Animas–La Plata Project:
Volume XVI – Final Synthetic Report

James M. Potter
Chapter 14: The Economy

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This chapter summarizes the basic economic data for the Ridges Basin community. An economy generally comprises the production, exchange, distribution, and consumption of goods and services of an area. This chapter, however, focuses on a fairly limited subset of the economy, specifically subsistence pursuits and exchange.

Most data recovered on Pueblo I subsistence were recovered through the sampling of cultural deposits from structure floors, hearths, ground stone implements, storage features, and middens to recover economically important pollen and plant and faunal remains. These collections provide the basic and most direct data on subsistence. In addition, evaluating artifact assemblages (particularly those with functionally specific tools), site locations, and the distribution of non-habitation (limited activity) sites and features allows for further inferences regarding subsistence pursuits. These data inform on economic activities focused primarily on the exploitation of local resources. In addition, though, the economic reach of this community spanned considerable distances, with ceramic and exchange networks extending at least 150 km. These two very different but linked aspects of the Pueblo I economy—the local (micro) subsistence economy and the more distant (macro) sociopolitical economy—are explored in this chapter.

Previous chapters have touched on the various economic activities emphasized in the different settlement clusters that composed the Ridges Basin community. Although the record does not contain clear indications of economic specialization at the levels of the household or the settlement cluster, a certain level of economic complementarity among settlement clusters does seem evident (see Chapter 12, Settlement Cluster Variation). This chapter, however, while recognizing variation in the activities emphasized by particular households or settlement clusters in Ridges Basin, characterizes aspects of the total economy of the community and compares it, when possible, with other Pueblo I communities across the Northern San Juan region, including Blue Mesa.

TRADE AND EXCHANGE

Ceramics

The ALP project ceramic assemblage is fairly typical of a Northern San Juan region Pueblo I assemblage. It contains grayware frequencies comparable to that of Pueblo I assemblages from the Duckfoot site and from sites excavated as part of the Dolores Archaeology Program (DAP) near Dolores, Colorado, and the Fruitland project in northern New Mexico (Table 14.1) (Blinman and Wilson 1988; Etzkorn et al. 1993; Wilson 2002). In contrast to these other Pueblo I assemblages, however, the ALP project assemblage contains a substantially smaller proportion of redware and a comparatively high percentage of whiteware. Redware composes only 1.0 percent of the ALP project assemblage, whereas redware percentages for the DAP sites range from 4.4 to 8.9 percent and are 5.2 percent of the Duckfoot assemblage (Table 14.1). Allison (2008:52) notes that redware percentages are
even higher at sites farther west in southeastern Utah than they are at DAP sites—12 percent at Martin’s Site 2 and about 19 percent at Monument Village. He suggests that these high percentages are good evidence that most early Pueblo I redware was produced in the western part of the Northern San Juan region (i.e., southeastern Utah).

The small amount of redware in the Ridges Basin assemblage is due at least in part to the fact that it was not locally made, and also to the ALP project area’s considerable distance from the redware production center in southeastern Utah (Allison 2010). On the other hand, the Fruitland project area (near Navajo Reservoir) contained considerably more redware (Table 14.1) and is located even farther east from Allison’s redware production center than is the ALP project area. The Fruitland sites are slightly later than the Ridges Basin sites, however, and this may account for the higher redware percentages. Nevertheless, there may be other reasons, in addition to distance, for the unusually low redware frequency in the ALP project assemblage. (See Allison 2008 and Chapter 15, Ritual, Social Power, and Identity for further discussions of redware vessels and their meaning in the Ridges Basin community.)

Neutron activation analysis reported in the ALP project volume Ceramic Studies (Allison 2010:135–160) generally confirms that most redware is non-local and most whiteware and grayware was produced locally but not within Ridges Basin. Previous neutron activation studies of San Juan Red Ware (Glowacki et al. 2002; Hegmon et al. 1997) recognize three compositional groups, and suggest that two groups probably had been associated with production in different parts of southeastern Utah, with a third, smaller group using clays similar to clays found just west of Cortez. Allison’s ALP project study greatly increased the sample size of San Juan Red Ware that has been analyzed by neutron activation, clarifying and largely confirming the previously recognized patterns. Specifically, two compositional groups recognized in this analysis correspond closely to groups identified in the previous studies. One of these compositional groups appears to represent production in the area around and west of Blanding, Utah, whereas a second compositional group probably represents production in or near Montezuma Canyon between Blanding and the Colorado-Utah state line. A third compositional group includes the small group that Glowacki et al. (2002) suggest might represent production with clays available near Cortez. The current analysis expands this third compositional group, but also makes the exact locale of this group more tenuous. The current analysis also defines a fourth compositional group not recognized in the previous studies; there is no solid evidence to indicate where specimens in this fourth compositional group were made.

Grayware and whiteware vessels also appear, for the most part, to have been imported into Ridges Basin but from much shorter distances than for redware vessels. Clay distributions, combined with the relative lack of other evidence for pottery production, suggest that most of the pottery found at Ridges Basin sites had been made somewhere close to, but not within, Ridges Basin. Ridges Basin residents probably obtained most of their pottery through exchange with potters living in other parts of the Durango area, although some of it may have come from farther away. It is possible that

Table 14.1. Ware Percentages for Select Pueblo I Locales (from Potter 2010a:Table 3.2)

<table>
<thead>
<tr>
<th>Ware</th>
<th>ALP Project</th>
<th>Duckfoot</th>
<th>DAP A.D. 775–825</th>
<th>DAP A.D. 825–880</th>
<th>Fruitland Project</th>
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<tr>
<td>Grayware</td>
<td>87.7</td>
<td>89.8</td>
<td>88.8</td>
<td>91.0</td>
<td>88.8</td>
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<td>5.0</td>
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<td>5.2</td>
<td>8.9</td>
<td>4.4</td>
<td>7.8</td>
</tr>
</tbody>
</table>

* Etzkorn et al. 1993:Table 3.1
* Blinman 1986:Table 2.5
* Wilson 2002:Table 1.7
the Ridges Basin potters used raw materials not found within Ridges Basin itself, but other forms of evidence for pottery production in the basin are lacking except for features at two Ridges Basin sites, 5LP239 and 5LP240, which were likely ceramic kilns (Eisenhauer et al. 2007; Yoder et al. 2007).

**Obsidian**

Most of the lithic materials used by the Pueblo I people of Ridges Basin were procured from nearby sources (Railey and Wesson 2009). However, about 3 percent of the Pueblo I flaked stone assemblage is obsidian, a material that required trade or long trips to the source (Railey 2009a:112–113). Obsidian was favored for projectile points: 16.4 percent (n = 33) of the Pueblo I projectile point assemblage was of obsidian (Railey and Erhardt 2009:Table 7.13); 2.8 percent (n = 309) of the flake assemblage was obsidian and was made up of mostly small resharpening flakes (Railey 2009a:Table 6.13). Only one obsidian item was identified as a core. This suggests that most items were brought into Ridges Basin as finished tools (projectile points primarily) and that much of the flake assemblage resulted from resharpening these tools over their use life. It is not known whether these items were obtained by trade or long-distance procurement trips.

In total, 162 pieces of obsidian recovered from Ridges Basin were subjected to X-ray fluorescence analysis and identified to provenance (Railey 2009c:189–192). Ninety-seven percent (n = 157) derived from sources in the Jemez Mountains of northern New Mexico, specifically Polvadera Peak, Cerro del Medio, and Obsidian Ridge. Most obsidian items (n = 95) sourced to Cerro del Medio, which is in the eastern part of the Valles Caldera, 194 km (121 miles) southeast of Ridges Basin and the second-closest obsidian source identified in the ALP project assemblage. The Cerro del Medio source is referred to in geological terms as the Valles Grande rhyolite member (Northwest Research Obsidian Studies Laboratory [Northwest Research] 2006). Obsidian from this source occurs both in primary flows and as secondary gravels in San Antonio Creek, but apparently there are no secondary sources outside the Valles Caldera (Railey 2009c:190).

The next-most-common source identified through X-ray fluorescence analysis was Polvadera Peak (n = 60). Polvadera Peak, 184 km (114 miles) southeast of Ridges Basin, is the closest obsidian source identified in the ALP project assemblage. The term Polvadera Peak is the archaeological vernacular for an obsidian source that has been geologically identified as El Rechuelos (Baugh and Nelson 1987; Glascock et al. 1999; Northwest Research 2006). Polvadera Peak, itself, does not contain artifact-quality obsidian; the primary El Rechuelos source occurs in several smaller rhyolite domes to the north, west, and south of the peak, proper. Abundant secondary sources, mostly nodules less than 10–15 cm in diameter, occur in alluvial gravels of the Cañada del Ojitos, which drains these domes (Railey 2009c:190).

Only two pieces in the ALP project assemblage derived from Obsidian Ridge, a source just southeast of Valles Caldera, approximately 206 km (128 miles) southeast of Ridges Basin. Geologically, this source lies within the Cerro Toledo rhyolite, which outcrops in the Obsidian Ridge–Rabbit Mountain area and in other, smaller outcrops on the south side of the Jemez Mountains, with another large area on the northeast rim of the Valles Caldera (closer to the ALP project area than the Obsidian Ridge–Rabbit Mountain source). Obsidian occurs in both the southern and northern exposures of this geological formation and in alluvial gravels downslope and into the Rio Grande drainage (Bailey et al. 1969; Baugh and Nelson 1987; Heiken et al. 1990; Smith et al. 1970). Five items were sourced to three additional locations: two to Government Mountain in northern Arizona, two to Wild Horse Canyon in central Utah, and one to Cow Canyon in southeastern Arizona (Railey 2009c:191).
Obsidian sourcing results for Pueblo I sites excavated as part of the Rocky Mountain Expansion Loop Pipeline Data Recovery Project, which included one site in Ridges Basin (5LP515), two on Blue Mesa (5LP203 and 5LP379), and four near Aztec, New Mexico, were similar to the ALP project results. “All the obsidian subjected to X-ray fluorescence tests on the [Rocky Mountain Expansion Loop Pipeline] project from Pueblo I contexts were from the Jemez Mountains with all but one sample from the Polvadera Peak source” (Silverman et al. 2003:4-41). No other projects west of Ridges Basin have included comparable studies on obsidian artifacts.

**Shell**

Eighty-six pieces of sea shell were recovered from Ridges Basin (Eisenhauer 2009). All of them were worked to some degree and were found in association with human remains or in pit structures. The dominant genus among shell ornaments is *Olivella* (90.9%). Most were found singly or in groups of four or fewer. The one exception is a collection of 52 beads recovered from Burial 76 (Feature 41) at 5LP185. Those beads appeared to have been strung together and placed next to the cranium, along with a ceramic pipe and several vessels. Other taxa in the assemblage are *Haliotis cracherodii*, unidentified gastropod, unidentified bivalve, and unknown nacreous shell.

Olivella shell was found on seven of the nine sites containing shell. Olivella shells are well-suited for beads and need only the spire removed to create a suspension ornament. Only one bead—a bivalve ground into a disc shape with a central hole—was made from a taxon other than *Olivella* sp. The exotic shell assemblage indicates participation in a long-range trading network that reached as far as the Gulf of California.

**SUBSISTENCE**

Though primarily agriculturalists, the Pueblo I people of Ridges Basin practiced a broad-based subsistence economy consisting of cultivated crops, domesticated and wild animals, and native plants. Osteological analysis of human skeletal remains suggests that adults were relatively healthy prior to their demise (Perry et al. 2010), likely due in large part to their diverse diet. Analysis of Pueblo I skeletal populations from nearby Bodo Canyon (Fuller 1988a) and Blue Mesa (Horn et al. 2003a) indicates that these groups were also fairly healthy. Additionally, dental data reported in Martin and Goodman’s (1995) analysis of skeletal material from Ridges Basin indicate that the Pueblo I diet was varied and not overly reliant on maize.

**Domesticated Plants**

Ubiquity indices for maize from the Ridges Basin community are relatively high. Maize cupules and cob fragments were found in 62 percent (180 of 290) of flotation samples from Pueblo I habitation sites; kernels were present in 28 percent. The combined ubiquity (cupules, cob fragments, and kernels) is 81 percent.

Horn et al. (2003b:4-36) report a 40 percent ubiquity for Pueblo I sites investigated as part of the Rocky Mountain Expansion Loop Pipeline project, which includes one site from Ridges Basin, two sites from Blue Mesa, and four sites near Aztec, New Mexico. Presumably this ubiquity value includes cupules, cob fragments, and kernels. Sesler and Hovezak (2002:178) report a ubiquity index value of 84 percent for maize from Pueblo I sites in the Fruitland project area. Though dating to the Pueblo I period, the Fruitland sites are later than A.D. 859, making them somewhat later than the Ridges Basin and Blue Mesa sites, and this may partially account for the slightly higher maize ubiquity index value.

To the west of Ridges Basin we see a similar pattern of increased maize ubiquity from the early Pueblo I period to the late Pueblo I period. Petersen (1986:481) reports ubiquity for all cultigens combined (maize, beans, and squash or gourd) from DAP sites dating to A.D. 700–900. The values are 71 percent for sites dating to A.D. 700–800, 66 percent for sites dating to 800–850, and 85 percent for sites dating after 850. Petersen does not report the ubiquity of maize alone, but this study does
Chapter 14: The Economy

strongly affirm the pattern of increasing dependence on domesticates from the early to late Pueblo I period as noted above for sites east of the La Plata River drainage.

Adams (1993) notes that “the roles played by domesticates at Duckfoot and at the DAP sites (Matthews 1986:158)1 appear to have been similar. In both assemblages, maize kernels are common, indicating that maize was a ubiquitous domesticate in both places.” No additional data on ubiquity are provided for Duckfoot, but Adams’s observation does appear to support the pattern seen in the Fruitland and DAP data of domesticates composing a substantially greater portion of the diet in the later Pueblo I period. As noted above, kernels were present in only 28 percent of Ridges Basin flotation samples, a value which would probably not be considered common or ubiquitous.

Beans and squash or gourd are rare in the Ridges Basin assemblage. Only two charred beans and three remnants of squash or gourd were recovered from flotation samples. This contrasts markedly with the DAP botanical assemblage, in which 1,663 beans and 16 pieces of squash or gourd were recovered from Pueblo I contexts (Petersen 1986:480). It should be noted that both beans and squash are rarely preserved in the archaeological record.

**Wild Plants**

Seventy wild plant species were identified in the macrobotanical and pollen record of Ridges Basin. All Pueblo I households within the project area regularly harvested the greens and seeds of ruderal goosefoot and pigweed plants, known collectively as Cheno-ams (Adams and Murray 2008:226) (Figure 14.1). These plants thrive in disturbed habitats and probably grew within the maize fields. Thus, together the maize and Cheno-am records suggest that during the growing season families living in Pueblo I hamlets regularly tended maize fields and gathered ruderals from these same fields. Grasses were also routinely sought, likely both as food in the form of grains and for other household needs in the form of stems. The pollen record indicates the importance of numerous members of the sunflower family, including marsh elder; plants in the parsley family; and riparian species such as cattail and bulrush. In addition, people gathered a variety of seeds and fruits from annual and perennial plants throughout the growing season. In late spring, these consisted of tansy mustard seeds, pepper grass seeds, and ricegrass grains. In the summer, seeds and fruits from purslane, sunflower, marsh elder, beeweed, and groundcherry were gathered. Cactus fruit and piñon nuts were collected in the fall (Adams and Murray 2008:197–198).

**Pollen Washes**

An examination of pollen wash samples from 20 artifacts indicates some of the plants processed on them or stored within them (Adams and Murray 2008). Of 13 ground stone artifacts, 10 items retained Cheno-am pollen and eight preserved maize pollen, reinforcing the interpretation of routine processing of Cheno-am seeds and maize kernels with pollen still clinging to them. Five sandstone trough metates had been used to process maize as well as other plants. Cactus fruits were frequently prepared. Less often, achenes in the Asteraceae (high spine) group, which includes sunflowers and sagebrush, were prepared by grinding. An unusual record of legume pollen on one of the sandstone trough metates from a Blue Mesa site (5LP2026) suggests processing of wild or domesticated legume seeds. Likewise, it appears that someone ground piñon nuts at Sacred Ridge (5LP245) Locus 3 on a sandstone trough metate. A record of cattail pollen on a paint stone (at Eastern Cluster site 5LP177) may represent use of cattail pollen in painting. Finally, a ceramic jar on the floor of an Eastern Cluster structure contained Cheno-am and maize pollen, evidence these foods had been stored inside the jar.

1 Matthews (1986:158) writes for the DAP that “within the group of cultigens, Zea Mays is ubiquitous and the most abundant domesticate represented,” but she does not provide the percentages of samples, the contexts containing maize, or the raw data from which those percentages were derived.
Ground Stone Tools

The ALP project ground stone assemblage is comparable to other Pueblo I assemblages. Compared to the DAP assemblage, the most dramatic difference is in the frequency of one-hand manos in the ALP project assemblage, at 14.6 percent, as compared to 6.4 percent and 4.6 percent for the assemblages from DAP sites dating to the Sagehill subphase (A.D. 700–750) and the Dos Casas subphase (A.D. 750–825), respectively. According to Wesson (2009:235),

the difference may be due to the combination of various mano types under the rubric of “one-hand” mano, or it may be a function of the very high mano percentages seen in the Blue Mesa sites. It also could imply that generalized active abraders were more prevalent in the ALP sample due to a greater reliance on gathered floral resources than on corn. However, such interpretations should be considered tenuous at best, considering the problems inherent in comparing the two datasets.

The percentages of two-hand manos are strikingly similar in the ALP project assemblage, at 11.1 percent, and in the DAP assemblages, at 11.1 percent for the Sagehill subphase assemblage and 12.9 percent for the Dos Casas subphase assemblage. Trough metates, on the other hand, were more prevalent at ALP project sites, with 11.8 percent, than at the contemporary sites from the DAP assemblage, with 9.4 percent for the Sagehill subphase sites and 5.4 percent for the Dos Casas subphase sites. Wesson suggests that the greater frequency of metates in the ALP project assemblage than at the DAP sites is due to a greater reliance on plant materials.

As both two-hand manos and trough metates are considered indicators of intensified corn processing, this comparison suggests that corn processing may have been more important at the ALP sites than at the DAP sites. In light of the patterns outlined above, it might be expected that the ALP sites would exhibit a lower percentage of slab and basin metates, but this assumption is not borne out by the data. The ALP sites in fact had higher percentages of both tool subtypes than the DAP sites.
Perhaps the milling of floral resources in general was more important to early Puebloan peoples in the Durango area than to those in the Dolores area. (Wesson 2009:235)

Another possibility for the larger proportion of trough metates in the ALP project assemblage is the greater distance and duration of the migration out of the area. Schlanger (1991) and Schlanger and Wilshusen (1993) have argued that it is possible to distinguish long moves from short ones by comparing the weights and kinds of materials on structure floors between different periods and that the kinds and frequencies of moves appear to affect the percentages of ground stone. With long-term moves, such as the migration out of Ridges Basin in the early A.D. 800s, it may be expected that more ground stone would have been left behind, elevating ground stone proportions, especially those of the heavier objects such as metates.

**Animal Resources**

Hunted resource assemblages varied considerably among Pueblo I communities. Artiodactyl index (Artiodactyl/[Artiodactyl+Lagomorph]) (Szuter and Bayham 1989) and lagomorph index (Sylvilagus/[Sylvilagus+Lepus]) (Driver and Woiderski 2008) values are highly variable among various communities (Figure 14.2). Artiodactyl index values are high for DAP sites (including the communities of Sagehen Flats, Grass Mesa Village, and McPhee Village) (Wilshusen et al. 2000) and the Ridges Basin community (Potter and Edwards 2008), moderate for Blue Mesa (Fritz and Honeycutt 2003; Potter and Edwards 2008), and comparatively low for Duckfoot (Walker 1993) and sites excavated during the Fruitland project (Hovezak 2002; Hovezak and Dice 2002; Hovezak and Gass 2002; Sesler 2002). Potter (2009) suggests that two factors likely cause this variation. The first is that Ridges Basin, Blue Mesa, and Dolores area communities were at high elevations, between 6,800 and 7,000 feet above mean sea level and occupied relatively lush river basins—environments that were attractive to deer and elk. Duckfoot and the Fruitland project sites, on the other hand, were in locations ranging from 6,020 to 6,380 feet in more xeric environments.

A second factor potentially contributing to higher artiodactyl index values at DAP and ALP project sites is that these sites composed very large Pueblo I communities. Potter (2009) suggests that larger communities can more easily draw on local populations to participate in communal hunts, which increases the returns per individual (see also Kohler and Reed 2008). Additional factors potentially causing elevated artiodactyl frequencies at larger sites include 1) more and/or larger communal feasts occurring at big villages and 2) these communities, by virtue of their size, laying claim to and controlling access to particular resource areas (Wilshusen and Potter 2010).

It should be noted that although the artiodactyl index values of Ridges Basin and Dolores area sites are nearly identical, the actual artiodactyl proportions are vastly different—the proportion of the total Ridges Basin assemblage composed of artiodactyls is only 2.9 percent, whereas that of Grass Mesa is 10.2 percent. This discrepancy arises because of the relatively low frequency of lagomorphs in the Ridges Basin assemblage (which is what the artiodactyl index uses to standardize artiodactyl frequencies) as well as the high relative frequency of other taxa, such as birds (see below), which the artiodactyl index does not take into account.

Lagomorph index values also vary widely among the locales. The Ridges Basin and Dolores area communities produce the lowest values (see Figure 14.2). Again, Potter (2009) suggests that this may relate to the impacts of larger populations in Ridges Basin and the Dolores area to the local environment, which may have favored jackrabbits over cottontails, or to more effective communal hunting of jackrabbits by larger aggregated populations. Whatever the specific reasons, in the Pueblo I period there appears to be a strong correlation between community size and elevated artiodactyl index values as well as jackrabbit ratios.
As suggested above, avian percentages are also variable among Pueblo I communities (Figure 14.3). The lowest values were produced by sites at the western extent of the sampled area, at the Duckfoot and Dolores area sites. Ridges Basin yielded by far the highest proportion of bird bones, composing nearly 12 percent of the total assemblage. Potter (2009) suggests that this inordinately high frequency of birds is probably due to two factors. The first is the presence of a sizable marsh or wetland in Ridges Basin in the A.D. 700s and 800s (Anderson 2008a). Consequently, water birds, including swans, cranes, wood stork, osprey, ducks, teal, and snipe, are well represented in the assemblage (Potter and Edwards 2008). The second contributing factor is the high frequency of turkeys in the Ridges Basin assemblage, especially compared to other Pueblo I assemblages. A full 5.1 percent of the total Ridges Basin assemblage comprises turkey, compared to 1.3 percent of the McPhee Village assemblage and 0.5 percent of the Grass Mesa assemblage.

**Figure 14.2.** Plot of artiodactyl and lagomorph indices from five Pueblo I locales.
Within the Ridges Basin community turkeys were most abundant in the Eastern Cluster and were represented there mostly as burials in structure fill (Potter and Edwards 2008). But they were also quite abundant in other clusters where they were recovered as disarticulated remains from midden and pit structure floor contexts. Indeed, a pit structure in the North-central Cluster appeared to have been used exclusively to process fauna, particularly turkey and rabbit carcasses. This same site produced pieces of eggshell—evidence of turkey rearing. Turkeys, then, were an important food source for at least some households in Ridges Basin.

LIMITED ACTIVITY SITES

Many of the activities of the Ridges Basin subsistence system—including gathering and processing wild foods, tending to agricultural fields, procuring materials for and processing flaked stone tools, and processing maize—were conducted at limited activity sites. These sites are defined as those not containing a domicile (i.e., a pit structure). Nineteen Pueblo I limited activity sites were identified in Ridges Basin and investigated as part of the ALP project (Figure 14.4). These sites contained Pueblo I ceramics and are therefore considered contemporaneous with Pueblo I habitations in Ridges Basin. For more detail on limited activity sites, see the ALP project volume, *Ridges Basin Excavations: Archaic, Basketmaker II, and Limited Activity Sites* (Potter ed. 2008a).

Features

Five of the 19 Pueblo I limited activity sites in Ridges Basin contained architectural features (Figure 14.5; Table 14.2). Two sites—5LP181 and 5LP567—are interpreted as field houses. They contained pit rooms and slab-lined pits, and were situated in the southern portion of the basin where soils contained relatively high levels of nitrogen and phosphorus and were thus better suited to agriculture than most other local soils in the project area (see Chapter 9, The Natural Environment, and Chapter 12). These sites were also near the “south field,” which proved to be one of the most successful experimental garden plots (Adams et al. 2008:166–168; see also Chapter 9).

Sites 5LP186 and 5LP171, located along the northern edge of the basin, were quite different from the field houses in the southern part of the basin. First, they were located adjacent to pit house habitations, which makes it unlikely their primary function was as field houses in the classic sense. (Field houses generally functioned as temporary habitations for farmers tending fields away from their main domicile.) Second, these two sites contained surface structures that were more substantial than the pit rooms at the southern basin field houses. Finally, a wider array of behaviors is evident in their assemblages, including animal
and maize processing (see Table 14.2). Despite their differences from the southern basin sites, however, it is possible that their uses included those associated with field houses. They may have been places to store tools near fields, or to watch crops in the shade of a ramada, or tend to other agricultural tasks (e.g., stockpiling crops for processing), even though they were close to the main domicile. The location of these sites close to the northern experimental garden plot, which was very productive (Adams et al. 2008:166–168), suggests that these architectural sites were multipurpose but largely related to agricultural pursuits.

Site 5LP498 contained both a surface structure and a pit room. Several attributes of this site—its position well above any potential agricultural fields, substantial assemblages of flaked stone and ground stone, a lack of faunal remains, and multiple associated roasting pits—suggest that the collecting and processing of wild plants, particularly pine nuts, were the primary activities associated with this site. This site also contained a Basketmaker II component and likely functioned as a plant gathering and processing site during that period, as well.

Thermal features (hearths and roasting pits) were the most common extramural feature type at limited activity sites and were present at six sites, including two architectural sites (Table 14.3). Less common were pits used exclusively for storage; in fact, these types of pits were never the only type of pit present on a site. Roasting appears to have been the primary activity associated with these sites. Figure 14.6 plots the distribution of limited activity sites with roasting features. Note that two architectural sites discussed above as plant processing sites (5LP186 and 5LP498) contained roasting pits. The presence of these features in association with charred maize suggests that maize was processed at 5LP186. As noted above, wild plants, particularly pine nuts, were probably processed at 5LP498. Neither of the southern basin field houses contained roasting features, reinforcing the interpretation that they functioned as temporary shelters rather than as processing sites.

### Table 14.2. Pueblo I Limited Activity Sites and Their Attributes

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<th>Site Number</th>
<th>Architecture</th>
<th>Extramural Hearths/Pits</th>
<th>Ceramics</th>
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<th>Ground Stone</th>
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</table>
Figure 14.4. Map of Pueblo I limited activity sites in and around Ridges Basin.
Figure 14.5. Map of Pueblo I limited activity sites containing architectural features in and around Ridges Basin.
Chapter 14: The Economy

Figure 14.6. Map of Pueblo I limited activity sites containing roasting features in and around Ridges Basin.
Three classes of artifacts were present on almost all limited activity sites: ceramics, flaked stone, and ground stone. However, the types of artifacts within these classes varied considerably.

### Ceramics

Every Pueblo I limited activity site, by definition, contained pottery (i.e., if they did not contain pottery they were considered undated rather than Pueblo I). But ware frequencies and bowl-to-jar ratios vary among site assemblages (Table 14.4). Very few redware sherds were present on limited activity sites, and although rare in general in the project area, they were extremely rare on these sites. Whiteware sherds compose about 16 percent of the total assemblage from limited activity sites, an unexpectedly high proportion. Ceramic assemblages from Pueblo I pit structure habitation sites in the Eastern and North-central clusters, for instance, contain an average of 12 percent whiteware (Potter 2008:321; Wilshusen 2007:396). The reason for the large proportion of whiteware at limited activity sites is unknown. Also unexpected is the high ratio of bowls to jars, which averages 1.1:1 (Table 14.4). Since bowls are generally thought of as serving vessels and

### Table 14.4. Ceramic Artifacts from Pueblo I Limited Activity Sites

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Plainware</th>
<th>Whiteware</th>
<th>Redware</th>
<th>Bowl</th>
<th>Jar</th>
<th>Bowl-to-jar Ratio __:1</th>
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<td>2</td>
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<td>25</td>
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</tr>
<tr>
<td><strong>Total/Mean</strong></td>
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<td>264</td>
<td>173</td>
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</table>

* The bowl-to-jar ratio from this site is a statistical outlier and is not included in the project-wide ratio calculation. If this site were to be included, the ratio would be 1.5:1
jars are thought of as storage and cooking vessels, it was expected that these sites would have mostly jars composing their assemblages. This was decidedly not the case, however; food serving apparently occurred at many of these sites. On the other hand, sites that contained more jars than bowls often were those that had roasting features associated with them (5LP498, 5LP635, and 5LP186), suggesting that boiling and roasting in jars predominated at these sites (Figure 14.7).

**Flaked Stone**

All limited activity sites yielded flaked stone artifacts (see Table 14.2). One of the main differences among site assemblages is the ratio of cores to flakes (Figure 14.8; Table 14.5). Low ratios appear to be related to small sample size, as in the cases of 5LP1095, 5LP569, and 5LP608 (Table 14.5). The generally high ratio of flakes to cores suggests that initial core reduction occurred at these sites and then most cores, once reduced, were carried off-site for further reduction. Railey (2009d) concurs with this interpretation, suggesting that flint knapping—including core reduction, tool production, and perhaps tool refurbishment—was disproportionately the main task carried out at limited activity sites. Railey (2009d) also notes that bifacial flakes were relatively more frequent at limited activity sites than at habitation sites. In addition, he found that tools related to resource procurement were relatively common, such as hammerstones for lithic reduction, axes or choppers for felling and trimming wood, and used flakes and scrapers for a variety of activities, including processing game and plant resources (Table 14.5).

Other tools are not so obviously related to resource procurement and initial processing activities, such as drills and engravers or perforators, and the presence of these specialized tools suggests domestic activities and perhaps an additional function for at least some limited activity sites. One possibility is that some of the limited activity sites were short-term camps set up by newly arrived immigrants to Ridges Basin, temporary locations where everyday domestic tasks were conducted while land occupancy issues were sorted out and nearby houses were being constructed. This scenario could help explain the overall similar ranges of tools at habitations and limited activity sites (Railey 2009d:94).

**Ground Stone**

All but three limited activity sites contained non-ornamental ground stone items (Table 14.6). Ten sites had relatively high frequencies of ground stone items (i.e., a flake–to–ground stone ratio below 10:1 [Figure 14.9]), suggesting that these sites, in particular, were loci for plant processing.

**Faunal Remains**

Seven sites identified as Pueblo I limited activity sites contained faunal remains (Table 14.7). Though sample sizes are small, all but one of the assemblages are dominated by ungulates, ungulate-sized-mammal remains, and rodents. Since the rodents could be intrusive, ungulates are the dominant category unambiguously associated with past human behavior. Note that only two cottontail bones are present and no jackrabbit remains are represented. Even the assemblage with numerous dog-sized mammal bones contains a deer bone and no lagomorph remains. Moreover, in every case, all identifiable ungulate elements are low-utility elements. This pattern is consistent with the interpretation that ungulate processing occurred at these sites, where carcasses were butchered and low-value portions left at the processing site while high-value portions were transported to a consumption (i.e., habitation) site (Potter and Edwards 2008).

These limited activity sites ringed the basin and were spaced at fairly even intervals along the base of the various highlands that define the basin (Figure 14.10). Site 5LP588 contained a component that was defined as a Pueblo I limited activity site based on the presence of Pueblo I ceramics and the lack of any structures.
This site was excluded from Table 14.7 because it also contained possible Late Archaic and protohistoric components, and it could not be determined whether the faunal specimens, including numerous ungulate and ungulate-sized mammal remains (84% of the assemblage) recovered from that site were associated with the Pueblo I component. Regardless of those associations, though, when the location of 5LP588 is considered, it was well positioned to close the ring, so to speak, around the basin (Figure 14.10). This suggests that the locations for large game-processing activities during the Pueblo I period were not randomly selected. Instead, it appears they were purposely placed at the base of the highlands routinely exploited by hunters and at locales that members of various households could easily access and use.
<table>
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<th>Site Number</th>
<th>Cores</th>
<th>Flakes</th>
<th>Flake-to-core Ratio</th>
<th>Tools Hammerstone</th>
<th>Used Flake</th>
<th>Scraper</th>
<th>Perforator/Engraver</th>
<th>Chopper</th>
<th>Saw</th>
<th>Drill</th>
<th>Knife</th>
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Table 14.6. Ground Stone and Flake Artifact Counts and Flake–to–Ground Stone Ratios from Pueblo I Limited Activity Sites

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Table 14.7. Identifiable Faunal Remains from Pueblo I Limited Activity Sites

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<th>Cottontail</th>
<th>Small Mammal/Rodent</th>
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<td>5LP186</td>
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<tr>
<td>5LP635</td>
<td>20</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>16</td>
<td>2</td>
<td>20</td>
<td>74</td>
</tr>
</tbody>
</table>

Figure 14.9. Flake–to–ground stone ratios for Pueblo I limited activity sites. Sites on the left side had higher ratios of ground stone.
Figure 14.10. Map of Pueblo I limited activity sites with faunal remains.
Types of Activities at Pueblo I Limited Activity Sites

Feature and artifact data suggest that at least seven basic activities were conducted at limited activity sites—short-term living or camping, field tending, maize processing or cooking, wild plant collecting and processing, large game processing, core reduction and flint knapping, and tree felling and processing. None of these activities were mutually exclusive, of course, and most of the limited activity sites were the loci of multiple activities (Table 14.8). Short-term living or camping is determined by the presence of hearths, high ratios of serving bowls, the presence of surface rooms, and evidence for non-procurement-processing flaked stone tools. Field tending sites are defined by the presence of shallow pit rooms, proximity to potential field areas, distance from habitation sites, and a lack of processing features such as roasting pits. Maize processing is inferred from the presence of charred maize kernels. Wild plant processing and procurement are inferred from roasting pits and high frequencies of ground stone. The presence of faunal remains and high frequencies of scrapers and used flakes suggests game processing. High proportions of flakes and hammerstones may indicate core reduction and knapping. Finally, a high frequency of choppers or hand axes suggests tree chopping or processing, or both.

Several conclusions regarding limited activity sites in the project area can be drawn from the data presented in Table 14.8.

Most of the sites were loci for multiple activities. Only four sites yielded evidence of a single activity. It is therefore difficult, if not impossible, to assign type designations to these sites other than a generic processing site designation for many of them. It should not be assumed that the location of these sites on the landscape, with the possible exception of field house sites, was due to specific activities.

Most Pueblo I limited activity sites, even those with architectural features, were not field houses, at least according to the criteria applied to this sample of sites. Some activities, such as wild plant processing,

Table 14.8. Activities Evident at Pueblo I Limited Activity Sites

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Short-term Living/Camping</th>
<th>Field Tending</th>
<th>Maize Processing/ Cooking</th>
<th>Wild Plant Collecting/ Processing</th>
<th>Game Processing</th>
<th>Core-reduction/ Knapping</th>
<th>Tree Felling/ Processing</th>
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<tbody>
<tr>
<td>5LP171</td>
<td>×</td>
<td></td>
<td>×</td>
<td>×</td>
<td>×</td>
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<td>5LP181</td>
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<td>5LP183</td>
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<td></td>
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<td>×</td>
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<td>5LP186</td>
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<tr>
<td>5LP588</td>
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<td></td>
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<tr>
<td>5LP601</td>
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<td></td>
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<td>×</td>
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<tr>
<td>5LP608</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>×</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5LP635</td>
<td>×</td>
<td></td>
<td></td>
<td></td>
<td>×</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5LP1095</td>
<td>×</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

× = One criterion was met to infer this activity.
×× = Two criteria were met to infer this activity.
were more common than others, such as field tending. This implies the relative importance of various tasks that have been attributed to these sites and, by extension, their importance to the overall economy of the community. The sample may be unrepresentative. SWCA’s investigations necessarily focused on sites in the basin rather than in upland areas or areas farther from habitation sites. Thus, sites for processing agricultural and wild foods are probably overrepresented, and sites for extracting lithic tool materials and upland foods like piñon nuts are underrepresented.

SUMMARY

This chapter highlights the variety of scales at which the Pueblo I economy operated, and juxtaposes a successful small economic universe with a much wider set of exchange ties for social and political purposes. Whereas people generated most of their daily economic needs from an area of no more than a few square kilometers (or perhaps on occasion as large as 100–400 km²), their socioeconomic ties extended for hundreds of kilometers, if not more. This pattern suggests that Pueblo I people had one set of ties to provide day-to-day subsistence, and another set of longer distance ties to establish and maintain social and economic (and perhaps even religious) relations with the wider world. The economy of the Ridges Basin community, for example, involved the long-distance importation of redware ceramics. Redware was imported from the west, primarily from southeastern Utah, whereas whiteware and grayware appear to have been imported primarily from somewhere in the Durango area, although the specific location of production has not been identified. Some ceramic production is evident in Ridges Basin, primarily in the form of kiln features and polishing stones in the Eastern Cluster, but for the most part there is a dearth of ceramic production evidence in the Ridges Basin community. Other resources that were imported include obsidian from Jemez Mountain sources and olivella shell from the Gulf of California. Both of these resources are quite rare in the Ridges Basin assemblage, however, and represent only a small portion of the overall economy.

The vast majority of lithic resources appears to have been acquired locally (Railey and Wesson 2009).

The subsistence economy of the Ridges Basin community included the cultivation of maize, common beans, and squash or gourds. Maize was common and was present in some form in 81 percent of flotation samples. Beans and squash were rare: Only two beans and three pieces of squash or gourd were identified in flotation samples. Wild plants composed a substantial portion of the subsistence economy of Ridges Basin, as well. Cheno-ams were present in 43 percent of flotation samples, and several other wild plants were also common, including ground cherry, knotweed/bulrush, purslane, and sunflower. Seventy species of native plants were identified in the botanical record (either in flotation or pollen samples) indicating that although maize was highly ubiquitous wild plants also composed a large portion of the overall cuisine of Ridges Basin people.

Large game composed a relatively modest portion of the subsistence regime. Only 3.0 percent of the faunal assemblage is artiodactyl remains (excluding antler, which can be acquired independently of a hunted animal) compared to 10.2 percent at Grass Mesa. On the other hand, riparian resources such as waterfowl and shore birds were relatively abundant, as were turkeys. It is not known whether the Ridges Basin turkeys were fully domesticated, but the high relative frequency of their remains and the presence of egg shell in one pit structure at 5LP237 in the North-central Cluster suggest that some birds may have been born in captivity and representative of animal husbandry.

Finally, although maize agriculture composed a large portion of the overall economy, Pueblo I limited activity sites were primarily oriented toward activities related to hunting and gathering. Only two of 19 sites are interpreted as field tending sites, whereas, for example, 12 sites contained evidence for wild plant collecting and processing. This pattern reaffirms the broad-based nature of the subsistence economy of Ridges Basin.
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