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AN ARCHAEOLOGICAL SURVEY IN THE PLAINS - FOOTHILLS ECOTONE, NORTHERN COLORADO

by

Lauri Travis

ABSTRACT

The study area is located northwest of Loveland, in Larimer County, Colorado. It is on and immediately adjacent to the first major hogback, the Dakota formation, which rises at the western edge of the Great Plains. This location provides a magnificent view in all directions and supports an abundance of plant, animal and geological resources. The survey covered an area measuring about 2.5 miles from north to south. The east-west dimension follows the sinuous contour of the hogback. At its widest part this dimension is about a half mile.

Twenty-seven sites were recorded and surface collections made over a period of years. The relatively dense site occurrence was examined to determine settlement patterns, site function, and chronological placement. Fourteen sites contained chronologically diagnostic artifacts which assisted in temporal placement. Of these, 12 are considered to have had multi-component occupations. One site produced a Paleo-Indian point, seven sites had evidence of Early Archaic occupation, seven sites had evidence representing the Middle Archaic period, 12 sites had evidence of Late Archaic occupation, 11 sites indicated the early Ceramic Hogback phase, one site had what is thought to be a Middle Ceramic teepee ring, and one site had a slab and dead tree structure that is interpreted to date from either the Late Ceramic Period or the Historic Contact Period.

Examination of environmental variables revealed the preference for campsites located on easterly sloping shelves protected from the prevailing west winds. A preference for open, relatively flat areas in the Mountain Mahogany or Mountain Mahogany- Ponderosa Pine communities is also present. The ridge itself provides views over the surrounding landscape that would have been excellent for general surveillance.

INTRODUCTION

The study area, located northwest of Loveland, in Larimer County, Colorado, ranges in elevation from 5200 ft to 5519 ft. Its abrupt rise above the Plains provides magnificent views in all directions. There is a wide variety of plainsfoothills ecotone flora and fauna which were probably a major attraction for prehistoric peoples. Vegetation is dominated by ponderosa pine and mountain mahogany. The most prevalent animals today are deer and rabbits. This area has an unusually high density of sites, perhaps because it does not experience the extremes in weather found in the mountains to the west or the high plains to the east. Sites were examined to determine settlement patterns and, when possible, function and chronological placement. The research conducted by Thomas in the pinon pine ecotone in Nevada provided both inspiration and methodology for this survey and its site location predictive modeling (Thomas and Bettinger 1976).

To emphasize the high site density in this particular area, comparative surveys were conducted in three nearby localities. The density of sites in all three areas was much lower. One comparative survey was conducted on the unforested ridge west of the Dakota hogback. Only four sites were recorded in an area of approximately the same size as the study area. A second comparative survey was conducted along an unforested part of the same Dakota hogback one mile north of the study area. Again the site density was very low. A third comparative survey was conducted by one section of the 1985 Colorado State University field school in an essentially tree-less portion of Lory State Park, eight miles north of the study area. Once again, prehistoric sites were rare. Although less time was spent on the comparative surveys, it is felt they were adequately sampled. They were conducted in the late stages of this research and settlement patterns had already begun to appear; therefore, the comparative areas were not covered randomly but surveyed in potentially high site density districts. These areas are very similar to the study area in all ways except they lack thick ponderosa pine coverage. If it is assumed the vegetation was similar during prehistoric times, trees would have provided shelter from wind, food sources such as nuts (Morris in prep.), inner bark (Martorano 1981) resources for construction and firewood, and cover for an abundance of game animals. The frequency of manos may be indicative of pine nut processing or treatment of other plant materials. The smooth working surfaces of the edge ground cobbles suggest that they were used in hide tanning. Research has shown that mule deer browse intensively on mountain mahogany and understory plants sheltered by ponderosa pine (Neff 1974:33).

Field work was complete when Greiser's monograph *Predictive Models for Hunter*gatherer Settlement Strategies was published. In general, the results described here fit into her more comprehensive presentation. Specifically, the importance of the Ponderosa Pine outliers, as described here, adds useful information to the larger scene (Greiser 1985).

METHOD

The study area sites have been revisited an uncounted number of times throughout the last ten years by the author, Dr. Elizabeth Ann Morris, and other anthropology faculty members and students from CSU. Ground visibility varied greatly due to differences in seasonal vegetational coverage, rodent activities, grazing and erosion. Many of the artifacts were located in bulldozed roadcuts where erosion was greatest. Site locations and descriptions are on file with the Office of the State Archaeologist in Denver. The collections are stored in the Department of Anthropology, Colorado State University in Fort Collins.

SITE TYPES

The archaeological sites of the study area are classified into five types (Table 1). They are:

(1) Campsite – These fifteen sites have evidence of prolonged stay as indicated by diverse artifacts such as structures, hearths, ceramics and a variety of ground and flaked lithics. Site 5LR155 is by far the largest of these. It produced a vast amount of cultural material, hypothetically reflecting not only the frequency of survey collections but the large size of the site and the richness of the deposit. Found here were almost one half of the projectile points, all except one pre-form representing the Hogback phase of the Early Ceramic period and perhaps the Early Archaic period, all of the cord-marked ceramics, about half of the edge ground cobbles, almost half of the grinding slabs, and approximately 80% of the flakes and cores. The majority of small cobble flakers from all sites, except the lithic processing station to be described below, were recovered on these camp sites. Most of the other sites, however, exhibited campsite attributes also. It is felt that this may partially reflect the frequent collections made by archaeologists as well as an unusually high proportion of campsites to lithic scatters and other site types. As has been discussed elsewhere, revisitation of surveyed sites has proven to be extremely useful in terms of increasing the

	Campsite	Rock Shelter	Lithic Scatter	Lithic Processing	Quarry
5LR155	Х				
156	Х				
157		Х			
175	Х				
176					Х
641	Х				
642	Х				
939	Х				
940			Х		
941			Х		
942	Х				
943	Х				
944	Х				
945	Х				
946				Х	
947			Х		
948			Х		
949	Х				
950	х				
951		Х			
952		Х			
953			Х		
954	Х				
955					Х
956	Х				
957	Х				
958		Х			
Total	15	4	5	1	2

Table 1. Quantitative Occurrence of Site Types in Study Area.

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interpretive potential of surface collections (Morris 1981:296).

(2) Rock Shelter – These four localities are also campsites located in areas which are sheltered by rock overhangs, or simply huge boulders which protect small relatively level areas from at least some of the elements. Of these, 5LR157 is particularly interesting because of the diversity of artifact types present, as well as the presence of a large, level open area adjacent to the two separate north and west facing rock shelters. The artifacts include an Early archaic projectile point base (Fig. 4), fragments of several manos and grinding slabs, two large metamorphic cobbles, and several categories of flaked stone tools.

(3) Lithic Scatter Sites – These are represented by the presence of flaked stone tools and/or accompanying debris. These sites, of which 5LR941 is a typical example, tend to be small in size and contain little diversity of materials or tool types.

(4) Lithic Processing Station – The only site in this category, 5LR946, has hundreds of white chalcedony flakes and cores, the majority being primary or secondary, and dozens of smooth river cobbles which are walnut sized to softball sized. Very few other cultural materials were recovered. Some of the river cobbles have battered ends and are apparently flakers. This does not appear to be a quarry site since both the white chalcedony material and the river cobble flakers are intrusive. Three other site collections in this group include the white chalcedony rock type and 11 include similar cobble flakers. Just why there are so many flakes and flakers raises fascinating problems of interpretation. Hundreds of pounds of material are represented. The similarity of artifacts and a lack of campsite attributes would appear to indicate a single short-term functional specific occupation. It might well be asked why the work was not done at the primary procurement area? Also, if it was a single short-term occupation, why were there so many flakers?

(5) Lithic Procurement Areas – Two areas with natural rock outcrops provide access to desired materials for stone flaked tools. Utilization of 5LR176 is indicated by flake and core lithic debris, an occasional finished tool and river cobble flakers at the site, as well as the presence of the stone on most of the other sites. The site is located on and near an outcrop of Morrison quartzite. The rock is a varigated, light greenish grey color with a medium grain size.

Site 5LR955 is located on the west face of a limestone outcrop. The material is a dark red chalcedony which formed in large cracks in the limestone. No lithic debris was found at the site but a few artifacts of this material were identified on the nearby sites of 5LR155 and 5LR156.

HEARTHS

Two sites, 5LR155 and 5LR156, have hearths continuously eroding out of the roadcuts. It is estimated that, through the years, five to ten hearths have been exposed on each site. All contain dark stained soil and an occasional chunk of charcoal or fire-cracked rock. One hearth on 5LR155 contained a mano discovered during an attempt to take archaeological samples. Unfortunately, the hearth material was unconsolidated and too sandy to be dated. The negative results did help clarify the definition of suitable hearths on which to use the chronological placement method as described by Eighmy (1980). The land owner requested that we not excavate any more hearths because he feared the activity would attract private collectors. Cultural materials were concentrated near these fireplaces. Quantitative data is unavailable, but the hearths are generally ovoid to round in shape and are rather shallow. Slab-lined and rockfilled hearths, such as those described on nearby sites (for example Kainer 1976), were not noted on either site.

STRUCTURES

Two sites had evidence of structures visible on the surface. Feature one is a stone ring found on 5LR642 (Fig.1). The stones which form the



Fig. 1. Plan View of Feature 1, a stone ring, on 5LR624.

outline are of locally obtained sandstone. They are 20- 60 cm in diameter and weigh from 5 to 15 kg. The diameter of the ring is approximately 3.5 m. While other stone rings may be buried on this camp site, a single ring is not uncommon on sites in the area (Morris et al. 1983:49).

Feature two is a wood and sandstone slab shelter with two small nearly contiguous compartments or rooms. It is located on the crest of a shallow hill sloping toward the east on site 5LR954 (Figs. 2, 3). A now dead ponderosa pine and some of its broken branches were incorporated into the westernmost part of the structure. It is suspected the tree was living when the structure was built and that some branches were flexible enough to permit interweaving. There are no steel axe cuts on the tree or branches. Although no modern or historic contact period artifacts were found on the site, it is estimated that the structure was built within the last few hundred years. It is considered unlikely that the structure, while the tree was alive and after it died, would be preserved much longer. A reader noted that, "There is a dead tree in the Black Hills that was already dead when photographed in 1876 by Custer that was identical in appearance in 1976." The arrangement of the wood

and sandstone slab portions of the superstructure exhibit an experienced level of craftsmanship that reflects aboriginal manufacture rather than modern construction.

Compartment A, the easternmost room, is an oval rock alignment. As many as three or four small sandstone slabs were piled on top of each other horizontally to form walls. At one time they were probably higher but have since collapsed. The inside dimensions are one meter east and west by two meters north and south. The slab walls range from 20 cm to one meter in thickness with the thickest portions being on the easternmost or downhill end. The earth floor of the oval exhibits a slight depression. Many of these slabs occur on the adjacent ground surface.

The east side of Compartment B has two large slabs of sandstone which are stuck vertically into the ground leaning slightly on the tree branches behind them to the west. The largest is 65 cms tall and 115 cms in length. The north and south walls also consisted of vertical sandstone slabs which have collapsed downhill to the south. The northwest portion of the wall includes the trunk of the ponderosa pine. Several



Fig. 2. Plan View of Feature 2, a wood and stone structure on 5LR954.



Fig. 3. Photograph of Feature 2, 5LR954, Looking North.

gnarled branches reach out over the compartment, the height of the lowest branch next to the trunk being just over one m, thus permitting an occupant to sit upright. Other branches have been cleverly intertwined with the attached branches to form the foundation for a roof covering. The resulting network has withstood decades, perhaps centuries, of frequent, heavy winds. The covering may have consisted of hides, brush, or mats. The only west wall remains were two tree branches. Compartment B has smooth flat slabs of sandstone bedrock for a floor.

These compartments would have been big enough to allow only one or two grown persons to sit or lie down. Their function might have been storage; however, it is suggested that they were constructed quickly for shelter, perhaps during a storm, out of the limited materials available at the moment. It is also possible that one or both served as hunting blinds, eagle traps, or vision quest localities (Morris et al.in prep.). The associated artifact assemblage indicates a campsite with at least a Late Archaic period occupation.

ARTIFACTS

Chipped stone tools, made from a variety of materials, were found in the study area. The most common of these were cryptocrystalline, such as chert and petrified wood, and quartzites, although basalt spalls and quartz crystals were also found in small numbers. Most of the quartzite artifacts were made form light greenish grey, medium-grained quartzite, like that found on the quarry site - 5LR176. Only two sites, 5LR155 and 156, had flakes from the chalcedony material found at the other quarry site, 5LR955. Three sites, 5LR155, 156 and 942 had flakes made from the white chalcedony material widely spread over the lithic processing

	ļ	5LR155	156	157	641	642	939	940	941	942	944	947	951	954	956	958	TOTALS
Bifaces:	Type 1 2 3 4 5 6 Fragment	3 1 1 1 1 5	1	1			1		1				1				3 1 3 1 1 2
Side Scraper:	Type 1 2 3 4 5 6 Fragment	2 1 s 3	1 2			1			1		1	1			1	1	4 1 1 1 1 1 6
End Scraper:	Type 1 2 3 Fragment	1 1 1 s 2			<u></u>												1 1 1 2
Drill:	Type 1													1			1
Graver:	Type 1									1							1
Burin:	Type 1								1								1
Tanged Knife:	Type 1				1					1							2
Choppers:	Type 1 2 3 4			1		1		1			1						1 1 1 1
TOTALS		18	4	2	1	2	1	1	3	2	2	1	1	1	1	1	41

Table 2. Quantitative Distribution of Whole and Fragmentary Chipped Stone Artifacts by Type and Site.

station – 5LR946. Other materials are from unknown sources but most occur commonly in the area. Some specimens resemble materials from Spanish Diggings in Wyoming.

Ten chipped stone tool categories were identified and quantitative data is presented in Table 2. Each has been classified into sub-types which are distinguished from each other by morphological attributes. Specific attributes of each sub-type are presented in detail in Travis (1986). A brief summary is presented below. Projectile points were divided into twelve types, containing representatives from the Paleo-Indian period, the Early, Middle and Late Archaic periods and the Early Ceramic period (Fig. 4) (Table 3). Preforms, or projectile point blanks, are of similar size, shape, material, and manufacture as the projectile points but lack some attributes such as notches or tips. Table 4 portrays the debitage and quartz cobble distribution.

Bifaces are oval to irregularly shaped, lenticular across both sections and flaked all over or nearly all over both surfaces. Edge-wear indicates that at least some were used for cutting and scraping. Some smaller specimens may be projectile point blanks. Sub-type classification was based on symmetry of shape, size of specimen and fineness of flaking.

Side scrapers vary considerably in shape and section. They exhibit retouching along one or more edges and sometimes intentional flaking

Projectile Points	5LR155	5LR156	5LR157	5LR641	5LR939	5LR954	5LR956	(IF) 5LR972	(IF) 5LR981	TOTALS
Type 1 2 3 4 5 6 7 8 9 10 11 12	6 2 2	2 1 1	1		1	1	1	1	1	6 2 3 1 1 1 1 2 1 1 1
Preforms Type 1 2 3 4 5	5 2 1 2			1						5 2 1 2 1
TOTALS	20	4	1	1	1	2	1	1	1	32

Table 3. Quantitative Distribution of Whole and Fragmentary Projectile Points and Preforms by Type and Site.



Fig. 4. Projectile Points Found on the Survey. Type numbers in brackets precede chronological period designations. Top Row, left to right: [1]Early ceramic period, 5LR155; [2]Early Ceramic period, 5LR155; [7] Late Archaic period, 5LR954; [6] Late Archaic Period, 5LR954; [11] Late Archaic period. 5LR972; [12] Late Archaic period, 5LR981. Bottom Row, left to right: [9] Early Archaic period, 5LR156; [10] Middle Archaic (Duncan) period, 5LR156; [8]Early Archaic period (Mt. Allbion)?, 5LR156; [3] Early Archaic period 5LR157; [4] Paleo-indian period, 5LR939; [5] Early Archaic period, 5LR956.

						Total		Quartz Cob	ble
	Primary	Secondary	Tertiary	Utilized	Shatter	Flakes	Cores	Fragmen	ts
51 01 55	20	1.01	553		72	050	7	67	
156	29	191	10		/3	856	/	67	
157	1	3	40	3	5	20	5	1	
175	1	0	2	1		20	1	1	
176			L	1		4	3	^	
641	1	6		1		8	2		
642	7	4	20	-		31	2	з	
939	1		1	2		4		5	
940	1		1			2	2		
941		2	2			4	ī		
942	8	1	20	3		32	1	8	
943						-		2	
944						-		3	
946								*	
947					1	1	1	14	
948			6			6			
949			1	1		2			
951	r	1	F		1			1	
953	3	1	5		1	10	2		
954	1	9	9	1		19	-	2	
950	1		7	1		9	1		
IF's		2	/			/		1	
						<u>∠</u>	·		
TOTALS	71	227	682	12	81	1073	23	105	
*These si	tes have no	ot been compl	letely colle	ected for 1	ogistic	reasons.	Cultural	materials	are
nur	merous and	repetitious	in size and	shape.					

Table 4. Quantitative Distribution of Debitage and Quartz Cobbles by Site.

on one or both surfaces. Sub-type categories are based on shape, section, and number of sides and edges retouched.

End scrapers are characterized by having retouching along one slightly curving end of essentially oval flakes. Most are plano-convex in cross-section. The sub-types are divided on the basis of size, section and indications of hafting. None are tanged.

The drill has an expanding roughly triangular base, flaked all over both surfaces. The edges of the base are slightly convex; the incomplete shaft has a diamond-shaped section.

The graver has two sharp protruding points on an end and a side of a plano-convex flake. It is made on crystalline quartz and it seems that retouch flakes have been removed from part of the edges to create the points.

The burin exhibits a long curling spall scar on one edge and the classic resulting chisel edge. A smaller spall has been removed from a second edge, at nearly right angles to the first. Neither edge shows much use but the presence of both spar scars indicates the nature of the tool.

Both tanged knife fragments have a planoconvex section on the steeply retouched working edge. Both faces exhibit thinning scars on most of their surfaces. The single complete tang is located on one side of the specimen. Frison has associated them with the Late Archaic period (Frison 1978:80).

Choppers are generally large, thick artifacts which have one or more highly sinuous working edges that often exhibit battering or crushing. Sub-types are defined on the basis of section, size, and number of working edges.

Groundstone tools were divided into five categories (Table 5). Manos were the most numerous type of artifact, followed by edge ground cobbles. From one to four manos were found on five sites that produced no grinding slabs or fragments. This can probably be considered the result of vagaries of exposure and recovery.

				51.81.55	156	157	175	641	642	030	0/2	042	044	045	047											
				0011200	4			074	0.42	333	346	943	944	945	947	948	950	951	952	954	955	956	957	958	I.F.s	TOTALS
Manus		Туре	1	4			1				2											1				9
			2 3	1	1		1	1	2 1		7		1									-				12
			4	4					1		4	1		1			1								1	13
			ő						_		1															1
			8	1			1		1			1					1		1							2
			9 10		1				2			ī					•									3
۱ ۱	Undiagnos	tic F	rags	. 28	i	7		1	10		2	3	2			1	2	1	1	2		2				1 63
Edge G	Ground Co	bbles	,	,																						
		Type	2	2							5															8
U	Indiagnos	tic F	rags.	109	2		2		6	2	11	12	8	2	6	3	2	1		2		2				2 170
Large	Metamorp	hic																								
CODDIE		l ype	2			1				1	1														1	2 3
Grindi	ing Slabs	_																								
		Туре	1 2	25 156	4	6 9	5		17 15		6 5	1	2	1 1		1				2 1			1	1 1		60 200
Ground	I Axehead	_			_																					
		Туре	1		1																					1
TOTALS				334	10	24	10	2	55	3	52	19	13	5	6	5	6	2	2	7		5	1	2	3	566

Table 5. Quantitative Distribution of Whole and Fragmentary Groundstone Tools by Type and Site.



Fig. 5. Edge Ground Cobbles.

Manos are made from imported sandstone or metamorphic rock types and, with one exception, are of a size to be held in one hand. Most exhibit grinding surfaces on both sides and some have one or more edges flattened by grinding as well. These differ from edge ground cobbles on the basis of their smaller size, softer material, and variety of faceted edges as described below. The sub-types are divided on the basis of shape, size, and working surface section across both axes.

Of the seventeen sites on which manos were found, only five did not produce grinding slab fragments as well. Because only one to four manos were recovered from each of these five sites, however, this disparity may be due to vagary of exposure and discovery. Manos are usually associated with plant foods, but may also have played a role in meat processing. All grinding slabs are made from the tabular, naturally fractured Lyons sandstone formation and all are fragmentary. Sixty exhibit bifacial utilization and 200 were unifacially used. Some exhibit percussion shaping on the edges; apparently, the desired shape was oval.

Edge ground cobbles are heavy, fine grained, metamorphic water-worn rocks which are roughly rectangular or oblong in shape (Fig. 5). Polish occurs on one or both long edges on one to five narrow facets of varying width. The polish on the edges often exhibits fine striations which are located at 90° angles to the long axis of the grinding facets. Frison (1967:18) has called these stones "tanning" stones and feels they are made by rubbing a hide with them during the finishing process. A reader commented that, elsewhere, they are called camus mashing stones, but, as Death Camus is the only repre-



Fig. 6. Ceramics Recovered from 5LR155.

sentative of this plant group in northeastern Colorado, it is not a likely use for this locale.

The large metamorphic cobbles are huge river cobbles with naturally water worn surfaces. One type is oval with coarse and fine parallel striations along one end of one edge. The other type is rectanguloid with slight smoothing and irregular pecking (?) on one surface. These may be anvil stones for breaking bones. The four whole specimens range in length from 145 to 232 mm, from 81 to 172 in width and from 56 to 68 mm in thickness. They differ from all other ground stone tool categories in their size, shape, material, and probable use.

The axe head is approximately rectanguloid and is made from a heavy, dark grey metamorphic rock similar to that utilized in the edgeground cobble category. There is a roughly pecked groove around its center.

All 18 sherd fragments came from 5LR155 (Fig. 6) and all were defined as belonging to the same type. At least four vessels are represented. The ceramics exhibit paddle and anvil construction and a sandy temper. Exterior surfaces are cordmarked, with some sherds exhibiting slight smoothing. Three sherds have overlapping cord marking, which produces a small diamond pattern. Thirteen sherds, including the rim sherd, exhibit S-twist cordage. Three reflect Z-twist cordage. One has both, and one heavily weathered sherd cannot be categorized. The exterior surfaces are grey to dark brown in color and range in thickness is from 5 mm to 8 mm. The single rim sherd exhibits a smooth, flat, slightly outward flaring self rim that is slightly thinner than the body sherds.

DATING

Temporal indicators in tool assemblages for this area are based on typological attributes as other dating methods, such as radiocarbon, were unavailable. Temporal changes in projectile point morphology are the most useful. Frison has stated, "projectile point typology offers the best temporal indicator for many situations where stratigraphic, faunal or absolute dating evidence is lacking (1978:19)." Particularly use-

Table 6. Periods of Occupation of Sites with Diagnostic Artifacts.



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ful references include Benedict and Olsen (1978), Breternitz (1975), Eighmy (1984), Kainer (1976), Metcalf (1973), Morris (1982), Nelson (1971), and Wood (1967). Although projectile point typology is the most clearly defined and most widely used, other tool types may also be used. When excavating the Magic Mountain site near Denver, the Irwins found that groundstone tools were among the more sensitive temporal indicators recovered from the site (Irwin-Williams and Irwin 1966:154). The survey area held an abundance of ground stone tools which portray characteristics similar to those found at the Magic Mountain site. Although none of the mano types are placed securely in a single time period, morphological similarities do justify hypothesizing a temporal range for each type. In some cases, such as 5LR156, the tentative chronological placement of the manos was supported by projectile point typology or other remains. In others, for example, 5LR155, the ceramics and all except two of the projectile points and blanks represent the Hogback phase of the Early Ceramic period and the manos represent the Early, Middle and perhaps Late Archaic periods. Two atypical points, however, are considered Early Archaic period. More research is needed to establish a reliable mano chronology. Other temporal indicators from the study area include ceramics, tanged knives, possibly the stone ring, and the two-part shelter on 5LR954. Table 6 illustrates evidence of occupation for sites with temporally diagnostic materials.

SETTLEMENTS VARIABLES

Environmental variables within the study area clearly indicate preferences for particular camping areas. All 27 sites are relatively close to each other and the distance to a permanent river or intermittent springs and potholes does not appear to be a factor in camp position. They are all located in or near mountain mahogany or mountain mahogany- ponderosa pine vegetational communities. Nearly half the occupational sites were located on slopes with 8.1 to 12 percent grade. This was steeper than expected, but most sites include some flatter areas as well. Over ninety percent of the sites are protected from prevailing north-westerly winds by rocks and, sometimes, trees. The two lithic procurement sites were located where the materials were available rather than for other attributes

Table 7. Direction(s) of View from Sites. Note that many sites have views in more than one directiion.

Aspect	Number	Percentage
North	19	70.3
South	21	77.7
East	24	88.8
West	8	29.6

Table 8. Site Location with Reference to Topography.

Topography	Number	Percentage
East Slope Shelf	19	70.4
East Facing Valley	3	11.1
West Slope	3	11.1
Ridge Top	2	7.4

DIRECTION OF VIEW FROM THE SITE

Nearly ninety percent of the sites have an eastern view. These sites would be warmed by the morning sun. Over seventy percent of the sites have north or south views as well. The low number of west facing sites probably reflects avoidance of prevelently north-west winds and inhospitable natural topography. Both lithic procurement sites have a western aspect and one is on a ridge top as well. The west face of the ridge drops off abruptly, often with cliffs (Table 7). All views would have been advantageous when watching for game or approaching people.

TOPOGRAPHY

Nearly eighty percent of the sites that were not lithic procurement localities were located on east slope shelves or benches. These shelf locations are always at least halfway up the hogback and are relatively high compared to the surrounding area. These sites would be good surveillance stations (Table 8).

CONCLUSIONS

The 27 sites indicate a relatively frequent prehistoric occupation, probably reflecting available water, firewood, shelter from wind, and flora and faunal resources. Literature on most of the other sites in northeastern Colorado indicates that the occupants were nomadic hunter-gatherers using the campsites seasonally for short periods of time. The numerous multicomponent assemblages from the 19 campsites and rockshelters support this interpretation. Being an ecotone area between the Great Plains and the Rocky Mountains, the people in the area had access to both ecosystems plus resources found only in the foothills ecotone. Predominant among these are a sizeable deer population and a ponderosa pine outlier forest providing nuts, bark, firewood, and shelter from sun and wind. It is suggested that this forested ridge was the location for preferred seasonal camps throughout prehistoric time.

Examination of environmental variables reveals a preference for campsites located in open areas on easterly sloping shelves. A majority of these sites were blocked from prevailing west winds and provided optional lookouts across the surrounding terrain. These open, relatively flat areas are usually located in the mountain mahogany or mountain mahogany-ponderosa pine communities.

The age of occupation of the sites ranged from the Paleo-Indian period to the Historic Contact period as indicated by lithic and ceramic artifacts on 14 sites and by a stone ring and a two room wooden and stone slab structure on two sites. Twelve sites could not be dated. Artifacts, found predominately on the campsites, included 17 types of projectile points and preforms, six types of side scrapers, three types of end scrapers, six types of bifaces, four types of choppers, two tanged knives, a drill, a graver, a burin, ten types of manos, two types of grinding slabs, three types of edge-ground cobbles, two types of very large metamorphic cobbles, and a grooved stone axe.

Functionally, there were 15 open campsites, four rockshelters that are interpreted as also being campsites, five lithic scatters reflecting presumably less diverse activities and probably shorter occupations, two lithic procurement areas, and one lithic processing site.

The relatively large number of sites in such a small area and the extensive artifactual assemblages on many of them reflect both the numerous revisitations of the area by archaeologists and the abundant resources of the ponderosa outlier ecological zones along the eastern foothills of the Rocky Mountains.

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