RECENT WORK on LATE PALEOINDIAN SITES at the SARGENT WILDLIFE MANAGEMENT AREA, CHAMA, NEW MEXICO

Overview and Prospects for the Future

by
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Cover Photo: Sargent Wildlife Management Area, Late Summer 2005

Introduction

The New Mexico Department of Game and Fish (NMDGF) is proposing to construct an elk viewing facility at their Edward Sargent Wildlife Management Area (Sargent WMA) in northern New Mexico (Figure 1). This development is viewed as a means of allowing the general public, through the "Gaining Access Into Nature" (GAIN) program, to acquire an appreciation of the game management activities being undertaken by the NMDGF and to view some New Mexican wildlife. As part of the planning and design process for this facility, and to protect any historic properties from adverse effects, the NMDGF completed a Class III cultural resources inventory and subsequent technical report (Dello-Russo 2005) for a block area encompassing the Area of Potential Effect (APE) for the proposed development.

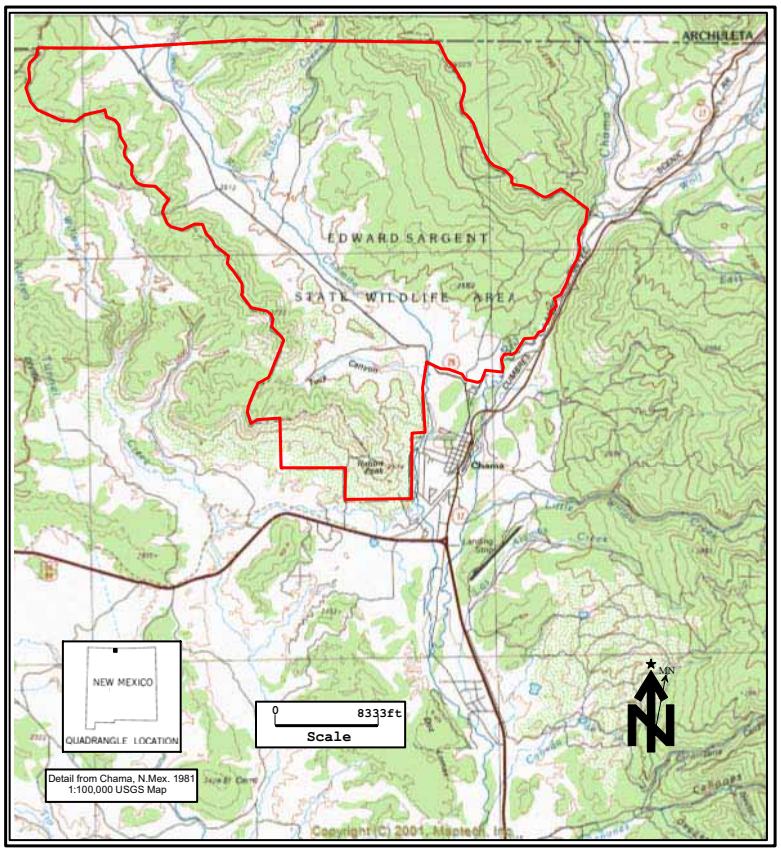

Figure 1. Location of the Sargent Wildlife Management Area near Chama, NM.

Cultural Context for the Region Surrounding the Sargent WMA

The following discussion focuses solely on Paleoindian and Archaic time periods, primarily because neither the Late Paleoindian nor the Archaic occupations in the region surrounding the three Sargent sites is well understood and, perhaps more importantly, because the Sargent sites have the potential to provide researchers with chronological, technological, subsistence and paleoclimatic data that can help us understand the important transitional time between the terminal Late Pleistocene epoch and the start of the Holocene epoch.

Paleoindian Period

Due to the apparent relative paucity of Paleoindian remains in the Chama area, and the relative abundance of documented Paleoindian remains in the nearby San Luis Valley and environs of southern Colorado, the following summary of the Paleoindian period is largely distilled from a comprehensive discussion of the Paleoindian manifestations in the upper Rio Grande basin presented by Jodry (1999). The reader is referred to Jodry's study for additional supporting details.

It is generally recognized that the earliest evidence of man in the American Southwest occurred during the end of the Late Pleistocene geological epoch. The previously accepted early route of entry into the New World (across the Bering land-bridge, south along the Canadian Rockies via an ice-free corridor between the Laurentide and Cordilleran ice sheets) is being questioned because the corridor environment is now viewed as having been too harsh to support human groups. Alternate routes include a New World entry along the exposed continental shelf of the Pacific coast.

Originally, a unilinear progression of projectile point forms (Clovis to Folsom/Midland, followed by Agate Basin, Hell Gap, Alberta, Cody, and Frederick/James Allen) represented the temporal framework for Paleoindian evolution in western North America. However, it is now thought, by some, that the western landscape was simultaneously utilized by several different hunter-gatherer groups (co-traditions) during the end of the Pleistocene and the early Holocene geological epochs. It is now argued that the Late Paleoindians exhibited both Plains adaptations and Foothills-Mountain adaptations (Frison 1991; Jodry 1999; Pitblado 2003), the latter of which were characterized by a variety of lanceolate, stemmed and fishtail bifaces that were flaked in a parallel-oblique pattern and utilized as projectile points and/or knives. These tools were generally made of locally available raw materials and were associated with the hunting of mountain sheep and mule deer. The Plains adaptation, in contrast, focused more on communal bison hunting and was characterized by Agate Basin, Hell Gap, Cody and James Allen point styles.

Additional Paleoindian manifestations in the region include the Goshen point style, which is considered similar to both Plainview types and the unfluted Folsom type known as Midland. Some excavations suggest that Goshen predates Plainview (a north-south dichotomy), and also predates Folsom in some places, while being essentially contemporaneous in others. Renewed excavations at the Hell Gap site suggest some overlap among Clovis, Goshen and Folsom around 10,900 BP. In addition, recent recalibrations of radiocarbon dates for Agate Basin and Cody Complex points suggest chronological overlap between those manifestations as well. In light of these complex chronological issues, continued excavations at stratified Paleoindian sites are imperative.

The Cody Complex, dating to between 10,000 and 8800 BP, is characterized by a variety of square base projectile points (e.g. Scottsbluff) with slight to strong shoulders, and a distinctive knife with a transverse blade. The widespread geographic distribution of Cody artifacts suggests long duration and/or higher populations than other possibly contemporaneous traditions. The expansion of the piñon pine around 9600 BP, possibly in response to greater summer

precipitation and warmer annual temperatures, may have redefined the significance of the foothill zone for Late Paleoindian groups such as Cody. Discovery of grinding slabs at the Jurgens site (Wheat 1979) suggests an intensification of plant processing by Cody peoples.

Weaponry manufactured as part of the Foothills-Mountain Tradition in Colorado (and possibly New Mexico) is thought to be characterized by parallel-oblique flaking, variable workmanship, a slightly concave, ground base, and an apparent preference for quartzite tool stone. Numerous Late Paleoindian quartzite James Allen points have been observed in the northern San Juan Mountain foothills near Montrose, Colorado (author, personal observation). Mueller and Stiger (1983:77) suggest that by 8800 BP, a "settlement preference for the contemporaneous occupation of northside ridge top and southside lowland locations" was established, with habitation camps on the ridge tops and flintknapping areas in the lowland areas. Despite the reported chronology for these developments, there are some indications that lanceolate concave base specimens may have continued in use until 7650 BP on the Plains (Benedict 1992) and until 6000 BP above timberline (Benedict 1996). According to Jodry (1999:104), "the period coincident with and following the Cody Complex is key to understanding cultural-ecological adaptations to essentially modern environments."

From a review of literature for the vicinity surrounding the current project area, it is apparent that the Paleoindian and Late Paleoindians adaptation are underdocumented and poorly understood. Townsend (2000:12), in a review of Dittert's (1958) work at Navajo Reservoir (to the northwest of the Chama area), notes that the earliest site in that area dates to about 1850 BC. From that Townsend concludes that "there is no Paleoindian horizon within this area." However, Trierweiler et al. (1988:8) note that the Paleoindian use of Pedernal Peak cherts and chalcedonies, as well as Jemez obsidian, to manufacture points clearly documents "that early hunters and gatherers were exploiting lithic sources in the Jemez and Chama areas as early as Clovis times." Duncan et al. (1998:8) suggest that few Paleoindian sites (sites with "unfluted spear points") are known from the Chama area.

Hannaford (1985:4) claims that two large lithic sites, "located some 32 km east and southeast" of his project area (which was, in turn, just west of Chama), contain Paleoindian components, but these are currently unidentifiable in the site records at ARMS. In a discussion of the Lobo Lodge sites (LA 3951 and LA 3952, recorded in 1970 by David Snow of the Laboratory of Anthropology), Boyer (1998:6) notes that LA 3952 contained, in 200 sq m, about 18 chert flaked stone artifacts, including "a single-edge side scraper, two multiple-edge scrapers, and an *un-notched, concave base projectile point fragment*" (emphasis added by Dello-Russo). It is possible that the aforementioned point fragment provides evidence of a Late Paleoindian (Foothills-Mountain Tradition) occupation in the area.

Archaic Period

As in other regions of the American Southwest, the Archaic period in northern New Mexico (5500 BC to AD 200) is often thought to have evolved out of the preceding Paleoindian tradition, although there is still some debate about this. Irwin-Williams and Haynes (1970) have argued that, as the populations of large bison dwindled with increased warming of the climate, the Paleoindian lifeways terminated in the Southwest, or became more focused on the Plains. Archaic peoples, arriving from the southwest, occupied the areas abandoned by the emigrating

Paleoindians. This hypothetical scenario suggests a temporal hiatus following the Late Paleoindian exodus and further points to the need to more closely examine the archaeological evidence from the transitional period between the Late Paleoindian period and the Early Archaic period in New Mexico. In particular, this underscores the need to re-examine similarities between the stemmed and stemmed-concave base projectile points of the Late Paleoindian Foothills-Mountain Tradition (e.g. Great Basin Stemmed, James Allen, Sierra Vista) and those very similar points currently associated with the Early Archaic period (e.g. Jay and Bajada points). While Turnbow (1997:223) considers the Early Archaic points in New Mexico to be very different from the Terminal Paleoindian Cody Complex points, he also sees similarities between a Jay point from site LA 66874 in the Jemez Mountains, with an associated date of 5559 – 5242 BC, and Paleoindian points by stating, "The quality of workmanship embodied in this point is reminiscent of earlier Paleoindian types and the possible association with the early end of the date range is intriguing" (Turnbow 1997:216).

By the Middle Archaic period (3500 to 1800 BC), an increasingly diversified assemblage of projectile point styles becomes evident and this is generally accompanied by a greater focus on grinding technology for the processing of seed and other plant resources. The Late Archaic period (1800 BC to AD 200) is characterized by a more-widespread appearance of domesticated plants (maize, beans) and the increased use of small, ephemeral habitation structures, particularly at seasonal gathering locations (Dello-Russo 1999).

To the west of Chama, Hannaford (1985:29) identified an obsidian projectile point at site LA 46172 as "reminiscent of a crude Bajada point (Chapman 1977:401)," with associated occupation dates sometime between 4800 and 3200 BC. The base and medial portions of this point exhibit rough bifacial trimming and "(t)he shouldered point has straight lateral edges and a contracting, slightly concave base; no basal grinding is evident. The point measures 2.7 x 2.1 x 0.7 cm; basal width is 1.3 cm." No illustration of the point is available in Hannaford's report, but the artifact was apparently collected and curated. It is possible that the point provides additional evidence of a Late Paleoindian (Foothills-Mountain Tradition) occupation in the Chama area.

Obsidian hydration dates from two sites in the region surrounding the current project area provide some evidence of Early-to-Middle Archaic period (4100 BC) and Middle-to-Late Archaic period (2300-2000 BC) occupations (McCrary 1983:22), although the projectile point found at site LA 45849 is thought to be associated with a Basketmaker II-III occupation. The image of the point provided in McCrary's report suggests a morphological similarity with the Sudden Side-notch or San Rafael point style, which has been dated to the Middle-to-Late Archaic period elsewhere (Turnbow 1997). Finally, an En Medio style projectile point suggests a Late Archaic occupation at nearby site LA 46170 (Hannaford 1985).

Brief Review of the 2005 Cultural Resources Inventory

The 2005 cultural resources inventory resulted in the documentation of three prehistoric, multi-component archaeological sites, two historic period sites (which are not discussed in this report) and 10 isolated occurrences within the APE. Subsequent visits to the area have produced additional isolated projectile points and one additional prehistoric site. These latter cultural materials have not yet been formally documented. Site LA 148949 is a Late Paleoindian and

Middle-Late Archaic flaked stone and ground stone artifact scatter. Site LA 148950 is a probable Late Paleoindian and Late Prehistoric campsite, and site LA 148951 is a probable Late Paleoindian kill and/or processing site eroding out of a small alluvial terrace. Of the isolated occurrences, a side-notched atlatl dart point base further supports the Middle-Late Archaic occupation observed at site LA 148949; a corner-notched hafted knife and a recently recovered basalt (or dacite) corner-notched, expanding base dart point support inferences for a Late Archaic presence in the area; and a small corner-notched arrow point provides additional evidence of an early Formative presence in the area. Together with the modern hunting that occurs at the Sargent each fall, the prehistoric materials described above have the potential to provide interesting glimpses into the behaviors of hunters over a span of 9,000 years.

Detailed Discussion of Three Sites at the Sargent WMA with Late Paleoindian Components

LA 148949 (Chamita Ridge I)

This site is thought to represent the remains of hunting-related occupations during the Late Paleoindian period (7400 – 5950 BC) and the Middle Archaic period (3500 BC – AD 200). The site consists of a broadly dispersed, open flaked and ground stone artifact scatter, located on a NNE-to-SSW trending, grassy ridge formed by tributary drainages of Chamita Creek along the southern flanks of the south San Juan Mountains. The ridge is comprised of Late Pleistocene alluvial outwash cobbles (mostly rounded), many of which are exposed on the ridge surface. The current vegetation community is comprised of grasses, some forbs and some shrubs (e.g. chokecherry), although the presence of several burned and cut tree stumps suggests the former existence of an open Ponderosa pine woodland. The site, as it is currently defined, covers an area of approximately 4230 square meters.

The broadly dispersed artifact assemblage on the site consists largely of debitage, a small assemblage of lithic tools and 1 tan sandstone slab metate fragment (16 mm thick). The debitage includes numerous interior flakes and utilized flakes, irregular cores and core fragments (n=5), a bifacial core, 1 utilized biface-thinning flake, and angular debris. The tools include 1 possible quartzite hammer stone, a red-and-white quartzite retouched knife (Figure 2 – Left; collected), 2 possible gravers, 1 notched flake, 1 burned red-and-white chert San Rafael Side-notch projectile point base (collected), and 1 dark gray dacite Scottsbluff projectile point base (Figure 3 – Left; collected). Raw materials observed include a wide range of cherts (including Cumbres Chert), chalcedony, quartzite, obsidian, fossiliferous chert, sandstone and basalt (dacite?). A number of the surface artifacts have been burned (crazed).

The artifact assemblage is suggestive of irregular core reduction, bifacial core reduction, flake utilization (notch and possible gravers) and cutting (retouched knife) activities. These activities were probably undertaken in conjunction with hunting-related activities (further substantiated by the presence of two projectile point bases). The small fragment of a sandstone slab metate suggests some limited plant processing activities as well. Although no unambiguous features were noted, the presence of a fire-cracked rock cluster and a partially buried upright slab do point to the possible presence of at least one thermal feature. Alternately, a natural burn (as indicated by burned tree stumps) may have produced the fire-cracked rocks.

Figure 2. Flaked stone knives from sites at Sargent WMA.
Left) Red-white quartzite retouched knife (LA 148949); Right) Purple-white chert retouched knife (LA 148950).

Figure 3. Temporally-diagnostic artifacts recovered from sites at Sargent WMA.
Left) dacite Scottsbluff projectile point base (LA 148949); Center) dacite James Allen (or Sierra Vista) projectile point base with impact damage at tip (LA 148950); Right) obsidian James Allen (or Sierra Vista) projectile point base (LA 148951).

As noted above, the projectile point bases include a dacite Scottsbluff style (for dimensions see Table 1), which indicates a Late Paleoindian presence, and a red-and-white burned chert San Rafael Side-notch style, which indicates a Middle-to-Late Archaic period presence. These two components appear to be somewhat spatially distinct on the ridge and, if so, the sandstone slab metate fragment is more closely associated with the Middle Archaic period occupation. The Late Paleoindian presence may represent manifestations of the Foothills-Mountain Tradition (Frison 1991; Jodry 1999; Pitblado 2003).

The Late Paleoindian and Middle-Late Archaic components of site LA 148949 have some potential for buried cultural materials although, because the land form is comprised largely of late Pleistocene alluvial cobbles (many exposed on surface), the deposits might be shallow. The site has some potential to address chronology and settlement-subsistence research issues for Late Paleoindian and/or Archaic occupations. It is likely that unauthorized collection of diagnostics occurred at this site in the recent past.

Table 1. Summary of Late Paleoindian diagnostic artifacts recovered at Sargent WMA.

Artifact Type	**Scottsbluff projectile point base**	**James Allen (Sierra Vista) projectile point**	**James Allen (Sierra Vista) projectile point base**
Site No.	LA 148949	LA 148950	LA 148951
Site Name	Chamita Ridge I	Chamita Ridge II	Chamita Knoll
Sample No.	01-01	02-02	03-01
Report Figure No.	Figure 2 – Left	Figure 2 – Center	Figure 2 – Right
Material	Dacite	Dacite	Obsidian
Flaking Pattern	Irregular	Collateral / irregular	Collateral / irregular
Artifact Outline	Parallel sides, very slightly flared at base	Slight inward taper along basal edges with very slight outwardly flared ears	Slightly expanding or flared at ears
Base Shape	Straight	Shallow concave	Moderately deep concave
Transverse Cross-section	Thin lenticular	Very thin lenticular	Thick lenticular
Comments	Basally thinned, very light grinding on lateral edges	Basally thinned, very light grinding on 1 lateral edge, too thin?	Basally thinned, moderate grinding on lateral edges and ears
Dimensions	Max base width: 22 mm Max broken length: 21 mm Max basal thickness: 5 mm Depth basal concavity: n/a	Max base width: 16 mm Max broken length: 24.5 mm Max basal thickness: 3.5 mm Max thickness: 6.7 mm Depth basal concavity:0.8 mm	Max base width: 21 mm Max broken length:15 mm Max basal thickness:8.5 mm Depth basal concavity: 3 mm
C-14 Age Range	9,400 – 8,300 BP	9,350 – 7,900 BP	9,350 – 7,900 BP
Reference	Pitblado 2003:84	Pitblado 2003:112	Pitblado 2003:112

LA 148950 (Chamita Ridge II)

This site, interpreted as the remains of a multicomponent campsite, consists of a dense, broadly distributed lithic artifact scatter with a thermal feature and an associated dense scatter of ground stone metate fragments. The site is located on the top and side slopes of a NE-to-SW trending grassy ridge that is flanked by two small intermittent drainage tributaries of Chamita Creek. The current vegetation community is composed of grasses, some forbs and some shrubs (chokecherry?) although the presence of several burned and cut tree stumps suggests the former existence of an open Ponderosa pine woodland. The site, as it is currently defined, covers an area of approximately 6078 square meters.

The prehistoric artifact assemblage at this site numbers in the 100's and varies in density from 0.5 artifacts per sq m to over 10 per sq m. The highest density of artifacts is found in association with Feature 1 (Figure 4). The assemblage includes expedient interior flakes (very few cortical flakes observed), utilized flakes, irregular cores, biface fragments, a very high percentage of biface thinning flakes and sharpening flakes, and a range of tools. The lithic materials represented in the assemblage include a wide range of cherts, obsidians, chalcedonies, dacite and petrified wood (1 biface). Some of the artifacts are crazed from burning.

The tools in the assemblage include 1 retouched tabular gray-blue chert tool; 1 purple-white fossiliferous chert knife made from a large blade core and retouched at one end (Figure 2 – Right; collected); 1 biface fragment heavily retouched on both the lateral and distal edges; 1 almost complete dacite James Allen point (Figure 3 – Center; collected; See Table 1 for metrics); and a very high number of sandstone slab metate fragments clustered at Feature 1. At least 9 of the slab fragments are both ground and pecked. A single, well-flaked hafted knife fragment made of orange-and-white chalcedony was found on site not far from Feature 1. The base of this artifact is parallel-sided and slightly concave with parallel-oblique flaking. The lateral edges of the base taper slightly inward and end with slightly flared ears. Some very light grinding occurs on one lateral edge and the broken blade is strongly asymmetrical. The artifact is very thin, but

Figure 4. Feature 1 at LA 148950 (probable hearth).

its morphology is somewhat reminiscent of a Cottonwood Triangular style of projectile point (Ireland 1986).

This temporally diagnostic artifact suggests a Late Archaic or Late Prehistoric period presence, sometime between 4,000 and 250 BP, although dates between 1,050 BP and the Historic period are more common. The second diagnostic artifact found at the site (a largely complete James Allen (or Sierra Vista) Late Paleoindian point made of dacite) provides Late Paleoindian occupation dates of 9,350 – 7,900 BP (Pitblado 2003:112).

The site is interpreted as a prehistoric camp where hunting-related activities (particularly biface manufacture) occurred, along with some probable plant processing activities. The possibility that the surface assemblage is a palimpsest created by multiple occupations is good, given the density of artifacts and the presence of more than one diagnostic artifact. It is likely that unauthorized collection of diagnostics occurred at this site in the recent past.

LA 148951 (Chamita Knoll)

This site is thought to represent the remains of a site occupied during the Late Paleoindian period (7400 – 5950 BC). It is located on top of and along the gentle south and east slopes of a small knoll (remnant terrace) landform. The terrace has been created by a small, unnamed drainage that is a tributary of Chamita Creek. The current vegetation community is composed of grasses and some forbs, although the presence of several burned and cut tree stumps suggests the former existence of an open Ponderosa pine woodland. The site, as it is currently defined, covers an area of approximately 3060 square meters.

The surface artifact assemblage at this site contains a minimum of 47 artifacts, with some occurring in a density of 3-5 artifacts per sq m. The classes of artifacts observed include a majority of interior flakes, some biface thinning flakes, utilized flakes, 1 irregular core fragment (white-orange chert), 1 very large tested rock made from a black chert cobble, angular debris, 1 large white chert or chalcedony spurred end scraper (Figure 5; collected), a red quartzitic sandstone flake knife, 1 irregular core-hammer stone, and 1 obsidian James Allen projectile point base (Figure 3 – Right; collected; see Table 1 for metrics). Lithic material types include various cherts (most likely from nearby Cumbres Pass), a relatively high frequency of basalt (dacite?), jasper, chalcedony, translucent obsidian (Jemez?), and quartzitic sandstone.

In addition to the flaked stone assemblage, a single fragment of pre-mineralized bone was noted and collected. This probable long bone fragment suggests the possibility that additional faunal material of Late Paleoindian age is buried at this site, although the species of animal is currently unknown. The artifact assemblage suggests that hunting-related activities, including biface production, weapon replacement, hide preparation and butchering activities occurred at the site. Accordingly, the site may be the remains of a kill site and/or a processing site. Lithic density at the top of the knoll landform is low, while density increases along a hill slope contour line (on the drainage sides of the hill) one-to-two m below the top of the knoll. This pattern suggests that the artifacts are eroding out of the landform from a buried, stratigraphic position. It is likely that unauthorized collection of diagnostics occurred at this site in the recent past.

Figure 5. White chalcedony spurred end-scraper / knife (LA 148951).

Post-Inventory Investigations

Metric Comparisons of Late Paleoindian / Early Archaic Projectile Points

Metric material data for an assemblage of 128 Late Paleoindian and Early Archaic projectile points, from northern New Mexico and the San Luis Valley area of Colorado, have been compiled by Dr. Pegi Jodry (unpublished data – 2005 personal communication) and discussed recently by Vierra et al. (2005). From these data, comparative metric data for four projectile point types (Jay, Bajada, James Allen and Sierra Vista) are presented in Table 2. These data can be compared to dimensions for the obsidian James Allen point base recovered from site LA 148951 and for the dacite James Allen point recovered from site LA 148950, as well as to dimensions for other similar points noted in regional CRM gray literature.

The obsidian James Allen point base found at site LA 148951 has a maximum base width of 21 mm which, in Table 2, is similar to the mean neck width dimensions for the Jay point, the James Allen point and the Sierra Vista point. It has a maximum broken length of 15 mm, which is less than all the mean broken length dimensions in Table 2, but does fall in the range for both the James Allen and Sierra Vista points. Its maximum basal thickness of 8.5 mm is similar to the mean maximum thickness for the Jay and Bajada points. Finally, its depth of basal concavity (3 mm) falls within the range of base depth measurements for Jay, Bajada and Sierra Vista points but comes closest to the mean base depth for the Sierra Vista point.

The almost-complete dacite James Allen point found at site LA 148950 has a maximum base width of 16 mm which, in Table 2, is most similar to the mean neck width of the Bajada points, and most similar to the minimum neck widths of the Jay points and the Sierra Vista points. It has a maximum broken length of 24.5 mm, which is most similar to the mean broken lengths of the James Allen points and the Sierra Vista points. Its maximum thickness of 6.7 mm most closely resembles the maximum thickness dimension for the Sierra Vista points and its depth of basal

concavity (0.8 mm) is less than the mean basal concavity depth of all points and most similar to the minimum for the Jay point.

In the OLE report, Turnbow (1997:169-171) notes that a point labeled as a Plainview type, and recovered from site LA 82615 in the Jemez Mountains, is similar to an "Allen" point (probably meaning James Allen). This quartzite specimen is described as having a basal concavity that "tends to be more pronounced and smoothed than either the Midland or Milnesand," with no parallel oblique flaking. The description and illustration (Figure 16.5a in Turnbow 1997:170) of this specimen compare very favorably to the obsidian James Allen point base recovered from site LA 148951 in the Sargent WMA. The dimensions of Turnbow's Plainview point include a neck/stem width of 21 mm (which compares well to the mean neck width for Jay, Bajada and Sierra Vista points), a stem length of 18 mm (which falls most closely to the mean stem length of James Allen points, but is within the range for Jay, Bajada and Sierra Vista points), and a stem width of 22 mm (which compares most favorably with the mean stem width of the Sierra Vista point, but falls within the range of all four types). The thickness of Turnbow's point (5 mm) also compares well to the mean thickness for James Allen and Sierra Vista points in Table 2, but is thinner than the Sargent James Allen point.

Turnbow (1997:172-173) also discusses a clear black Valle Grande obsidian "Bajada" point base from site LA 82598 in the Jemez. The stem width (20 mm) is similar to the Sargent James Allen point (21 mm) and to the mean stem width for James Allen and Sierra Vista points in Table 2, although it also falls in the range for Jay and is at the high end of the range for Bajada points. The 10 mm thickness for Turnbow's obsidian Bajada point is within the range for Jay points and at the high end of the range for Bajada points in Table 2. Turnbow's obsidian Bajada point is characterized by irregular flaking and both of the Sargent James Allen points have collateral / irregular flaking patterns. All three are basally thinned with ground lateral edges. Both the obsidian points appear to have been made of Jemez obsidian (see discussion below) although the Bajada point has not been subjected to XRF analysis.

And, as noted previously in this paper, Hannaford (1985:29) suggested that an obsidian projectile point at site LA 46172 to the west of Chama was "reminiscent of a crude Bajada point". The base and medial portions of this point were said to exhibit rough bifacial trimming and "(t)he shouldered point has straight lateral edges and a contracting, slightly concave base; no basal grinding is evident." The length of the point, at 27 mm, does not compare at all to the mean maximum lengths of points in Table 2, but does fall within the range of broken lengths for all four points, suggesting that the point was actually broken or heavily resharpened. Its width of 21 mm compares quite well to the mean blade widths of James Allen and Sierra Vista points and falls in the range for both Jay and Bajada points. Its thickness of 7 mm falls within the range of the Jay and Bajada points and is at the high end for the Sierra Vista points. Finally, its basal width of 13 mm falls within the range for both the Jay and Bajada points. By this comparison, Hannaford's point may be a Bajada type, but, because *none* of the Bajada points in Table 2 are made of obsidian (unpublished data from Jodry 2005), this classification should be considered tentative. Jodry's data shows that 29.4% of the regional Sierra Vista assemblage and 16.7% of the James Allen assemblage are made of obsidian and this suggests that Hannaford's point may in fact be a James Allen or Sierra Vista type.

Table 2. Comparative measurements for four Late Paleoindian / Early Archaic projectile point types.

DIMENSION		Mx L	Br L	Mx W	Mx Th	Bl W	Neck W	Bl L	Stem L	Stem W	Base depth	Max N
TYPE	**STATISTIC**											
Jay												
	mean	**48.83**	**36.36**	**25.02**	**8.41**	**24.33**	**20.90**	**25.67**	**24.50**	**17.17**	**2.03**	
	n	15	25	39	40	12	18	15	20	35	10	40
	max	73.43	58.96	32.48	13.39	31.58	25.50	45.15	42.54	25.01	3.27	
	min	30.83	21.67	19.15	5.86	16.99	16.24	7.78	12.41	10.50	0.87	
Bajada												
	mean	**41.28**	**41.65**	**20.81**	**8.34**	**19.79**	**17.04**	**23.16**	**20.47**	**16.70**	**2.04**	
	n	30	22	50	51	39	43	29	42	38	35	52
	max	58.83	58.46	25.87	10.52	31.65	20.18	43.16	28.09	20.53	4.56	
	min	27.10	23.00	17.04	5.67	12.83	14.74	6.91	14.59	12.83	0.70	
James Allen												
	mean	**47.48**	**21.74**	**22.57**	**5.14**	**21.02**	**21.57**	**38.15**	**19.82**	**19.79**	**4.57**	
	n	3	3	6	6	3	2	2	3	5	4	6
	max	76.87	32.44	26.08	6.07	22.90	23.05	56.63	20.26	22.02	5.39	
	min	26.46	14.75	20.19	4.45	19.04	20.08	19.66	19.50	16.87	4.00	
Sierra Vista												
	mean	**43.11**	**23.26**	**22.66**	**5.40**	**20.88**	**20.20**	**32.37**	**14.40**	**21.63**	**3.25**	
	n	8	22	28	29	14	18	6	21	24	27	30
	max	59.27	41.29	30.32	7.07	24.13	24.32	42.39	32.95	27.09	5.22	
	min	32.33	10.98	16.77	4.08	14.87	15.19	20.18	7.51	16.20	1.28	
TOTAL												128

Note: all measurements reported in millimeters / Mx L = Maximum length; Br L = Broken length; Max W = Maximum width; Mx Th = Maximum thickness; Bl W = Blade width; Neck W = Neck width; Bl L = Blade length; Stem L = Stem length; Stem W = Stem width; Max N = Total number in sub-sample.

While the previous metric and morphological comparisons underscore the degree to which all the four point types are similar and the difficulty in assigning an "unknown" to a single type, purported temporal disparities between the Late Paleoindian and Early Archaic types make it unclear whether the Bajada and Jay styles represent a temporal continuum of Late Paleoindian (Foothills-Mountain Tradition) adaptations in northern New Mexico or whether they represent a separate Early Archaic manifestation, as posited by Irwin-Williams (1973). Clearly, the patterns discussed above point to the need for additional research in this area.

Results of XRF Source Study

Following the field inventory at the Sargent WMA, collected diagnostic artifacts made of obsidian and dacite were subjected to X-ray fluorescence (XRF) analysis by Dr. M. Steven Shackley (2005). The results of the analysis, reproduced in Table 3, provide assessments of the source location for each diagnostic artifact and suggest conclusions about hunter-gatherer mobility around the Sargent WMA during Late Paleoindian, Middle Archaic, Late Archaic and Formative periods. The locations of source areas are illustrated in Figure 6.

Table 3. Projectile points from the Sargent WMA submitted for XRF source analysis.

Artifact No.	Site No.	Material Type	Artifact Class	Type	Provisional Dates	Identified Source
01-01	LA148949	dacite	Lanceolate projectile point or knife	Scottsbluff or Cody	9,400 – 8,300 BP	San Antonio Mt.
02-03	LA148950	dacite	Parallel-sided stem, concave-base projectile point	Sierra Vista or James Allen	9,350 – 7,900 BP	Newman Dome
03-01	LA148951	obsidian	Parallel-sided stem, concave-base projectile point	Sierra Vista or James Allen	9,350 – 7,900 BP	El Rechuelos, Jemez Mts.
IO 11	(isolate)	dacite	Serrated projectile point blade	San Jose?	5,450 – 3,750 BP	San Antonio Mt.
03-04	near LA148951	dacite	Corner-notched projectile point	En Medio	2,750 – 1,650 BP	San Antonio Mt.
IO 9	(isolate)	obsidian	Small corner-notched projectile point	Trujillo or Rosegate	1,650 – 950 BP	El Rechuelos, Jemez Mts.
03-05	near LA148951	obsidian	Small corner-notched projectile point	Trujillo or Rosegate	1,650 – 950 BP	El Rechuelos, Jemez Mts.

As is apparent in Table 3, source areas for obsidian and dacite raw materials appear to have remained relatively constant across all periods of occupation at the Sargent WMA, with obsidians being quarried from the El Rechuelos source on the north side of the Jemez Mountains and the dacites being quarried, for the most part, from the San Antonio Mountain source. The Jemez Mountains are approximately 88 km (55 mi) miles south of the project area and San Antonio Mountain is approximately 50 km (31 mi) to the east-southeast. One minor anomaly is the James Allen (or Sierra Vista) point recovered from site LA 148950 (Figure 2 – Center). The dacite from which this point was made came from the "Newman Dome" source (Shackley 2005),

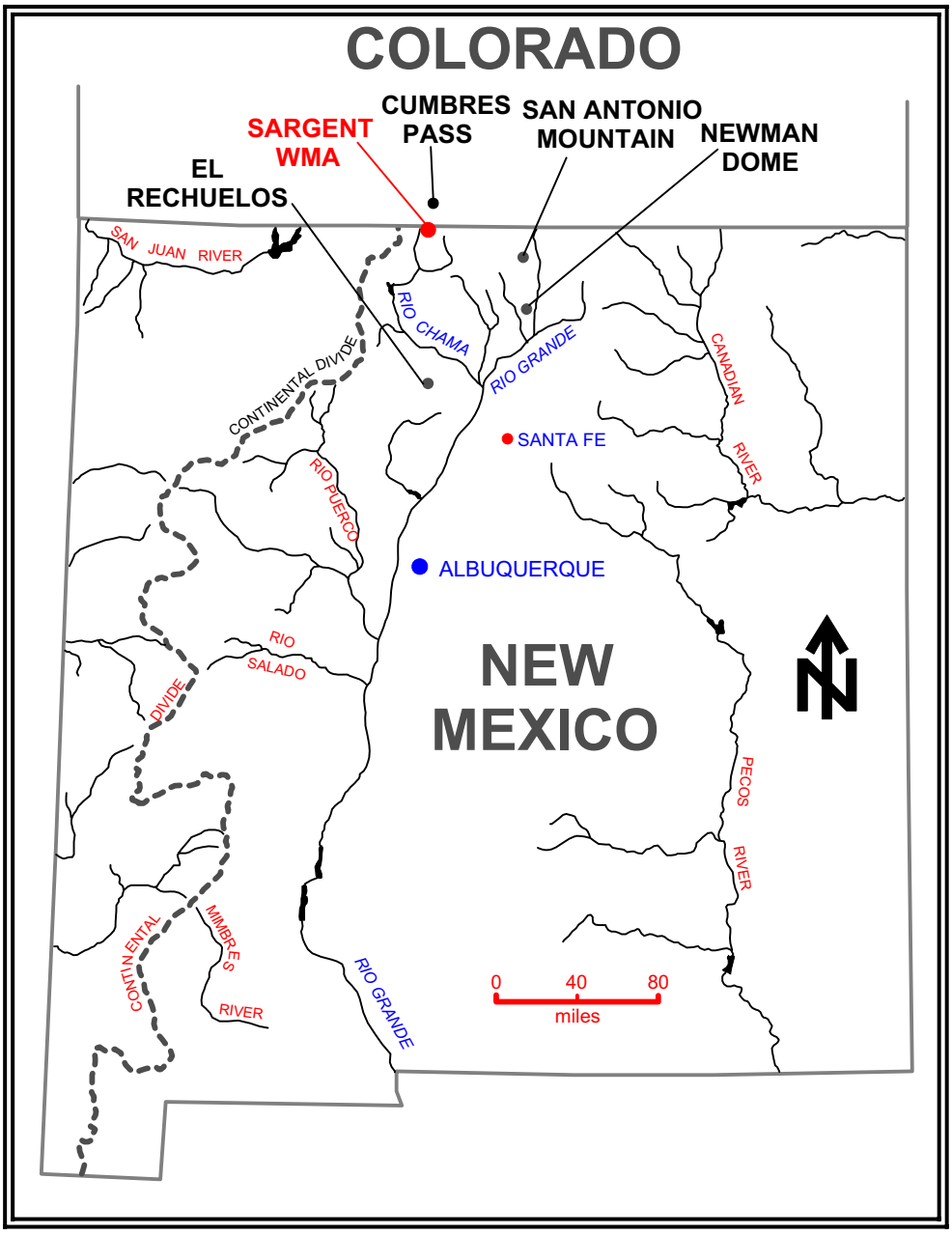

Figure 6. Locations of Lithic Source Areas and the Sargent WMA.

a small location east of Cerro Montoso, approximately 32 km (20 mi) south-southeast of San Antonio Mountain and about 80 km (50 mi) southeast of the Sargent sites.

These findings compare somewhat favorably with the results of a similar study completed by Shackley and Vierra (2005) for northern New Mexico and the San Luis Valley of southern Colorado. In that study, Late Paleoindian points from the Sierra Vista site in the San Luis Valley were found to have been made of both El Rechuelos obsidian and Cerro Toledo obsidian. For

Late Paleoindian points made of dacite, San Antonio Mountain was the dominant source for points found north of the Abiquiu area. These patterns, when combined with patterns for the Sargent sites, suggest north-south corridors of prehistoric mobility along the Rio Grande corridor, the Rio Chama corridor, or both. Raw material patterns at the Sargent sites add some complexity to the north-south model by suggesting additional routes of movement between Chama and the San Luis Valley via Cumbres Pass [debitage on Sargent sites is macroscopically similar to Cumbres Pass chert (personal communication Dr. Pegi Jodry, Smithsonian Institution)] and between Chama and Taos via an unnamed pass between the Rio Tusas and Rito de Tierra Amarilla. Finally, while the San Luis Valley evidence indicated that Late Paleoindian Cody groups were utilizing Knife River flint (Shackley and Vierra 2005:9), the evidence from the Sargent sites indicates that they were using more locally available San Antonio Mt. dacite as well.

Brief Summary of the Proposed Archaeological Testing Plan

Construction of the elk viewing facility is anticipated for the fall of 2006 or early 2007, depending on funding. Potential primary impacts to the sites by the facility construction were avoided through redesign of the trail and observation stand, while potential secondary impacts are being mitigated through a limited program of archaeological monitoring and testing.

A recently devised archaeological testing plan is directed at three sites in particular – LA 148949 (Chamita Ridge I), LA 148950 (Chamita Ridge II) and LA 148951 (Chamita Knoll). The rationale for this focus derives from the following points: 1) each of the three sites contains a Late Paleoindian component (ca. 9400-7900 BP) and some or all of the sites may contain Archaic components (2750-1650 BP); 2) the presence of Late Paleoindian components in the region surrounding the project, and in New Mexico in general, is extremely rare; and 3) the potential for secondary or indirect impacts to the sites, resulting from public use of the proposed elk viewing facility, is high. Accordingly, NMDGF is proposing, through archaeological testing, to evaluate the nature and extent of the cultural deposits at each site. By this, NMDGF will be able to: 1) evaluate the potential at each site for multiple occupations and for intact cultural deposits; 2) characterize each site in terms of its eligibility for inclusion in the State Register and/or the National Register of Historic Places; 3) provide data to more adequately manage the sites in the future; and 4) augment lithic sourcing studies. Testing efforts will include instrument mapping of the site, collection of any remaining or newly identified surface tools or diagnostic artifacts, mechanical excavation of one trench at each site, and manual excavation of a small number of 1-by-1 m unit(s) at each site. Manual excavation at site LA 148950 will also include the excavation and sampling of Feature 1, a purported thermal feature. Additional work in the vicinity of the three sites will include archaeological monitoring immediately southwest of site LA 148950 during the construction of the proposed walkway to the elk viewing facility and archaeological monitoring southwest of site LA 148949 during the construction of the proposed elk viewing platform.

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