Chapter 4

PALEOINDIAN AND ARCHAIC PERIODS

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INTRODUCTION

Despite the extensive and intensive archaeological investigations conducted in the Southern Colorado River Basin over the past 125 years, Paleoindian and Archaic sites represent only a small part of the inventory database. As of 1998, examination of the state site database indicated that evidence of Paleoindian or Archaic occupation had been recorded at 432 sites (Table 4-1). In most cases, this evidence consists of the occurrence of stylistically distinctive points. Some of these undoubtedly represent items collected by later peoples and then incorporated in later site assemblages. Sites with some type of Paleoindian or Archaic evidence represent about 3.2 percent of the approximately 13,400 sites documented in the state site files for the study area, or about 2.2 percent of the more than 19,000 components represented at those sites. No Paleoindian components and only a few probable Archaic components have been excavated in the study area.

Table 4-1 shows that although sites with evidence of Archaic occupation are not common in the state database for the study area, they are much more abundant than are sites with Paleoindian evidence. Table 4-1 also shows that the distribution of early materials is far from uniform geographically, with the Ute drainage unit having the largest number and highest proportion of both Archaic and Paleoindian sites. With regard to the Archaic sites, this concentration is not surprising, given the low elevation of the southern part of the drainage unit and its proximity to the San Juan River. In the San Juan Basin in New Mexico, Archaic sites are relatively abundant in the sandy low-lying grasslands and shrublands just south of the San Juan River (Simmons 1989; Vierra 1990; Vogler et al. 1993). The Ute drainage unit has the highest proportion of grasslands of any unit in the study area (see Adams and Petersen, Chapter 2, this report) and thus is similar to areas of northwestern New Mexico that have a substantial archaeological record of Archaic occupation.

The Southern Colorado River Basin has received proportionately more survey by area than most parts of the state, yet other regions have yielded greater numbers of sites with evidence of early occupation. This could imply that prior to the introduction of cultigens, much of southwestern Colorado was not as favorable for use by foragers as were other parts of Colorado (and other parts of the greater Southwest—see comments on this point in Matson [1991] and Lipe [1995]). Alternatively, the history of research in the study area may have contributed to a lack of attention to the earlier manifestations. Since the late nineteenth century, archaeological research in southwestern Colorado has been overwhelmingly dominated by attention to the Basketmaker II through Pueblo III periods. The intensity of occupation during these periods has also produced a massive archaeological record that may in some cases mask the occurrence of both earlier and later sites that lack pottery.

Since the publication of the last prehistoric context document (Eddy et al. 1984), progress has been made in documenting and beginning to understand the earliest periods of human occupation in southwestern Colorado. York (1991) reviewed site records and collections from the

San Juan National Forest and identified 12 projectile points (all from surface contexts in the Dolores drainage unit or just north of it) that could convincingly be assigned to Late Paleoindian point types. Pitblado has substantially extended this approach by surveying existing site records and collections from the southwestern quarter of Colorado (Pitblado 1993, 1994, 1998) and more recently, from a large area extending from the Rocky Mountains into the eastern Great Basin (Pitblado 1999) in order to identify evidence of Paleoindian occupation. Thus, surface evidence of the distribution of point types is now being used systematically to begin to characterize the Paleoindian occupation of a broad region that includes the study area. No Paleoindian components have been excavated in the study area, however.

Table 4-1. Distribution of Paleoindian and Archaic Components in the Study Area by Drainage Unit (based on records in the Colorado state site database).

	USJ-Piedra	Animas	La Plata	M.V.-Mancos	Ute	Monu-McElmo	Dolores
Paleo-indian	1	0	0	0	8	3	7
Archaic	47	51	31	8	137	80	59
Paleo/Arch Site Totals	48	51	31	8	145	83	66
% of sites in drainage unit	4.0	9.0	8.8	0.2	13.3	1.7	4.3
% of All Paleo/Arch Sites	11.1	11.8	7.2	1.9	33.6	19.2	15.3

In addition to new survey evidence of Archaic occupation recorded since 1984, several Archaic components have been excavated. These have been reported by Fuller (1988a) for the Animas drainage unit; Kane et al. (1988) for the Dolores drainage unit; and Billman (ed. 1997) for Ute drainage unit. In addition, relevant studies of Paleoindian and Archaic occupation have been carried out in adjacent parts of Colorado (Reed 1984; Black 1991; Reed and Metcalf 1999; Martorano et al. 1999), as well as in nearby parts of New Mexico (e.g., Moore and Winter 1980; Hogan and Winter 1983; Hancock et al. 1988; Simmons et al. 1989; Vierra 1990; Brown 1991; Kearns 1992; Vogler et al. 1993; Elyea and Hogan 1993; Tainter 1997) and adjacent portions of Utah (e.g., Copeland and Fike 1988; Davis 1989; Geib and Davidson 1994; Schroedl and Coulam 1994; Geib 1996a, 1996b). Several syntheses of the Southwestern Archaic have also appeared (Matson 1991; Vierra, ed. 1994; Huckell 1996).

In this chapter, "Paleoindian" and "Archaic" are referred to as periods, rather than stages (*sensu* Willey and Phillips 1958). The latter terminology implies some knowledge of the basic adaptation represented by the archaeological materials under consideration—in particular, it requires the inference of adaptive differences between "Paleoindian" and "Archaic" manifestations. Although it seems likely that earlier and later pre-ceramic populations in the Intermountain area had modal differences in patterns of mobility, subsistence, and social organization, the empirical evidence in most specific archaeological cases is too scanty to allow a clear assignment to one or the other adaptive stage. Furthermore, there is abundant evidence that some early Holocene groups in western North America followed adaptive strategies generally Archaic in adaptive character, in the sense of increased diet breadth and reduced mobility (Beck and Jones 1997:216-221). Consequently, the pre-ceramic portion of the archaeological record for the study area is divided into periods rather than stages—Paleoindian for materials considered to date earlier than about 7500 B.P. (Pitblado 1999) and Archaic for materials dating from about 7500 B.P. to the introduction of maize into the region at about 1000 to 500 B.C. Others (e.g., Huckell 1996) would draw the boundary between Late Paleoindian and Early Archaic a bit earlier—at about 8000 to 8500 B.P. Given the extremely modest amount of evidence of either Late Paleoindian or Early Archaic sites in the study area, this definitional difference does not have much if any impact on interpretations.

PALEOINDIAN PERIOD

Pitblado (1993, 1999) has compiled data on the occurrence of definite or probable Paleoindian points at 44 sites or locations in and just to the north of the Southern Colorado River Basin study area (Figures 4-1 and 4-2; Table 4-2). This was part of a larger study that compared the distributions of Paleoindian point styles across the several physiographic regions found in Colorado and Utah: Great Plains, Southern Rockies, Colorado Plateau, Great Basin (CO), and Great Basin Mountains (Pitblado 1999). Identification of sites in and near the study area as potential Paleoindian components was based principally on the occurrence of stylistically early projectile points, and secondarily on statements in site records. A few sites were classed as Paleoindian in the site records, but had insufficient descriptive data to characterize associated points, and Pitblado was unable to examine all collections personally. However, by carefully examining site records, selected museum collections, and in a few cases, private collections, Pitblado (1993, 1999) was able to identify substantially more evidence of Paleoindian presence in and near the study area than had resulted from compiling component assignments from the state site database (e.g., Table 4-1). The site locations plotted in Figure 4-1 are those identified in Pitblado's (1993, 1999) studies and include locations identified by York (1991).

The sites documented in Figure 4-1 and Table 4-2 include single-component Paleoindian sites, occurrences of diagnostic Paleoindian materials in multicomponent contexts (including points that probably had been collected by Puebloans), and isolated finds. The "Associated Points" column in Table 4-2 lists the typology of points examined by Pitblado or ones that could be reliably characterized on the basis of drawings and descriptions in the site notes. The fact that some of the points included in the study may have been collected and redeposited by later peoples has little effect on Pitblado's large-scale cross-regional distributional study (Pitblado 1999), but it could blur patterning somewhat at the regional level. In his more limited study, York (1991) made a strong argument that even if some of the Paleoindian points he studied had been curated by later peoples, the fact that most of them were made from locally available materials indicated a Paleoindian presence in the region. In general, the statements made below regarding associations of Paleoindian materials with particular elevations or vegetation zones need to be viewed with

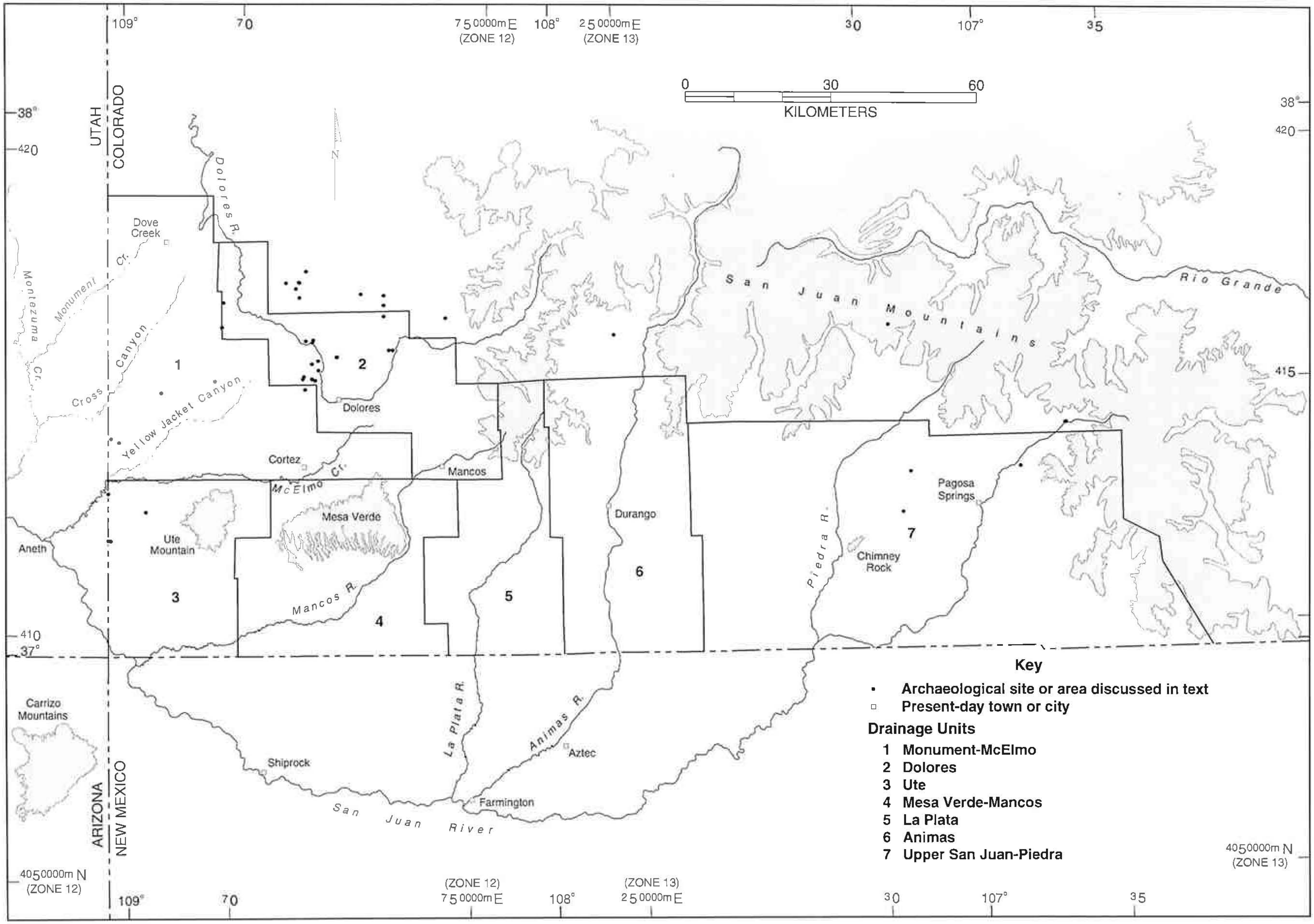

Figure 4-1. Distribution of Paleoindian components in and near the study area. (Reprinted with permission of Crow Canyon Archaeological Center.)

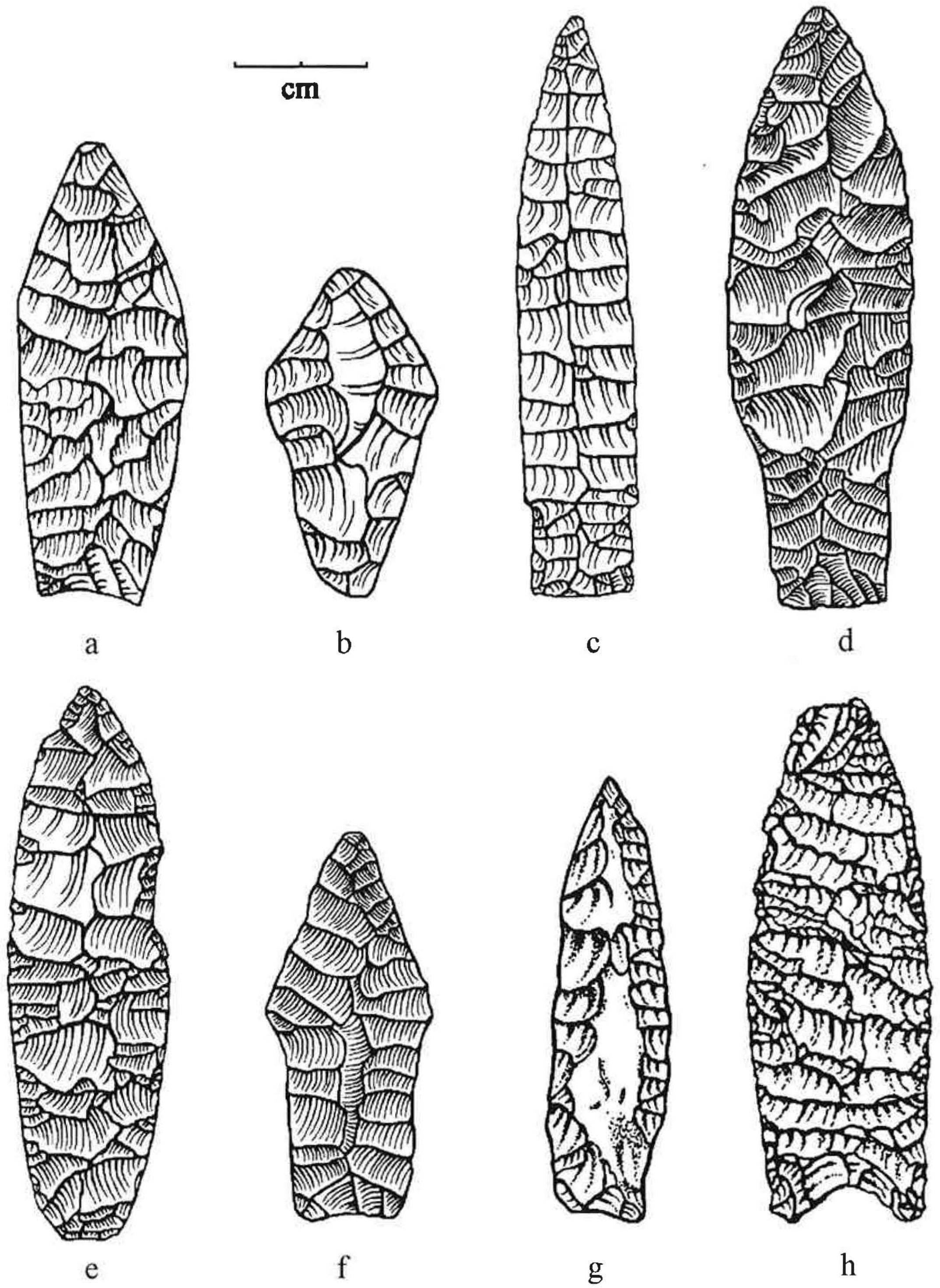

Figure 4-2. Projectile point type illustrations: a) Angostura (Ray Long site, SD [Wheeler 1995:380]); b) Great Basin Stemmed (Pleistocene Lake Mojave, CA [Amsden 1937:81; Beck and Jones 1997:186]); c) Eden (Finley site,WY [Frison 1991:64]); d) Hell Gap (Hell Gap site, WY [illustrated by Isobel Nichols]); e) Agate Basin (Agate Basin site, WY [Frison 1991:60]); f) Concave-Base Stemmed (Honea 1965:20); g) Pryor Stemmed (Sorenson site, MT [Husted 1969]); h) Jimmy Allen (James Allen site, WY [Frison 1991:63]).

appropriate caution. Paleoindian studies in the area are in their infancy; the tentative patterns perceivable in Table 4-2 should be considered a starting point for further investigation of temporal and distributional patterning of the Late Paleoindian archaeological record of the study area.

Table 4-2. Site Components or Isolated Finds Assignable to the Paleoindian Period.*

Site No.	Elev. (m)	Primary Vegetation	Associated Point(s)
5HN154	3420	Grasses	Angostura
5LP1599	3194	Spruce/fir	Great Basin Stemmed
5MT11969	2865	Unknown	Eden/Firstview (?)
5DL1043	2545	Scrub oak	Parallel oblique flaking
5DL1061	2542	Scrub oak	Possibly Hell Gap?
5MT5656	2536	Ponderosa pine	Indeterminate
5DL201	2524	Ponderosa pine	Angostura
5DL1059	2518	Ponderosa pine	Great Basin Stemmed
5DL1625	2511	Grasses	Agate Basin
5MT5653	2500	Ponderosa pine	Plano Complex
5DL1045	2499	Ponderosa pine	Parallel oblique flaking
5ML143	2487	Cottonwood	Other or indet.
5MT4631	2457	Ponderosa pine	Angostura
5AA1479	2450	Grasses	Angostura
5DL1231	2450	Ponderosa pine	Humboldt
5DL691	2445	Sage	Angostura
5DL775	2322	Ponderosa pine	Angostura (2)
5AA774	2317	Ponderosa pine	Great Basin Stemmed
5MT6663	2283	Pinyon-juniper	Great Basin Stemmed
5MT6660	2283	Pinyon-juniper	Angostura
5MT7013	2237	Pinyon-juniper	Angostura
5MT5353	2234	Pinyon-juniper	Great Basin Stemmed
5MT5972	2210	Pinyon-juniper	Great Basin Stemmed
5AA1407	2176	Grasses	Indeterminate
5MT2858	2166	Scrub oak	Angostura
5ML144	2151	Grasses	Intederminate Paleo
5MT5568	2143	Pinyon-juniper	Indeterminate Paleo
5MT6468	2121	Unknown	Angostura
5MT4678	2109	Pinyon-juniper	Indeterminate

5MT2235	2103	Sagebrush	Angostura
5MT4682	2097	Sagebrush	Plano complex
5MT4690	2091	Pinyon-juniper	Angostura
5DL821	2079	Pinyon-juniper	Concave base stemmed
5MT2245	2076	Pinyon-juniper	Other or indet.
5MT7063	2060	Non-native spec.	Great Basin Stemmed
5MT4671	2054	Grasses	Pryor Stemmed
5MT2161	2048	Pinyon-juniper	Great Basin Stemmed
5MT8249	1920	Pinyon-juniper	Indeterminate
5MT11234	1663	Pinyon-juniper	Other or indet.
5MT141	1657	Pinyon-juniper	Jimmy Allen/Frederick
5MT1988	1652	Pinyon-juniper	Indeterminate
5MT587	1609	Pinyon-juniper	Angostura
5MT7675	1551	Pinyon-juniper	Great Basin Stemmed
5MT7678	1551	Saltbush	Possible Folsom

*The table is arranged by elevation (data are from studies conducted by Pitblado [1993, 1999] and include sites and isolated finds both in and just north of the study area).

Of the 44 Paleoindian components/occurrences listed in Table 4-2, only one may be assignable to the Early Paleoindian fluted point horizon—this is a "possible Folsom" point fragment from a low-elevation site (5MT7678) in the Monument-McElmo drainage unit. In an initial survey of the southwestern quarter of Colorado (an area considerably larger than the Southern Colorado River Basin study area), Pitblado (1994, 1998) found fluted points to be very rare, despite the occurrence of numerous Folsom points and well-defined site components in the San Luis Valley just to the east (see Jodry 1999 for a review). To the west, Davis (1989) reports on a Clovis assemblage from a surface site on Lime Ridge in southeastern Utah near the San Juan River, and Copeland and Fike (1988) list three Folsom and three additional Clovis occurrences from southeastern Utah between the Colorado River and the Colorado state line (all surface finds of single points). Agenbroad et al. (1986, cited in Davis 1989) map eight widely scattered isolated finds of Clovis points from north of the Little Colorado River in northeastern Arizona, and Vogler (1993a:111-117) notes that in the Navajo Indian Irrigation Project (NIIP) area in northwestern New Mexico, three Clovis and six Folsom points or point fragments were found as isolated finds or as curated items in later assemblages. Taken together, these data indicate a widespread but very low intensity use of the Four Corners area, including the Southern Colorado River Basin, in Early Paleoindian times.

As compared with evidence of Early Paleoindian, which is virtually lacking, it seems clear that there was some use of the study area in Late Paleoindian times (Table 4-2). The most common point type complexes recognized by Pitblado (1999) are Angostura, with 14 occurrences, and Great Basin Stemmed, with nine occurrences. There are 17 occurrences of other forms, including some named types, some that could be characterized only descriptively, and some considered indeterminate (see Figure 4-2 for principal point types referred to in Table 4-2). The Angostura complex includes forms sometimes classified as Lusk, Hardinger, and Ruby Valley. These points are lanceolate with oblique to horizontal or collateral flaking, convergent basal sides, and straight to slightly concave bases. They are frequently made of quartzite. In earlier papers, Pitblado (1994, 1998) classified such points as part of the Foothills-Mountain complex, following terminology suggested by Frison (1991, 1992). Radiocarbon ages associated with materials of the Angostura complex range from 9700 to 7550 B.P., with a median age of 8550 B.P. (Pitblado 1999:198).

The Great Basin Stemmed complex (previously referred to as Western Stemmed by Pitblado [1994, 1998]) includes long-stemmed points with random, collateral, or other flaking patterns; stems are parallel-sided or convergent, and stem bases are straight or convex. This complex includes a variety of forms, many of which have been given type names in various contexts, and which figure in a number of "traditions" that have been proposed, including Western Stemmed, Old Cordilleran, San Dieguito, and the Western Pluvial Lakes tradition (Pitblado 1998:336). Hence, the Great Basin Stemmed complex includes forms that according to the literature tend to be more common in the Intermountain West than on the Plains. The Great Basin Stemmed complex also includes examples that would be classed as Jay points in the San Juan Basin (and hence be considered as Early Archaic). Pitblado's survey of radiocarbon ages associated with points of the Great Basin Stemmed complex gave a range of 10,700 to 7,550 B.P., with a median age of 9000 B.P. (Pitblado 1999:198).

In and near the study area, the Paleoindian occurrences documented in Figure 4-1 and Table 4-2 have a spatial and elevational distribution quite different from that of the later Basketmaker and Pueblo period sites, which are concentrated at intermediate elevations in the pinyon-juniper zone. This suggests that collecting and reuse of some Paleoindian points by these later peoples has not obscured the earlier pattern. A number of the Paleoindian occurrences are associated with ponderosa pine or scrub oak communities, and one has an association with the spruce-fir zone. Even though in the extreme western part of the study area, some of the sites occur at relatively low elevations, the average elevation of the 44 loci is 2248 m (7373 ft). In part, the elevational distinctiveness of the Paleoindian materials results from inclusion of sites and occurrences that are located in higher areas just north of the study area boundary (and also largely outside of and higher than the areas where Basketmaker and Pueblo sites are common). Even within the study area proper, however, the only substantial spatial concentration of Paleoindian loci is in the relatively high elevation Dolores drainage unit. These patterned differences in the distribution of Paleoindian and later Basketmaker-Pueblo materials reinforces York's (1991) argument that even if some Paleoindian points have been subject to curation and movement, their final deposition was probably not far from where they were initially deposited.

The Paleoindian materials show some small differences in average elevation. The 13 Angostura loci (which yielded 14 points) average 2325 m and the 9 Great Basin Stemmed examples have a mean elevation of 2268 m. Both means are slightly higher than the mean for all 44 loci considered together (2248 m).

Angostura and Great Basin Stemmed points from the study area and environs showed quantitative differences in raw material. Of the 11 Angostura points for which data were available, 9 were made of quartzite and 2 of microcrystalline material (e.g., chert, chalcedony). The 9 Great Basin Stemmed points for which data were available were quartzite (4), microcrystalline (3), obsidian or ignimbrite (1) and other (1). The 8 other points which were characterized included microcrystalline (3), quartzite (2), obsidian or ignimbrite (2) and basalt or rhyolite (1).

The southwestern Colorado sites and points studied by Pitblado (1999) were part of a much larger study that sought to answer the question of whether in Late Paleoindian times the Southern Rocky Mountains were used year-round, seasonally, or just sporadically. Comparisons were made of points from the Plains, Southern Rockies, Colorado Plateau in Colorado and Utah, and adjacent portions of the Great Basin mountains and the Great Basin (lowlands) in Utah; variables considered included point morphology, technology, raw material type and source, and distribution.

In her cross-regional survey, Pitblado (1999) found that 67 percent of the Angostura points occurred in the Southern Rockies, with 14 percent from the Colorado Plateau and only small percentages from other regions. Within the Rockies, however, Angostura complex points comprised only 37 percent of the total set of points she recorded for that region. This suggests that the Rockies were not the exclusive territory of those who manufactured points of the Angostura style.

The second most common Late Paleoindian point complex in the Southern Rockies was Jimmy Allen/Frederick. Unlike Angostura, however, this complex is more common on the Plains; 51 percent of the Jimmy Allen/Frederick points in the survey were from that region, and only 37 percent from the Rockies. Pitblado (1999) notes that when Jimmy Allen/Frederick points occur in the Rockies, a large majority are from the subalpine and alpine zones, which are only accessible during the warmest months. By contrast, Angostura points are much more common at lower elevations, with only 25 percent of the specimens coming from the two highest zones. These distributions indicate to Pitblado that the Jimmy Allen/Frederick points may have been left by groups using the mountains only seasonally.

The other complex that is common in the Rockies is Great Basin Stemmed, which has a cross-regional distribution opposite that of Jimmy Allen/Frederick. Great Basin Stemmed points are virtually absent on the Plains, but constitute 17 percent of the Rocky Mountain specimens that Pitblado (1999) documented, 46 percent of those from the Colorado Plateau, and 52 and 73 percent, respectively, of the Late Paleoindian points from the Great Basin mountains and the Great Basin.

Slightly over half of the Late Paleoindian points from the Southern Rocky Mountains were made of quartzite, a pattern that contrasts strongly with the other regions. Within the Rockies, Angostura points exemplified this pattern most strongly, with 60 percent being made of quartzite; next were Jimmy Allen/Frederick points, at 53 percent quartzite. Pitblado (1999) notes that "...this unique raw material preference supports the notion that people occupying the Rocky Mountain environment, 10,000 to 7,500 B.P., were spending enough time there that they either developed idiosyncratic habits that differed from those of people living in adjacent regions, or they responded to unique features of the mountain environment by utilizing the raw material type best suited to those ecological parameters."

The makers of Late Paleoindian points in the Southern Rockies appear typically to have selected raw materials found relatively close (mean 54 km) to the location where the point was discarded. This is similar to distances calculated for the Great Basin mountains, but contrasts strongly with the Plains and Great Basin, where source materials were obtained from much greater distances. Data from the Colorado Plateau are weak, but suggest greater similarity to the Rockies than to the Plains or Great Basin (Pitblado 1999). Pitblado also documents a number of technological variables in which Late Paleoindian points from the Rockies contrast with those of other regions. These contrasts are generally amplified when dominant point types from the several regions are compared, i.e., Angostura points from the Rockies with Eden/Firstview from the Plains, and with Great Basin Stemmed from the Great Basin, Great Basin mountains, and Colorado Plateau.

Pitblado (1999) concludes that by 10,000 to 7,500 years ago, some groups had adapted to year-round life in the Southern Rocky Mountains. This inference is supported by the ubiquity of a distinctive Rocky Mountain projectile point type—Angostura, as well as by differential raw material preferences, a local raw material orientation, and several Rocky Mountain-specific features of projectile point production technology. At the same time, there is complementary evidence to suggest that other groups, generally adapted to life in adjacent areas, also utilized the Rocky Mountain environment to a greater or lesser degree. This is consistent with the idea that Paleoindian populations utilized very large areas, especially when a group's pattern of movement is considered over a period of several years or generations. Late Paleoindian projectile point types such as the Jimmy Allen type that are more commonly found to the east on the Plains are also sometimes recovered in the Southern Rockies. Likewise, Great Basin Stemmed points, which have their "center of gravity" in the Great Basin lowlands and highlands are also found in the Rockies and on the Colorado Plateau. Although local materials were often utilized in point production, overall patterns of raw material selection for both the Plains-oriented and the Basin-oriented specimens differ from those used to produce the predominant Rocky Mountain Angostura type points, suggesting differential knowledge of raw material source localities, differential access to sources, or simply different preferences. Technological features of non-dominant point types also vary in some instances from those of the dominant Rocky Mountain type in some instances.

Pitblado (1999:28) suggests that a review of Late Paleoindian excavation and survey data from the Central as well as Southern Rockies indicates that the people who occupied the mountains "...subsisted upon a highly varied diet. Preferred big game species included bighorn sheep, deer, antelope, and to a lesser extent, bison....Smaller faunas are well-represented as well, and include everything from rabbits to rodents to reptiles to fish. Groundstone is also a component of many Rocky Mountain Paleoindian sites, and direct evidence for plant use has been documented by charred seeds and pollen at sites like Barton Gulch [Montana]."

Against this background, the Late Paleoindian points from the study area and environs resemble the overall Southern Rockies pattern. Angostura points are dominant, followed by Great Basin Stemmed. Quartzite is the most common raw material used, especially for the Angostura types. Paleoindian loci occur over a wide range of elevations, from high to low. The presence of high elevation loci suggest use in the warm months, while the occurrence of low elevation loci suggests cold season use (although of course these loci would also have been accessible in the warmer seasons as well). The evidence does not support the inference that the set of Late Paleoindian loci identified in the study area represents the full annual round of a single group based in that area. If the Late Paleoindian period represents as much as 2,500 years, the small number of manifestations that have been identified, despite the distinctive nature of the projectile points, suggests that the area was utilized infrequently. Although some Late Paleoindian groups were based in the Southern Rockies, they are likely to have had ranges larger than the Southern Colorado River Basin, which would have been visited only on an occasional basis (see Binford 1983 for examples of extensive land use patterns resulting from shifting of annual ranges through time).

ARCHAIC PERIOD

Introduction

The framers of the Pecos classification recognized that the Basketmaker II stage must have been preceded by a stage that was "pre-agricultural, yet adumbrating later developments" (Kidder 1927:490). They named this postulated stage Basketmaker I. However, in the 1940s and 1950s, when components that fit this description began to be recognized in the Southwest, the proposed Pecos terminology was not applied to them. Initially, they were placed in various local "cultures" or "complexes," such as the "Cochise Culture" (Sayles and Antevs 1941) or the "San Jose complex" (Bryan and Toulouse 1943; Mohr and Sample 1959). From the late 1950s through the 1960s, various broader concepts were proposed to categorize the preceramic, nonagricultural, non-Paleoindian manifestations in the Southwest. These included the Desert culture (Jennings 1956, 1957), the Picosa culture (Irwin-Williams 1967), and the Archaic (Willey and Phillips 1958; Kelley 1959).

By the 1970s, Archaic had become the term of choice, following Willey and Phillips' (1958) definition (which was stated so as to emphasize contrasts with the preceding "Lithic" stage): "...we may briefly define the Archaic as the stage of migratory hunting and gathering cultures continuing into environmental conditions approximating those of the present... [T]here is now a dependence on smaller and more varied fauna. There is also an apparent increase in gathering; it is in this stage that sites begin to yield large numbers of stone implements and utensils that are assumed to be connected with the preparation of wild vegetable foods" (Willey and Phillips 1958:107). This definition was general enough to cover numerous archaeological complexes found in both North and South America, making it relatively easy for archaeologists to pigeonhole a site as "Archaic" and move on to consider various questions specific to particular time periods and regions. As noted previously in this chapter, the Archaic is defined chronologically, rather than adaptively, as implied by use of the term "stage."

In the previous prehistoric context document for southwestern Colorado (Eddy et al. 1984), discussion of the Archaic was based largely on a review of Irwin-Williams' (1973, 1979) proposed Oshara tradition and phase sequence for the San Juan (geologic) Basin. It was noted that relatively large numbers of Oshara sites had been identified south of the San Juan River. This was contrasted with the general paucity of reported occurrences of such sites north of the river. Eddy et al. (1984:25) did note that Winter (presumably Winter 1976, 1977) had reported strong concentrations of Oshara archaeology in the area of Hovenweep National Monument in the extreme western part of the McElmo drainage unit. No excavated Archaic components were mentioned for the Southern Colorado River Basin study area.

In the Southwest in general and the study area in particular, the Early Archaic probably replaces the late Paleoindian by about 8000 to 8500 B.P. (Huckell 1996), and no later than 7500 B.P. (Pitblado 1998). The Middle Archaic extends from about 5500 to 3500 B.P. (Huckell 1996). The Late Archaic dates from about 3500 B.P. (1500 B.C.) to 1500 B.P. (A.D. 500), but in most parts of the Southwest, it overlaps with and is increasingly replaced by what Huckell (1996) terms the Early Agricultural period. In the study area, pre-ceramic manifestations with evidence of maize are generally called Basketmaker II (see Chapter 5, this report). Maize was introduced to the study area no later than approximately 400 B.C. (Lister 1997:134); evidence from adjacent parts of the Four Corners area indicates that maize was present by 1000 B.C. and perhaps earlier in some locations (Smiley 1994). The Early Agricultural or Basketmaker II adaptation clearly became widespread in the Four Corners area, including southwestern Colorado, during the last millennium B.C. As discussed in Chapter 5, there is some debate on how rapidly maize became a major focus of adaptation in the Four Corners area once it was introduced.

For the purposes of this review, the Archaic period is defined as extending from about 7500 B.C. to the introduction of maize at about 1000 or 500 B.C. Cultures of the following period in the study area, Basketmaker II, are considered to be part of the Basketmaker-Puebloan cultural tradition. Whether or not there are continuities between Late Archaic and Early Basketmaker II in the Four Corners area is a subject of debate; Matson (1991) argues that the Durango Basketmaker II manifestations may have cultural origins in the regional Late Archaic, while other Basketmaker II groups farther west may have descended culturally from migrants from the Sonoran Desert. Evidence indicates that by the early years A.D., Basketmaker II groups in the Four Corners area were primarily dependent on maize for subsistence, although they may have been more dependent than later groups on foraging as a risk-buffering strategy. The evidence regarding adaptations in the last millennium B.C. in the Four Corners area is much less clear. It seems likely that some early Basketmaker II groups were already heavily dependent on maize, while others may have made less use of it. A temporal definition of the Late Archaic–Early Agricultural (Basketmaker II) boundary may result in a somewhat different assignment of components to these categories than would a definition based on overall adaptation, but the evidence from sites dating near this boundary is seldom adequate to permit the adaptive inferences that the latter type of classification would require. In the following paragraphs, the authors discuss regional chronologies and settlement models and summarize results of excavations at Archaic sites in southwestern Colorado.

Regional Chronological Trends and Settlement Models

The literature regarding the Archaic in areas adjacent to the study area includes several different phase or period schemes, and presents a variety of interpretations about chronological markers, demographic trends, settlement patterns, and environmental relationships. To some extent, this interpretive diversity appears to be the product of differing regional research traditions. It also appears indicative of real diversity in Archaic culture history and adaptations in the larger region that includes southwestern Colorado. It is not within the scope of the present report to do the kind of detailed, systematic, bottom-up review of the actual evidence (as opposed to published interpretations) that would be required to provide an integrated comparative survey of the Archaic in the Four Corners area. Such a review would be very helpful to future researchers in the study area and elsewhere in the broader region. Because projectile point styles figure strongly in the chronological assignment of most surface and some excavated components, a systematic review of the evidence for formal, temporal, and spatial variation in projectile points would be a good starting point (but see Reed and Metcalf [1999] for a pessimistic view of the utility of such a review). Despite questions of comparability of work emanating from different research traditions, archaeologists working in the Southern Colorado River Basin need to be aware of the literature on the Archaic in adjacent regions, because research has been much more extensive than in the study area. Furthermore, it is likely that the multi-year ranges of the Archaic groups that used the study area extended into adjacent regions as well.

Because the wild food resources of the Four Corners area are available at different seasons and in different vegetative and physiographic zones, maintaining an Archaic lifestyle would have involved high mobility over a large geographic area. Even though the study area is environmentally diverse (see Chapter 2), many of the Archaic sites in the study area probably represent seasonal occupation by groups that spent other parts of the year outside this area. The likelihood that the ranges of Archaic groups extended outside the study area is explored below.

The study area covers approximately 13,500 to 14,000 km^{2}. Vierra (1994) has recently summarized data on the annual ranges and overall territories of various hunter-gatherer groups. Annual ranges vary from about 460 km^{2} to more than 13,000 km^{2}., with the annual ranges of arid environment foragers (e.g., the Alywara and !Kung San) averaging about 2,900 km^{2}. Perhaps more relevant to our situation were the groups classified by Vierra as "temperate forager collectors," which include a number of Great Basin Shoshonean groups as well as the Shasta, Maidu, Owens Valley Paiute, and Washo. The last four groups, which had annual ranges averaging about 2,800 km^{2}, live in areas where resources are relatively concentrated and predictable. The annual ranges of the various Great Basin Shoshonean bands, however, varied from approximately 1,260 km^{2} to more than 13,000 km^{2}. These data suggest that some ethnographically known foragers from the western U.S. had annual ranges essentially as large as the Southern Colorado River Basin study area, though others could easily have fit within it, provided resource zones were suitably placed. The environmental characteristics of the Four Corners area would indicate that adequate annual ranges for forager bands would be larger than the mean for the groups that Vierra tabulated.

Vierra (1994) found considerably less data regarding the overall territory used by hunter-gatherer groups during a series of years, but the existing data suggest that this area may be 4 to 12 times the size of the annual round. By "overall territory," Vierra is not referring to defended core territories or annual ranges, but to the area that a group used over time as its annual range was relocated due to resource depletion or other variations in resource supply. Vierra's "overall territory" appears equivalent to Binford's "lifetime range" or "band range" (Binford 1983:42). By interviewing elderly Nunamiut men, Binford found that on average, a Nunamiut band relocated its annual range every nine years, so that in a 45-year cycle, the band range was roughly five times the size of the average annual range. He notes that Nunamiut hunters identified their band's territory as being this "lifetime range" or "extended range" (Binford 1983:27), rather than the annual range. Vierra (1994) suggests that the overall territories of several hunter-gatherer groups could overlap because each would be utilizing only a part of the territory in any given year. The few quantitative estimates he could find for the size of overall territories ranged from 22,000 km^{2} for the Nunamiut (though Binford [1983] estimates 25,900 km^{2}), to 28,532 km^{2} for the Alywara, and 33,670 km^{2} for the Washo. All of these are larger than the present study area. Unlike Vierra, Binford (1983:43) appears not to accept the possibility that logistically-organized hunter-gatherers would have overlapping band ranges. Using an estimate of 10,000 mi^{2} (25,900 km^{2}) as the Nunamiut band range, he suggests that Arizona, New Mexico, and Utah together would have supported only about 32 hunter-gatherer bands totaling less than 1,000 people, if these bands exploited the landscape in the same fashion as did the Nunamiut. These estimates are given only to make the point that archaeologists usually underestimate the scale of land use by hunter-gatherers.

The sources of obsidian found at sites in the northern San Juan Basin provided Vierra (1994) with potential information about the size of the "overall territory" exploited by Archaic groups in that area. The set of sites he studied would presumably include materials acquired over a number of annual rounds. Using the distances from a central point in the northern San Juan Basin to the obsidian sources, he calculated a circular area of about 39,800 km^{2} as a potential maximum overall territory. There is no reason to believe that the distribution of important resources would have required a circular territory, however, so the actual area may have been less.

Another approach to understanding the spatial context for hunter-gatherer land use is the "procurement range" discussed by Shackley (1996). This concept takes into account the differential movement of individuals and families that constitute a group as well as the total area used by a group over time. As an ethnographic example, Shackley described the Watarma band of Northeastern Yavapai; in one year, various task groups from this small kin-based band dispersed to harvest resources from an area of central Arizona approximately 17,000 km^2 in extent (Shackley's [1996] Figure 2.3 suggests a much smaller area, but his scale appears to be incorrectly labeled). Archaeologically, data on sources of obsidian found at the Middle Archaic New River and Harquehala sites in central Arizona also indicated obsidian procurement from a zone similar in size to the one recorded for the Northeastern Yavapai band (Shackley 1996:13). These data indicate that both Shackley's archaeological and ethnographic examples from central Arizona had a procurement range as large as if not somewhat larger than the Southern Colorado River Basin study area. The main point here is that the study area is probably small relative to the size of areas utilized over several generations by at least some of the Archaic groups that utilized the Four Corners area.

Below, several pertinent recent studies of Archaic settlement trends and settlement models in adjacent regions are briefly reviewed. Readers are also referred to Huckell's (1996) excellent overview of the Southwestern Archaic, as well as earlier reviews by Simmons (1989) and Matson (1991). Figure 4-3 displays several phase and period schemes for the larger region that includes the study area. Given the previous discussion about the probable scale of Archaic land use, the differences within the greater Four Corners region are rather striking, and suggest that at least some of these differences are related to differing terminological and classificatory traditions in the various areas. Alternatively, the differences may indicate that portions of the Four Corners area were utilized differently by the same groups, and/or that portions of the area were used differently through time by groups based largely outside the area. Archaeologists working with Archaic sites and projectile point types in the Southern Colorado River Basin will need to be well-informed about related research in adjacent areas, both because of the settlement system scale issues noted above, and because much more work has been done in Archaic contexts in these areas. It is hoped that the summaries below provide a useful survey of the regional literature most relevant to future research in the Southern Colorado River Basin.

Northwestern New Mexico

The oldest and most widely used phase scheme for the Archaic in the southern Colorado Plateau is the Oshara tradition sequence (Figure 4-3), proposed by Cynthia Irwin-Williams (1973, 1979) on the basis of fieldwork in the Arroyo Cuervo region of north-central New Mexico, approximately 80 km northwest of Albuquerque. Many of the excavated contexts Irwin-Williams relied on when developing phase descriptions and chronology have not been published, but the point types she recognized as phase markers occur widely in at least the southern part of the Four Corners area; the occurrence of these types is commonly used to assign sites to phases of the Oshara tradition. These phases have been used as organizing devices in many of the recent reports on aceramic sites in northwestern New Mexico and have been applied by some researchers to materials from the Southern Colorado River Basin.

Irwin-Williams (1973) postulated a discontinuity between the Cody complex of the Paleoindian tradition and the earliest manifestations of the Oshara tradition in central New Mexico, as represented by the Jay and Bajada phases. Matson (1991) and others have suggested that the diagnostic projectile points of the Jay phase are related to the late Paleoindian stemmed

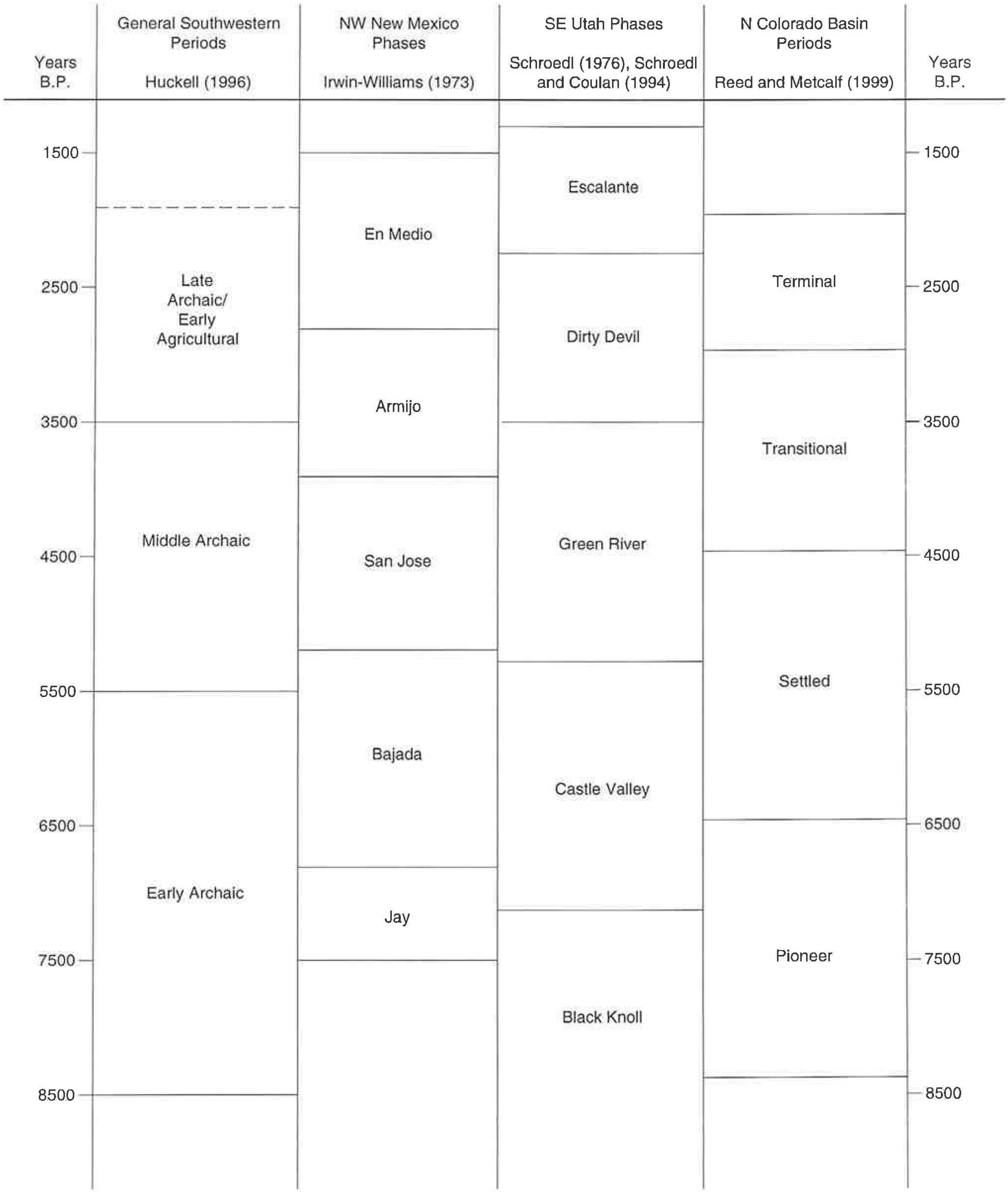

Figure 4-3. Archaic period chronologies for the northern Southwest. (Reprinted with permission of Crow Canyon Archaeological Center.)

point series in the Great Basin and on the Plains (see discussions in Huckell 1996:332-336 and Cordell 1997:108, as well as comments in the Paleoindian section of this chapter). Excavations at 13 Jay components on the NIIP in northwestern New Mexico generally support Irwin-Williams' chronological placement of Jay points at 7000 to 8000 B.P. (Vogler 1993a; Huckell 1996). The NIIP research also showed that ground stone milling tools frequently were present at Jay sites, something that Irwin-Williams had not observed in the Arroyo Cuervo sites. This evidence tends to support her assignment of the Jay phase to the Early Archaic.

Vogler (1993a, 1993b) has summarized the results of the extensive surveys and excavations done to mitigate the effects of construction of the NIIP in northwestern New Mexico. More than 200,000 acres were surveyed, and more than 1,900 sites representing at least 2,300 components were recorded, ranging from Paleoindian to recent Navajo and Euroamerican in age. Excavations were conducted at 79 of the 245 components classed as Archaic. Langenfeld and Vogler (1993) have synthesized data from other recent projects in the northern San Juan basin in New Mexico, showing that the record of Archaic occupation documented on the NIIP is characteristic of this region in general.

The areas intensively investigated on the NIIP were primarily the low mesas, including Gallegos Mesa, that comprise the northern part of the Chaco Plateau (Vogler 1993b:1-5). The several areas included in the project are focused on lands level enough to be suitable for the development of agricultural plots watered by large center-pivot sprinklers. The surface deposits on the mesas are generally eolian sands distributed as sand sheets, parabolic dunes, or longitudinal dunes. The various project areas include or are adjacent to several large ephemeral drainages with broad flood plains (e.g., Gallegos Wash). The edges of the mesas are ledgy cliffs and badlands. Precipitation displays a peak in late summer and early fall with a secondary peak in winter. Average annual rainfall ranges from 12.7 to 20.3 cm (5 to 8 inches) annually at the lower, northern end of the project area to 20.3 to 25.4 cm (8 to 10 inches) a year at the higher, southern end (Vogler 1993b:4). The vegetation "can be characterized as Upper Sonoran, dominated by a semiarid grassland community, with scattered (remnant?) populations of juniper and pinyon pine" (Vogler 1993b:4). Major grassland species are blue grama, dropseed, and Indian ricegrass. Animals of potential economic importance to foragers include ground squirrels and prairie dogs, desert cottontail, black-tailed jack rabbit, pronghorn, and mule deer (Vogler 1993b:5). The latter two species occur infrequently today but may have been more common in the past.

Vogler (1993a) tabulated "single-phase" components to review trends in site frequency and site type through time in the NIIP area (Table 4-3). Since a component is by definition a manifestation of a phase or focus at a site (Willey and Phillips 1958:21-22), Vogler presumably uses "single-phase component" to refer to sites which could be assigned to a single phase. To account for the differing length of phases, he divided the number of sites by the number of years in a phase to get a calibrated figure that would facilitate comparisons among phases. Both the raw counts and the calibrated figures indicate a strong peak of occupation in the Middle Archaic San Jose phase; the Armijo phase, which extends from late Middle to early Late Archaic, has the second highest figures on both the raw count and the calibrated basis. The calibration does reveal that the Jay phase occupation may have been more intense than the raw counts would indicate. At 700 years, Jay is assigned less than half the longevity of the Bajada phase (1,600 years). Whether these early phases and point styles can be so precisely dated may remain a question, but as noted above, the NIIP studies did provide some independent support for placing Jay points at between 7000 and 8000 B.P. (Huckell 1996).

Table 4-3. Single-phase* Oshara Components from the NIIP (Vogler 1993a:125-127).

	Jay	Bajada	San Jose	Armijo	En Medio	Total
Extended Habitation	0	0	0	1	0	1
Base Camp	12	14	30	18	11	85
Satellite Site	11	12	37	18	6	84
Indeterminate Site Type	0	1	2	2	1	6
Total (Calibrated Site-yrs.)**	23 (0.033)	27 (0.017)	69 (0.049)	39 (0.39)	18 (0.015)	176 (0.03)

* These phases are assigned the following dates: Jay: 5500-4800 B.C.; Bajada: 4800-3200 B.C.; San Jose: 3200-1800 B.C.; Armijo: 1800-800 B.C.; En Medio: 800 B.C.–A.D. 400 (Vogler 1993a:83)
**Calibrated site-years = number of sites in a phase divided by number of years in a phase.

In addition to the Oshara tradition components, Vogler also recognizes 11 components assignable to the Chiricahua phase (or stage) of the more southerly oriented Cochise tradition. One component was also assigned to the Late Archaic San Pedro phase of the Cochise tradition. The Chiricahua stage is approximately contemporaneous with the San Jose and early Armijo phases of the Oshara tradition and hence corresponds to the Middle Archaic. The 11 "Chiricahua" sites therefore add to the already strong Middle Archaic peak of occupation in the NIIP area. If all 11 were assigned to the San Jose phase, it would boost that phase's calibrated site-year number to 0.057. Data from other recent archaeological projects in northwestern New Mexico also show that for Archaic contexts, San Jose components are generally the most numerous (Langenfeld and Vogler 1993).

The assignment of components to Chiricahua Cochise is based on the occurrence of large projectile points with "high" side-notches at these sites (Vogler 1993a:122-123). Irwin-Williams (1979:40) used the occurrence of similar points at the Moquino site in northwestern New Mexico to argue for "a strong penetration of that area during Chiricahua phase times" by groups from the south. Vogler (1993a:122-123) also cites an alternative view presented by Anderson and Gilpin (1984), who argue that the distinctive side-notched points from the NIIP were not related to point styles of the Cochise tradition, but had more affinity with point types occurring farther north. The points depicted by Vogler (1993a:123) resemble Sudden Side-notched points from Utah (Holmer 1986:104), which occur predominantly in the Middle Archaic. Another "high" side-notched form, San Rafael Side-notched (Holmer 1986:104-105), may extend into the Late Archaic. Elyea and Hogan (1993:9.2-9.3) report examples of Sudden and San Rafael Side-notched points from Middle Archaic contexts on the Bolack Land Exchange, which is located on the northern edge of the NIIP project area. Elyea and Hogan suggest that San Jose points and the large, side-notched styles have somewhat nonoverlapping distributions in the northern San Juan Basin, raising the "possibility that the northern basin was being exploited by two hunter-gatherer populations during the Middle

Archaic period, each with a distinct winter range but overlapping summer ranges (Elyea and Hogan 1993:9.1).

Vogler's site types are defined as follows: The category *extended habitation* refers to "components evidencing protracted use beyond two seasons" (Vogler 1993a:87). They may or may not contain structures or middens. *Base camp* "refers to a centralized locus of generalized activity from which a number of specific, specialized activities are carried out at spatially discrete locations in the surrounding vicinity" (Vogler 1993a:87-88). Base camps are viewed as temporary residence sites probably not occupied beyond a single season. The label *satellite site* "refers to a location where a very limited number of activities occurred....Artifacts evidence less functional diversity than is the case with artifact assemblages at base camps or extended habitations" (Vogler 1993a:88). These sites are ordinarily smaller than base camps.

Vogler (1993a:186-187) infers that a basic land use and settlement pattern was established by about 8000 B.P. and persisted through the Archaic occupation of the NIIP, although there was some increase in the proportion of base camps in the En Medio phase. He characterizes the basic pattern as follows:

> Despite evidence for a number of different resources having been utilized, the focus of resource procurement appears to have been a rather limited number of vegetal resources (*cheno-ams*, tansy mustard, and perennial grasses [especially Indian ricegrass and dropseed]) and small game species (jack rabbits, cottontail, and perhaps prairie dogs). There is no direct evidence that might indicate winter utilization of the project area, but botanical evidence attests to its use from spring through late fall....Archaic Period settlement on Gallegos Mesa appears to have been influenced strongly by the occurrence of hydrological features, primarily drainages and playas. The occurrence of many Archaic Period sites in settings generally thought to have a high degree of vegetative diversity (ecotones and zones of interface between ecological communities) is well documented on the mesa. These areas also frequently correspond with hydrological features, however, and thus the extent to which this distribution is a function of vegetative diversity rather than the presence of hydrological features is currently unclear. Archaic Period sites are generally characterized as either base camps or satellite sites....The correlation of base camp locations with hydrological features is far greater than is the case with satellite sites, suggesting the importance of reliable water sources in the immediate vicinity of base camps. Many Archaic Period sites on the mesa were used repeatedly, suggesting that the resource procurement activities on the mesa were undertaken in conjunction with a structured seasonal round [Vogler 1993a:186-187].

There is some disagreement among researchers about the most appropriate models of settlement and site types to apply to Archaic data from the NIIP and other project areas recently investigated in northwestern New Mexico. Using data from the El Paso Coal Company (EPCC) Project (Anderson and Sessions 1979) located just west of the southern part of the NIIP, Vierra and Doleman (1994) cast doubt on typologies such as Vogler's, which presuppose a logistical settlement organization with base camps and special purpose or satellite sites. Their analysis suggests that there is little statistical support for the functionally differentiated site types proposed by Anderson and Sessions, and that the variability in assemblage content of the EPCC sites is closely correlated with assemblage size and hence is largely explainable as the product of sampling. In other words, the sites display a continuum "from small sites with few tool types to large ones with considerable diversity" (Vierra and Doleman 1994:89). Vierra and Doleman argue that the continuous nature of variation in the EPCC sites is more in keeping with a warm-season forager strategy, in which small groups moved as a unit to a series of resource locations. They conclude that the EPCC sites "probably represent similar residential components of a [forager] settlement system, with inter-assemblage variability mainly being due to differing levels of occupational intensity, including group size, length of occupation, and re-occupation" (Vierra and Doleman 1994:91-93). They also suggest that the same Archaic groups are likely to have employed a more logistically oriented settlement strategy in the winter when "groups could have aggregated together at a winter site location. Stored foods would have been utilized in conjunction with logistical trips from the residential site for hunting and to field caches" (Vierra and Doleman 1994:78).

Elyea and Hogan (1993:1.4-1.5) characterize Vogler's model as *central-based collecting*, in which seasonal base camps were established by macrobands in areas of high vegetative diversity near water supplies. Resources would be processed by task groups at satellite sites for transport back to the base camps for use. Elyea and Hogan (1983, 1993) propose that a *serial-foraging* model is likely to be a better fit the Archaic data from NIIP and most other recently-investigated areas in NW New Mexico. Under this model, Elyea and Hogan (1993:1.4) propose that "...the Archaic population was dispersed into family or extended family groups from spring through early fall....Plant resources were procured from the area immediately surrounding the residential camp and were processed and consumed at the camp. As resources in the foraging zone were depleted, the camp was moved to another location. Since the settlement pattern was tethered to water sources...some favorable areas would be occupied repeatedly, resulting in sizable accumulations of cultural debris."

Elyea and Hogan (1993) report on excavations of Middle and Late Archaic components in the Bolack Land Exchange area, located adjacent to the northeastern part of the NIIP, but on the upper margins of the San Juan Breaks, where Gallegos Mesa gives way to a "transition zone between the Chaco dune field and canyons on the southern margins of the San Juan River valley" (Elyea and Hogan 1993:9.5). Their studies showed that the most intensive occupation of the area occurred in the Middle Archaic, but that unlike the contemporaneous sites on the NIIP, components of this age in the Bolack area had one or more relatively substantial pit structures with internal hearths; many had large interior storage pits. Although subsistence evidence was sparse, it permitted some comparisons with the archaeological record from Middle Archaic sites on Gallegos Mesa in the NIIP. The evidence indicated reliance on the same plants as in the NIIP sites—primarily Indian ricegrass and cheno-ams—but suggested a greater procurement of deer in the Bolack sites (Elyea and Hogan 1993:9.6-9.7). Elyea and Hogan (1993:9.7-9.8) propose that the Bolack Middle Archaic sites with pit structures probably functioned as winter base camps; their occupants depended heavily on stored foods that had been gathered in the warm season, supplemented by hunting in the nearby canyon and riverine environments. Areas such as the Bolack Land Exchange might have been used for overwintering when there was no pinyon nut crop in nearby higher-elevation woodlands. They note, however, that "[b]ecause late fall and winter resources are most abundant in the uplands on the periphery of the basin, we still think that winter habitations were generally located in these areas. We expect those settlements to be located in areas that would minimize the cost of transporting stores from caches in lowland areas, however" (Elyea and Hogan 1993:9.8).

A somewhat similar model of Archaic resource use and settlement has been proposed by Simmons (1989:57-58 and in earlier publications) on the basis of studies in the area around Chaco Canyon in northwestern New Mexico. It incorporates elements of both foraging and collecting strategies. He suggests that in the spring and summer, Middle and Late Archaic bands dispersed into smaller groups that relied on foraging for wild resources in the dune fields north of Chaco Canyon. In the fall, these groups would aggregate in the Chaco Canyon-Chacra Mesa areas, transporting processed foods to be stored at overwintering sites. During the winter and early spring, stored foods would be supplemented by hunting and gathering carried out by task groups. Simmons (1989:57-59) argues that maize could have been introduced into this adaptive pattern as a secondary resource without dramatically altering the existing Archaic lifestyle.

Southeastern Utah

Phil Geib (1996a, also see 1996b) has recently summarized the Archaic occupancy of the Glen Canyon region, which includes the portion of southeastern and south-central Utah directly west of the study area. Geib also includes part of northeastern Arizona in his survey. He tabulates nearly 180 radiocarbon determinations from preceramic contexts (prior to 1600 B.P.) from 74 sites, providing a substantial chronological framework for the Archaic period, which extends from ca. 9000 to 2000 B.P. Geib does not think that Irwin-Williams' Oshara phase sequence fits the archaeology of the area and finds Schroedl's (1976; Schroedl and Coulam 1994) sequence based on excavations at Sudden Shelter and Cowboy Cave (see Figure 4-3; Figure 4-4) more appropriate for the Glen Canyon basin. For his synthesis of the archaeological record of the Archaic of this region, however, he relies on Early, Middle, and Late Archaic periods keyed to the radiocarbon chronology.

Geib argues that there are no apparent local antecedents for the Early Archaic occupation of the Glen Canyon region, and essentially no cultural continuities between the artifact inventories of the Early Archaic occupations of the region and those of the Southwestern Paleoindians. "It seems doubtful that the point types (Elko Corner/Side-notched, Northern Side-notched, Pinto), sandals (open-twined and plain-weave), close-coiled basketry, and generalist subsistence remains (diverse small seeds, cactus pads, and small mammal bone) that characterize the earliest [Archaic] cultural deposits...were the cultural residue of local late Paleoindians turned foragers. Though the region apparently had a low-level late Paleoindian occupation, a break in occupation probably occurred before about 9000 B.P., and Archaic hunter-gatherers soon resettled the abandoned rugged canyon landscape" (Geib 1996a:28).

Even though Irwin-Williams (1973) had postulated a break between late Paleoindian and the Early Archaic Jay phase in New Mexico, Geib thinks it is possible to see the Jay materials as having developed from a late Paleoindian stemmed point tradition and suggests that "there could well be a different origin for Archaic populations on portions of the northern and southern Colorado Plateau" (Geib 1996a:28-29). That is, he implies that the Oshara tradition, with the Jay phase as a transition from Paleoindian to the Early Archaic, may be present in northwestern New Mexico, but not in southeastern Utah (which is not exactly the "northern Colorado Plateau" but is more northerly than the San Juan Basin). Elsewhere in the article Geib (1996a:38) suggests that the initial Archaic settlement of the Glen Canyon region was by populations intrusive from the eastern Great Basin.

As discussed in the earlier section of this chapter, Pitblado (1999) has assembled evidence that points of the Late Paleoindian Great Basin Stemmed tradition (which includes points similar to Irwin-Williams' Jay type) were widely distributed from the Great Basin eastward through the Colorado Plateau and into the southern Rocky Mountains. Given the extremely low population density inferred for Paleoindian groups, it may well be that the absence of Great Basin Stemmed

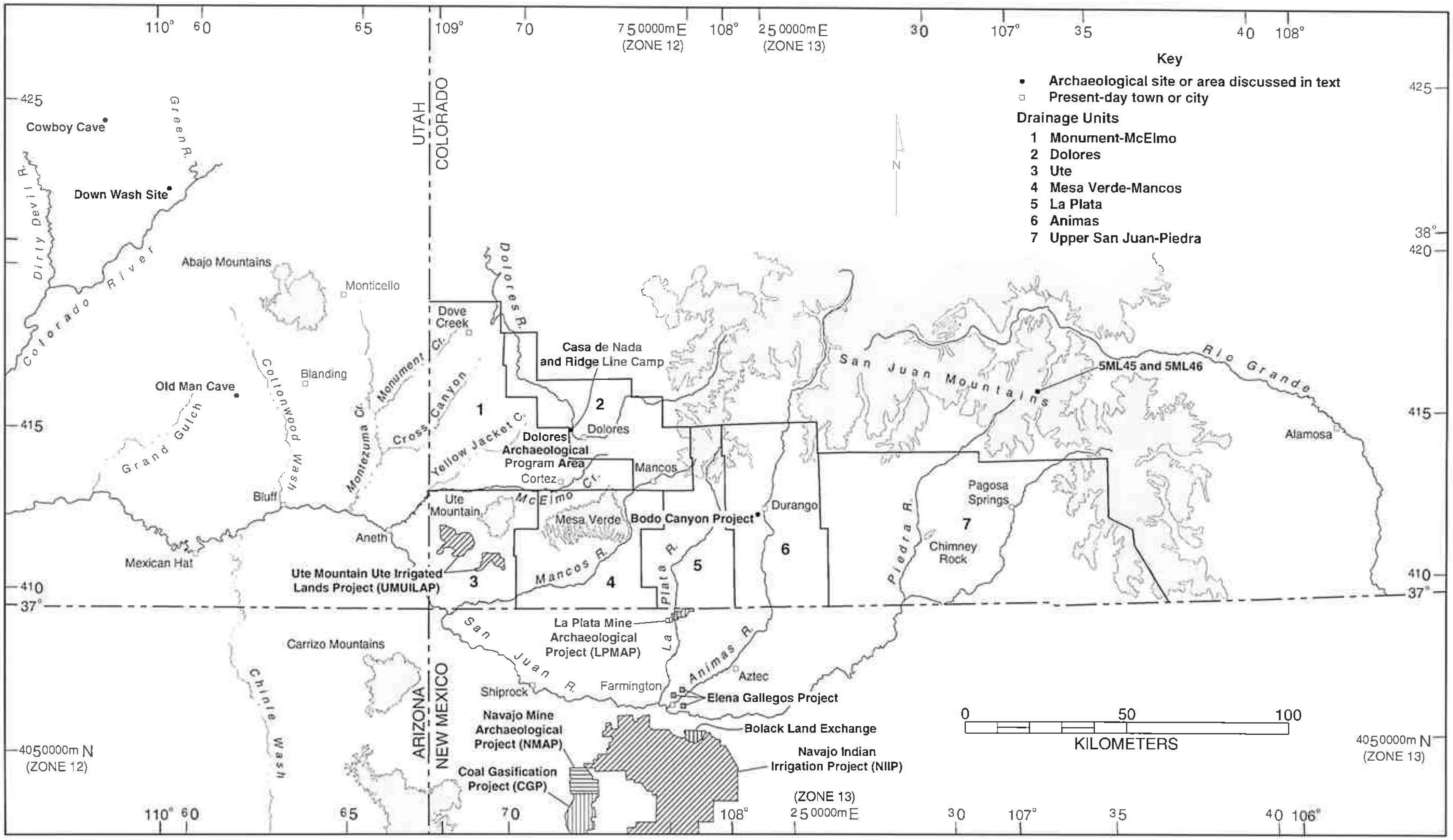

Figure 4-4. Sites and projects in and near the study area with excavated Archaic components. From west to east, these include Cowboy Cave (Jennings 1980; Schroedl and Coulam 1994); the Down Wash site (discussed in Geib 1996a, 1996b); Old Man Cave (Geib and Davidson 1994); the Ute Mountain Ute Irrigated Lands Archaeological Project (UMUILAP) (Billman, ed. 1997); Casa de Nada (Kane et al. 1988) and Ridge Line Camp (Southward 1988) in the Dolores Archaeological Program (DAP) area; the Navajo Mine Archaeological Project (NMAP) (Hogan and Winter 1983); the Coal Gasification Project (CGP) (Moore and Winter 1980); the Navajo Indian Irrigation Project (NIIP) (Vogler et al. 1993); the La Plata Mine Archaeological Project (LPMAP) (Hancock et al. 1988); the Farmington Sector of the Elena Gallegos Land Exchange Project (Tainter 1997); the Bolack Land Exchange (Elyea and Hogan 1993); the Bodo Canyon Project (Fuller 1988a); and sites 5ML45 and 5ML46 in the Piedra Pass area (Reed 1984). (Reprinted with permission of Crow Canyon Archaeological Center.)

points in the Glen Canyon Basin represents the vagaries of archaeological sampling. Also, in the absence of much excavation in Late Paleoindian and Early Archaic sites in the southern Colorado Plateau, statements about adaptive differences between these two periods seem premature.

Geib (1996a:26-27) displays the Archaic period radiocarbon dates from the Glen Canyon region in the form of a histogram of date frequencies by 150- and 300-year intervals. The histograms show a strong occurrence of dates throughout the Early Archaic, from about 9000 B.P. to about 6000 B.P. in radiocarbon years, with only a single gap of one 150-year interval centered on 8500 B.P. The strength of the Early Archaic date distribution holds up even when only dates on short-lived organics are considered in order to minimize the "old wood" effect.

Geib (1996a:38) thinks that after an initial period of "settling in," Early Archaic populations increased, and may have had relatively low residential mobility, with frequent reoccupation of favored sites and localities. An example of such an Early Archaic occupation comes from Old Man Cave (Geib and Davidson 1994), a stratified site located at about 1830 m elevation in southeastern Utah approximately 60 km west of the Colorado state line. This small shelter yielded evidence of frequent and evidently fairly intensive use from about 7800 to about 6800 B.P., followed by less frequent use to about 6100 B.P., after which it was apparently abandoned until used again by Late Basketmaker II groups at about 1800 B.P.

Analysis of coprolites from the Early Archaic deposits indicates that the "plant taxa with the most significant contribution to diet at Old Man Cave include: *Opuntia* cf. *polyacantha* (prickly pear), *Sporobolus cryptandrus* (sand dropseed), *Iva* spp. (marshelder), *Helianthus annuus* (sunflower), and *Chenopodium* cf. *leptophyllum* (goosefoot)" (Hansen 1994:ii). Coulam and Sharpe (1993, cited in Hansen 1994:28) analyzed macrobotanical remains from the site, and inferred that Indian ricegrass (*Stipa hymenoides*) was also an important food resource, in addition to *Sporobolus* and chenopods.

The abundance of *Opuntia* stem parts and the frequencies of certain nondietary pollen types led Hansen (1994:ii-iii) to infer that the majority of coprolites that he analyzed had been deposited in the winter or early spring. Ethnographic information indicates that *Opuntia* pads were frequently used as food by Intermountain region hunter-gatherers in the early spring, when nothing else was available. In addition, Hansen inferred that a group of coprolites from one particular location in the site may have been deposited in the later summer or fall.

Geib and Davidson (1994:200) report that abundant chaff from dropseed was present in Early Archaic contexts, indicating that "harvesting and processing the seeds of this plant was an important economic pursuit." This would appear to indicate warm-season use of the cave. Geib and Davidson (1994:200) also report burned bone in and around Early Archaic hearths, indicating that hunting took place while the cave was being occupied. Old Man Cave is very small; the sheltered area is only about 14 m wide at the front by about 7 m deep, and parts of the shelter floor are very irregular and bouldery. If the people who were using the cave were in fact all taking shelter there, the group must have been a small one.

Perhaps the most striking feature of Geib's (1996a) date histograms is the relative paucity of dates for the Middle Archaic, which Geib defines as between about 6000 and 4000 B.P. Three consecutive 150-year intervals, centered on 4600, 4750, and 4900 B.P., have no dates at all. The number of dates per interval rises again in the Late Archaic; however, when only dates on short-lived organics are considered, date frequencies do not recover to Early Archaic levels until Late Archaic, at about 2400-2000 B.P.

Geib (1996a) thinks that the Glen Canyon region was not abandoned during the Middle Archaic, but that there was a drastic reduction in population, probably due to warmer and drier conditions that caused prolonged and widespread drought. As population and resources declined, the larger territories, increased mobility, and more frequent residential moves that resulted would have led to less reuse of sites. Thus, fewer sites large enough to have archaeological visibility would have been created, amplifying the effects of population decrease on the archaeological record. Geib suggests that the locations of residential base camps may have become focused on areas having the most reliable water sources, for example, major streams that flow year around. Radiocarbon dating of museum specimens of organic materials from now-inundated sites in the Glen Canyon proper revealed previously unrecognized Middle Archaic occupations (Geib 1996a:33-34), lending support to this hypothesis.

Geib (1996a:34) also notes that along major year-round streams, residential camps would not be tethered to springs, and hence would be less likely to be re-used. Therefore, along the rivers, residential camps would have low archaeological visibility. He also suggests that high-altitude areas in and around the Glen Canyon region (e.g., the Henry Mountains, Boulder Mountain, the La Sal Mountains) may also have become more important to Middle Archaic populations, but cites no evidence that sites of that age are abundant there. Since water resources are usually more abundant at the higher elevations, camps would be less tethered to a few locations there, and might be less often reoccupied, leading to low archaeological visibility.

The inferred decline in population during the Middle Archaic in the Glen Canyon area is in striking contrast to the apparent peak in population during this period in northwestern New Mexico (Langenfeld and Vogler 1993) and probably in the Ute drainage unit in southwestern Colorado. Vogler (1993b) notes that in the NIIP area, Middle Archaic base camps are likely to be associated with watercourses. However, these watercourses are dry during most of the year. It would be hard to make the argument that domestic water sources are or ever were more numerous on Gallegos Mesa than in the canyon country of the Glen Canyon region. In the latter area, the Navajo and Wingate sandstones are excellent aquifers that support springs in both large and small canyons, providing domestic water sources in locations well away from major flowing streams such as the Colorado, Escalante, and Dirty Devil. Spring flow may have decreased during a major long-lasting drought, but it seems unlikely that a regional drought would have caused more reduction in domestic water supplies in the Glen Canyon region than on Gallegos Mesa. On the other hand, it cannot be presumed that climatic conditions were identical in both areas at this time.

Geib (1996a) argues that population in the Glen Canyon region increased substantially during the late Archaic, after about 4000 B.P. Although this is not clearly shown by his date histograms, he suggests that on the basis of the totality of evidence, the highest regional populations may have been reached between about 4000 B.P. and 2400 to 2000 B.P. He recognizes that the apparent population increase may also be a function of greater archaeological visibility of sites due to settlement pattern shifts resulting in smaller territories, reduced mobility, and more reuse of rockshelters, as well as to the more frequent preservation of Late Archaic sites, simply because they are relatively young.

The highest frequencies of radiocarbon dates in the Glen Canon region, both in total dates and those based on short-lived organics, are from the last part of the Geib's date tabulation, between about 2350 and 1600 B.P. This interval includes the Early Agricultural (i.e., Basketmaker II) period. The earliest reliable direct dates from maize in the Glen Canyon region are currently no earlier than about 2000 B.P. (Geib 1996a:35), but there are earlier dates on other materials in contexts in which maize occurs (e.g., Aasen 1984), as well as earlier dates directly on maize from other portions of the Four Corners area (see Chapter 5). This makes it likely that maize was introduced to the Glen Canyon region somewhat before 2000 B.P. The rise in date frequency after 2400 B.P. thus may be correlated with population increase associated with the introduction of maize horticulture.

In general, the data assembled by Geib and others for the Glen Canyon region suggest a basic Archaic settlement system not greatly different from the reconstructions by Elyea and Hogan (1993) and Simmons (1989) for northwestern New Mexico—that is, a pattern of serial foraging in small groups during the warmer months with lessened mobility and greater dependence on food stored at a residential base camp during the winter and early spring. The winter pattern may also have involved greater aggregation at those times and places where the resource supply permitted it.

Northern Colorado Basin

As part of their report on the prehistoric archaeological contexts of the Northern Colorado Basin, Reed and Metcalf (1999) have capably synthesized information on the Archaic. Because workers in southwestern Colorado may refer primarily to the Southern Colorado River Basin context report, it is relevant to summarize some of Reed and Metcalf's main points here.

Reed and Metcalf (1999) do not recognize a clear-cut break between the Paleoindian and Archaic eras in the Northern Colorado Basin. Rather, they consider that there was a temporal overlap between these two general kinds of adaptation in the Pioneer period (described below); there are elements of both continuity and contrast between Paleoindian and Archaic in the area. This viewpoint is generally consistent with Black's (1991) view that a distinctive "Mountain tradition" can be recognized in the southern Rocky Mountains from Paleoindian through Late Archaic times.

Reed and Metcalf (1999) utilize a four-period scheme to succinctly summarize the major features of the Northern Colorado River Basin Archaic.

> The Pioneer period (8350-6450 B.P.) witnessed the demise of fully nomadic Paleoindian adaptations and the arrival of full-time occupants who established seasonal settlement systems in all the major basins of the study area...The Settled period (6450-4450 B.P.) shows a fluorescence [sic] of locally oriented occupations. This period is characterized by use of large numbers of processing features. Evidence points toward a sort of central-place foraging strategy centered on predictable winter habitation areas. Though there is some indication of daub architecture predating this period, the use of pit and basin structures becomes established during this time. The Transitional period (4450-2950 B.P.) has a large degree of continuity with the preceding period, but can be characterized by increasing variability in material culture, perhaps less sedentism in settlement patterns, and possibly by more seasonality in use of the higher elevations. The Terminal period (2950-1950 B.P. [A.D. 1]) is a time of apparent stress on settlement systems and saw experiments with various intensifications in subsistence, including the faint beginnings of a shift to bow and arrow use, early experiments in growing corn, and increasing shift toward processing of seeds and other lower rate-of-return foods. The end date for the period is somewhat

arbitrary, and was chosen simply because a number of the trends established during the period come together at about this time to form a more definable entity, the Aspen tradition of the Formative era.

An outstanding feature of Reed and Metcalf's synthesis is the presentation of data on 714 radiocarbon determinations from the Northern Colorado Basin. These are presented in histograms that show the distribution of all dates by 100-year increments, as well as the temporal distribution of dates from sites above and below 2134 m (7000 ft). Eliminating multiple dates from the same component and dates from badly mixed contexts enabled presentation of another histogram displaying the age distribution of 485 components; this shows the same general patterns as did the histogram of all dates.

The histograms of all dates and components show a continuous record of occupation from about 8300 B.P., with only very gradual increases through time until about 2500 B.P., when the number of dates rises rapidly to a peak at about 1200 B.P. It then tapers off rapidly to the historic period. The pronounced trough that Geib (1996a) found in southeastern Utah dates between about 6000 and 4000 B.P. is not apparent. The Northern Colorado Basin record shows a modest peak of dates between about 6300 and 5800 B.P., followed by a decline back to the long-term trend.

The date histograms above and below 2134 m show interesting patterns. More dates come from the higher zone than the lower one up to about 4000 B.P. In particular, the higher zone strongly "outperforms" the lower one between about 7800 and 5600 B.P. After about 4000 B.P., however, dates are slightly more numerous from the lower zone. At about 2500 B.P., the lower zone "takes off" with most of the bulge in late dates that noted above coming from the lower zone. Reed and Metcalf (1999) also graph the average elevation of dated contexts through time, showing a gradual decline in elevations from about 2440 m at about 8000 B.P. to about 1950 m at 1200 B.P.; there is a modest increase in average elevations after that.

Reed and Metcalf (1999) summarize relevant paleoclimatic data and then correlate it with the observed date trends, as follows:

> The high elevation sample has its peak during the period of maximum Holocene warming [which elsewhere is suggested to fall around 7300 B.P. in this area], generally during the period of maximum regional dryness as well. Around 4000 B.P., when the higher elevation paleoenvironmental record shows a trend to cooler conditions, the radiocarbon record is balanced between the higher and lower elevation sites. This corresponds to widespread cooler and, at least in the lower elevation record, moister conditions. Late in the Archaic record, as the radiocarbon frequencies increase in the lower elevations[,] climates appear to have been generally in a cool-dry regime much like what is considered "modern."

Reed and Metcalf (1999) provide a thorough discussion of the potential pitfalls of reading too much into their regional date histograms. Their appropriately cautious interpretation of the broad trends shown by the histograms shows what a useful tool they can be, however.

One of the striking characteristics of the archaeological record in the Northern Colorado River Basin is the high frequency and variety of house structures and pits. In this respect, the region contrasts strongly with southeastern Utah, northwestern New Mexico, and the Southern Colorado River Basin area. This suggests that many of the archaeological components in the Northern Colorado River Basin area represent winter residences, and in some cases, year-round residential bases. It is conceivable that there was some cycling of population between the Northern and Southern Colorado River Basins as part of an annual round.

Archaic Occupation of the Southern Colorado River Basin: Survey Data

Turning finally to the study area, we find an Archaic record that is much sparser and even less well understood than that of adjacent regions. The distribution of Archaic components is somewhat uneven across the various drainage units (Table 4-1). The available data do not permit a calculation of site density per drainage unit, but the percentage of the total Archaic components recorded in each drainage unit provides a very rough measure of distribution. There were 413 components classed as Archaic in the state site database as of early 1998. The distribution among drainage units, by highest to lowest percentage, is as follows: Ute: 33.2 percent of the total Archaic components; Monument-McElmo: 19.4 percent; Dolores: 14.3 percent; Animas: 12.3 percent; USJ-Piedra: 11.4 percent; La Plata: 7.5 percent; and Mesa Verde-Mancos: 1.9 percent. The concentration of Archaic components in the Ute drainage unit is notable, as is the very low percentage in the Mesa Verde-Mancos unit.

One speculation about why this pattern exists (already touched upon in the introduction to this chapter), is that Archaic components tend to be relatively common in low-elevation, sandy grassland environments, and relatively poorly represented in upland pinyon-juniper environments. Because of the extensive surveys associated with the development of the Ute Irrigated Lands south and southeast of Ute Mountain, large areas of low-elevation grasslands have been surveyed in the Ute drainage unit, while in the adjacent Mesa Verde-Mancos unit, survey has been concentrated in the pinyon-juniper uplands. Speculatively, the relatively high proportion of Archaic components in the Monument-McElmo drainage unit may be related to extensive surveys on Cajon Mesa and other relatively low-lying, sandy areas in the southwestern part of the unit. In Adams' and Petersen's survey of the resource potential of biotic communities (Chapter 2), grasslands were given the highest ranking for resources of potential importance for foragers. This biotic community currently makes up only an estimated 3.0 percent of the study area but is best represented in the Ute drainage unit. Adams and Petersen also proposed that the pinyon-juniper woodland, which comprises nearly 34 percent of the study area, had a moderate resource potential for foragers. The distributional data summarized above and in Table 4-1 do not bear this out. Finer-grained analyses of the association between biotic communities and Archaic sites are needed, however, if this line of investigation is to be pursued further.

The resolution of the survey data obtained from the state site files (Table 4-1) does not permit addressing temporal variation in Archaic site frequency across the study area. Other ways of compiling information from the database might permit a more detailed future analysis. A sampling of recent published survey reports provides a modest amount of information about temporal distributions of Archaic sites.

In a report of a recent Class II survey of the Mancos and La Plata drainages, Stirniman (1996:113-114, in Chenault [1996]) indicates that several probable Middle Archaic sites were encountered, but these are not classified separately in the final site tabulation. Of the 421 components recorded in the survey as a whole, 12 are assigned to the Archaic, 4 to the late Archaic, and 8 to Archaic-BMII (Chenault 1996:289). All are from the La Plata drainage, except for 3 of the Archaic-BMII components, which are from the Mancos drainage.

In a recent overview of projectile points collected from sites in Ridges Basin and other locations in the Durango area, Smiley (1995c) documents the occurrence of a number of points generally thought to be associated with the Middle Archaic and the early part of the Late Archaic and a few thought to be associated with the Early Archaic. Interestingly, "high" side-notched forms resembling the Sudden and San Rafael types associated with the Middle Archaic in the northern Colorado Plateau sequence (Schroedl 1976; Holmer 1986) outnumber those associated with Middle Archaic in the Oshara sequence (Irwin-Williams 1973, 1979). None of the sites intensively surface collected in Ridges Basin in 1992 and 1993 could be assigned to the Early or Middle Archaic. Rather, the "early" points occurred in Late Archaic/Basketmaker II or Puebloan contexts (Smiley 1995c), suggesting that they represent small undefined earlier components at these sites or are the result of "collecting" by the inhabitants of the later sites.

On the DAP, recognized Late Archaic components were assigned to the Great Cut phase (Kane 1986a). It was felt that insufficient evidence of earlier Archaic occupation existed to support the designation of earlier phases. Phagan (1988a), however, depicts a few probable Middle Archaic points from the DAP collections, including some of the "high" side-notched forms noted above. These points come from a variety of contexts.

The Mockingbird Mesa survey (Fetterman and Honeycutt 1987) in the Monument-McElmo drainage unit resulted in the recording of 18 Archaic temporal components out of a total of 834 recorded on the survey (Fetterman and Honeycutt 1987:27, 29). Of these, 1 was assigned to the Early Archaic, 13 to the Middle Archaic, and 4 to Late Archaic-Basketmaker II. In addition, Fetterman and Honeycutt (1987:29) note that several Archaic-style points were encountered at later Puebloan sites; they infer that the earlier points had been collected by the occupants of these sites. Fetterman and Honeycutt (1987:30) classed one Late Archaic-Basketmaker II site as a possible temporary habitation, and all the other Archaic sites as various kinds of limited activity and processing sites. They note that these sites ranged from "...a tiny chipping locus which contained a single diagnostic projectile point...[to] sites that were composed of extensive lithic scatters containing hundreds of pieces of flaked lithic debris, dozens of flaked lithic and ground stone tools, and several burned rock or upright slab features" (Fetterman and Honeycutt 1987:29). The Middle Archaic point styles depicted and described by Fetterman include a number of "high" side-notched examples, as well as San Jose and Armijo types assigned to Middle Archaic contexts in the Oshara sequence.

Another recent survey in the study area that has produced evidence of a strong Archaic occupation prior to the Late Archaic is the Ute Mountain Ute Irrigated Lands Archaeological Project (UMUILAP) in the Ute drainage unit (Fuller 1988c, 1989a). According to Billman (ed. 1997:6.31-6.35), the survey identified a number of probable Archaic components that could be assigned to phases on the basis of associated projectile point styles. The Oshara Tradition phase scheme (Irwin-Williams 1973) was applied to the data from this project. There were 8 Jay/Bajada, 22 San Jose, 11 Armijo, and 3 En Medio phase components. A standardization of these data in terms of sites per 100-year intervals showed that the Middle Archaic San Jose phase had a significant lead in standardized site frequency, followed by Armijo, En Medio, and Jay/Bajada (Billman, ed. 1997:6.33).

The scattered survey data from the Southern Colorado River Basin provide enough evidence of Middle Archaic occupation to suggest that the study area did not undergo a depopulation or settlement pattern shift of the sort that Geib infers for the Glen Canyon Basin during this period. On the other hand, Geib's evidence is based on a systematic compilation of radiocarbon dates, while the evidence of Middle Archaic occupation in the study area is based on scattered reports of projectile point styles thought to be associated with this period. Hence, the two sets of evidence are not very comparable.

Another speculative inference that can be drawn from sketchy evidence is that projectile points similar to Northern, Sudden, and San Rafael Side-Notched (Holmer 1986) have been reported from several parts of the study area. These styles are typically associated with the sequence developed on the basis of work at Sudden Shelter and Cowboy Cave in Utah, suggesting northern or northwestern affiliations for Middle and Late Archaic sites in the study area. On the other hand, points of this sort also regularly occur in the San Juan Basin in addition to the standard Oshara tradition diagnostics, perhaps indicating that this style is simply a widespread one that can occur in association with a number of complexes. (See earlier discussions of Irwin-Williams' [1979] attempts to relate broadly similar side-notched points to a southern Cochise tradition.)

Excavated Archaic Components in the Study Area

Below is a review of the evidence from the few Archaic components that have been excavated in the study area. The best-understood and best-dated excavated contexts come from the Late Archaic, and in some cases, it is questionable whether particular contexts should be assigned to the Archaic or to Basketmaker II. Several of the components excavated as part of the UMUILAP (see below) were probably Middle Archaic in age, although chronometric dates could not be obtained. As noted above, survey data from this project suggest a substantial Middle Archaic presence in the area.

Ute Mountain Ute Irrigated Lands Archaeological Project

Sixteen probable Archaic sites located south of Ute Mountain in the Ute drainage unit were intensively surface collected, tested, and/or excavated as part of studies designed to mitigate the impact of federally funded agricultural development on lands of the Ute Mountain Ute Tribe (Billman, ed. 1997). Chronological evidence was sparse at most of these; only one site, 5MT10525, yielded radiocarbon-derived dates. Several sites had projectile points that could be assigned a date estimate based on their typology. According to Billman (ed. 1997:6.2-6.6), five of the intensively investigated sites had Middle Archaic San Jose phase components, one had a Late Archaic Armijo phase component, and two (including 5MT10525) had Late Archaic En Medio components. (On the basis of radiocarbon dates and other evidence, site 5MT10525 is considered in this report as a Basketmaker II site and is discussed in Chapter 5.) The chronological distribution of intensively investigated sites roughly mirrors the results of earlier surveys of Ute Irrigated Lands, as reported by Billman (ed. 1997:6.31-6.35).

The project area is located in the western part of the Ute Mountain Ute reservation, near the Utah border, on Ute Mountain's southern pediment, which gently slopes toward the San Juan River. Elevations in the project area range from about 1650 m to below 1525 m. Surface sediments are largely eolian or alluvial sandy loams, and the area is drained by a series of large and small intermittent southwest- and west-trending watercourses. The eastern part of the project area has the larger drainages, including Mariano and Cowboy washes. The vegetative community is described by Billman (ed. 1997:26) as semidesert grassland, with the common plants including Indian ricegrass, sagebrush, greasewood, wolfberry, globemallow, shadscale, and prairie sunflower. Ute Mountain rises just northeast of the project area and its lower slopes support a pinyon-juniper community. Riparian environments occur along the San Juan River to the southwest and the Mancos River to the south.

Billman (ed. 1997) notes that the San Jose and Armijo phase components that were intensively investigated, as well as the sites that could not be assigned to any phase, are small both in area and number of artifacts, and lack structures or features. He suggests that they represent small special use sites, probably associated with procuring and processing plant and/or animal foods, that were used briefly by small groups (Billman, ed. 1997:6.42-6.44). The lack of evidence of residential activity leads him to postulate that they are part of a logistically organized "collector" type of settlement system. The residential base camps that would be associated with such a system would presumably be located in the riparian or pinyon-juniper zone not far outside the predominantly grassland-shrubland zone in which the project area is located. Unfortunately, these areas higher up on the flanks of Ute Mountain have received little or no survey. However, survey data from other drainage units where pinyon-juniper vegetation is dominant do not provide evidence supporting the hypothesis that Archaic sites are numerous in this vegetation zone.

Billman (ed. 1997:6.28-6.31) reports that the analysis of flaked stone material from all UMUILAP Archaic components established that nearly all raw materials came from relatively close to the project area, indicating that the Archaic groups utilizing the area had considerably smaller ranges or "catchments" than did most Southwestern Archaic groups. He attributes this to the environmental diversity of the region surrounding the project area. There is a rise of more than 1600 m in elevation in the 36 km from the San Juan River to the peak of Ute Mountain. Over this distance, vegetative zones include riparian, grassland (most of the project area), sagebrush savanna, pinyon-juniper woodland, ponderosa pine forest, coniferous forest, and alpine.

On the basis of work at site 5MT10525, Billman (ed. 1997:6.43-6.46) argues that the settlement strategy changed during the terminal Archaic En Medio phase (800 B.C. to A.D. 400), and that the project area became the location of residential base camps as well as special-use extractive sites. He hypothesizes that this resulted either from climatic shifts that increased the supply of grass seeds in the project area, and/or from overall macroregional population growth that reduced forager territory size and increased the importance of establishing control over key resource areas. Although Billman suggests that agriculture may have played a limited role in Late Archaic adaptations, he does not emphasize it.

Following Matson (1991), it is suggested here that agriculture in fact became significantly more important in the Four Corners area in En Medio/Basketmaker II times, and that the most reasonable hypothesis to put forward is that the settlement and demographic shifts at this time were related to substantially increased agricultural dependence. The UMUILAP area supported fairly large agricultural populations in later periods on the basis of flood water farming in ephemeral washes (Huckleberry and Billman 1998). This area should have been as favorable for agriculture in En Medio/Basketmaker II times. In Chapter 5, the case is made that the primary occupation of 5MT10525 should be referred to Basketmaker II—not a major departure from Billman's interpretation, since En Medio is by definition considered correlative if not equivalent to Basketmaker II in northwestern New Mexico (Irwin-Williams 1973). The difference of emphasis here is that Irwin-Williams originally viewed En Medio/Basketmaker II as having an essentially Archaic foraging-based adaptation, with some modest use of cultigens as a supplement. Evidence reviewed by Matson (1991) and in Chapter 5 of this report provides a strong challenge to this interpretation. Certainly by the B.C.–A.D. transition, most if not all Basketmaker II groups in the Four Corners area were probably obtaining the majority of their calories from maize.

Casa de Nada (5MT2731)

Site 5MT2731, located in the Dolores drainage unit, is an extensive (ca. 450,000 m^2) site with numerous "hot spots" of surface artifacts and sandstone rubble. Sherds were absent or rare in most hot spots, suggesting the presence of early components. Casa de Nada refers to the portion of this site that was intensively surface collected and partially excavated by personnel from the DAP in 1982 and 1983 (Kane et al. 1988).

Excavations at Casa de Nada revealed evidence of a probably Late Archaic component that included an occupational surface with an associated surface structure. The structure is represented by a relatively indistinct, saucer-shaped floor surface that is oval in plan view and measures approximately 2.5 m north/south and 2.5 m east/west with a floor area of 5.5 m^2. Evidence of the structure was detected about 20 cm below modern ground surface, and at its greatest depth, the floor is 42 cm below the present surface. Associated with the floor surface are a more-or-less centrally located fireplace and an unburned pit feature. The lack of post molds or evidence of roof/wall material indicates a lightly built superstructure. Outside the structure but apparently associated with the same occupational surface are one burned and two unburned pits and a possible refuse disposal area.

Several carbon samples from the structure were radiocarbon dated at 3340 B.P. (floor); 2830 B.P. (fill); and 2650 B.P. (fireplace). Taking calendrical calibration of these dates into account, Kane et al. (1988:201-202; 218-219) estimate that the structure and the associated use surface and features were occupied about 1200 B.C. plus or minus a few hundred years. Projectile points associated with this component were not depicted or described in detail, so they cannot be evaluated here for chronological placement.

Several additional pits were encountered in the excavations that evidently originated at higher levels than the Late Archaic component described above. Radiocarbon ages of 1630 B.P. and 1250 B.P. were obtained from these features.

Artifacts clearly associated with the Late Archaic structure include "1 basin metate, several 1-hand manos, 1 projectile point, 2 bifaces, 8 utilized flakes, and numerous pieces of flaked lithic debitage" (Kane et al. 1988:220). Associated with the occupational surface outside the structure were a number of utilized flakes, several unifacial tools, 4 projectile points, 2 thin bifaces, 2 one-hand manos, 2 metate fragments, several indeterminate or miscellaneous nonflaked lithic artifacts, and more than 100 pieces of lithic debitage (Kane et al. 1988: 225-233).

Botanical analysis of a sample of fill from the structure fireplace yielded seeds or fruit identifiable as chokecherry (*Prunus virginiana*), mustard family, and goosefoot (*Chenopodium*), but no maize or other domesticates. A bulk soil sample from the structure fill produced additional evidence of possible food plants, including *Amaranthus*, *Portulaca*, and *Pinus edulis*, but no domesticates. Samples from the later occupations at the site also lacked evidence of domesticates, even though the dates indicate that maize was being grown in the area at these times.

Kane et al. (1988:219-221) interpret the early component at Casa de Nada as reflecting a seasonal occupation, perhaps as a residential base camp employed as part of a logistic settlement strategy in a mobile settlement framework. They suggest that the Late Archaic occupation was by a small group, probably an extended or nuclear family. After this initial use in the early part of the

Late Archaic, there was a long hiatus, after which the locus was used as a limited activity area by Basketmaker II or Pueblo I period individuals or groups.

Kane et al. (1988:219-221) also propose that the remainder of the large site 5MT2731 reflects a similar use history as does the portion labeled Casa de Nada. They believe that the site was probably a regular "reoccupation" locus during the late Archaic, with small groups establishing residential camps repeatedly over a period of years or centuries as part of a seasonal procurement schedule. At later times, the site served as a limited activity locus for groups that practiced agriculture and presumably maintained more substantial habitations in other locations.

Ridge Line Camp (5MT2242)

This site, which appears to have an Archaic component as well as evidence of later Puebloan occupations, is located on a ridge in the Sagehen Flats area overlooking Sagehen Marsh approximately 1.5 km west of the Dolores River. Portions of the site were excavated in 1979 as part of the work of the DAP (Southward 1988). Seven additional sites with probably Archaic components occur within 1 km of Ridge Line Camp. An area approximately 100 x 100 m was investigated by means of magnetometer survey, intensive surface collection, excavation of a random sample of 2 x 2 m test pits, and blading of selected areas in search of buried features. Of the more than 5500 items collected at the site, only 93 were sherds; there were 162 flaked lithic tools, 277 nonflaked lithic artifacts, and more than 5,000 pieces of flaked lithic debitage. Assemblage profile analysis indicated that the Ridge Line Camp lithic materials represented a highly curated technology and were more similar to Archaic than to Anasazi assemblages (Southward 1988:249; Hruby 1988).

Also supporting a predominantly Archaic origin for the assemblage is the predominance of one-hand manos. Of the 39 manos that were collected at the site only one was classed as a two-hand variety, with the remainder being either one-hand manos or fragments (Hruby 1988). Several of the projectile points that were collected (primarily from the surface) are said to be Archaic types but are not assigned to typological categories (Southward 1988:250). The three points that are pictured are from surface collections (Southward 1988:250). One may be classifiable as an early, "high" side-notched style resembling Northern and Sudden Side-notched points from Utah or the Moquino Side-notched type from the southern Colorado Plateau (Holmer 1986; Matson 1991). This would suggest a Middle Archaic occupation. According to Matson, similar points at the Moquino site near Grants, New Mexico are associated with a radiocarbon age of 3920 B.P., which is roughly at the Middle/Late Archaic transition. The other two depicted points may fall within the range of variation of the Armijo complex, which Irwin-Williams (1973) ascribes to the Late Archaic, about 3800 to 2800 B.P.

The excavations at Ridge Line Camp encountered three features in the northwestern quadrant of the site: a cluster of 3 one-hand manos and a thin uniface; a basin-shaped fireplace filled with cracked cobbles and burned soil; and an unlined hearth. Carbonized material from this last feature yielded a radiocarbon age of 3710 B.P. (Southward 1988:248) which would fall at the end of the Middle Archaic in Huckell's (1996) scheme, which divides Middle from Late Archaic at 3500 B.P. The two burned features yielded no macrobotanical specimens that could be interpreted as food remains.

Southward (1988) interprets Ridge Line Camp as a limited activity site that was repeatedly used over a long period of time. The tool assemblage includes implements used both in hunting and plant food processing. Hruby (1988) notes that the debitage analysis suggests that the final stages of tool manufacture or maintenance of curated lithic tools took place at the site.

Bodo Canyon Sites

In 1985 and 1986, CASA of Cortez, Colorado excavated portions of several sites as part of a data recovery plan to mitigate the effects of the disposal of uranium mill tailings in Bodo Canyon, located just south of Durango, Colorado (Fuller 1988a). Several of these sites had what are probably Late Archaic or Basketmaker II components—5LP1096, 5LP1102, and 5LP1114. Chronometric dates from two of the sites indicate they fall within the early Basketmaker II period, as it is defined in this report. On the other hand, Fuller (1988a) classed them as Late Archaic and they lack some of the cultural diagnostics of the more clearly defined Basketmaker II sites in the Animas drainage unit.

At site 5LP1096, a shallow, poorly preserved surface structure was encountered in a trench in an area of a multicomponent site where surface collections consisted entirely of lithic artifacts. No subsistence remains or datable materials were recovered. Fuller (1988a:222-223) suggests that the structure may be part of either to a Basketmaker II or a Late Archaic component, but that evidence is not sufficient to choose between the two.

Site 5LP1102 (Fuller 1988a:269-281) was unusual among the preceramic components excavated in Bodo Canyon in that the site did not also have evidence of later ceramic period occupation(s). Excavations at this site revealed a possible structure consisting of a shallow, basin-shaped pit 2 or 3 m in diameter that had been partially destroyed by an arroyo. On its poorly preserved floor was a cluster of burned sandstone. The walls of the pit structure were nearly vertical where preserved. It could not be determined whether this was a small habitation structure or the base of another type of pit feature (Fuller 1988a:274). Carbonaceous material was abundant in the pit fill; radiocarbon ages from the fill were 2390 ± 70 B.P. and 2090 ± 70 B.P. (Fuller 1988a:276). Near the pit structure were a small pit and a circular area of cultural fill that possibly indicated an additional pit structure. No burned cobble midden of the sort found at nearby sites assignable to the Basketmaker II period was observed.

Artifacts from 5LP1102 included a portion of a shallow basin-shaped metate and a one-hand mano. Projectile points included the base of a large, corner-notched dart point similar to Basketmaker II styles and the bases of two smaller points with straight bases and side notches placed relatively high on the sides of the point. These resemble Sudden Side-notched and San Rafael Side-notched points; in central Utah, the latter style probably dates to the late Middle Archaic (Holmer 1986; Fuller 1988a:276). Macrobotanical remains recovered from a sample taken from the lower fill of the basin-shaped pit structure yielded only a few *Chenopodium* seeds and several fragments of charred pinyon and juniper wood. The radiocarbon dates from the site are consistent with an assignment to Basketmaker II rather than Late Archaic, but there is not enough other evidence to confirm this. The presence of the two side-notched points noted above may indicate multiple uses of this site over a long period of time, but again, there is not enough evidence to conclusively confirm or deny this possibility.

At Site 5LP1114, interpreted as a Late Archaic campsite, the floor of a small, poorly preserved room was excavated (Fuller 1988a:305-315). The diameter of the more-or-less oval, slightly basin-shaped floor ranged from 3.25 to 3.4 m. One definite and two possible postholes were recorded on the perimeter, but there were no other floor features. A single radiocarbon date of A.D. 30±60 was obtained from charcoal in a burned roof fall stratum overlying the floor (Fuller 1988a:312). It is not clear whether this was reported as a calendar-calibrated date or whether it is actually in radiocarbon years, but expressed as calendar years instead of years before present. No flotation or pollen samples from the site were submitted for analysis. Fuller (1988a:312) states that "the lack of food-processing features or well-preserved use surfaces precluded the recovery of interpretable subsistence remains." Few artifacts and no projectile points were recovered from the site. There was no evidence of a burned cobble midden such as characterized clear-cut Basketmaker II sites in the Bodo Canyon area.

At the time Fuller wrote, it was still generally accepted that the Basketmaker II period did not date before A.D. 1. It is possible that 5LP1096, 5LP1102, and 5LP1114 represent Basketmaker II habitations that are somewhat earlier than sites 5LP478A and 5LP1104 from this project, which have clearer Basketmaker II cultural diagnostics. The first three sites listed above may represent seasonally used field stations or camps that were part of a Basketmaker II settlement pattern but that lack the diagnostics of this cultural complex that are evident at habitation sites.

Relevance of Paleoenvironmental Reconstructions

A number of the studies reviewed above propose or suggest that major variations in numbers of sites (or radiocarbon ages) may have resulted from the effects of climatic change on human adaptations. This is especially true for the Middle Archaic, where the mid-Holocene warm period (formerly called the Altithermal) is frequently discussed in relation to changes in site numbers, types, or distributions. For example, Geib (1996a) cites a number of authors who postulate a relatively warm, dry mid-Holocene in the northern Southwest. In a fairly recent comprehensive review, Thompson et al. (1993) have summarized pollen, pack rat midden, and lake level evidence regarding late glacial and Holocene climates in the Western U.S. These authors infer that the period of minimum effective moisture for the northern Southwest was around 6000 B.P., but that conditions at that time were wetter than today southeast of the Four Corners, and either drier or the same as today northwest of that point (Thompson et al. 1993:493-494). A closer examination of their data sources confirms that most of the ones indicating lower effective moisture levels at 6000 B.P. are from locations north of the Four Corners area. Likewise, a number of locations in Arizona and New Mexico have yielded evidence of effective precipitation higher than present at approximately 6000 B.P.

This pattern is consistent with Adams and Petersen's (Chapter 2, this report) claim that the mid-Holocene was in fact warmer than present, but that higher temperatures should correlate with an intensified summer monsoon in the Southwest. Heating of the highlands of western North America would have provided more energy for the circulation pattern that draws moist air from the Gulf of Mexico and the Pacific into the Southwest, leading to a stronger monsoon that penetrated farther inland to points north and northwest of the Four Corners. This should have caused the boundary between wet-summer and dry-summer areas to shift to the north or northwest, making summer rainfall more abundant and reliable in the Four Corners area. Adams and Petersen state that data from pack rat middens suggest that warmer, wetter summers may have been paired with cooler, drier winters during the mid-Holocene in the Colorado Plateau.

The apparent rise in Middle Archaic site numbers in northwestern New Mexico and probably in the study area is consistent with Adams and Petersen's model. A strong summer monsoon would favor the growth of the grasses and weedy annuals that were evidently an important part of warm-season subsistence for Middle Archaic groups utilizing the San Juan

Basin. If Petersen's reconstruction is correct, however, the apparent decline in Middle Archaic sites in the Glen Canyon Basin seems anomalous. The summer monsoon does weaken from southeast to northwest, and at present, it is less reliable in southeastern Utah than in northwestern New Mexico. Perhaps this gradient was even steeper in mid-Holocene times. And the Northern Colorado River Basin, being farther north, may have been less affected by variations in the strength of the monsoon. The warming trend in the mid-Holocene would also have made the higher elevations in this area somewhat more attractive to hunter-gatherers, as noted by Reed and Metcalf (1999) although cooler, drier winters might have counterbalanced this to some extent. Adams and Petersen (Chapter 2, this report) also note that data from the Four Corners area indicate that the upper tree line had dropped to approximately its present location by about 3500 B.P., presumably recording the end of the mid-Holocene warm period. This is consistent with the shift of sites toward lower elevations at about 4000 B.P. that was noted by Reed and Metcalf (1999) in the Northern Colorado River Basin study area.

RESEARCH ISSUES AND FUTURE DIRECTIONS

Since the publication of the last prehistoric context document for southwestern Colorado (Eddy et al. 1984), progress has been made in documenting and analyzing archaeological manifestations of the Paleoindian and Archaic periods. Understanding of the Archaic has especially benefitted from increased recognition of sites of this period on survey, and by excavation of several Archaic components. There has also been a great deal of research on the Archaic in neighboring parts of the Four Corners area, and this work helps provide a context for further research in the study area. Knowledge of the Paleoindian period has also increased, but largely on the basis of increased recognition of scattered surface evidence. Jodry (1999) and Pitblado (1999) review evidence of site distributions and of excavated Paleoindian components in the Rocky Mountains that is relevant to understanding Paleoindian manifestations in and around the study area.

Site Recognition

To date, this work has served to inform researchers that the archaeological record of the study area is capable of providing a substantial amount of information about early occupations, but that the information source has just begun to be tapped. At this point, the primary need is for better recognition and documentation of both Paleoindian and Archaic manifestations by surveys done in southwestern Colorado. Fieldworkers in the area, who may be trained primarily to record later materials, need to be well informed about the typological and technological indicators of early components as these are manifested in the larger Four Corners region, not just in southwestern Colorado per se.

Functional Site Types

Assignment of functional site type designations on the basis of field survey alone is probably not warranted for most early sites. It is clear that many sites are the product of multiple uses over long periods of time. If functional labels are to be assigned to surface assemblages from open sites, it should be on the basis of the totality of evidence, including analysis of the kind of technological organization that is represented, taking into account kind and location of lithic source materials. Billman's (ed. 1997) grouping of aceramic sites into large, medium, and small categories for the purpose of selecting a sample for testing is a conservative but sensible approach at this stage of research. It may be possible to design other descriptive categories (such as sites with and without evidence of features) that will address a site's potential to provide information regarding its role(s) in a settlement system (or a series of such systems through time).

Chronology

Dating Paleoindian and Archaic manifestations is a huge problem and will continue to be one, given the nature of the record. Locating sites that have the potential to yield samples for interpretable chronometric dating is a high priority, as is preserving and ultimately testing such sites. Although a number of workers have become increasingly skeptical of the use of projectile point types as effective temporal markers, it is worth continuing to try to calibrate the temporal distribution of particular types. It is the opinion here that this is best done on a broad regional scale, or at least one considerably larger than the study area. What is needed is a systematic comparison of projectile points from dated, well-understood contexts over the greater Four Corners area. This is necessary to obtain a large enough sample, and to overcome the effects of differing research and labeling traditions in the four states that are involved.

Regional and Inter-regional Date Summaries

Summaries of chronometric dates and associated archaeological contexts, such as have been made by Geib (1996a) and Reed and Metcalf (1999) can be enormously helpful in building chronological frameworks, as well as in helping researchers develop hypotheses about demographic and settlement pattern changes through time and space. The existing summaries need to be expanded to include the entire "greater Four Corners area," and well-dated archaeological contexts need to be summarized systematically and in a comparable way across the whole region. The scale of Archaic and especially Paleoindian mobility makes it appropriate to investigate demographic, cultural, and adaptive change at this broad regional level, and a summary of dates and associated contexts for such a region will establish a firm temporal-spatial foundation for such studies. As noted by both Geib (1996a) and Reed and Metcalf (1999), date histograms for particular localities or regions cannot be used as direct proxies for prehistoric population; adaptive mode, site formation process, and site preservation and visibility must all be considered. Nonetheless, such chronological frameworks can be extremely useful if applied intelligently.

Paleoenvironmental Correlations

Similar comments can be made about the paleoenvironmental data and reconstructions that various researchers have attempted to correlate with perceived cultural, demographic, and adaptive changes. At this point, there is some tendency for workers in each region to point to the paleoclimatic reconstruction that best fits their archaeological data. As noted in the discussion of the Middle Archaic, the climatic reconstruction that seems to fit the archaeological data from one area may conflict with the archaeological patterns in an adjacent region. A broader macroregional approach to both the paleoclimatic record and the archaeological record may lead to a better understanding of the temporal and spatial dynamics of both kinds of record, and to whether it makes sense to look to climatic change as an explanation for changes in the archaeological record. In particular, the related questions of whether Middle Archaic site frequencies and distributions are responsive to a mid-Holocene climatic change, and if so, to what aspects of this climatic change they are responding, are important ones in research on the Archaic period throughout the West. Archaeologists and paleoenvironmental specialists working in the Four Corners region can make an important contribution to further resolution of these questions.

Temporal Trends in Site Frequency

The preceding text has reviewed temporal trends in site frequency for different parts of the Four Corners area and has pointed out that these trends are often complementary rather than parallel (e.g., a relatively strong record of Middle Archaic occupation in Northwestern New Mexico and the study area but a weak one for the Glen Canyon basin). Is this the result of differences in sampling, differences in application of various phase schemes, or actual differences in the archaeological record that have implications for reconstructing broad regional settlement and demographic patterns?

Paleoindian–Archaic Transition

The question of the relationship of Late Paleoindian to Early Archaic is one that remains open, and may have different answers in different parts of the Four Corners area. It is easier to see Early Archaic connections to the Paleoindian complexes that Pitblado (1999) associates with Great Basin Stemmed points and those she labels as Angostura than it is to relate Early Archaic manifestations to the more Plains-oriented Paleoindian complexes. Irwin-Williams' (1973, 1979) Jay phase may provide a link between the Early Archaic and the Great Basin Stemmed point complex, although Matson (1991) has questioned Irwin-Williams' late dating of Jay points and the validity of the associations used in the initial phase definition. Vogler (1993a) provides evidence, however, of the utility of the Jay phase construct in the northern San Juan Basin. Pitblado's (1999) Great Basin Stemmed complex includes much variety and as presently defined, occupies approximately 3,000 years. It may be that further refinement of this concept would enable chronological and associational distinctions to be made between manifestations that represent a more "Archaic-like" adaptation and those that are more "Paleoindian." At this point, however, sorting out the relevant chronological and distributional patterns remains a challenge, and there is little evidence available on which to base comparisons of Paleoindian and Early Archaic adaptations.

Maize and the Late Archaic–Basketmaker II Transition

For the Late Archaic, the most significant questions have to do with when maize appeared, what difference it made in the lifeways of groups occupying the Four Corners region, and what roles migration versus diffusion played in the introduction and establishment of maize agriculture. These questions are discussed further in Chapter 5. It appears that a maize-dependent lifestyle was well established in the Four Corners area by late B.C./early A.D. times, during the "classic" Basketmaker II period (now referred to as Late Basketmaker II). We now know that maize appears in some parts of the Four Corners region as early as 1000 or 1200 B.C., and is documented in the study area by approximately 400 B.C. The possibility exists that during the last millennium B.C., some groups continued to pursue a foraging adaptation, some used maize as an relatively minor "insurance policy," and others moved fairly rapidly to a substantial or even heavy dependence on the new food source. In addition to continuing to find and exploit contexts where actual botanical evidence of subsistence patterns might be obtained, researchers need to continue to define settlement pattern and artifactual correlates of these three different adaptive patterns.

Ecological Modeling

As discussed by Reed and Metcalf (1999) and by Adams and Petersen (Chapter 2, this report), this type of modeling will be helpful in a number of ways—for example, in providing expectations about what types of sites should be found in what parts of the region; what resources would be exploited and what ranges might be required in periods of widespread drought; and whether maize would have been adopted rapidly or only gradually in the Four Corners area, given low initial population densities. That is, modeling the yields and distributions of resources known to have been used in the Archaic can provide some expectations about what economic strategies prehistoric groups could (and should) have pursued if they were making optimal choices about costs and benefits of alternative strategies. Modeling of this sort is not a substitute for using the archaeological record to find out what people where actually doing, but it can provide testable hypotheses to help direct empirical research, and can also be of help in sorting out alternative explanations for empirically observed patterns.