is expected to be at least 30cm. Soils were light tan, very silty and mixed with roof fall (sandstone chunks).

Table 2. Summary of excavated materials from site 5ME6144.

Test Unit	Excavation Depth	Findings
#1	0-10cm 10-20cm Feature 1, grass-lined pit	--6 flakes (outside Feature 1) --2 flakes (outside Feature 1) --Fill contained 1 bison bone fragment, 9 flakes, and large chunks of charcoal (collected); grass mat sample collected
#2	0-5cm 0-10cm	--Projectile point, med. corner-notched; --Proj. pt. tip; 3 biface frags.; 71 flakes; 3 pine nuts; burnt bone (small mammal); C-14 sample, dated 1190±60 BP; flotation sample (analyzed); soil sample
#3	0-10cm Feature fill 0-10cm	--53 flakes; core frag. --utilized core; 15 flakes; burn bone frag.; mat sample

During the testing procedure large mammal bones were noted on the surface of the slope east of the test units and in a pack rat midden in the shelter. A sample was collected from each of these deposits and analyzed. The bones were identified as bison and are described in the faunal analysis section of the report.



Plan View
Test Excavation of 5ME6144

Notes: Feature is grass lined pit against backwall of overhang measuring 80cm x 130cm, 10-15cm deep

Area of loose sandy fill consists of charcoal, roof-fall, rat dung, nut shells

Feature rests on bedrock and was originally dug into shelter fill

Grass clumps are 15-30cm in length and contain some oak leaves

Short bundles of grass were on incline on south end and longer bundles were laid flat throughout pit area

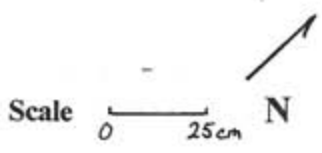
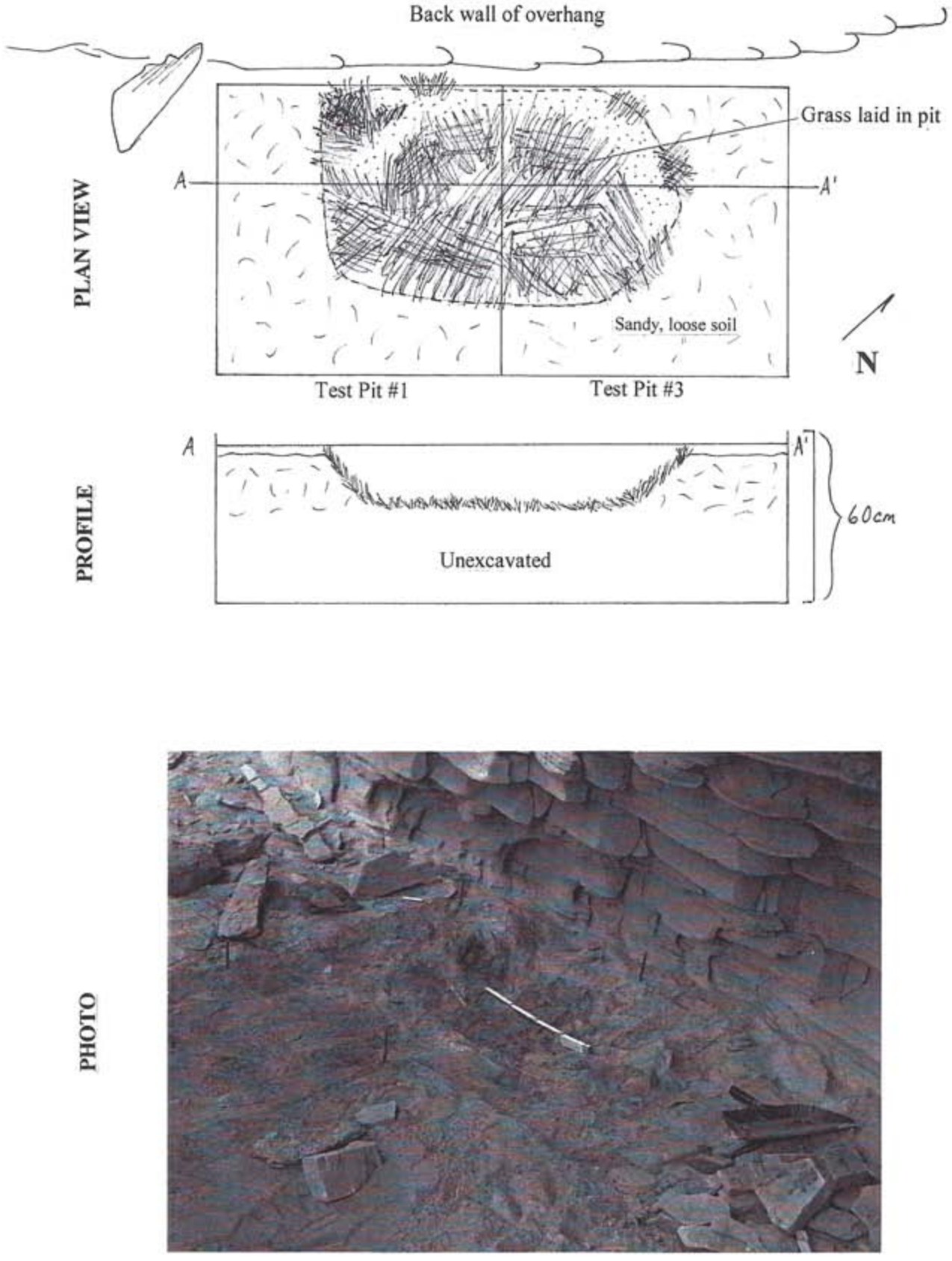


Figure 7. Plan view of the test units in site 5ME6144.



Plan and Profile View, and Photo of Feature #1, Test Excavation of 5ME6144

Figure 8. Plan and profile views and photo of Feature #1, grass-lined pit, 5ME6144.

Description of Artifacts

This section of the report describes the lithic and ceramic artifacts recovered from both sites. Diagnostic projectile points and ceramics are discussed first, followed by bifaces, unifaces and flake tools, and debitage. Surface collected artifacts are listed on the plane table maps (Figures 3 and 4), and field specimen (FS) lists of the excavated artifacts are found in Appendix A.

Projectile Points

Three Desert Side-notched points were recovered from the test excavation at 5ME5997. All are the tri-notched variety (Figure 9). The two surface finds (FS-3 and FS-4) have basal fractures, but the basal notch is still evident. One is made of obsidian (FS-3) and the other of opaque chalcedony. The third point (FS-9), made of quartzite, is complete. It was excavated from Test Unit #4 at 6.5cm bpgs, and was associated with an ashstain in the NW corner of that unit. All three are triangular in shape, made on flakes, and exhibit fine retouch flaking along the edges. They have a size range of 17.5+mm-23.1mm (length), 9.2+mm-13.3mm (width), and 1.3mm-2.15mm (thickness). Obsidian analysis of the projectile point indicated it originated from a quarry at Teton Pass, Wyoming. The points are directly associated with Feature #2 that yielded a radiocarbon date of 510±70 BP (ca. AD 1440).

Figure 9. Desert Side-notched projectile points recovered from testing of 5ME5997; from the left: FS-3, FS-4, and FS-9. Actual size.

Desert Side-notched points occur in Numic sites throughout the Great Basin and Intermountain West and date from around A.D. 1200 to 1700 (Holmer 1986:107; and Thomas 1981:18). Similar points have been recovered from the Pioneer Point site near Gunnison, where associated features dated ca. AD 1470 (Dial 1989:19), and site 42GR2236, an open campsite located near Moab that yielded a date of ca AD 1280 (Reed 1990).

Within test pit#2 of 5ME6144, a small corner-notched projectile point was recovered from 4cm bpgs. It compares well with Type C-21 (identified as part of the Dolores Archaeological Program) is an Ancestral Puebloan type that had its highest occurrence in sites dated between AD 880 and 920 (Phagen 1988:125-163). Figure 10 provides an illustration of this point.

Figure 10. 5ME6144.s1, Type C-21, small corner-notched.

Ceramics

Ceramics were recovered from both 5ME5997 and 5ME6144. Sherds from 5ME5997 and 5ME6144 were analyzed by F. Richard Hauck, Ph.D. of Archaeological-Environmental Research Corporation (Appendix B). The lab at AERC has a comparative ceramic type collection from Utah, Colorado and the Southwest. Also for this analysis, Hauck consulted Harold Colton's 1955 "Pottery Types of the Southwest."

The analyses indicated that the three body sherds found in close association within 5ME5997 all evidence corrugation. Two were identified as Mancos Corrugated and originated from the same vessel. The third was classified as a Tusayan Corrugated. All three are Late Pueblo II or early Pueblo III and date between ca. AD 900 and 1200.

Site 5ME6144 yielded six sherds (one rim and five body) from the surface of the rockshelter. All are from the same vessel, which lacked surface decoration. The vessel was constructed using coiled techniques and evidence wiping or scraping. Temper was identified as fine to medium quartzite gravel that was mixed into a micaceous paste. Sherd thickness ranges from 4.55mm to 5.35mm. Hauck's assessment was that the six are poorly prepared Chapin Gray or Plain Gray pottery, and as such originated during the Basketmaker III/ Pueblo I period (AD 450-900).

Bifaces

Bifaces collected from 5ME6144 were too fragmentary for indepth description. However, the fragments of three bifaces found in surface contexts of 5ME5997 (Figure 3) are complete enough to provide meaningful data. All three are base fragments.

The largest biface fragment, designated s3, is made of a fine-grained, orthoquartzite. In its present condition, it measures 83.2+mm (L) by 46.5mm (W) and is 8.3mm thick. It is irregularly fractured with a break that begins near the present tip and follows a flaw to the projected mid-section of the point, then cuts diagonally to the blade edge about one-third of

its length above the base (Figure 11). The blade outline is oblanceolate– narrowing toward the base. The base is broken over three-quarters of its length, but the remaining portion indicates a slight concavity. Flaking is generally horizontal and highly variable; e.g., narrow parallel flakes are found on the blade edge near the base (dorsal side). There are two thinning flakes on the dorsal side that extend nearly one-fourth the length of the projected original size of the biface (ca.110mm). The thinning process may have caused the cross-section break in the base. The lower blade edges appear to be ground. This tool was used as a knife and resharpened along the right-side blade edge.

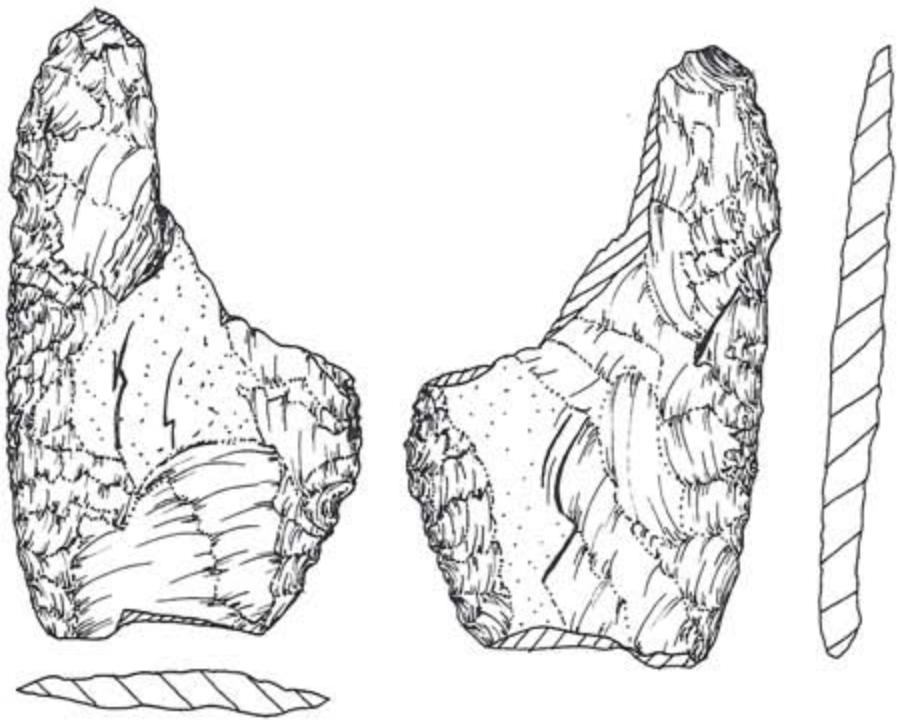


Figure 11. Large biface collected from the surface of 5ME5997(s3). Made of fine-grained quartzite. Actual size.

Another biface found at this loci (s5) appears to have been curated by the occupants. It is a fragment of a square-based knife made of moss agate that has developed a heavy patina. This base fragment measures 42.7+mm (L) by 35.9mm (W) and 8.2mm (Th). The specimen exhibits large expanding flake scars on the ventral side and fine, finish flaking on the dorsal side edges (Figure 12). Square-bottomed knives are a characteristic Fremont tool type (Madsen 1989:64).

A fragment of a smaller, convex-based biface was also recovered from surface contexts (s4). It measures 34.2+mm (L) by 25.7mm (W) by 6.2mm (Th) and is made of light gray chert. Flaking includes small to medium-sized expanding flakes on both surfaces. Of interest are two, long (~20mm), parallel, basal thinning flakes that occur on the dorsal side and one diagonal such flake that extends from the right base corner to the longitudinal midsection of the biface on the ventral side (Figure 10). This may represent an attempt to duplicate the fluting pattern on Paleoindian points by the Early Numic lithic craftsmen. A similarly constructed biface preform was recovered from 5ME6400 (.s11) a Numic site near Mesa, Colorado (Conner and Hutchins 1985:26).

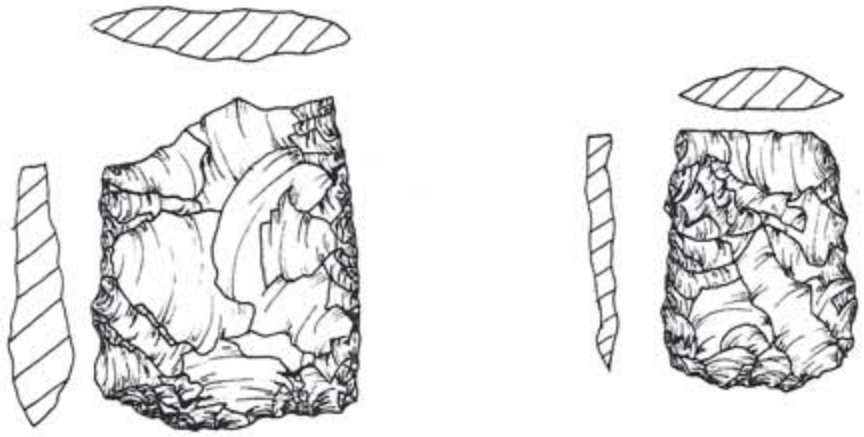


Figure 12. Bifaces from 5ME5997: left s5, right s4. Actual size.

Unifaces

Two distal edge tools (end scrapers) were identified in the collection from 5ME5997 (Figure 13). One, a surface find (s2) made of maroon-colored jasper, exhibits a notch on the right side and a small area of crushing on the left. The second is a narrow end-scraper made on a chalcedony blade that was excavated from TP#2. The left lateral edge is slightly damaged, which suggests possible use-wear. This artifact may also have been hafted. In general, hafting of this type of scraper, is implied by a lack of lateral edge retouching (or reduced retouching as compared to the distal end of the tool), tapered lateral edges, and notching or edge manipulation one-third to one-half of the way up the lateral edges for binding the tool to a handle.

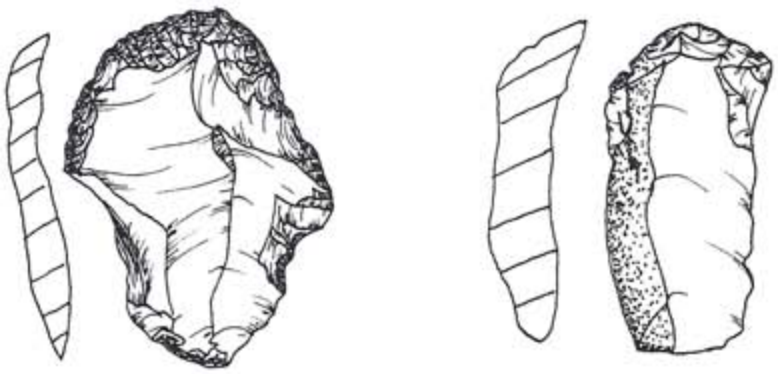


Figure 13. Unifaces from 5ME5997: left s2, right FS#2d. Actual size.

Debitage Analyses

Debitage was examined for placement in the reduction sequence, flake morphology, material type, nature, site location relation and general size classification. The reduction sequence taxa include categories such as primary (> 50% cortex), secondary (< 50% cortex), interior (no cortex), shatter (angular and blocky, no discernable platform or bulb of percussion), blade (length equals three times the width), bifacial edge thinning (dorsal side of flake exhibits three or more negative flake scars), and pressure (generally small flakes where the platform extends laterally along the wide axis of the flake and the length of the platform is at least three times the width. No evidence of crushing is evident on the platform).

Material type classifications included shale/siltstone, orthoquartzite, cherts/ chalcedonies, and obsidian. Thermal alteration, such as pot-lidding or crazing, were also noted. Finally, length, width, and thickness measurements were made on collected flakes. The purpose of these tabulations was to set up a general size classification series. Four size classes were evident. These were designated: micro (<4mm), small (4.1-18mm), medium (18.1-30mm), and large (30.1-50mm).

The analysis of the collected debitage from 5ME5997 is summarized in Table 3. The overwhelming majority of the flakes are micro to small (81%), interior reduction flakes (90.77 %) indicating that most of the initial reduction process was performed away from the site. These attributes of size and type also represent evidence of re-sharpening of existing tools or the finish work on preforms rather than the manufacture of new tools. The material types are fairly evenly distributed (siltstone (37%), chert/chalcedony (56%), orthoquarzite (6%) and obsidian (1%), and appear to indicate the production of bifaces out of all suitable material available. The largest volume of flakes (90%) were located in Test Pit #2 which indicates a possible workstation location. The proximity of this workstation to the eroded (washed out) hearth, Feature #2, fits with the overall context of short-term camp sites (see Figure 3).

Table 3. Summary of collected debitage from site 5ME5997

Provenience	# of Flakes	Material				Utilized	BifaceEdge Thinning	Size			
		se	ch	qz	ob			micro	sm	med	lg
Test Pit #1, 0-5cm	11	7	4			1		2		6	3
5-10cm	0										
Test Pit #2, 0-5cm	186	69	104	12	1	2	5	104	53	24	5
5-10cm	0										
Test Pit #3, 0-5cm	0										
Test Pit #4, 0-10cm	4		4			1			3	1	
10-15cm	2		2						2		
Test Pit #5, 0-10cm	3		2		1				3		
10-15cm	0										
Total	**206**	**76**	**116**	**12**	**2**	**4**	**5**	**106**	**61**	**31**	**8**
Key to summary of material types: se = siltstone ch = chert/chalcedony qz = quartzite ob = obsidian											

The analysis of the collected debitage from 5ME6144 is summarized in Table 4. Again, the majority of the flakes are micro to small (79%), interior reduction flakes (96%). The material types however are not distributed as evenly here. The bulk of the worked stone appears to be chert/chalcedony (92% of the overall sample). The quantity of flakes was almost equally distributed between Test Pit #2 (45%) and Test Pit #3 (42%). No primary flakes were collected from 5ME6144; notably, the size and cortex percentages from both sites are almost identical. The proximal location of these flakes with the tools, and the heavily dispersed ashy soil indicates site use as a short term camp rather than a lithic processing site.

Table 4. Summary of collected debitage from site 5ME6144

Provenience	# of Flakes	Material				Utilized	BifaceEdge Thinning	Size			
		se	ch	qz	ob			micro	sm	med	lg
Test Pit #1, 0-10cm	6		6					1	5		
10-20cm	5		3	2				1	3	1	
Feature Fill	9	1	8						8	1	
Test Pit #2, 0-10cm	40	4	36					13	12	10	5
3-10cm	31	1	29	1				22	5	3	1
Test Pit #3, 0-10cm and Feature fill	15		14	1				6	4	4	1
3-10cm	52		49	3				35	10	3	4
Total	**158**	**6**	**145**	**7**	**0**	**0**	**0**	**78**	**47**	**22**	**11**
Key to summary of material types: se = siltstone ch = chert/chalcedony qz = quartzite ob = obsidian											

Comparisons were made of the flake characteristics between the excavated materials from open campsite 5ME5997 and the sheltered camp 5ME6144 (Table 5). The only notable difference lies with the materials. The sheltered camp materials that date to ca. AD 880 have a significantly higher percentage of chert/chalcedony. The open campsite dating ca. AD 1410 produced a higher occurrence of siltstone, and the presence of obsidian, an imported material. (Dates are based on C-14 samples.)

Table 5. Comparisons of lithic debitage characteristics by site.

Flake Characteristics	5ME5997 (percent)	5ME6144 (percent)
Material:		
Siltstone	37	4
Chert/Chalcedony	56	92
Quartzite	6	4
Obsidian	1	0
Cortex:		
Primary	1	0
Secondary	8	4
Interior	91	96
Size:		
Micro	51	49
Small	30	30
Medium	15	14
Large	4	7

Lithic Material Resources

There are several geologic formations exposed by erosion of the northern extension of the Uncompahgre Plateau that provide lithic source materials. Sources of chalcedony, banded chert and moss agate are reported in a broad band of Dakota Sandstone and Morrison Formation that extends from south of Glade Park along the north edge of the Uncompahgre Plateau. The Summerville, a sandstone member of the Morrison Formation, has masses 3 to 5 feet in diameter of red and white chert, or grades and mixtures thereof. The Summerville also produces a mudstone that can be conchoidally fractured (a requirement of toolstone). The Brushy Basin Member of the Morrison contains deposits of black, red, white and green cherts, agate, jasper, and chalcedony. The Dakota Sandstone and Burro Canyon Formations also provide suitable raw lithic materials for tool stone. The basal conglomerate of the Dakota Sandstone is known to contain cobbles of black, dove gray, or white chert up to three

inches in diameter. It also contains an orthoquartzite that is fine to medium grained and moderately silicified with angular quartz grains. The Burro Canyon Formation also has a conglomerate containing chert, a variegated flint-clay, and a hard, dark green, cherty, medium-grained sandstone. The latter two break with a conchoidal fracture. The Burro Canyon chert generally grades from green to gray, though sometimes red chert nodules will appear in the conglomerate (O'Neil, 1993).

Obsidian and pumpkin chert were two materials that were apparently conveyed into the area. One large utilized flake of pumpkin chert was collected from the surface of 5ME5997 (Figure 3). This material is found in many Numic sites in northwest Colorado and originates in quarries along the Yampa River in exposures of the Morgan Formation. Samples of obsidian were collected from both sites. A Desert Side-notched projectile point [surface find, 2.4mE / 0.2mS of the NE corner of TP #2] and a flake [TP #5, 4cm bpgs] were selected from 5ME5997, as was a large flake recovered from the surface of 5ME6144. These were sent to Richard E. Hughes, Ph.D., Director of the Geochemical Research Laboratory in Palo Alto, California. The analysis involves the non-destructive use of x-ray fluorescence. Hughs found that the two samples from 5ME5997 were derived from sources at Teton Pass, Wyoming; and, the sample from 5ME6144 originated from Bear Gulch, Idaho. Appendix C contains a copy of Hughes laboratory letter report.

Radiocarbon Analysis

One radiocarbon sample was processed from each site: 5ME5997, Feature 2, 2-3cm bpgs; and, 5ME6144, carbon deposit in TP2, 3-6cm bpgs. These samples were submitted to Beta-Analytic of Coral Gables, Florida, for processing. The two carbon samples submitted were sufficient for processing, and resulted in relatively low sigma values. Table 6 lists the dates obtained and gives the approximate calendar years.

Table 6. Dating analysis of carbon samples from sites 5ME5997 and 5ME6144.

Site/Feature	Lab #	C-14 Age (ya at 1 sigma)	Calendar Years *
5ME5997, Feature 2, FS#12	Beta-32043	510 ± 70 BP	ca. AD 1410
5ME6144, FS#24 (½ sample)	Beta-32044	1190 ± 60 BP	ca. AD 880

*Corrected using the Radiocarbon, 1993 v.35, 1; Table 1.

A series of radiocarbon dates for the Archaic, Fremont, and Ute periods were obtained from samples collected at the TZ Site (5ME4828) and the Ladder Spring Site (5ME3789). These C-14 dates and those from other sites on the northern extension of the Uncompahgre Plateau, north of the Dolores River and west of Unaweep Canyon, are presented in Table 7. It is notable that there is a cluster of dates in the late AD 800 to mid-900 range. In the Douglas Creek area of northwest Colorado, Conner and Langdon (1989:45-48) report a hiatus of dates during this time, which may be ascribed to a period of drought on the Northern Colorado Plateau.

Table 7. Radiocarbon dates from sites on the northern Uncompahgre Plateau.

Site No.	C-14 Date (B.P.)	Calibrated Date
5ME3789	Modern	post AD 1510
5ME3789	Modern	post AD 1510
5ME901	470±45	AD 1450±60
5ME3789	730±100	AD 1290±105
5ME4828	850±110	AD 1215±115
5ME901	1020±80	AD 1015±85
5ME4828	1040±110	AD 1010±115
5ME4828	1050±110	AD 1000±115
5ME4828	1080±100	AD 980±115
5ME3969	1100±50	AD 970±70
5ME200	1250±60	AD 770±80
5ME6126	2510±90	560±140 BC
5ME88	3170±80	1520±95 BC
Luster Cave	3410±130	1820±135 BC
5ME4828	3430±120	1845±125 BC
5ME4828	3930±170	2510±195 BC
5ME4828	4490±180	3110±200 BC
5ME4828	4890±170	3685±190 BC
5ME5962	5980±90	CA. 4740 BC

Faunal Analysis

Faunal remains were recovered from the excavated contexts within site 5ME5997 (Table 8). Field Specimen #5a consisted of 8 small burnt bone fragments that were recovered from Feature #1. These were identified as rabbit. Appendix D summarizes the faunal analysis.

Field Specimen #20 is the nearly complete left scapula from an adult bison (Figure 14). This specimen was analyzed by biologist Elaine Anderson, Ph.D., of Denver, in July of 1989 (Appendix D). It was determined that the bone had probably been butchered. The vertebral border has been broken and the edges show wear and are smoothed. Apparent cut marks on both sides of the blade, especially near the vertebral border, were noted. An irregular shaped hole in the infraspinous fossa was evident and the edge facing the caudal border of the scapula was smoothed. Detailed investigations of bison kill sites indicate that bone choppers, bison humerus fleshers, and the use of bone tools in general were an important part of the butchering tool assemblages in most such sites (Frison 1978: 305-315). Understanding that bone tools used for butchering often display breakage that occurs naturally, this specimen can be identified as a tool by its evidence of use: the worn and smoothed edge on the vertebral border and the edge facing the caudal border (ibid:319). Notably, this specimen (FS #20) was found *in situ*, well preserved, and in context with a Desert Side-notched point. Carbon from the immediately adjacent feature (#2) was dated 510 ± 70 or 1410 A.D.

Table 8. Faunal specimen recovered from Site 5ME5997.

Field Specimen #	Provenience	Description
FS# 5a	Test Pit # 3, Feature #1, 0-5cm	8 small burnt bone fragments
FS #20	Test Pit # 5, 2-10cm	bison scapula specimen (nearly complete)

Faunal remains were also recovered from both surface and excavated contexts within site 5ME6144 (Table 9). Six bone fragments (three burnt) were recovered from surface contexts, 15 bone fragments (13 burnt) were extracted from the test excavation screened fill, and 35 were located in association with a packrat midden. Five of the surface collected bone fragments and the 35 associated with the packrat midden were analyzed by Elaine Anderson. Of the 40 fragments analyzed, the majority (38) were found to be either deer, bison or pronghorn. Notably, four of the bones determined to be bison were burned. Mule deer are found in the site area today, however, the last bison in northwestern Colorado was killed by

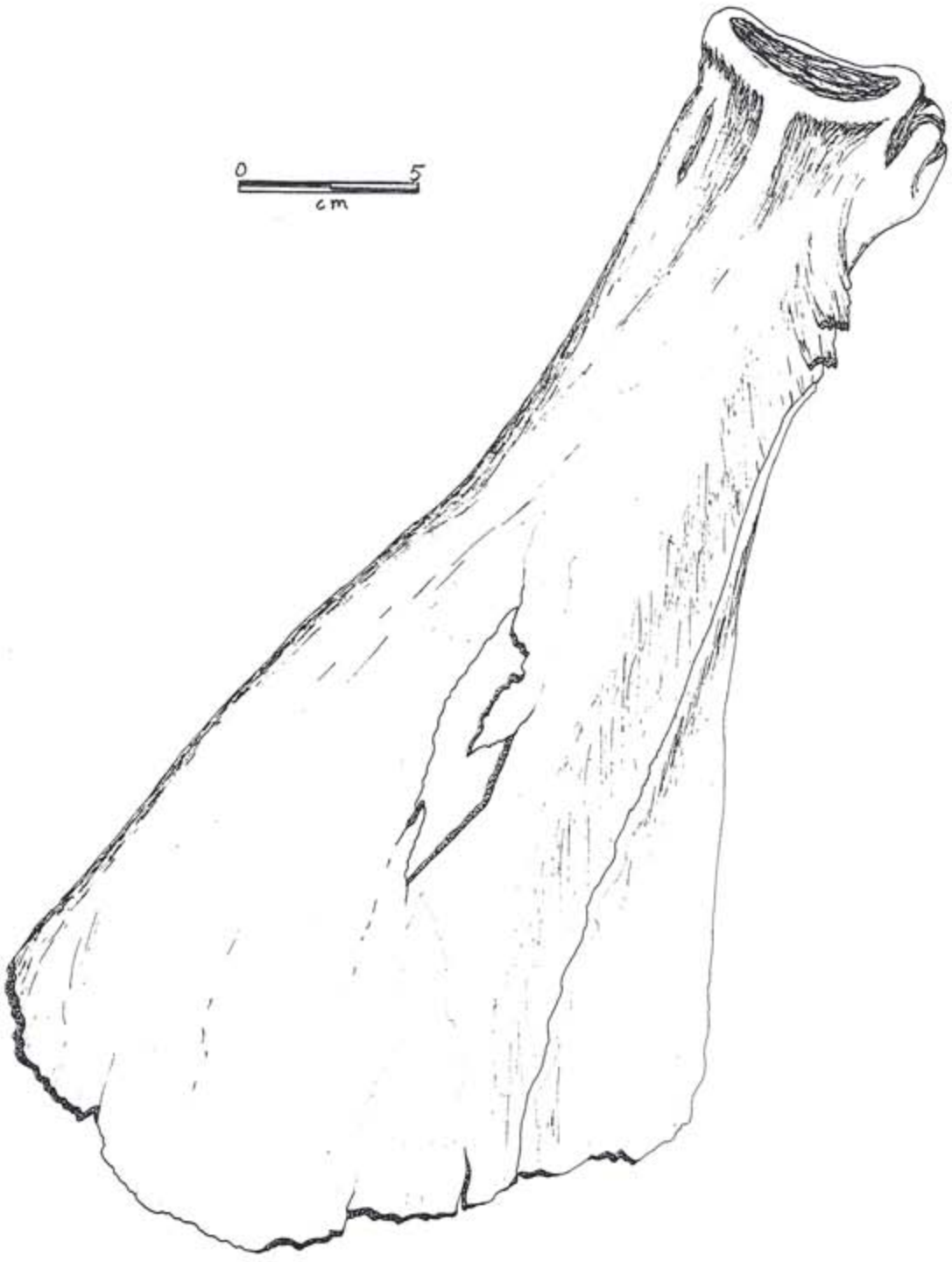


Figure 14. Utilized bison scapula recovered from 5ME5997, FS#20.

the Utes in 1884 west of Craig (Armstrong, 1972). The bone fragments recovered from the excavated pits were all found to be small (rabbit, rodent or bird size) with the exception of one bison bone fragment which interestingly was the only bone excavated from the feature fill of Feature #1, the grass-lined pit.

Table 9. Faunal specimen recovered from Site 5ME6144

Field Specimen #	Provenience	Description
FS# 3b	Test Pit #1, Feature Fill	1 large-mammal long-bone fragment
FS# 4b	Test Pit #2, 3-10cm	5 small bone fragments (4 burned)
FS# 5b	Test Pit #2, 0-10cm	3 small burnt bone fragments
FS# 6b	Test Pit #3, 3-10cm	4 small burnt bone fragments
FS# 7b	Test Pit #3, 0-10cm	1 small burnt bone fragments
FS# 9	Surface Collection #2	1 medium burnt bone fragment
FS# 20	Surface Bone Sample #1	5 large bone fragments (3 deer bone and 2 bison bone)
FS# 21	Surface Bone Sample #2 (Associated with packrat midden)	35 bone fragments: 3 cottontail, 4 deer (two burned), 3 deer tooth fragments, 4 bison (3 burned), 21 large artiodactyl: deer, prong-horn, bison (13 burned)

Macro-botanical Analysis

Two one-liter, macro-botanical samples collected from 5ME5997, TP#3, Feature 1 fill (FS#8), and from 5ME6144, TP#2, 0-10cm were sent to Archaeological-Environmental Research Corporation of Bountiful, Utah, for analysis. The former yielded charred pinyon needles, Chenopodium-Amaranthus (Cheno-Ams) seeds, mustard seeds, and shadscale seeds. It also contained fragmentary remains of uncharred pinyon nut hulls, sedge seeds and several unidentified seeds, as well as, insect parts, calcined bone fragments, and a chalcedony microlith. The sample from 5ME6144 contained similar materials: charred pinyon needles, and cone scales, Cheno-Am seeds, shadscale seeds, and a single grass seed. It also had

fragmentary remains of uncharred pinyon nut hulls, juniper needles and two unidentified seeds. Notably, the largest qualitites floral materials were from pinyon pine and Cheno-Ams whose seeds are gathered in the fall and parched over a fire prior to grinding (Hadden 1998:3; see Appendix E).

Evaluation of Research

Testing of these sites has met the research objects for this project. Both sites were tested in the areas containing suspected features in order to excavate and recover significant scientific data, and to evaluate the sites' potential depth of cultural fill and their likelihood of yielding additional significant information. Research domains that were addressed included cultural affiliation, site function, seasonality, subsistence, social organization, technology, extra-regional relationships, site formation and transformation, and paleoenvironment. Testing of sites 5ME5997 and 5ME6144 has contributed valuable data on occupation of the Northern Uncompahgre Plateau during the Formative and Early Numic periods. Both sites provided this information through very shallow buried remains and as surface deposits.

Site 5ME5997 is an extensive open camp that lies along the rim of Clark Wash. The Locus I area that was tested is at the extreme east end of the site. There remain numerous concentrations of artifacts throughout the remainder of the site, which represent small camp locations and lithic processing localities, that are likely to contribute as much information as Locus I.

The surface materials of Locus I indicated an Early Numic camp, and the artifacts and C-14 sample recovered from this area confirmed the early assessment. Projectile points included three Desert Side-notched types, one of which was made of obsidian. An obsidian flake was found *in situ*, as well. Both artifacts were sent for obsidian source analysis and were found to originate from a quarry at Teton Pass, Wyoming. A second source of obsidian was derived from analysis of a flake found on the surface of 5ME6144. Its quarry was Bear Gulch, Idaho. Another imported material was found at Locus I, 5ME5997, during surface mapping. It is a large flake of "pumpkin" chert, a type found only in quarries along the Yampa River in exposures of the Morgan Formation. These materials indicate strong trade relationships throughout the region during the Late Prehistoric period. It the case of the Early Numic peoples, these finds imply a mobile lifestyle with distinct contacts to the north.

One of the most significant finds at Locus I, 5ME5997, was the bison scapula that was recovered from dated contexts. This bone was apparently utilized as an expedient, scraping tool for the fleshing of a bison hide. Two inferences can be made from this find: 1) that the site was used as a short-term camp for the processing of a bison, and 2) that bison were present on Glade Park ca. AD 1410.

The projectile points and bifaces recovered from Locus I, 5ME5997, also suggest the primary function of this locus was the processing of a bison. Two of the three Desert Side-notched points had basal fractures that would be consistent with their breaking from the shaft after striking the animal. In fact, these points were likely removed from the animal during processing. Additionally, the four biface fragments recovered from the surface were all broken, probably during the butchering procedures.

Bison skulls have been observed in streambed strata along the Little Dolores drainage in at least two locations, both of which the authors have visited. But the scapula is the first, clearly dated, prehistoric bison occurrence reported from the Uncompahgre Plateau. Bison foot bones were also found on the slope outside the overhang of 5ME6144 and in a packrat midden within the shelter. These probably represent a toss of waste materials from one of the open camp localities of 5ME5997 situated above the shelter. Interestingly, the Uncompahgre Plateau and the San Juan Mountains are areas within Colorado that have had no previously recorded *Bison bison* specimen localities, as reported in Recent Distribution of Bison in Colorado West of the Great Plains (Meaney and Van Vuren 1993).

While the testing of Locus I of 5ME5997 removed a majority of what that portion of the site had to offer, testing of 5ME6144 removed only a small amount of the buried cultural deposits that are present. Surface recovered plain grayware ceramics at 5ME6144 indicated the at least one component of the rockselter may date ca. AD 500-900. A grass-lined pit was exposed in the east portion of the shelter and test excavation concentrated there. Two of the three test pits were placed over the apparent perimeter of a grass mat. The third pit dug south of the mat yielded a C-14 date of ca. AD 880. It also produced a small corner-notched projectile point that compares well with Type C-21, an Ancestral Puebloan type that had its highest occurrence between AD 880 and 920, which was identified as part of the Dolores Archaeological Program (Phagen 1988:125-163). The conclusion was that the site represents an occupation by Ancestral Puebloans of the Pueblo I period.

Except for the insect parts found in Feature #1 of Locus I, 5ME5997, the macro-botanical sample analysis at both sites yielded very similar data. Insect parts are found in hearths where meat is being prepared, and indeed, fragments of burned rabbit bones were also recovered from this feature. The greatest quantity of floral materials present in both samples were charred needles and nut hulls of pinyon pine and Cheno-Am seeds. Processing of the nuts and seeds of these plants involved parching over a fire before grinding into a meal. These two resources mature and are harvested in the fall, which suggests a late fall occupation of the sites (Hadden 1998:4; see Appendix E).

Both the sites were occupied during dry episodes that were recorded for the Southern Colorado Plateaus (Dean et al. 1985:541, Figure 1). These dry periods would have required hunter-gatherers to be seasonally migratory – to exploit the higher elevations for seeds in the summer and the lower elevations (where the food gathering period is extended) in the late fall

and early spring. Extremely dry episodes would have pushed the migratory cycle into the higher elevations altogether and probably allowed territorial permanence there. Times of greatest population movement likely occurred during the transitions between the wet and dry periods. However, progressions to the dry episodes appear to have developed quite rapidly.

The expansion of the Pueblo I culture from the Southwest, into the upper Northern Colorado Plateau is likely due to the dry episode of ca. AD 750 to 900. The same explanation may account for the movement of Early Numic populations into the mountains of western Colorado. A migration to the region appears to correspond to a dry episode that began ca. AD 1350 and continued until about AD 1500.

Recommendations

Based on the findings of this study, the remaining loci of site 5ME5997 and site 5ME6144 are considered likely to yield additional information concerning subsistence, technology, settlement, land use, social organization, and external relations patterns of its prehistoric occupants. Accordingly, both are field evaluated as eligible for listing on the NRHP. Preservation is recommended.

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Appendix A: Field Specimen List for 5ME5997 and 5ME6144

Field Specimen List for 5ME5997

FS#	Provenience	Description
FS# 1	Test Pit #1, 0-5cm	Debitage (11 flakes)
FS# 2a	Test Pit #2, 0-5cm	Debitage (186 flakes)
FS# 2b	Test Pit #2, 0-5cm	Charcoal specimen
FS# 2c	Test Pit #2, 0-5cm	Biface fragment
FS# 2d	Test Pit #2	Scraper
FS# 3	Surface, TP #2; 2.4mE/0.2mS of NE	Projectile point, obsidian
FS# 4	Surface, TP #2; 3.1mE/0.65mS of NE	Projectile point, chalcedony
FS# 5a	Test Pit #3, 0-5cm	Burnt bone fragments (8 small)
FS# 5b	Test Pit #3, 0-5cm	Floral sample
FS# 6	Test Pit #3, Outside Feature #1	Pollen sample
FS# 7	Test Pit #3, Feature Fill	Pollen sample
FS# 8	Test Pit #3, Feature #1	Feature fill
FS# 9	Test Pit #4, 4.0cm bgs	Projectile point, Desert Side-notched
FS# 10	Test Pit #4, 7cm bgs	Utilized chert flake
FS# 12	Test Pit #5, Feature #2	Charcoal sample (dated)
FS# 13	Test Pit #5, 0-5cm	Debitage (3 flakes)
FS# 14	Test Pit #5, Feature #2	Soil sample
FS# 15	Test Pit #5,	Organic sample
FS# 16	Test Pit #3,	Charcoal sample
FS# 17	Test Pit #3, Feature #1 fill	Float sample
FS# 18	Test Pit #4, 0-10cm	Debitage (3 flakes)
FS# 19	Test Pit #4, 10-20cm	Debitage (2 flakes)
FS# 20	Test Pit #5	Scapula specimen (bison)

Field Specimen List for 5ME6144

FS#	Provenience	Description
FS# 1	Test Pit #1, 0-10cm	Debitage (6 flakes)
FS# 2	Test Pit #1, 10-20cm	Debitage (5 flakes)
FS# 3a	Test Pit #1, Feature fill	Debitage (9 flakes)
FS# 3b	Test Pit #1, Feature fill	Bone fragments (1 bison)
FS# 3c	Test Pit #1, Feature fill	Charcoal specimen
FS# 4a	Test Pit #2, 3-10cm	Debitage (31 flakes)
FS# 4b	Test Pit #2, 3-10cm	Bone fragments (4 sm. burnt,1 sm. unburned)
FS# 4c	Test Pit #2, 3-10cm	Floral specimen (3 pine nut shells)
FS# 4d	Test Pit #2, 3-10cm	Biface fragment
FS# 5a	Test Pit #2, 0-10cm	Debitage (40 flakes)
FS# 5b	Test Pit #2, 0-10cm	Bone fragments (3 small burnt)
FS# 5c	Test Pit #2, 0-10cm	Projectile point, Rosegate
FS# 5d	Test Pit #2, 0-10cm	Projectile point tip fragment
FS# 5e	Test Pit #2, 0-10cm	Biface edge
FS# 5f	Test Pit #2, 0-10cm	Biface fragment
FS# 6a	Test Pit #3, 3-10cm	Debitage (52 flakes)
FS# 6b	Test Pit #3, 3-10cm	Bone fragments (4 small burnt)
FS# 6c	Test Pit #3, 3-10cm	Heated chunk
FS# 7a	Test Pit #3, 0-10cm + Feature fill	Debitage (15 flakes)
FS# 7b	Test Pit #3, 0-10cm + Feature fill	Float sample
FS# 7c	Test Pit #3, 0-10cm + Feature fill	Floral specimen
FS# 7d	Test Pit #3, 0-10cm + Feature fill	Utilized core
FS# 8	Surface find #1	Biface fragment
FS# 9	Surface find #2	Burned bone (1)
FS# 10	Surface find #3	Ceramic sherd
FS# 11	Surface find #4	Ceramic sherd
FS# 12	Surface find #5	Ceramic sherd
FS# 13	Surface find #6	Ceramic sherd
FS# 14	Surface find #7	Spent chert core
FS# 15	Surface find #8	Ceramic sherd
FS# 16	Surface find #9	Utilized blade flake
FS# 17	Surface find #10	Ceramic sherd
FS# 18	Surface find #11	Graver/scraper (heated chert)
FS# 19	Surface find #12	Utilized flake (jasper)
FS# 20	Surface	Bone sample #1
FS# 21	Sample asso. w/packrat midden	Bone sample #2
FS# 22	Test Pit #2, 0-10cm	Soil sample
FS# 23	Test Pit #1, Feature sample	Grass mat sample (floral)
FS# 24	Test Pit #2, 3-6cm	Charcoal sample
FS# 25	Test Pit #2, 0-10cm	Float sample

Appendix B: Report of Ceramic Analysis

ARCHEOLOGICAL-ENVIRONMENTAL RESEARCH CORPORATION

181 North 200 West, Suite 5 -- Bountiful, Utah 84010
P. O. Box 853, Bountiful, Utah 84011

Phone : (801) 292-7061 -- Fax: (801) 292-0614
Email: ari@xmission.com -- Web Page: ari-aerc.org

April 23, 1998

Grand River Institute
Attn: Carl E. Conner
P.O. Box 3543
Grand Junction, Colorado
81502

Reference: request of March 23, 1998 for ceramic analysis

Dear Carl:

I have examined the sherds that you sent from sites 5ME 5997 and 5ME 6144 for their characteristics and ran some checks against our ceramic type collection including the Colorado collections and the Southwestern collections. I also consulted Harold Colton's 1955 POTTERY TYPES OF THE SOUTHWEST, Museum of Northern Arizona Ceramic Series No. 3A, and PREHISTORIC CERAMICS OF THE MESA VERDE REGION, Museum of Northern Arizona Ceramic Series No. 5, prepared by David Breternitz, Arthur H. Rohn, Jr., and Elizabeth A. Morris, 1974. Here are the results:

Site 5ME 5997:

This site contains three body sherds (1-3), all evidencing corrugation. Samples 1 and 2 are Mancos Corrugated (they may be Mesa Verde Corrugated but impossible to determine without the rims). Both sherds may be from the same vessel. Sample 3 is Tusayan Corrugated. All three are Late Pueblo II or early Pueblo III and date between A.D. 900 and 1200.

Site 5ME 6144:

This site contains one rim sherd (FS-10) and five body sherds (FS-11, 12, 13, 15, 17), all evidencing wiping or scraping and lacking decoration. Paste contained very small mica particles. Rim tapers without a fold. All six sherds may be from the same vessel, or if not, were prepared using similar temper (quartzite gravels) and similar paste. I have two similar sherds in the type collection from NE Colorado that are presently not typed. My best assessment is that these six are poorly prepared Chapin Gray, and as such, originated during the Basketmaker III phase (A.D. 450-800) which would equate well with the C14 date from that site of 1190+/-60 B.P. If you have any BM III arrow points from this site you can be positive that you are working in a Basket Maker component.

F. Richard Hauck, Ph.D.
President and Principal
Investigator

Ceramic analysis conducted by Rick Hauck,Phd., on April 23, 1998.

Site Number	5ME5997			5ME6144					
Specimen No.	s1	s2	s3	s10	s11	s12	s13	s15	s17
Construction	C	C	C	C	C	C	C	C	C
Firing method	R	R	R	R	R	R	R	R	R
Core color	mG	ltG	ltG	B	B	B	B	B	BrnB
Paste	--	–	–	Mica	Mica	Mica	Mica	Mica	Mica
Temper material size temper shape % of temper	 Q Lrg. Ang. 20	 Q Lrg. Ang. 20	 S/Q S/L Ang. 30	 Qzte Med R/A 25	 Qzte Med R/A 25	 Qzte Med R/A 25	 Qzte Med R/A 25	 Qzte Med R/A 25	 Qzte Med R/A 25
Fracture	S	S	S	B	B	B	B	B	B
Vessel wall thick	69	60	64	49	49	51	54	50	47
Surface color	G	G	G	Brn	BrnG	Brn	Brn	Brn	BrnG
Surface finish	Corru	Corru	Corru	W	W	W	W	W/S	S
Decoration	No	No	No	No	No	No	No	No	No
Vessel shape	Unk	Unk	Unk	UR	Unk	Unk	Unk	Unk	Unk
Rim shape	Unk	Unk	Unk	Strt	Unk	Unk	Unk	Unk	Unk

Key

1: Construction (e.g. coiled [coil], paddle and anvil).
2: Firing method (e.g., reducing [R], oxidizing).
3: Core color (grey [G] - medium or light; black [B]; brown [Brn]; and, brown/grey).
4: Paste (micaceous).
5. Temper: a) material [quartz: Q; sand: S; fine, quartzite gravel: Qtze] , b) size,
c) temper shape [angular: Ang; and rounded: R], d) % of temper to paste.
6: Fracture (e.g., strong [S], brittle [B], or friable).
7: Vessel wall thickness (average in millimeters).
8: Surface color (see core colors).
9: Surface finish (e.g., corrugated [Corru], wiped [W], and scraped [S]).
10: Decoration (e.g., painted, incised, stamped, etc.)
11: Vessel Shape (e.g., unrestricted [UR], restricted, neck, unknown [Unk]).
12: Rim shape (e.g., straight [S], averted, widely averted.

Appendix C: Report of Obsidian Analysis

Geochemical Research Laboratory Letter Report 98-59

June 18, 1998

Patty Walker-Buchanan, Area Archaeologist
Bureau of Land Management
Grand Junction Resource Area
2815 H Road
Grand Junction, Colorado 81506

Dear Patty:

The table below presents x-ray fluorescence (xrf) data generated from the analysis of three obsidian artifacts from two archaeological sites (5ME5997, n=2; 5ME6144, n=1) within the Griffith Land Exchange area, Mesa County, Colorado. The research reported here was conducted pursuant to U.S.D.I. (Bureau of Land Management) requesting office requisition no. C0-076-8-PWP. Laboratory analysis conditions, artifact-to-source (geochemical type) attribution procedures, information on element-specific measurement resolution, and comparative literature references applicable to these samples follow those reported for obsidian from sites in the Glenwood Springs Resource Area (Hughes 1996, 1997).

	Trace Element Concentrations											
Cat. Number	Zn	Ga	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	$Fe_2O_3^T$	Obsidian Source (Chemical Type)
5ME6144, S #13	60 ±5	15 ±2	170 ±4	43 ±3	36 ±3	276 ±4	48 ±3	681 ±14	nm	nm	nm	Bear Gulch, ID
5ME5997, FS #3	59 ±5	17 ±3	123 ±4	123 ±3	24 ±3	76 ±4	10 ±3	1154 ±15	nm	nm	nm	Teton Pass, WY Variety 1
5ME5997, TP #5	65 ±5	20 ±2	125 ±4	131 ±3	25 ±3	78 ±4	12 ±3	1226 ±15	nm	nm	nm	Teton Pass, WY Variety 1

All values in parts per million (ppm) except iron (expressed as total iron in weight percent) ; ± = expression (in ppm) of x-ray counting uncertainty and regression fitting error at 600 seconds livetime. nm= not measured.

The flake from ME6144 has the same trace element composition as geologic obsidians of the Bear Gulch, Idaho, chemical type, while both flakes from ME5997 were fashioned from a variety of obsidian erupted near Teton Pass, Wyoming. Please contact me at my laboratory ([650] 851-1410) if I can provide further information or assistance.

Sincerely,

Richard Hughes

Richard E. Hughes, Ph.D.
Director, Geochemical Research Laboratory

REFERENCES

Hughes, Richard E.

1996 X-ray Fluorescence Analysis of Obsidian Artifacts from Eleven Archaeological Sites in the Glenwood Springs Resource Area, Colorado. Geochemical Research Laboratory Letter Report 95-68 submitted to Patty Walker-Buchanan, BLM Glenwood Springs Resource Area, March 15, 1996.

1997 X-ray Fluorescence Analysis of Obsidian Flakes from Archaeological Sites 5EA909 and 5EA1052 in the Glenwood Springs Resource Area, Colorado. Geochemical Research Laboratory Letter Report 97-43 submitted to Patty Walker-Buchanan, BLM Glenwood Springs Resource Area, May 13, 1997.

Appendix D: Report of Faunal Analysis

Faunal Analysis by Elaine Anderson, 1989

Mammal bones from **5ME5997** and **5ME6144**

5ME5997

FS #20 Bison bison - Bison

Left scapula, nearly complete. Adult
Measurements (see sketch):
Wt. 523.3g
Width neck 65.2mm
Height glenoid cavity 52.4mm
Width glenoid cavity 62.5mm
Max. width of blade 195mm
Min. length (vertebral border broken off) 383mm
Max. width infraspinous fossa 108.6mm
Max. width supraspinous fossa 43.9mm

Probably butchered. Vertebral border (see sketch) has been broken, edge show wear and are smoothed. Apparent cut marks on both sides of blade especially near the vertebral border. Irregular shaped hole in infraspinous fossa, the edge facing the caudal border of scapula has been smoothed.

5ME6144

FS #20 Bison bison - Bison

Right calcaneum, Adult. Weathered.
Wt. 101.7g

Proximal phalanx, complete, Adult. Scorched.
Wt. 39.0g
Total length 68.3mm
Proximal width 31.5mm
Distal width 32.6mm
Least Shaft width 28.9mm

cf Odocoileus - Deer

Right femur, Adult. Weathered. (Bone is slender and probably female)
Wt. 43.9 g

Odocoileus sp. cf O. hemionus - Mule Deer

Distal half of right humerus. Adult. Rodent-gnawed (small mice)
Wt. 62.9 g
Distal width 41.8mm
Least shaft width 22.1 mm

Fragment of right calcaneum. Adult. Scorched.
Wt. 11.2g

5ME6144, con't.

FS #21 Sylvilagus sp. - Cottontail

Right Ulna, Adult.
Wt. 0.2g
Proximal ½ left radius, Adult.
Wt. 0.1g
Distal ¾ right tibia, Adult. Proximal end is rodent -gnawed.
Wt. 1.7g.

Odocoileus sp. - Deer

RM_T (Right 1st lower molar)
Wt. 3.0 g
Fragment LM^3 (Left third upper molar)
Wt. 1.8g
3 tooth fragments
Wt. 0.1 g
Jaw fragment, rodent gnawed.
Wt. 1.6g
Fragment of mid-section of rib, slightly scorched.
Wt. 2.2g.

Bison bison - Bison

Proximal phalanx, adult. Weathered.
Wt. 27.6g
Mid-section of rib, rodent gnawed.
Wt. 29.2
Fragment of distal end of proximal phalanx, adult. Burned.
Wt. 4.3g
Fragment of proximal end terminal phalanx (hoof). Burned, rodent gnawed.
Wt. 2.7g

Large artiodactyl

Fragment of proximal end of metapodial. Burned, rodent gnawed.
Wt. 2.0g
Fragment of long bone
Wt. 10.2g
Jaw fragment, burned.
Wt. 0.7g
Three long bone fragments, all burned.
Wt. 10.6g
Fifteen small fragments. Eight are burned and four have a greenish stain.

Appendix E: Report of Macro-botanical Analysis

ANALYSIS OF FLOTATION SAMPLES RECOVERED FROM SITES 5ME 5997 AND 5ME 6144 MESA COUNTY, COLORADO

Report Prepared for Grand River Institute

Grand Junction, Colorado

AERC Project # GRI 98L2

Author of the Report:
Glade Hadden

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May 26, 1998

INTRODUCTION

On March 30, 1998 the Grand River Institute of Grand Junction Colorado, submitted two soil samples to the AERC labs for Macro-floral flotation and analysis. Sample number 8 was recovered from feature one of site 5ME 5997 and sample number 25 was recovered from Test Pit #2 of site 5ME 6144, both located in Mesa County, Colorado. Macro-floral analysis can be used to recover evidence of possible subsistence strategies which may reflect patterns of prehistoric human use of the area.

A radiocarbon date obtained for site 5ME 6144 was 1190 ± 60 years B.P. placing the site in the middle Formative period. Hearth feature number one of site 5ME 5997 was dated to 510 ±70 years B.P. This date, along with diagnostic Desert Side Notched points also collected from test pits on the site suggests a prehistoric Shoshonean context.

METHODOLOGY

The macro-floral samples for the two sites were floated using a two chambered, four stage flotation technique developed at the AERC laboratory. One liter of float sample was added to the agitation chamber and allowed to mix in a constant air/water vortex. Light fractions were drawn off through a 50 micron mesh sieve. At the end of each sample, the air injection was removed and near floatables were drawn off and filtered through a 50 micron mesh sieve. The remaining heavy fractions were filtered and dried for return to Grand River Institute for examination. All floated portions were allowed to dry.

The light fractions were then sorted for seeds and other identifiable organic remains. Remains were further sorted as to genus and where possible, species. Initial sorting was conducted under four power magnification. Organic macrofossils were examined under a binocular microscope at magnifications between 7x and 40x and were identified by comparison with modern collections. The term seed is herein used to describe seeds, caryopses, achenes and other floral disseminules.

DISCUSSION

Analysis of pollen and macro-floral remains found in excavated archaeological sites is useful in identifying plants which the prehistoric occupants may have found economically useful. The uses to which these plants were most likely put may be reflected in historic and ethnohistoric records. The comparison of archaeological remains to these records is not meant to provide conclusive evidence of prehistoric use, but rather serves to imply that such use is feasible and that, prior to the introduction of exotic foodstuffs during the period of European contact, historically known people did base their subsistence on many of these resources.

Flotation of the sample from site 5ME 5997 resulted in the recovery of charred needles of *Pinus* (Pinyon pine), Cheno/Am seeds, *Brassica* (mustard) seeds, *Atriplex* (Shadscale) seeds and the uncharred fragmentary remains of *Pinus* (pinyon) seed hulls, *Carex* (sedge) seeds and several fragmentary unidentifiable seeds. Other organics recovered from the samples include 42 insect parts, calcined bone fragments, mouse scats and a single white chalcedony microlith.

Flotation of the sample from site 5ME 6144 resulted in the recovery of charred remains of needles, cone scales and seed hulls of *Pinus* (Pinyon pine), Cheno/Am seeds, *Atriplex* (Shadscale) seeds and a single grass seed, and the uncharred fragmentary remains of *Pinus* (pinyon) seed hulls, *Juniperus* needles, and two fragmentary unidentifiable seeds. Other organics recovered from the samples include rodent droppings, rodent bones and microliths.

The largest categories of identifiable seeds and plant parts were those of Pinyon Pine (*Pinus edulis*) and Cheno/Ams. Seeds of Pinyon pine have been a traditional subsistence staple of prehistoric people throughout the Great Basin and Colorado Plateau, while the wood provides structural members for shelter as well as firewood (Ebeling 1986; Steward 1938). The seeds, although seasonally unpredictable, are highly nutritious and store well for late winter and early spring use. The presence of large quantities of Pinyon cone scales and bracts is usually taken to indicate pine-nut processing. Cheno-Ams are a comprehensive category composed of *Chenopodium* (plants of the Goosefoot family) and *Amaranthus* (plants of the Pigweed family). Physically, the seeds and pollen of these two groups are quite similar (in some cases indistinguishable), and their economic uses are likewise highly interchangeable. *Chenopodium* and *Amaranthus* are both widespread herbaceous annuals, growing in a number of differing plant communities. These

"weeds" grow best in disturbed areas such as roadsides, cultivated areas and after fires (Goodrich and Neese 1986). Seed production is very high. Minnis (1981: 144) reports that tumbleweeds (*Amaranthus graecizans*) are capable of producing up to six million seeds per plant, and that even in a poor year the desert may produce up to 3.7 billion seeds per hectare.

By far the major use of Cheno-Ams is as seeds for food. Generally, the seeds of both species would be gathered in the fall and parched over a fire prior to grinding. Ground seed meal was then made into a variety of flat cakes and mush. Many varieties were utilized as both wild and domesticated or semi-domesticated plant resources across much of the great basin by historically known Numic speaking people (Steward 1938; Winter 1974; Winter and Hogan 1986).

MACRO-FLORAL ANALYSIS RESULTS

Site 5ME 5997

Field Sample (FS) #8 (AERC Laboratory Sample Number **98221.1**) was recovered from Feature #1, a shallow hearth feature radiocarbon dated to 510 ± 70 years B.P. (Beta # 32043). A bulk soil sample of approximately two liters of soil was submitted to the AERC labs, where it was subsequently floated and examined. The charcoal content of the sample was light to moderate and much of the sample was highly fragmented, no charcoal ID was possible. The resulting dry light fraction came to some 10.5 grams and the heavy fraction weighed some 53 grams.

The light fraction was screened through a set of nested sieves, and 100% of the sample larger than one mm. was examined. 50% of the sample between 250 microns and one mm. was examined.

42 identifiable plant parts, seeds or seed fragments were contained in the sample. These remains included 4 un-charred Pinyon seed hulls, 5 charred pine needle fragments, 33 whole charred Cheno/Am seeds, two charred *Atriplex* seeds fragments, two charred *Brassica* seed fragments, two un-charred *Carex* seed fragments and five unknown seed fragments. In addition to these macrofloral specimens, 14 mouse or rodent droppings, 4 calcined bone fragments, 42 insect parts and 1 white chalcedony microlith were recovered.

Site 5ME 6144

Field Sample (FS) #25 (AERC Laboratory Sample Number **98221.2**) was recovered from Test Pit number 2, NW Corner, a small concentration of compact charcoal radiocarbon dated to 1190 ± 60 years B.P. A bulk soil sample of approximately two liters of soil was submitted to the AERC labs, where it was subsequently floated and examined. The charcoal content of the sample was moderate

to heavy and much of the sample consisted of un-charred pinyon pine needles, bracts and seeds, as well as charcoal from *Pinus*. The resulting dry light fraction came to some 142 grams and the heavy fraction weighed 81.2 grams.

The light fraction was screened through a set of nested sieves , and 100% of the sample larger than one mm. was examined. 50% of the sample between 250 microns and one mm. was examined. Most of the identifiable charcoal consisted of Pine wood.

Over 160 identifiable plant parts, seeds or seed fragments were contained in the sample. These remains included 26 charred and 24 un-charred Pinyon seed hulls and one entire un-charred pinyon seed, 25 charred pine needle fragments, 5 un-charred Juniper needle fragments, 27 charred Cheno/Am seeds, Two charred *Atriplex* seeds, one *Poaceae* or grass seed and two unknown seeds. In addition to these macrofloral specimens, several rodent droppings, rodent bones and microliths were recovered.

SUMMARY AND CONCLUSIONS

High seed counts, combined with the presence of non-charred chaff and processing waste tend to characterize most seed processing sites. Both sites (5ME 5997 and 5ME 6144) show strong evidence of use as seed processing sites, either as a resource procurement or for immediate consumption.

Site 5ME 5997 (FS #8), shows less evidence of basic procurement processing, and is more likely associated with occupational short term food gathering. Presence of both pinyon hulls and Cheno/Ams suggests a late fall occupation and the presence of calcined bone fragments and insect parts supports the contention of occupational use of the site. Insect parts are found in high numbers in hearths in which meat has been roasted. Overall, the hearth feature #1 of this site provides evidence of a temporary occupation in which a variety of resources were harvested and prepared for consumption .

Site 5ME 6144(FS #25) is more consistent with extended vegetal gathering and processing. The wide variety of seeds and plant parts suggests that the hearth was used for fall seed gathering for storage, although some level of occupational debris is also present indicating the possibility of use of the site as a multiple use resource procurement site. Heavy mixing with uncharred plant parts, rodent droppings and rodent bones indicates some degree of post-depositional mixing, meaning that some level of skepticism should be employed in the interpretation.

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Appendix F: Location map for 5ME5997 and 5ME6144