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Late Archaic Settlement Systems in the Northern Rio Grande

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INTRODUCTION

Last year at these meetings I proposed a possible seasonal transhumance pattern for the Late Archaic in the northern Rio Grande region. This pattern involved the movement of groups from the lowland juniper-savanna grasslands in the early summer, to the upland ponderosa pine/mixed conifer forests in the mid to late summer, and then back down to the piñon-juniper woodlands during the fall. The Rio Grande Valley was also used for winter habitation sites. Following on this research, I take the next step by studying the inter-assemblage variability represented in a sample of open-air sites located within each of these vegetation communities. The results indicate that there are significant differences in reduction tactics represented between valley habitation vs., upland campsites, and that these site sites are linked together by obsidian procurement patterns.

LATE ARCHAIC LAND-USE MODEL

Los Alamos National Laboratory occupies the central section of the Pajarito Plateau **(SLIDE).** The plateau covers an area roughly extending from Santa Clara Canyon on the north, to the mesas above Cochiti Pueblo on the south, to the caldera on the west and the mesas overlooking the Rio Grande valley to the east. LANL covers approximately 29,000 acres of land on this high mesa, ranging from about 6000 to 8000 ft in elevation **(SLIDE).** The mesa has been incised with several deep canyons that drain from the mountain country down to the river valley. Balice et al (1997) have defined four basic vegetation types at LANL: juniper-savanna, piñon-juniper, ponderosa pine and mixed conifer. **Figure 1** illustrates the distribution of these vegetation types. As can be seen, most of the area is covered with piñon-juniper woodlands at the lower elevations and ponderosa pine at the higher elevations.

Terry Foxx and I have proposed one possible Late Archaic land-use model based on the seasonal availability of exploitable plant resources (Vierra and Foxx 2002). Our review of regional ethnobotanical studies indicated that 108 species had been identified as potential subsistence foods (Foxx et al. 1998; Dunmire and Tierney 1995). These plants are available throughout the various vegetation communities. **Figure 2** illustrates the relative percentage of plant foods by vegetation community. As can be seen, the piñon-juniper community contains the greatest variety of plant foods followed by the ponderosa pine zone. **Figure 3** illustrates the seasonal availability of food plants by vegetation zone, with seasonal availability being mostly dependent on elevation. Based on the identification of a few target species that are both abundant and common in the various communities, we suggested a possible annual cycle for exploiting these resource areas. This pattern is graphically illustrated in **Figure 4.** In the juniper-savanna community, cool season grasses like Indian ricegrass are abundant having seeds that are available in the early summer. Although cheno-ams can be found in all disturbed and burned contexts, there were probably more patches represented in the ponderosa pine and lower mixed conifer communities. In addition, wild onions, berries and wild potatoes are also available in these areas during the mid to late summer time period. In contrast, acorns, pine nuts, broad leaf yucca and cacti would be available for consumption during the fall in the piñon-juniper zone. Dropseed grasses, seeds of cheno-ams and saltbush could have also been exploited during the late summer in this zone. If obsidian raw materials were procured at quarries while foraging at high elevation settings, then these materials could have been reduced while camping at these lower elevations. Lastly, riverine settings also appear to have been used for winter habitation during the Late Archaic (Lent 1991; Skinner et al 1980; Stiger 1986).

LATE ARCHAIC LAND-USE AT LOS ALAMOS NATIONAL LABORATORY

A total of 51 Archaic sites have been identified at LANL. These sites are characterized by obsidian lithic scatters ranging from 40 to 140,000 sq m in size. The assemblages emphasize the production/maintenance of obsidian bifacial tools, with occasional one-hand manos and millingstones also being present. The diagnostic Early, Middle and Late Archaic projectile point types on the Plateau are similar to those defined by Irwin-Williams for the Oshara Tradition (**Figure 4**). **Figure 5** illustrates the relative percentage of sites by Archaic time period. As can be seen, there are very few Early Archaic sites, somewhat more Middle Archaic sites, and mostly Late Archaic sites represented. This pattern does not necessarily reflect the increasing use of these upland areas through time, but rather the long-term effects of various geomorphic processes on the archaeological record.

Figure 6 illustrates the distribution of Archaic sites at LANL. Since the distribution of sites is sparse, let's combine them with the distribution of all obsidian lithic scatter sites (n=179) (**Figure 7**). These assemblages are also dominated by the production/maintenance of obsidian bifacial tools, but lack diagnostic projectile points. Given the previous data, it is likely that most of these sites represent Late Archaic occupations. Nonetheless, both figures illustrate several broad occupation zones: 1) juniper-savanna zone in the Rio Grande River valley, 2) piñon-juniper zone at lower elevations on the Plateau, 3) piñon-juniper/ponderosa pine ecotone at mid-elevations on the Plateau and 4) ponderosa pine/mixed conifer ecotone at the higher elevations. Overall, the site density decreases with elevation ranging from 1 site per 60 acres in the juniper-savanna, 1 site per 90 acres in the piñon-juniper woodlands and 1 site per 295 acres in the ponderosa pine forest. Although, the number of sites present in the ponderosa pine zone is probably underestimated due to poor surface visibility. On the other hand, **Figure 8** illustrates the distribution of sites as polygons, with the largest palimpsests being situated within the piñon-juniper/ponderosa pine ecotone. Most of Los Alamos National Laboratory would be located within a typical 10 km foraging radius of a campsite that is centrally located within this ecotonal setting, providing access to a variety of resources within all of these plant communities (e.g., Binford 1982; Yellen and Lee 1976:43).

LATE ARCHAIC OPEN AIR SITES

Seven Late Archaic open-air sites were selected for this study of debitage assemblages. Together, they cover an elevation range from 5580 to 9450 ft **(Figure 9).** From lower to higher elevations, this includes a possible winter habitation site near San Ildefonso Pueblo that contains a single structure, with storage pits and an outside activity area (LA 51912; Lent 1991; n=1747). Excavations along Highway 502 at the Los Alamos/Española interchange also identified an extensive Late Archaic site containing multiple hearths and activity areas (LA 65006; Moore et al. 1998; n=5997 for Component

1). Both of these sites were excavated by the Museum of New Mexico and are located in the valley just east and west of the Rio Grande, respectively. Two sites are situated in the piñon-juniper zone at LANL. LA 117883 is a small lithic scatter situated in Pueblo Canyon that was recently tested (n=135). Another site is located on Mesita del Buey that was mostly excavated. Although the site consists of an extensive lithic scatter, the sample used for this study included the area around a possible occupation surface (LA 70029; Biella 1992; n=1420). LA 115373 is another lithic scatter site that was recently tested, but is located in the Ponderosa pine at the upper elevations of LANL (Larson et al. 1997; n=402). 03-1172 is an extensive lithic scatter site that was tested by Forest Service archaeologists on Sawyer Mesa near Obsidian Ridge in the higher ponderosa pine zone (Moore 1986; n=1003). Lastly BG-21, is a small lithic scatter located in Redondo Creek valley along the west side of the Valles Caldera (n=296). It is one of 23 sites excavated by the University of New Mexico (Baker and Winter 1981). All but two of the sites have sample sizes of over 1,000 artifacts. However, the remaining two sites have smaller samples of 135 and 402 artifacts. Four of the seven sites were analyzed for this study; whereas, published data was used for the two Museum of New Mexico and the Forest Service sites. The general locations of all these Late Archaic sites and nearby obsidian source areas can be pointed out in **Figure 10.**

Analysis of the debitage assemblages from these sites indicates that there are some significant differences in the reduction tactics being implemented between riverine vs. upland sites. The sites are oriented from left to right, that is, from lower to higher elevations in **Figure 11.** As can be seen, the two riverine sites emphasize core reduction activities with less biface production/maintenance. In contrast, the upland sites emphasize biface production with less core reduction. The exception to this pattern is site 03-1172 which is located within the Cerro Toledo obsidian source area. Here the emphasis is on core reduction activities, which presumably reflects the production of prepared cores and flake blanks for transport to sites at lower elevation settings. Otherwise, the distinctive between core reduction, vs. biface production appears to reflect differences between lowland habitation, vs. upland campsites.

This complementary link between lowland and upland sites is also reflected in the lithic material assemblage. **Figure 12** illustrates that all the assemblages are dominated by obsidian. However, the four sites situated in the riverine and piñon-juniper settings also contain some chalcedony/chert and other materials. This includes basalt and quartzite in the lowland sites and orthoquartzite at LA 70029. With the exception of the orthoquartzite, these materials are available in gravels along the flanks of the Rio Grande valley. The presence of waterworn cortex on these materials supports this contention. It is, however, undetermined as to whether the orthoquartzite is also available from this secondary source, or was obtained from primary sources to the north near Abiquiu Reservoir. Otherwise, the higher elevation sites are almost exclusively composed of obsidian that primarily exhibits a natural weathered (i.e., nodular) cortex, indicating that this material was derived from the primary source.

XRF analysis had been conducted on four of the sites identifying the specific obsidian sources utilized by these groups. Samples were analyzed from a lowland habitation site

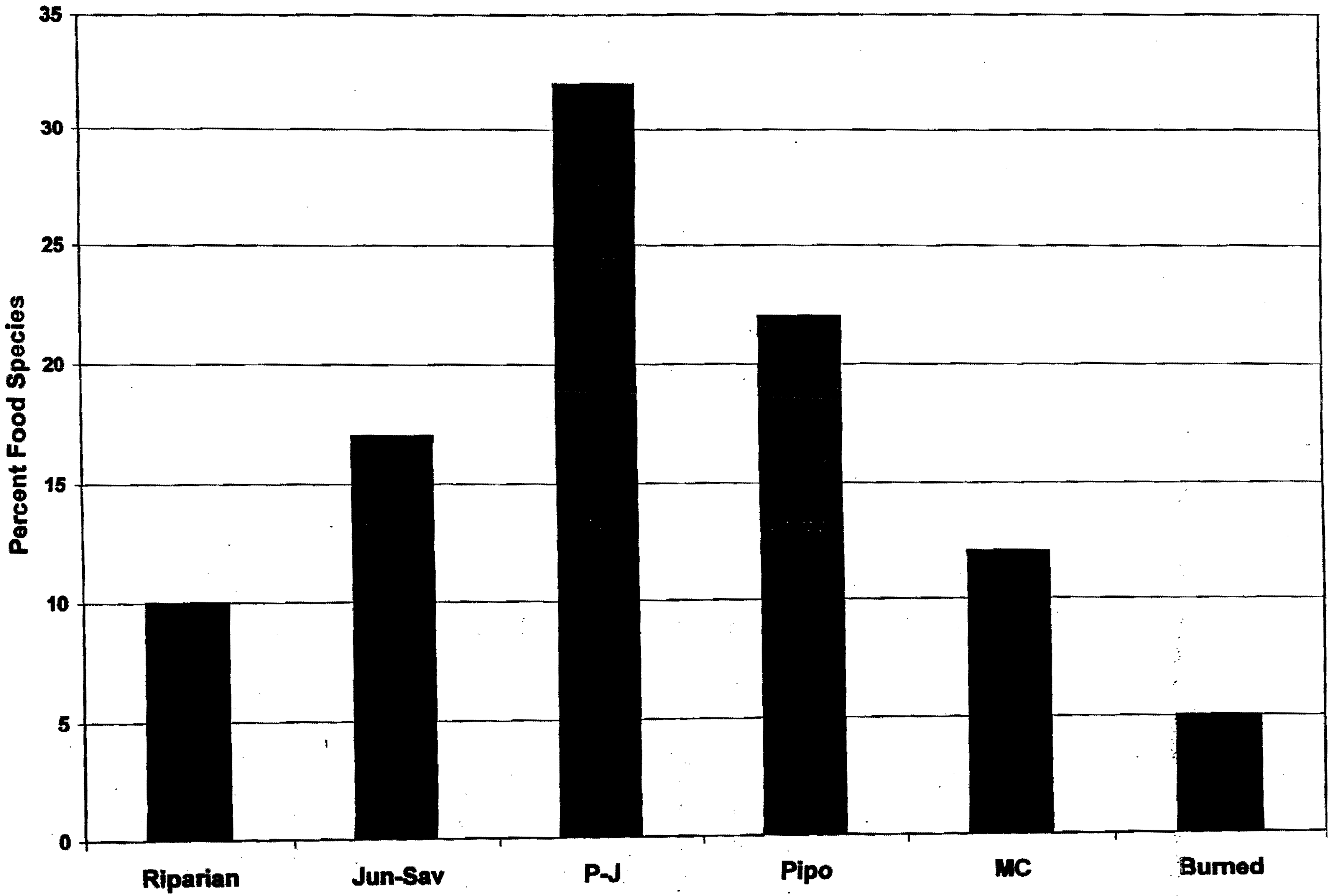
(Lent 1991:40), the LA 70029 campsite located in the piñon-juniper zone (Stevenson 1992) and the two higher elevation sites situated in the ponderosa pine/mixed conifer communities (03-1172: Hughes 1986; BG-21: Sappington and Baker 1981). Three points and four bifaces were analyzed at the lowland habitation site. Four of these artifacts are made of Cerro Toledo, two from Cerro del Medio and one from Polvadera obsidian. Five flakes were analyzed at the piñon-juniper campsite, with three being made of Cerro del Medio and two of Cerro Toledo obsidian. Twenty-one artifacts were analyzed from the campsite located within the Cerro Toledo obsidian source area, so it is not surprising that 18 of these were derived from this source, with two made of Polvadera and one of an undetermined source. Lastly, 100 flakes were analyzed from three sites located in the area of BG-21. All but one of these were derived from the nearby Cerro del Medio source, with a single flake being made of Polvadera obsidian. My own analysis indicates that Polvadera obsidian was visually identified at both the piñon-juniper campsite and BG-21, in both cases representing 2-3% of the debitage assemblage.

Overall, we see that the sites in my study are primarily linked to the Cerro Toledo and Cerro del Medio obsidian source areas, with each of the two high elevation sites being tied to the nearby obsidian source. This supports my contention that obsidian could have been procured at these high elevation settings during the mid-late summer, and later reduced at the lower elevation sites. The presence of small amounts of Polvadera obsidian, also reflects some distant ties to this area further to the north.

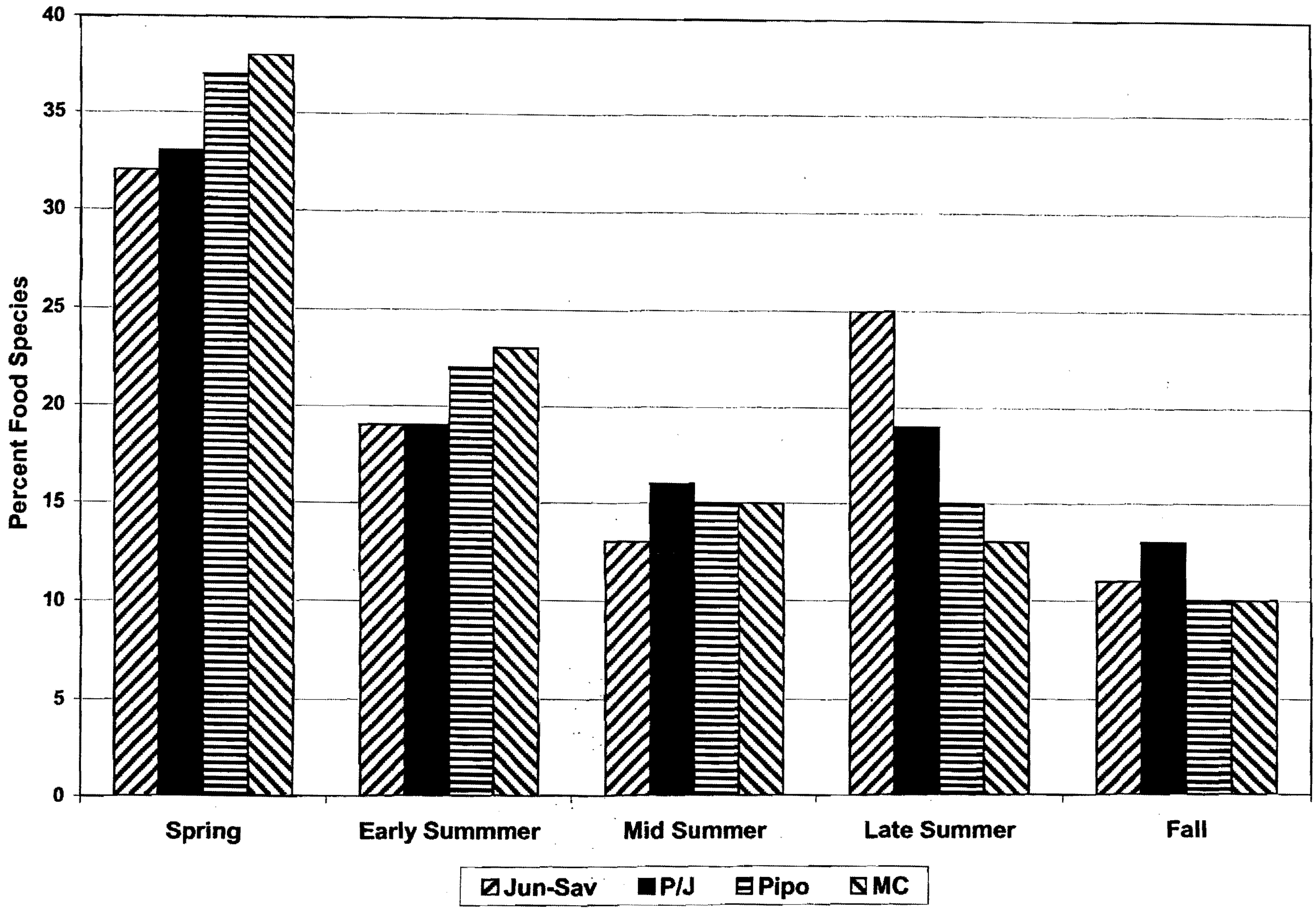
SUMMARY/CONCLUSION

In conclusion **(SLIDE)**, a variety of resources are present as plant foods in all the vegetation communities. Therefore, multiple foraging tactics could have been used by Late Archaic populations depending on seasonal rainfall, plant productivity and changes in annual resource structure. Nonetheless, I proposed one possible transhumance pattern, involving seasonal movements from the juniper-savanna to ponderosa pine/mixed conifer and then down to the piñon-juniper zone. Groups would have procured obsidian while foraging in the higher elevation settings.

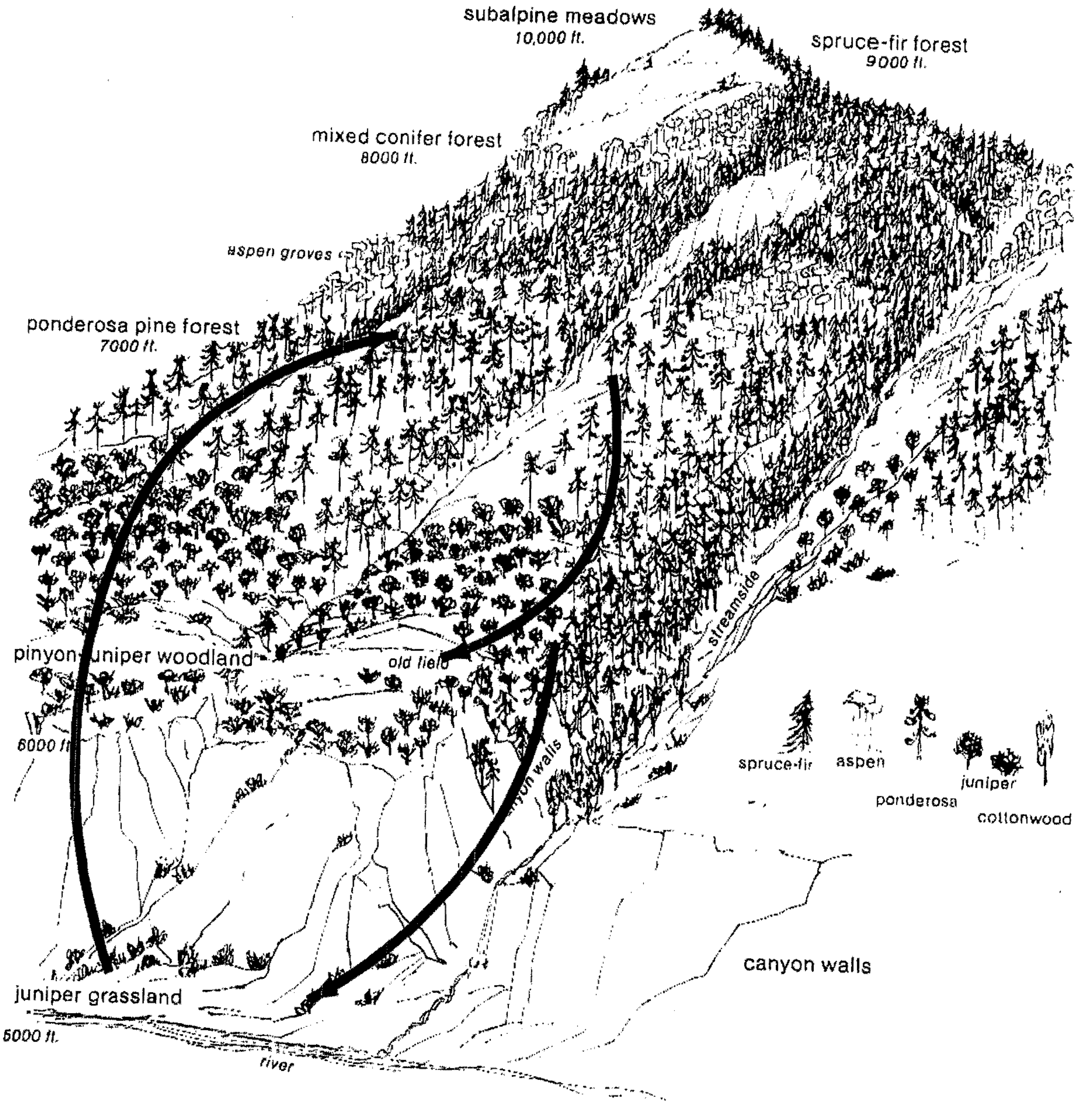
The analysis of debitage assemblages from a sample of sites distributed throughout these vegetation zones, indicates that they are all linked by reduction tactic and obsidian procurement patterns. That is, lowland habitation sites are characterized by an emphasis on core reduction, vs. upland campsites with biface production. Otherwise, obsidian dominated all the lithic assemblages, with sites situated in the juniper-savanna and piñon-juniper communities also containing a small amount of material derived from local river gravels. These data appear to lend some preliminary support to my model of a complementary settlement system that is distributed from river valley to mountaintop. Future research should focus on a more detailed study of technological differences between the various assemblages, increasing the sample of sites for this artifact analysis, and eventually conducting excavations at rockshelters situated within the various vegetation communities where subsistence and seasonality information might be obtained.



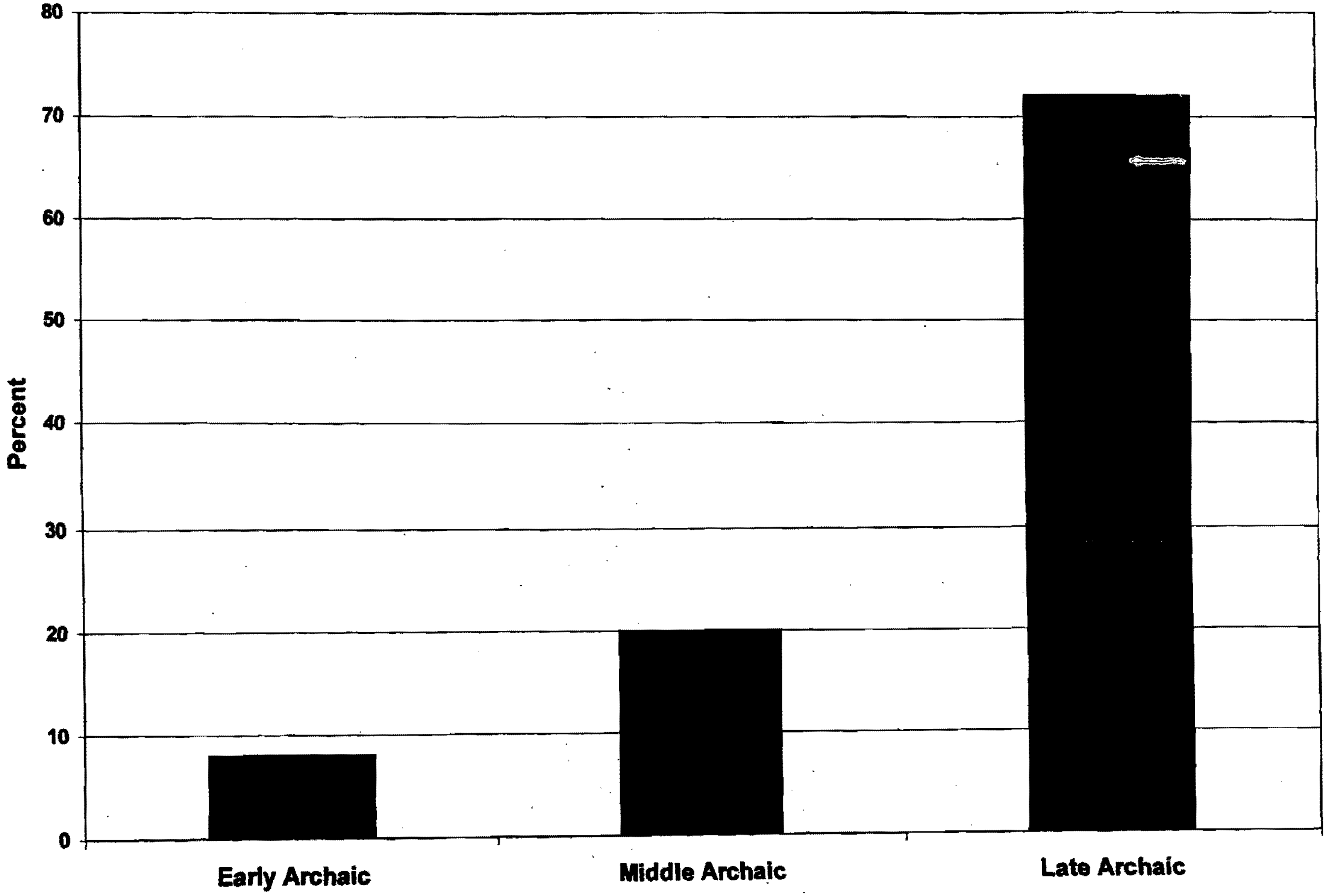
35
30
25
20
15
10
5
0
Percent Food Species
Riparian
Jun-Sav
P-J
Pipo
MC
Burned

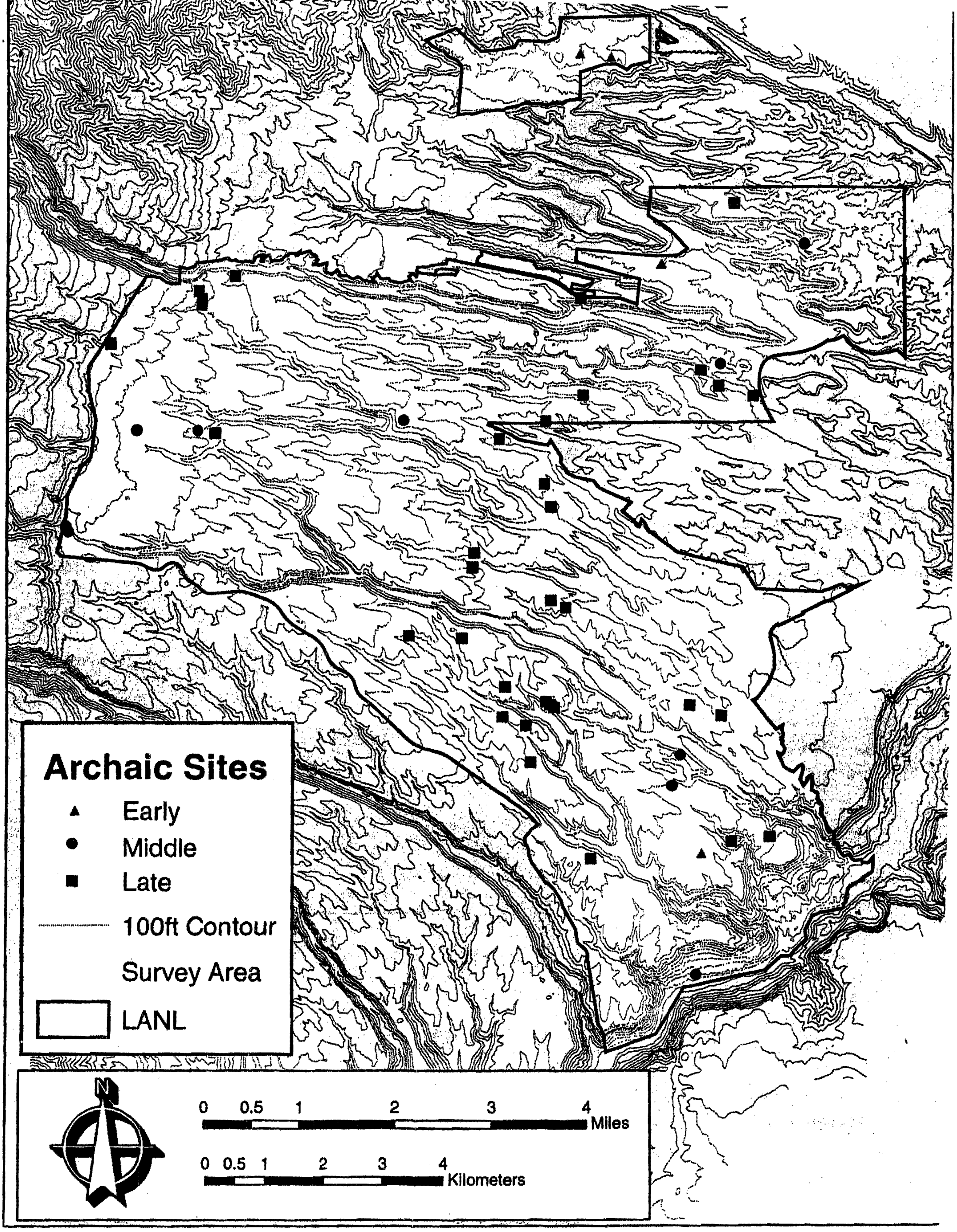


40
35
30
25
20
15
10
5
0
Percent Food Species
Spring
Early Summmer
Mid Summer
Late Summer
Fall
Jun-Sav
P/J
Pipo
MC

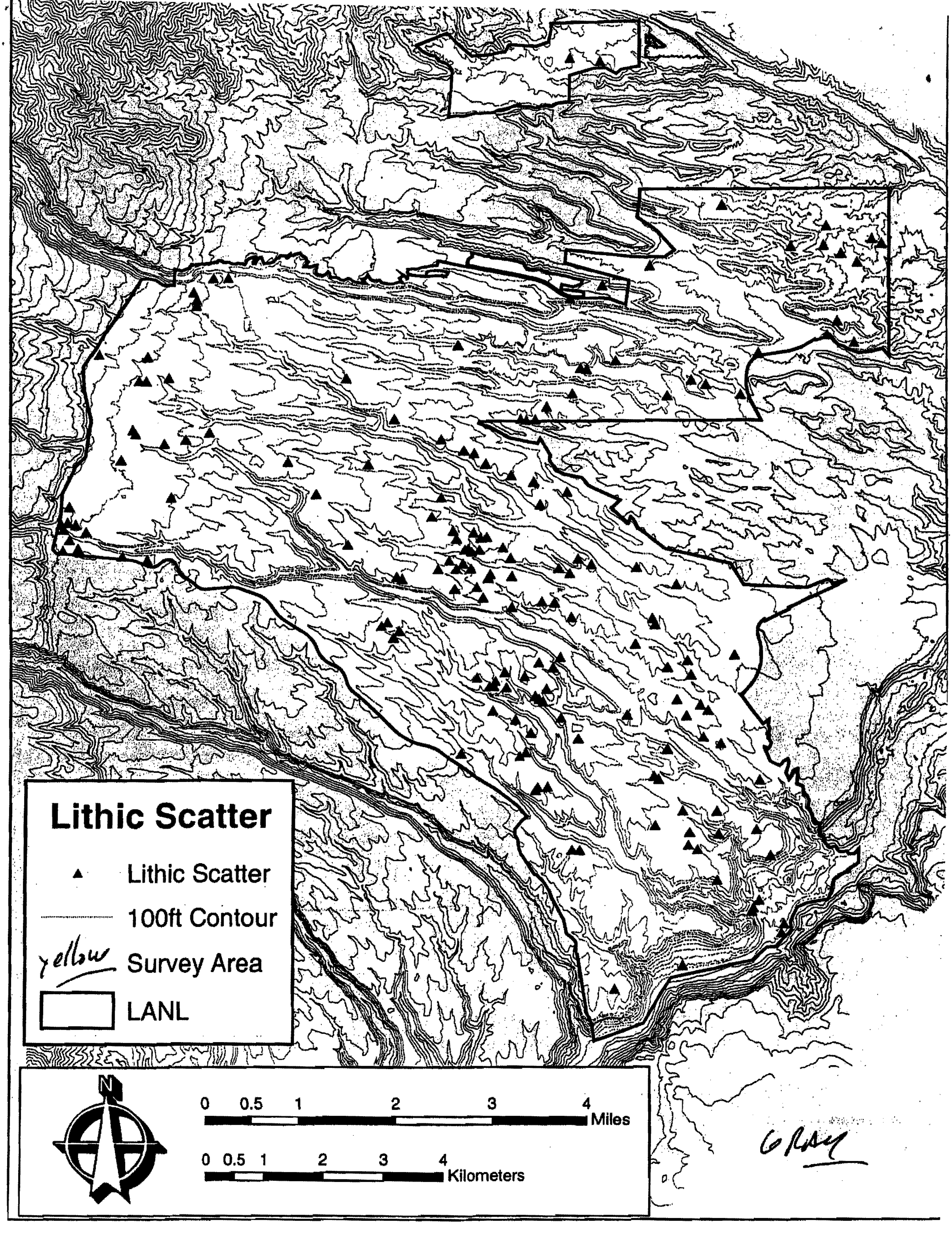


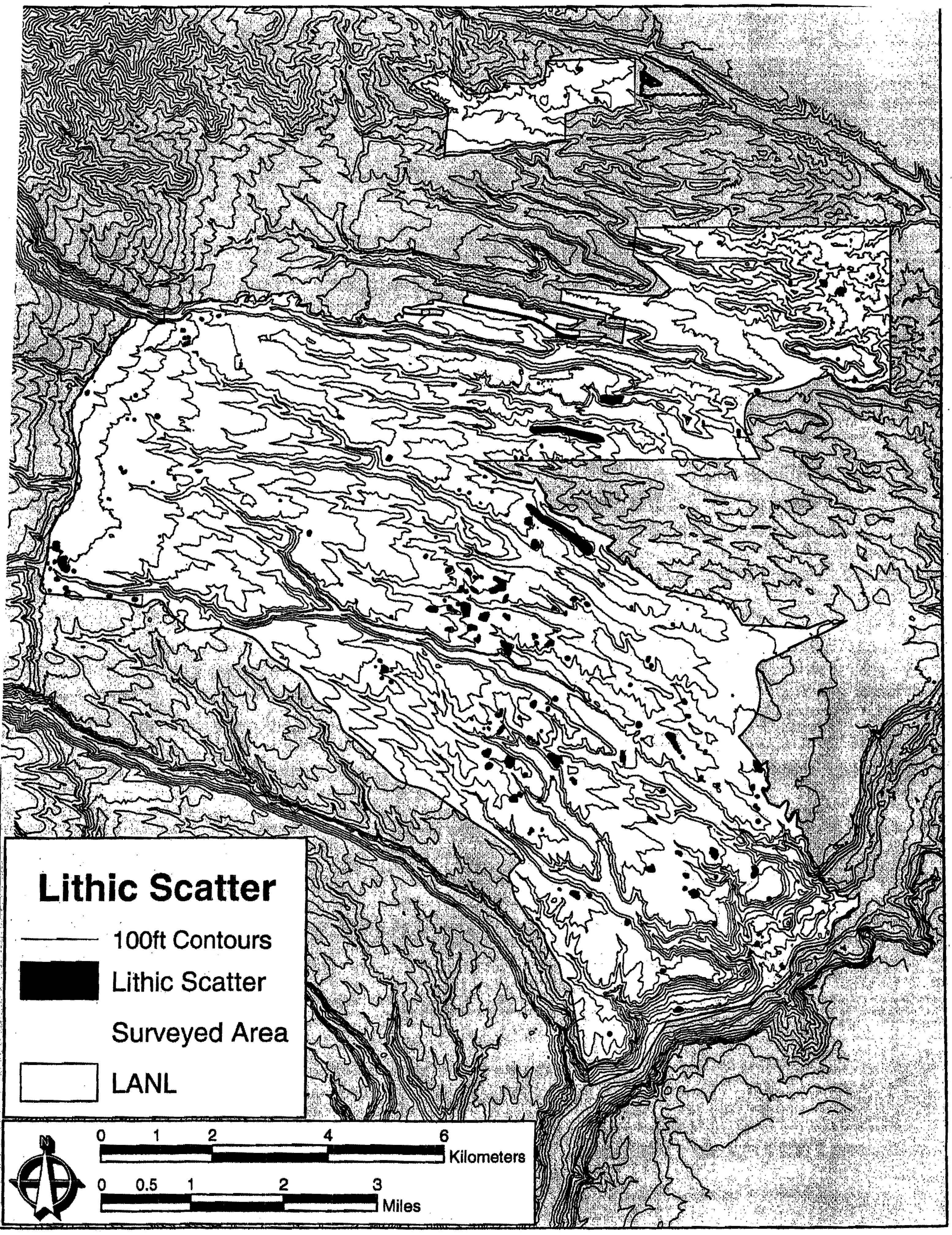
PLANT COMMUNITIES AND HABITATS


80
70
60
50
40
30
20
10
0
Percent
Early Archaic
Middle Archaic
Late Archaic

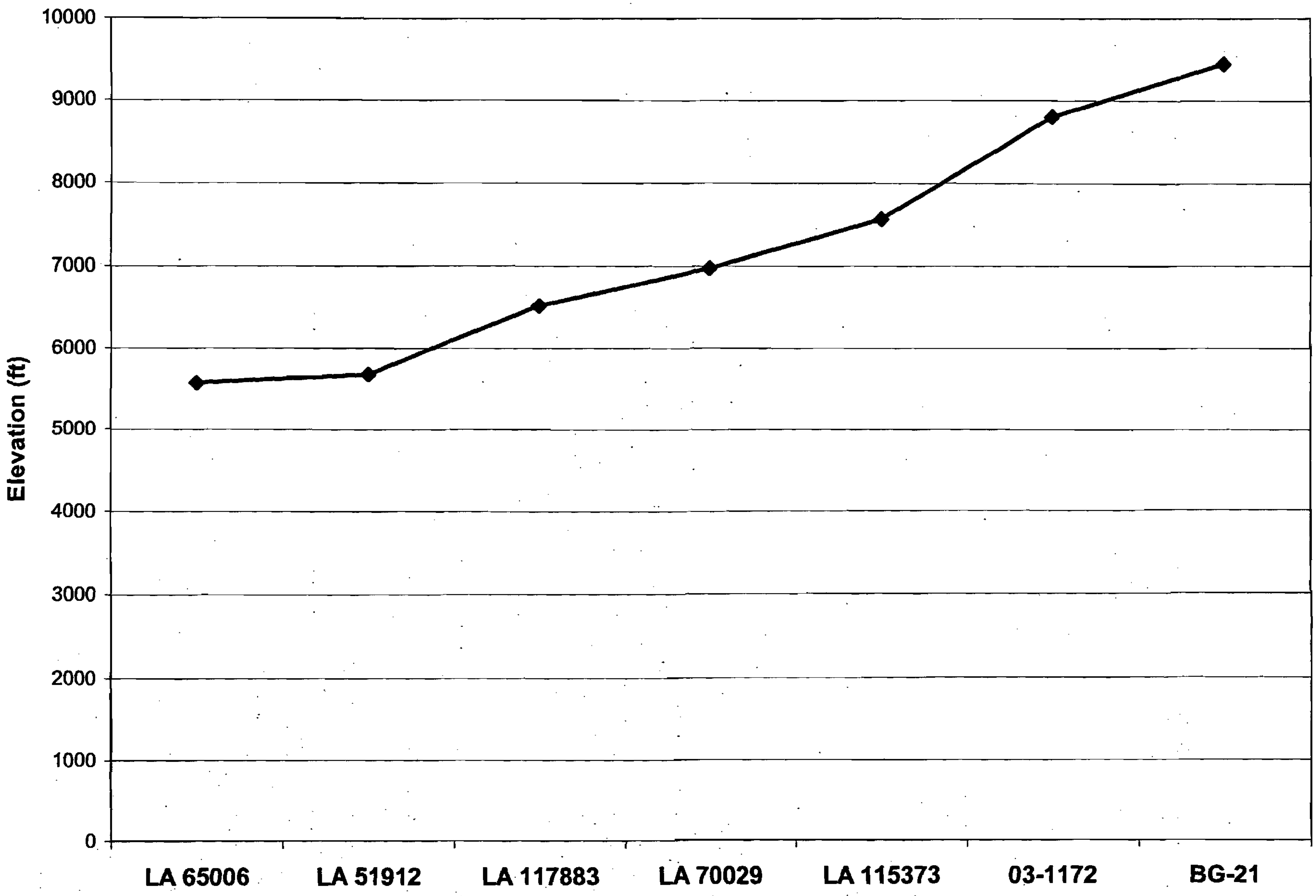


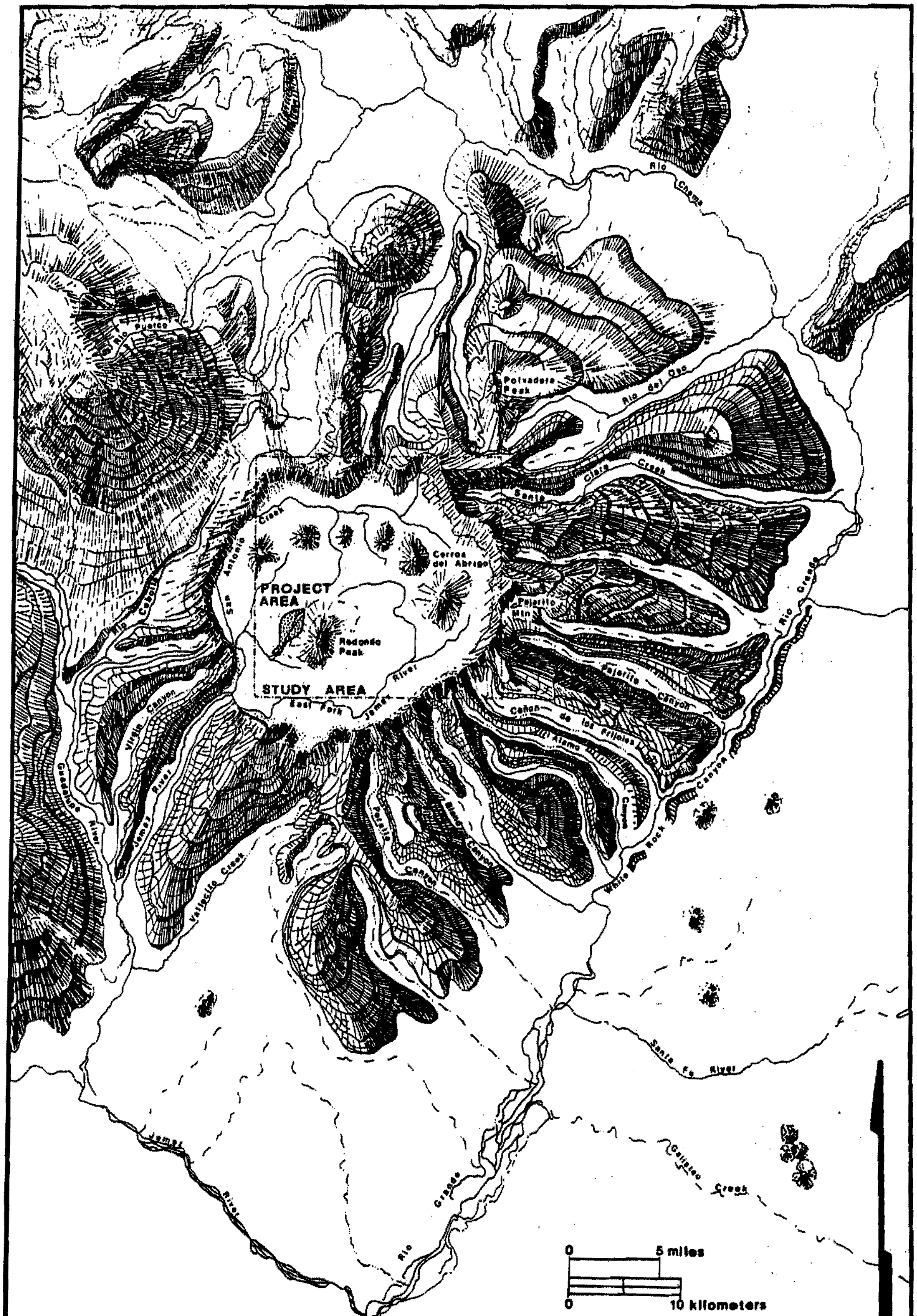
Archaic Sites
Early
Middle
Late
100ft Contour
Survey Area
LANL
N
0 0.5 1 2 3 4 Miles
0 0.5 1 2 3 4 Kilometers


Lithic Scatter
Lithic Scatter
100ft Contour
yellow
Survey Area
LANL
N
0 0.5 1 2 3 4
Miles
0 0.5 1 2 3 4
Kilometers

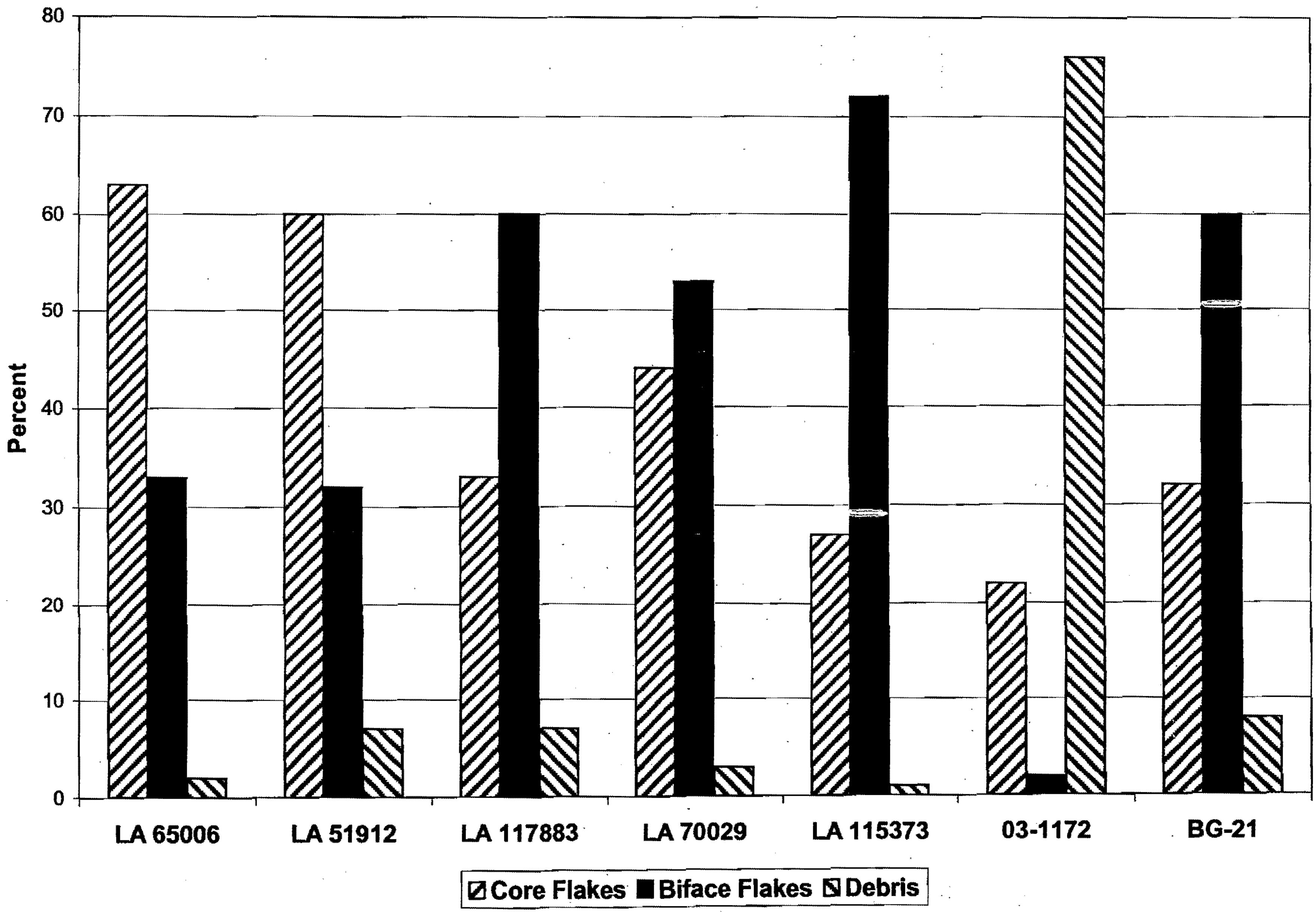


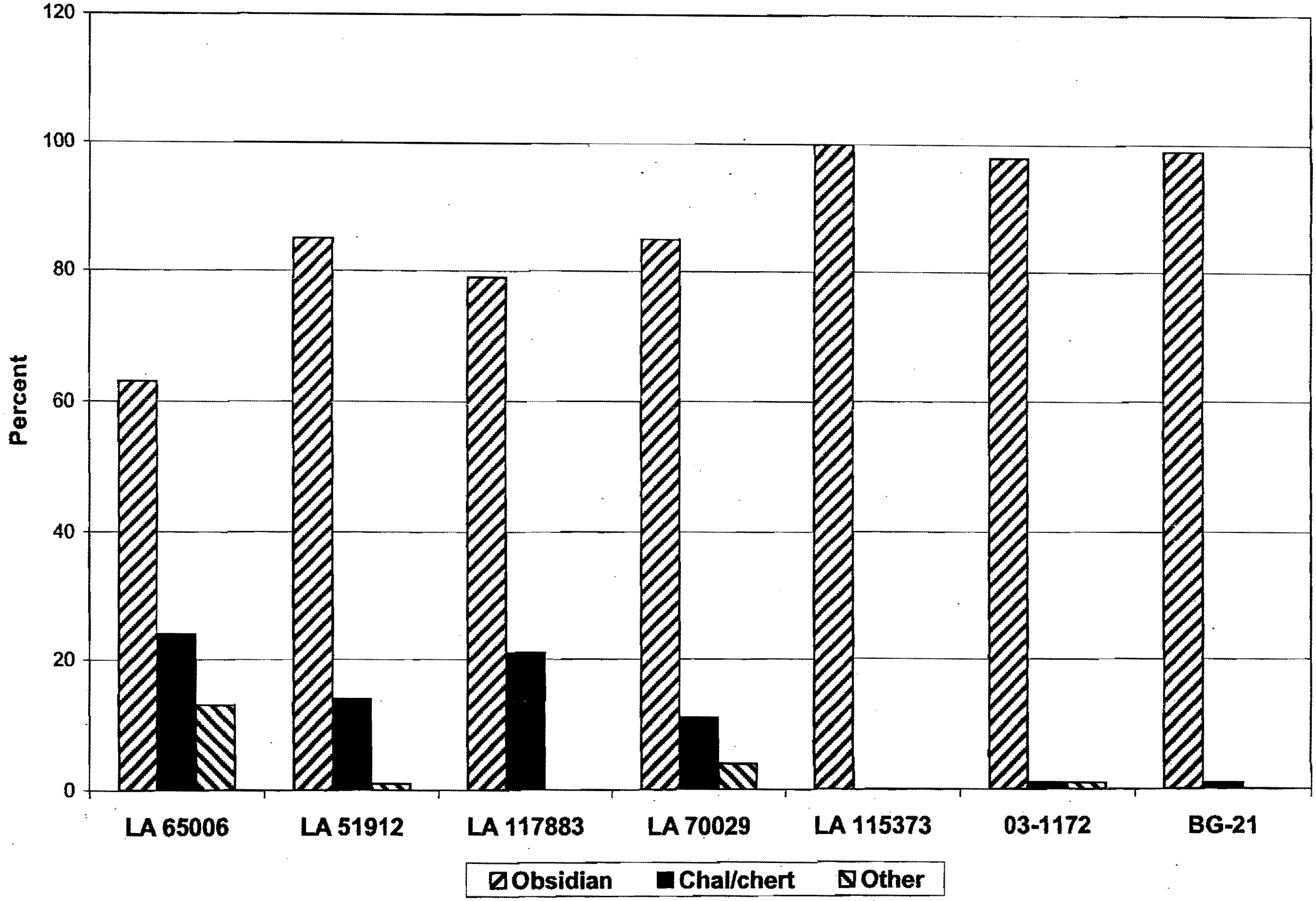
Lithic Scatter
100ft Contours
Lithic Scatter
Surveyed Area
LANL
0 1 2 4 6
Kilometers
0 0.5 1 2 3
Miles
N


10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Elevation (ft)
LA 65006
LA 51912
LA 117883
LA 70029
LA 115373
03-1172
BG-21



Rio Chama
Polvadera Peak
Rio del Oso
Santa Clara Creek
Cerros del Abrigo
San Antonio Creek
PROJECT AREA
Redondo Peak
STUDY AREA
Pajarito Mtn
East Fork Jemez River
Rio Grande
Pajarito Canyon
Cañon de los Frijoles
Jemez River
Vallecito Creek
Guadalupe River
White Rock Canyon
Santa Fe River
Galisteo Creek
0
5 miles
0
10 kilometers


80
70
60
50
40
30
20
10
0
Percent
LA 65006
LA 51912
LA 117883
LA 70029
LA 115373
03-1172
BG-21
Core Flakes
Biface Flakes
Debris



120
100
80
60
40
20
0
Percent
LA 65006
LA 51912
LA 117883
LA 70029
LA 115373
03-1172
BG-21
Obsidian
Chal/chert
Other