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

James M. Potter

SWCA
ENVIRONMENTAL CONSULTANTS

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Section I: Introduction

Chapter 1: Introduction and Project Setting

James M. Potter

From 2002 to 2005 SWCA Environmental Consultants (SWCA) conducted archaeological investigations at 74 sites as part of the Animas–La Plata reservoir project just south of the modern town of Durango in La Plata County Colorado (Figure 1.1). Most of the archaeological sites affected by this project were in Ridges Basin, the site of the new reservoir, Lake Nighthorse. Several sites were on Blue Mesa, a small prominence located southeast of Ridges Basin on the west bank of the Animas River that was used as a borrow area for dam fill (Figure 1.2). All sites were determined eligible for inclusion on the National Register of Historic Places. These investigations resulted in the recovery of data on Paleoindian, Archaic, Basketmaker II, Pueblo I, protohistoric, and historic occupation and use of the project area. By far the greatest amount of data was recovered from early Pueblo I contexts (Figure 1.3).

The reservoir was created by the construction of a 270-foot-high earthen dam across a narrow canyon between Ridges Basin and the Animas River (at the intersection of Carbon Mountain and Basin Mountain). When full, it will cover an estimated 1,490 acres. Water will be supplied from the Animas River through a pumping system that will transport water up Bodo Canyon into Ridges Basin.

The Ute Mountain Ute Tribe retained SWCA to undertake the required archaeological and cultural investigations in Ridges Basin and on Blue Mesa. This volume, the last of 16 to document the results of the Animas–La Plata archaeological project (hereafter referred to as the ALP project), is SWCA's final synthetic report for the treatment of archaeological resources affected by the construction and filling of Lake Nighthorse.

This volume has four objectives. The first is to address the research questions posed in the research design (Potter 2006). The second is to provide a stand-alone summary of the project results for the scientific community and other interested readers. Third, this volume summarizes the conclusions of other ALP project reports and directs the reader to those reports for additional, more detailed information on specific research topics. The final goal is to present new ideas and insights concerning the archaeological record of the project area based on the new information generated by the project.

The volume is organized into four sections. Section 1 (Chapters 1 and 2) provides the project background and history of research in the area. Section 2 (Chapters 3–5) summarizes the research results for the earliest occupations in the project area—the Paleoindian, Archaic, and Basketmaker II periods—spanning approximately 9,000 years from about 8400 B.C. to A.D. 500. Section 3 focuses entirely on the early Pueblo I period and consists of 12 chapters (Chapters 6–17). Section 4 consists of one chapter on post–Pueblo I archaeology in the region and a concluding chapter about Native American involvement in the ALP project.

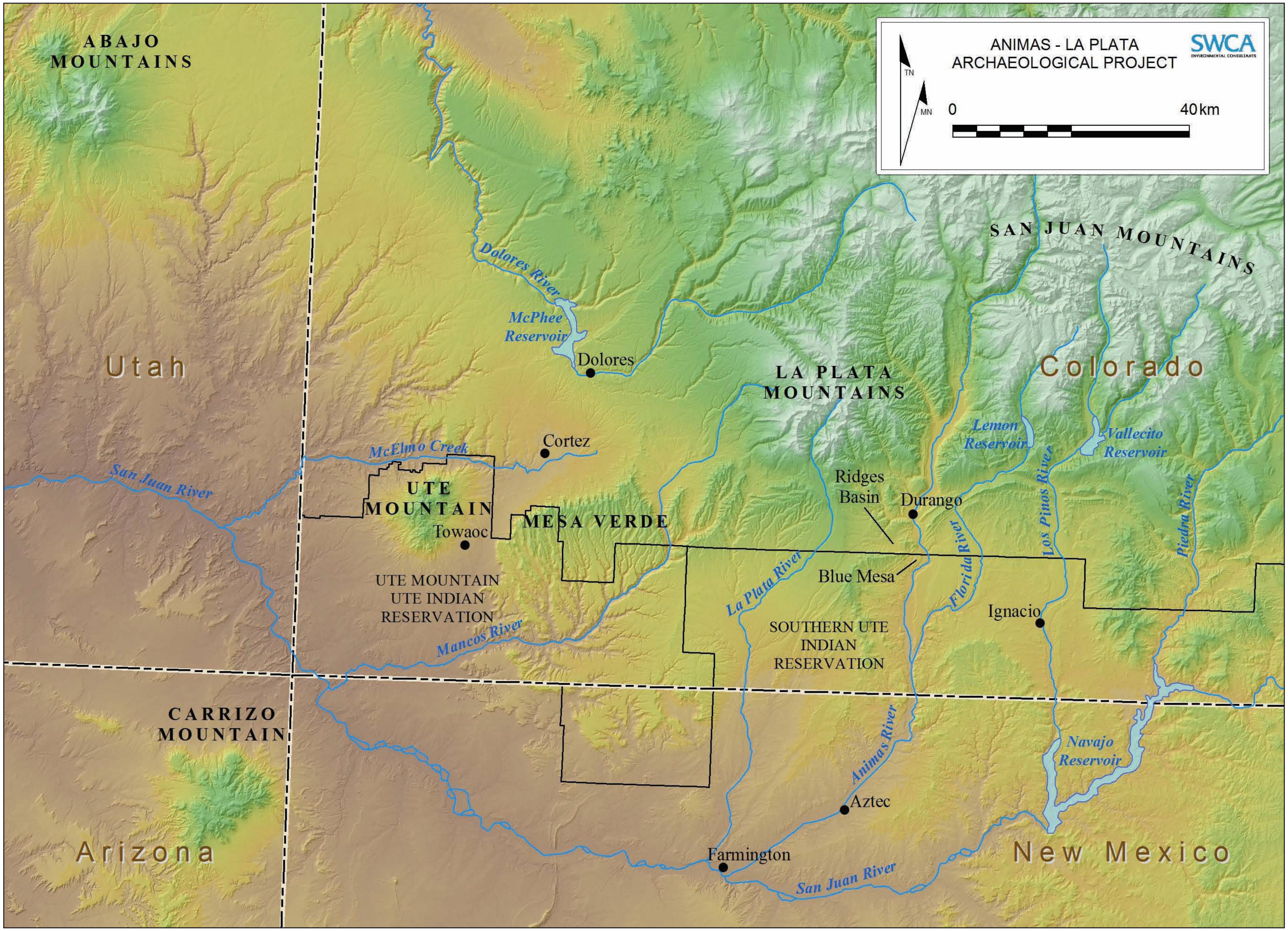

Figure 1.1. Location of Ridges Basin and Blue Mesa, the main locales of the Animas–La Plata project area in southwestern Colorado.

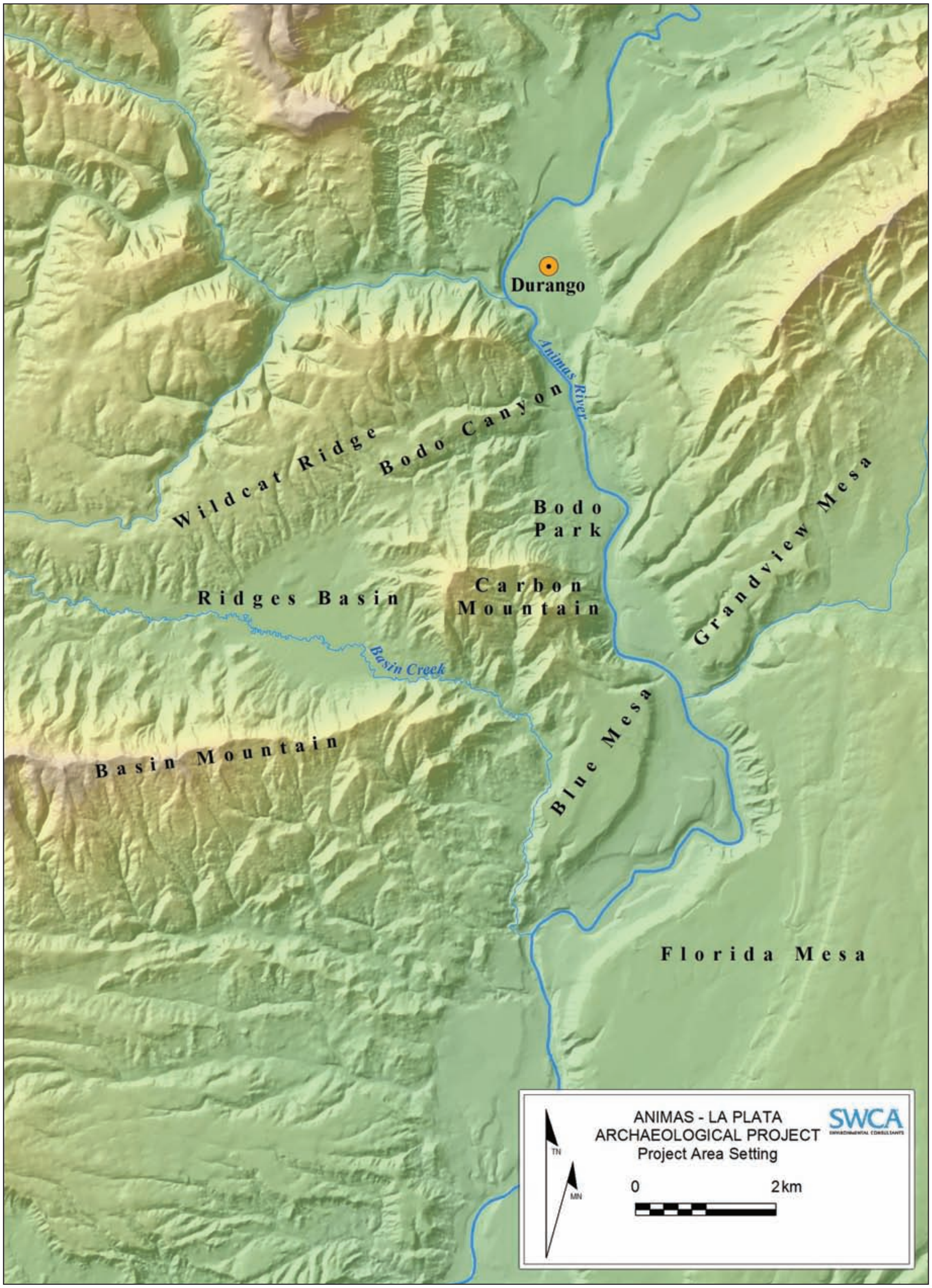

Figure 1.2. The Ridges Basin and Blue Mesa areas.

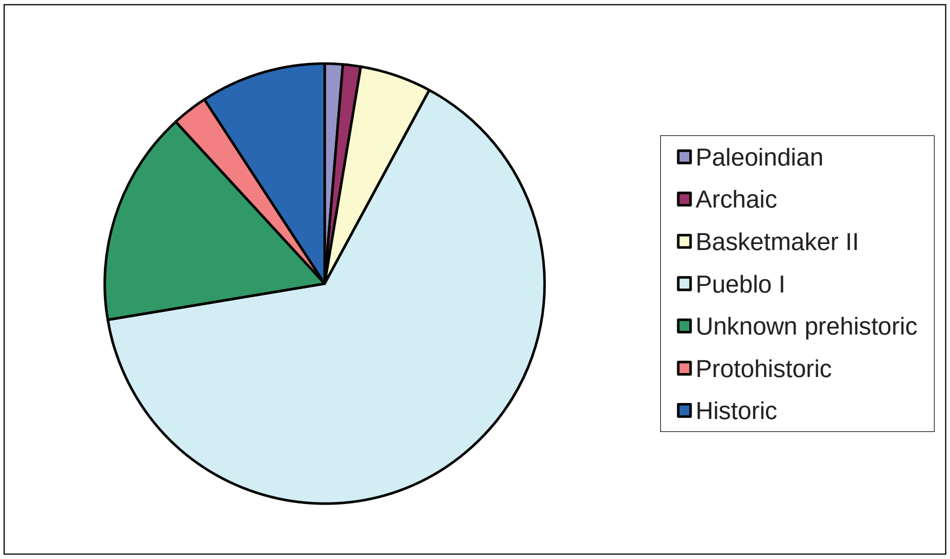

Figure 1.3. Proportions of all investigated components by time period.

ENVIRONMENTAL SETTING

Ridges Basin and Blue Mesa lie at the border between the Southern Rocky Mountain and Colorado Plateau physiographic provinces. This boundary is broadly defined as the zone in which sedimentary formations rise onto the uplift of the San Juan Mountains. Uplift and deformation have occurred episodically throughout the geologic history of the Durango area and are responsible for creating many of the major topographic features evident today. During the last two million years, the San Juan Mountains may have experienced 15 or more glacial advances, which have also greatly contributed to the formation of the modern landscape (Blair et al. 1966). The Hogback Monocline, a series of east–west-trending and southward-dipping ridges, dominates the topography in and around Ridges Basin and Blue Mesa. The Animas River crosses these hogbacks from north to south. Landforms along the Animas River are predominantly terraces of late Pleistocene age that formed during the last deglaciation between 18,000 and 15,000 years ago (Blair et al. 1966).

Ridges Basin

Ridges Basin is a broad triangular basin bounded on the south by Basin Mountain, on the east by Carbon Mountain, and on the northwest by Wildcat Ridge (Figure 1.4). Basin Creek enters Ridges Basin from the west (at the western corner of the triangle) at an elevation of 6,800 feet above mean sea level before exiting Ridges Basin in the southeast corner of the triangle at an elevation of 6,720 feet. The south side of Ridges Basin is bounded by Basin Mountain and its piedmont, the east side by Carbon Mountain and its piedmont, and the north side by a low ridge separating Ridges Basin from Wildcat Canyon. This low ridge, informally referred to here as Wildcat Ridge, rises to elevations between 7,200 feet and approximately 7,400 feet at its northernmost point. The highest point of Carbon Mountain is at an elevation of 7,844 feet, and Basin Mountain's highest point is at an elevation of 8,245 feet.

The Hogback Monocline is a regionally extensive geologic structural feature best defined in the project area by the tilted sandstone bedrock at the tops of Carbon and Basin mountains. The regional dip of the sedimentary stratigraphy of the Hogback Monocline is toward the east-southeast, and the axis of the monocline trends north–south. The landscape of Ridges Basin and its associated landforms is determined to a great extent by the geologic structure of the Hogback Monocline, combined with the variation in the erosive nature of the underlying geologic units (Anderson 2008a). The Hogback Monocline exposes Cretaceous sedimentary rocks that dip approximately 40 degrees to the southeast. At its peak Carbon Mountain has the erosion-resistant Pictured Cliffs Sandstone, which forms dramatic cream-colored cliffs. Underlying the Pictured Cliffs Sandstone is the more easily eroded Lewis Shale, the dark gray and black material that dominates much of the sediments in the eastern portion of Ridges Basin. Lower on the slopes of Carbon Mountain are younger colluvial and alluvial fan deposits of Lewis Shale–derived clays. Underlying these two units, which dominate the geology in the eastern and southern sides of the basin, is the Mesaverde Group, consisting of the Cliff House Sandstone, Menefee, and Point Lookout Sandstone formations that outcrop on the western side of the basin (Anderson 2008a).

Soils in and around Ridges Basin are primarily residual deposits formed on underlying shale and sandstone bedrock. Colluvial slope wash has redeposited these soils, and alluvial deposits are present along drainages. In Ridges Basin, sediments derived from the Mesaverde Group are generally sandier than the clayey deposits derived from the predominant Lewis Shale on the east and south sides of the basin. These two different types of sediments and their resulting soils have important implications for soil types and prehistoric agriculture (Anderson 2008b). In simple terms, soils derived from Lewis Shale have high clay content and are not optimal for growing crops, whereas soils eroded from sandstone tend to drain better and therefore accommodate crops better.

Ridges Basin encompasses four biotic communities (Brown 1994; Reith 1986a). At the basin's highest elevations is Petran Montane Conifer Forest, which is dominated by ponderosa pine and Douglas fir. The slopes of Basin Mountain, Wildcat Ridge, and Carbon Mountain support Great Basin Conifer Woodlands, principally piñon-juniper, and Great Basin Montane Scrub, composed of many small-leaved, deciduous scrub species. Great Basin Desert Scrub, dominated by sagebrush and rabbitbrush, populates lower slopes and the valley floors. Basin Creek, a major tributary to the Animas River and a permanent stream bisecting the basin, supports riparian species.

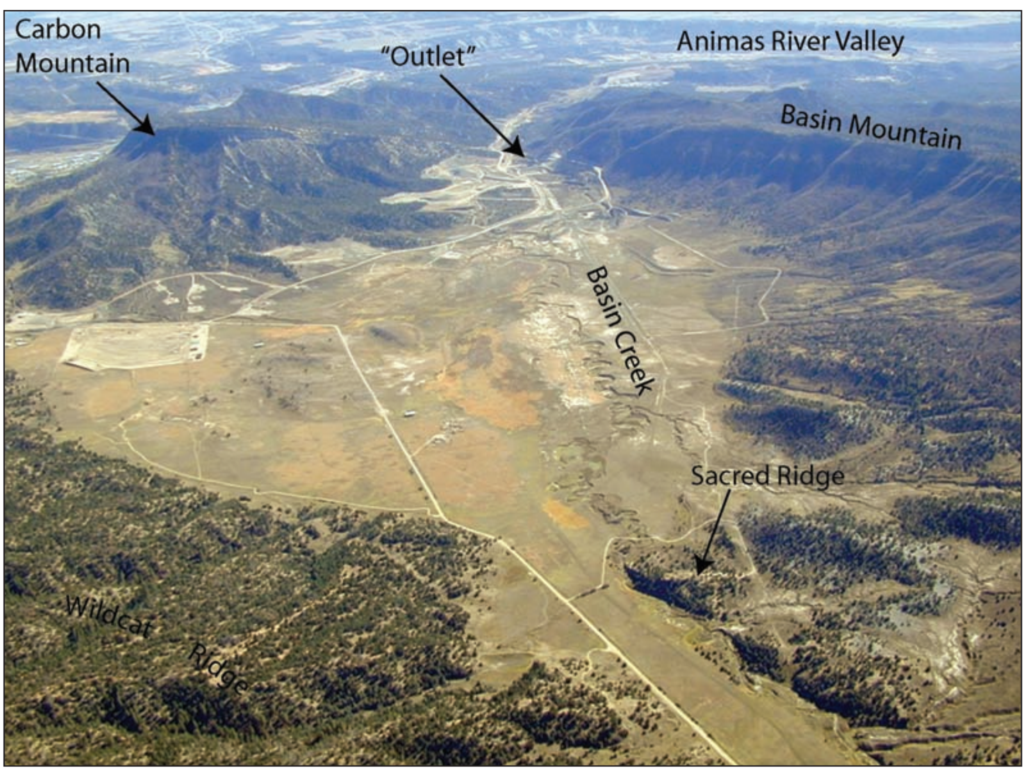

Figure 1.4. Aerial view of Ridges Basin, facing east.

The high diversity of habitats represented by these biotic communities supports a variety of vertebrate fauna. Although prior to the construction of the reservoir open water was too limited to support nesting waterfowl, Reith (1986a:20) notes that "the combination of forest, woodland, shrub, meadow, and streamside habitat provides for more than 50 species of passerine (perching) birds, as well as raptors, woodpeckers, hummingbirds, turkey, and dove." Deer, elk, rabbits, prairie dogs, badgers, weasels, squirrels, marmots, and porcupines are also common locally. In addition, 12 species of amphibians and reptiles have been recorded in the basin (Reith 1986a:20).

Reith (1986b:45–47) documents several human-induced factors that drastically changed the local setting in Ridges Basin, including fire, overgrazing, and construction and clearing. The historical presence of fire is evidenced by dense concentrations of Gambel's oak on the north-facing slope of Basin Mountain. Gambel's oak responds to severe burn by sprouting from stumps and producing dense stands of uniform height.

Overgrazing is the most widespread of recent human impacts to the area, resulting in the invasion of trees and shrubs into meadows and relegating most native grass species into relict patches among the oaks and piñon-juniper. In addition, a variety of annual and perennial weeds—principally in the sunflower and mustard families—have populated areas disturbed by overgrazing and construction. Crested wheatgrass (also known as cheat grass) had been allowed to revegetate most disturbed areas, and ponderosa pines have been selectively cut throughout the basin.

Blue Mesa

The core of Blue Mesa consists of Upper Cretaceous sandstone and shale formations that are exposed on the eastern and western escarpments (Chuipka and Potter 2007a:1). The bedrock core of the mesa is overlain by a layer of cobbles and gravels up to 12 meters (m) thick, which were deposited by glacial outwash streams 240,000–340,000 years ago. These glacial deposits are capped by a layer of reddish brown loess ranging in thickness from several centimeters (cm) to more than 6 m. Part of the Falfa clay loam soil series, this uppermost deposit is characterized as a fine, silty to sandy loam formed through thousands of years of aeolian and alluvial accumulation in a generally stable landscape. Loess-derived soils are highly suitable for dry farming techniques because they absorb significant amounts of moisture during melting of winter precipitation and they retain that moisture throughout the growing season.

Elevation ranges from 6,620 feet on the eastern edge of Blue Mesa to 6,780 feet on its western edge. This difference in elevation is primarily due to the presence of two southward-sloping terraces separated by a scarp. The scarp is concealed by thick loess deposits in the northern half of the mesa and becomes more pronounced to the south, where it is more than 4 m high.

The modern vegetation community on Blue Mesa has been affected by natural wildfires, historic clearing for agriculture, chaining to improve forage for cattle, and commercial development. The modern mesa top is covered mostly by piñon-juniper woodland and open areas of sagebrush. Prickly pear cactus, mountain mahogany, foxtail barley, tobacco, squaw apple, lemonade berry, Gambel's oak, yucca, and a variety of forbs and herbaceous plants were inventoried through a modern vegetation survey conducted by SWCA in 2002 (Murray et al. 2008). Cheat grass is also prevalent on the mesa.

No permanent surface water sources currently exist on Blue Mesa. Basin Creek, below the west side of the mesa, is approximately 1 kilometer (km) from recorded habitation sites; the Animas River is approximately that same distance to the east.

Climate and Precipitation

The climate of the area around Ridges Basin and Blue Mesa is semiarid with approximately 25 percent of precipitation falling as snow. Temperature ranges from a mean daily low of 10 degrees Fahrenheit in January to a mean daily high of 87 degrees Fahrenheit in July, with a long-term annual temperature of approximately 40 degrees Fahrenheit. The length of the growing season of the Durango area has been variously reported as 116 days (Fuller 1988a:12 citing Peterson 1984) and 99 days (Reith 1986a). Based on data collected over a four-year period, Bellorado (2007:186) reports widely varying average frost-free periods—from 116 days to 134 days—for different areas in Ridges Basin, depending on aspect and proximity to the cold-air drainage.

On average, Durango receives 18–19 inches of precipitation annually. Reith (1986a:22) reports a precipitation average of 18.98 inches for the Durango Airpark weather station on Blue Mesa. Fuller (1988a:12) reports the northwest Durango station yielding an average of 18.61 inches. According to Petersen (1988), based on a 66-year record, Durango receives 18.04 inches of precipitation annually. In 2007 Anderson and Bellorado (2009) recorded 20.14 inches of precipitation in Ridges Basin. No season is consistently without rainfall, but May and June often constitute a period of mild drought. In contrast, August is the wettest month with episodes of monsoon rainfall dropping an average of 2.38 inches. November marks a second period of mild drought that ends with snowstorms occurring throughout December, January, and February. Hack (1942) suggests that a minimum of 12 inches of annual precipitation is necessary for prehistoric maize agriculturalists using dry-farming techniques. Although Hack's suggestion was noted for the entire Colorado Plateau, his work was derived from a study that focused on the Hopi, who live in a part of the plateau that has a specific climatic regime with a significant portion of annual precipitation coming in the summer months when moisture is critical, and that has a specific group of soils composed of bedded sandy soils with subsurface drainage. Additionally, the Hopi use a sophisticated blend of different maize varieties, cultivation practices, and adaptations to specific microenvironments that allow for agricultural success with limited annual rainfall. Following Milo (1991), Adams and Petersen (1999:23) suggest that annual precipitation is a poor predictor of growing season precipitation, and they recommend average moisture between May and September as a far better predictor. Good maize-growing areas average 6.2 inches of precipitation in the five months critical to the success of a maize crop. Maize can be cultivated with less moisture, but it requires more and more enhancement of water delivery to the plants to ensure success. This suggests that the Durango area, with its May and June droughts, may not be the most predictable area to grow maize, even though it receives well over 12 inches of precipitation annually. Paleoclimate data and discussions of their implications on settlement in Ridges Basin and on Blue Mesa are presented in greater detail in Anderson (2008b).

ARCHAEOLOGICAL AND HISTORICAL SETTING

Prior to the ALP project there had been only sporadic episodes of systematic excavation conducted in the area. In many ways, the area represented a sizable gap in our knowledge of the prehistory of the Southwest. One of the goals of the ALP project was to gather basic chronological and settlement data from the area to help fill that void. Only a handful of Archaic sites, for example, were known in the area and even fewer had been excavated. Many of these sites were located in Ridges Basin during survey and were identified as Archaic based on the presence of Archaic point types and a lack of ceramics. Only two small Archaic sites had been excavated, however (Fuller 1988a), and no large Archaic sites had been excavated even though they had been identified during survey (Ware 1986a:147–159). Thus, any Archaic sites excavated as part of the ALP project had a high potential to add to our understanding of early hunter-gatherer settlement in the area. Furthermore, excavation data from Archaic sites might also aid in untangling the relationship between Archaic and Basketmaker settlement in the area, including, in particular, when and how maize agriculture was adopted. As is well known, the Durango area contains some of the most spectacular and best-preserved Basketmaker II sites in the Southwest. Talus Village and the Falls Creek rock shelters, excavated by Morris in the 1930s, represent some of the most thoroughly documented large Basketmaker II sites in the northern Southwest (Morris and Burgh 1954). It was hoped SWCA's excavations in Ridges Basin and on Blue Mesa would shed additional light on Basketmaker II settlement and population dynamics during this early agricultural period. A general summary of this area (Lipe et al. 1999) suggested a Basketmaker II exodus in the A.D. 400s and a Pueblo I re-entry in the early 700s, but these summaries noted the pressing need for intensive investigations in the area to confirm or deny these proposals (Wilshusen 1999a:190, 1999b:209).

In the early eighth century, occupation in the Durango area, including Ridges Basin and Blue Mesa, grew considerably, and by about A.D. 750 pit structure sites dotted the landscape. Often these pit structure sites were organized into settlement clusters (Fuller 1988a, 1989). Although most Pueblo I households occupied single pit structure habitations, some of which were loosely aggregated, one site in Ridges Basin appeared to represent something larger, perhaps a village. The Sacred Ridge site (5LP245) was the largest site in the region during the Pueblo I period, and it occupied much of a large knoll, covering approximately 12 acres (see Figure 1.4). The site's presence at the west end of Ridges Basin raised a number of questions. At the apex of the knoll were features that had been excavated by the Fort Lewis College field school in the late 1960s. Directed by Homer Root, these excavations were generally poorly controlled and reported, and therefore much of what SWCA wanted to accomplish at the site revolved around understanding Root's excavations. We hoped to re-document the work Root conducted and recover any additional information from this area of the site. The descriptions of unique features in Root's notes suggested this area may have been an important ritual locale for the village and perhaps for the entire basin.

By A.D. 850 the entire Durango area, including Ridges Basin and Blue Mesa, was completely depopulated. After the Pueblo I people left, Ridges Basin remained unoccupied for centuries. It was not until protohistoric groups such as the Utes, Paiutes, and Navajo began moving through the area sometime between A.D. 1400 and 1600 that Ridges Basin was again settled, though sparsely. As early as the 1400s, the Utes began to call the northern Southwest home, and for the next five centuries they dominated the Rocky Mountains, including the area around Ridges Basin. The most significant feature indicating a Ute presence in Ridges Basin was the Old Ute Trail, which ran directly through the basin and connected the town of Ignacio (the headquarters of the Southern Ute Indian Tribe) with Towaoc (the headquarters of the Ute Mountain Ute Tribe). The Old Spanish Trail followed this same route until 1876 when it bypassed Ridges Basin to go through the historic town of Animas City (now part of Durango).

In the 1800s Euroamerican miners came to the Rocky Mountains in search of precious metals. Gold and silver strikes all along the Rocky Mountains brought wealth to Euroamericans and displacement to the Utes. With the miners came the railroad and the ranchers. Ridges Basin was no exception to this process. George Thompson, a wealthy landowner and stockman from southeastern Colorado, established the first ranch in the area and grazed his cattle between the San Juan River in northwestern New Mexico and the La Plata Mountains (Gilpin 2007). Around 1880 Thompson began using Ridges Basin as his summer headquarters, and in the next 40 years, some 36 parcels were patented in and near Ridges Basin, some by members of the Thompson family.

In the early 1900s members of the Thompson family sold their ranches to Mike Bodo, Sr. Over the next 20 years, Bodo and his son Mike Bodo, Jr. bought out other homesteaders, and by 1940 they controlled everything from Wildcat Creek to the summit of Basin Mountain and from the Harper Ranch at the western end of Ridges Basin to the Animas River. In 1971 the Bodo family sold the ranch to the Nature Conservancy, which in turn passed it on to the Colorado Division of Wildlife to be used as a wildlife refuge. At the time of the first archaeological survey of Ridges Basin for the ALP project, the old Bodo Ranch was still in use as the headquarters for the Bodo Wildlife Refuge.

In the 1980s the Colorado Division of Wildlife turned the land over to the Bureau of Reclamation, who began planning the ALP project and the reservoir. Slated for completion in 2011, Lake Nighthorse will fill Ridges Basin, fulfilling long-standing treaty obligations to the Utes.

ORGANIZATION OF THE ALP ARCHAEOLOGICAL PROJECT

The Animas–La Plata reservoir project is a major water project authorized by the Colorado River Basin Project Act of 1968. The project was designed to provide water for municipal and industrial uses in the Four Corners region of Colorado and New Mexico; secure the senior water rights of the Ute Tribe, which includes both the Ute Mountain Ute Tribe (UMUT) and the Southern Ute Indian Tribe (SUIT); and assure a long-term water supply to the Ute Tribe. Because the reservoir project would significantly affect the lives of the Ute people by providing them a secure source of water and fulfilling their water rights, the project fell under the purview of Public Law 93-638, the Indian Self-Determination and Education Assistance Act of 1975, Title I, and its amendments. As a consequence, the construction of the dam for the reservoir was contracted to a Ute-owned company, Weeminuche Construction Authority, and the required cultural resources work was contracted directly to the UMUT. Because the UMUT did not possess the infrastructure or personnel to conduct a large archaeological project, the project was put out to competitive bid and was awarded and subcontracted to SWCA. The UMUT and the SUIT remained integrally involved in all aspects of the project and composed the majority membership of the ALP Cultural Resources Oversight Committee. This seven-person committee was responsible for selecting the contractor for the cultural resources work and for overseeing and approving annual budgets and work plans, reviewing reports, and approving any and all activities related to the project. Terry Knight, contract coordinator for the UMUT, headed the committee and was assisted by Lynn Hartman as contract administrator. Also on the committee from the UMUT were Harold Cuthair and Doug Bowman, an archaeologist contracted with UMUT. Committee members from the SUIT were Pathimi Goodtracks and Howard Richards. Finally, the Bureau of Reclamation was represented by the contracting officer's representative and archaeologist Warren Hurley. Once awarded the project, SWCA subcontracted two companies, Woods Canyon Archaeological Services (represented by Jerry Fetterman) and Michael A. Frost Environmental Services (represented by Stanley Frost), both of which provided personnel for the fieldwork.

Table 1.1 lists the members of the SWCA management team and those personnel responsible for directing portions of the project. Additional laboratory and analysis personnel were Laurie Webster (perishables expert); Joe Ezzo (isotope analysis expert); John McClelland (dental anthropologist); Kathy Mowrer, Anna Osterholtz, and Ann Lucy Stodder (bioarchaeologists); Nancy Eisenhauer, Mark Lowe, Josh McNutt, and Jim Railey (flaked stone analysts); Nancy Eisenhauer and Alex Wesson (ground stone analysts); Josh Edwards (faunal analyst); Janet Hagopian, Nikki Shurack, Heather West, and Sarah Wilcox (ceramic analysts); Dennis Gilpin (historic archaeologist); Shawn Murray (archaeobotanical analyst); and Ed Rezac (data entry).

Table 1.1. Management Team for the ALP Project

Name	Position(s)	Affiliation	Years Active on ALP*
Thomas Motsinger	Principal in Charge	SWCA	2002–2005
Kevin Thompson	Project Manager Principal in Charge	SWCA	2002–2010 2005–2010
James Potter	Project Director Principal Investigator Director of Archaeofaunal Studies	SWCA	2002–2006 2002–2010 2002–2008
Thomas Yoder	Field Director Project Director	SWCA	2002–2005 2006–2010
Randal Fox	Field Director	SWCA	2002
Jerry Fetterman	Field Director	Woods Canyon Archaeological Services	2002–2003
Danielle Desruisseaux	Laboratory Director	SWCA	2002–2005
Sarah Wilcox	Laboratory Director	SWCA	2005–2010
Kristina Horton	Database Manager	SWCA	2002–2007
Trent Reeder	Geographical Information Systems (GIS) Director	SWCA	2003–2010
Karen Adams	Director of Archaeobotanical Studies	Independent	2002–2007
James Allison	Director of Ceramic Studies	Brigham Young University	2002–2009
Carl Phagan	Director of Lithic Studies	SWCA	2002–2005
Kirk Anderson	Director of Geomorphology	Northern Arizona University (NAU)	2002–2008
Elizabeth Perry	Director of Human Osteology and NAGPRA Coordinator	SWCA	2003–2010
Jean Ballagh	Managing Editor	SWCA	2006–2007
Kari Chalker	Managing Editor	SWCA	2007–2010

* Years are fiscal years, which extended from October 1 of the previous year to September 30. Thus, 2004 extended from October 1, 2003, to September 30, 2004. Personnel were considered active for the year if they participated in the project for any portion of that year.

2002: Field Season 1

The initial season of excavation began on June 17, 2002, and ended on November 5, 2002. The field staff was based on four crews of five archaeologists, with some variation as required by site-specific work plans. Tom Yoder and Randy Fox of SWCA and Jerry Fetterman of Woods Canyon Archaeological Service acted as field directors. Crew chiefs were William Brown, Jason Chuipka, Elizabeth Perry, and Heather West. Crew members consisted of Alberta Alfred, Kayla Armstrong, Ben Bellorado, Sarah Coleman, Randy Davis, Alvin Koonsman Knight, Mark Lowe, Kathy Mowrer, Josh McNutt, Jeff Salvatore, Jacqueline Sharples, Nikki Shurack, Marwin Smith, Agnes Suazo, Harrison Tahe, Matilda Tahe, Willis Tahe, Corina Tsinnajinnie, Kai Valiente, Cliff Werito, and Jeffrey Whiteskunk.

During the 2002 season, fieldwork focused mostly on three areas: the Williams Gas pipeline relocation corridor along Wildcat Ridge, the dam footprint area at the eastern end of Ridges Basin, and the borrow area at the southern end of Blue Mesa. The first priorities for fieldwork were eight sites in the Williams Gas pipeline relocation right-of-way to the east and north of Ridges Basin. The second priority was investigating seven sites in the dam footprint area. Four sites were investigated on Blue Mesa (Borrow Area B) during the 2002 field season. Finally, Level II Historic American Building and Structure (HABS) recordation and supplementary historic documentation was completed for the historic Bodo Ranch in the Ridges Basin pool area. In total, 20 sites were treated during this first field season (Figure 1.5; Table 1.2).

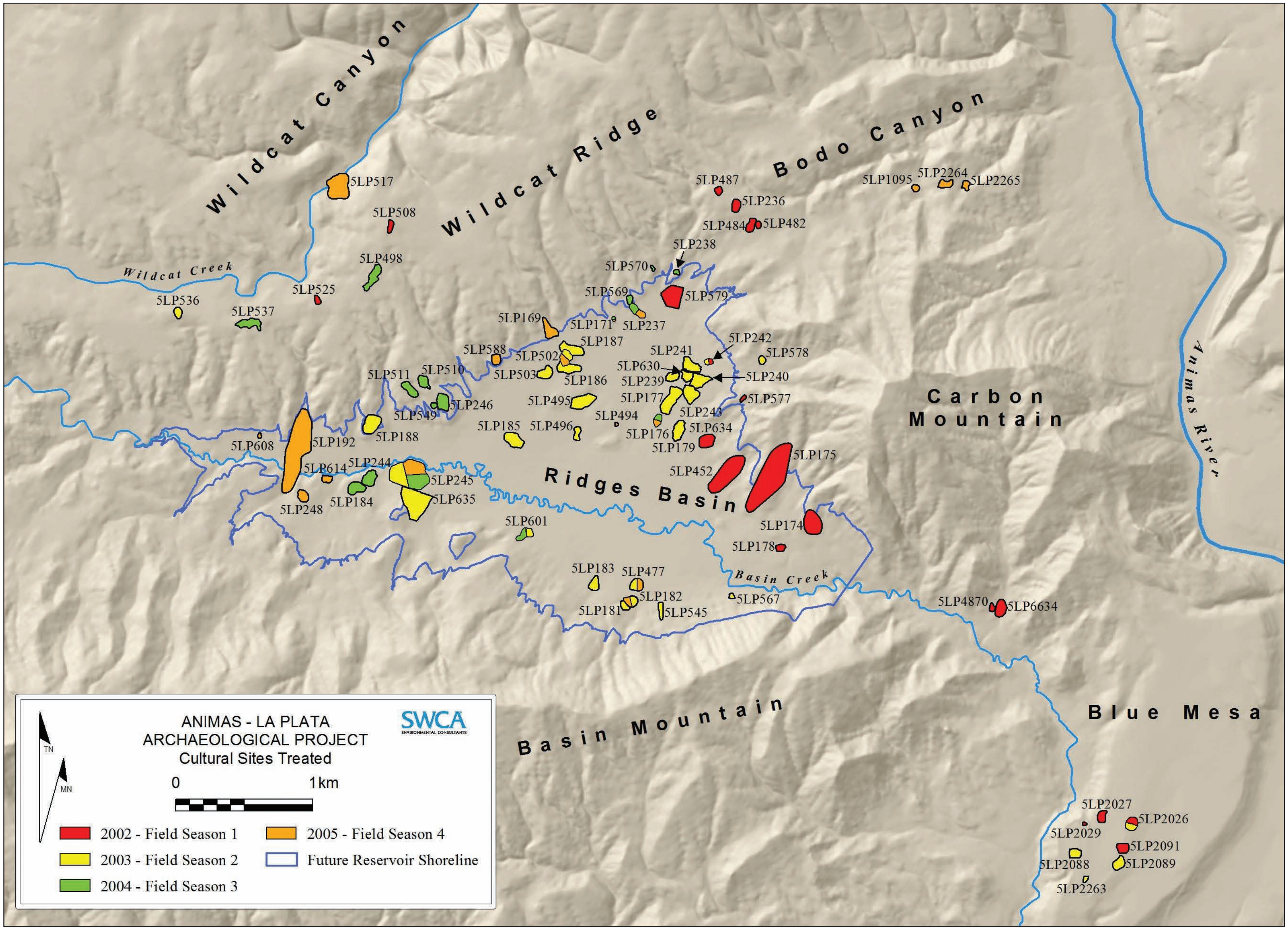

Figure 1.5. Sites treated by SWCA in the ALP project area by field season.

Table 1.2. Sites Investigated in 2002 Field Season

Location in Project Area	Site Number	Site Type	Report Reference (see Table 1.6)
Wildcat Ridge	5LP236	Early Pueblo I habitation	Potter and Yoder (eds.) 2008a and 2008b
	5LP482	Early Pueblo I habitation	Potter and Yoder (eds.) 2008a and 2008b
	5LP484	Artifact scatter	Potter (ed.) 2008a
	5LP487	Artifact scatter	Potter (ed.) 2008a
	5LP508	Artifact scatter	Potter (ed.) 2008a
	5LP525	Artifact scatter	Potter (ed.) 2008a
	5LP4870	Artifact scatter	Potter (ed.) 2008a
	5LP6634	Historic homestead	Gilpin and Yoder 2007
Ridges Basin Dam Area	5LP174	Early Pueblo I habitation	Yoder and Potter 2007
	5LP175	Limited activity site	Potter (ed.) 2008a
	5LP178	Early Pueblo I habitation	Yoder and Potter 2007
	5LP242	Early Pueblo I habitation	Yoder and Potter 2007
	5LP452	Artifact scatter	Potter (ed.) 2008a
	5LP577	Artifact scatter	Potter (ed.) 2008a
	5LP634	Early Pueblo I habitation	Yoder and Potter 2008
Blue Mesa Borrow Area	5LP2026	Early Pueblo I habitation	Chuipka and Potter 2007a
	5LP2027	Artifact scatter	Chuipka and Potter 2007a
	5LP2029	Limited activity site	Chuipka and Potter 2007a
	5LP2091	Early Pueblo I habitation	Chuipka and Potter 2007a
Ridges Basin Pool Area	5LP579	Historic Bodo ranch	Gilpin and Yoder 2007

2003: Field Season 2

During the second season of fieldwork from May 5 to October 30, 2003, SWCA conducted fieldwork at 31 sites (see Figure 1.5; Table 1.3). Field crews numbered five, and each contained six archaeologists, with some variation as required by site-specific work plans. Tom Yoder acted as field director, with assistance from Jerry Fetterman of Woods Canyon Archaeological Services. Elizabeth Perry acted as NAGPRA coordinator. Crew chiefs were Jason Chuipka, Gary Ethridge, Vern Hensler, Mark Lowe, and Heather West. Assistant crew chiefs were Gary Duncan, Jim Hampson, Josh McNutt, Nikki Shurack, and Sarah Wilcox. Crew members consisted of Free Alfred, Pat Alfred, Sally Antonio, Kayla Armstrong, Chris Barnes, Ben Bellorado, Jean Conlan, Nancy Eisenhauer, Paula Gutcheon, Robert Howe, Sarah Isgar, Alvin Koonsman Knight, Mike Lynagh, Kathy Mowrer, Aaron O'Brien, Marten Pinnecoose, Anne Raney, Jacqueline Sharples, Ruth Shepard, Dave Skoglund, Greg Stoehr, Harrison Tahe, Corina Tsinnajinnie, Kai Valiente, Cliff Werito, and Jeffrey Whiteskunk. In addition, Rich Feit, Neal Morris, and Agnes Suazo conducted mapping.

During the 2003 season, fieldwork focused on three areas: Wildcat Ridge, the Ridges Basin pool area, and the borrow area on Blue Mesa. The first priority for fieldwork was 5LP536 within an access road for the Williams pipeline relocation right-of-way on Wildcat Ridge. This site was not originally scheduled for work in 2003, but road improvement in the site area would affect the remains there, necessitating the full excavation of the site. The second priority was investigating 26 sites in Ridges Basin and four sites on Blue Mesa (Borrow Area B). Only two of 10 loci were excavated at 5LP245 (Sacred Ridge) in the second season, and thus this site was excavated during subsequent field seasons, as well.

2004: Field Season 3

SWCA conducted fieldwork between May 3 and October 29, 2004. The field crew was based on four crews of six archaeologists, with some variation as required by site-

Table 1.3. Sites Investigated in 2003 Field Season

Location in Project Area	Site Number	Site Type	Report Reference (see Table 1.6)
Wildcat Ridge	5LP536	Early Pueblo I habitation	Potter and Yoder (eds.) 2008b
Ridges Basin Pool Area	5LP177	Early Pueblo I habitation	Yoder and Potter 2007
	5LP179	Early Pueblo I habitation	Yoder and Potter 2007
	5LP181	Limited activity site	Potter (ed.) 2008a
	5LP182	Historic corral	Gilpin and Yoder 2007
	5LP183	Limited activity site	Potter (ed.) 2008a
	5LP185	Early Pueblo I habitation	Potter and Yoder (eds.) 2008a
	5LP186	Limited activity site	Potter (ed.) 2008a
	5LP187	Early Pueblo I habitation	Potter and Yoder (eds.) 2008a
	5LP188	Early Pueblo I habitation Basketmaker II habitation	Potter (ed.) 2008a
	5LP239	Early Pueblo I habitation	Yoder and Potter 2007
	5LP240	Early Pueblo I habitation	Yoder and Potter 2007
	5LP241	Early Pueblo I habitation	Yoder and Potter 2007
	5LP242	Early Pueblo I habitation	Yoder and Potter 2007
	5LP243	Early Pueblo I habitation	Yoder and Potter 2007
	5LP245	Early Pueblo I habitation	Chuipka 2009
	5LP477	Historic homestead	Gilpin and Yoder 2007
	5LP495	Artifact scatter	Potter (ed.) 2008a
	5LP496	Artifact scatter	Potter (ed.) 2008a
	5LP502	Historic homestead	Gilpin and Yoder 2007
	5LP503	Early Pueblo I habitation	Potter and Yoder (eds.) 2008a
	5LP545	Limited activity site	Potter (ed.) 2008a
	5LP567	Limited activity site	Potter (ed.) 2008a
	5LP578	Artifact scatter	Potter (ed.) 2008a
	5LP601	Artifact scatter	Potter (ed.) 2008a
	5LP630	Early Pueblo I habitation	Yoder and Potter 2007
	5LP635	Limited activity site	Potter (ed.) 2008a
Blue Mesa Borrow Area	5LP2026	Early Pueblo I habitation	Chuipka and Potter 2007a
	5LP2088	Early Pueblo I habitation	Chuipka and Potter 2007a
	5LP2089	Early Pueblo I habitation	Chuipka and Potter 2007a
	5LP2263	Artifact scatter	Chuipka and Potter 2007a

specific work plans. Tom Yoder acted as field director. Elizabeth Perry conducted NAGPRA coordination and consultation. Crew chiefs were Jason Chuipka, Vern Hensler, Mark Lowe, and Heather West. Assistant crew chiefs were Jim Hampson, Josh McNutt, Nikki Shurack, and Sarah Wilcox. Crew members consisted of Pat Alfred, Ben Bellorado, George Connell, Marshall Deer, Gary Duncan, Nancy Eisenhauer, Derek Heersink, Greg Hovezak, Alvin Koonsman Knight, Kathy Mowrer, Aaron O'Brien, Jacqueline Sharples, Harrison Tahe, Kai Valiente, Benda Watts, Cliff Werito, Jeffrey Whiteskunk, and Casey Zingg. In addition, Creigh Godson and Neal Morris conducted mapping.

During the 2004 season, fieldwork focused on sites within the future Ridges Basin reservoir pool limits and within the proposed County Road 211 realignment corridor on Wildcat Ridge. In addition, a few sites were excavated to the north of the Ridges Basin reservoir pool. In total, 16 sites were treated during the 2004 field season, including a second season at 5LP245 (Sacred Ridge) in which six separate loci were investigated (see Figure 1.5; Table 1.4). Site 5LP601 also received an additional week of fieldwork during this third season.

Table 1.4. Sites Investigated in 2004 Field Season

Location in Project Area	Site Number	Site Type	Report Reference (see Table 1.6)
Ridges Basin Pool Area	5LP171	Limited activity site	Potter (ed.) 2008a
	5LP176	Early Pueblo I habitation	Yoder and Potter 2007
	5LP184	Early Pueblo I habitation	Potter and Yoder (eds.) 2008b
	5LP237	Early Pueblo I habitation	Potter and Yoder (eds.) 2008a
	5LP238	Early Pueblo I habitation	Potter and Yoder (eds.) 2008a
	5LP244	Early Pueblo I habitation	Potter and Yoder (eds.) 2008b
	5LP245	Early Pueblo I habitation	Chuipka 2009
	5LP246	Early Pueblo I habitation	Potter and Yoder (eds.) 2008b
	5LP510	Early Pueblo I habitation	Potter and Yoder (eds.) 2008b
	5LP511	Early Pueblo I habitation	Potter and Yoder (eds.) 2008b
	5LP549	Early Pueblo I habitation	Potter and Yoder (eds.) 2008b
	5LP569	Limited activity site	Potter (ed.) 2008a
	5LP570	Basketmaker II habitation	Potter (ed.) 2008a
	5LP601	Limited activity site	Potter (ed.) 2008a
Wildcat Ridge	5LP498	Limited activity site	Potter (ed.) 2008a
	5LP537	Limited activity site	Potter (ed.) 2008a

2005: Field Season 4

During the final field season, SWCA conducted fieldwork from May 2 to September 29, 2005. The field crew was based on two crews of six archaeologists. Tom Yoder was the field director. Elizabeth Perry conducted in-field NAGPRA coordination and consultation. Crew chiefs were Jason Chuipka and Mark Lowe. Assistant crew chiefs were George Connell and Nancy Eisenhauer. Crew members were Creigh Godson, Derek Heersink, Tyson Hughes, Alvin Koonsman Knight, Neal Morris, Kathy Mowrer, Aaron O'Brien, Nikki Shurack, Ed Rezac, Trent Reeder, Sarah Wilcox, Jeffrey Whiteskunk, and Casey Zingg. Creigh Godson, Neal Morris, and Casey Zingg conducted site mapping.

During the 2005 season, fieldwork focused on sites in the future Ridges Basin reservoir pool area and specifically on sites located on the future reservoir shoreline where wave action would cause erosion. Three sites (5LP1095, 5LP2264, and 5LP2265) were excavated in Bodo Canyon, in the inlet pipeline corridor for the water pipeline that was installed between the pumping plant and the reservoir. Two sites, 5LP171 and 5LP237, locations where human remains were known to exist in future shoreline areas, were investigated to remove burials. Three sites where unexcavated human remains were known to exist were stabilized using soil, landscape fabric, and shale to prevent future erosion and disturbance. In total, 20 sites were treated in the final season (see Figure 1.5; Table 1.5). A number of sites had received treatment in past field seasons and received additional work this season; these were 5LP176, 5LP177, 5LP182, 5LP237, 5LP245, 5LP246, 5LP477, and 5LP502.

ALP PROJECT VOLUME SERIES

In addition to this report, 15 volumes have been prepared and published to document the results of the ALP project (Table 1.6). Each is a volume in Number 10 of the Anthropological Research Papers series published by SWCA Environmental Consultants and available through the University of Arizona Press.

Table 1.5. Sites Investigated in 2005 Field Season

Location in Project Area	Site Number	Site Type	Report Reference (see Table 1.6)
Ridges Basin Pool Area	5LP169	Basketmaker II habitation	Potter (ed.) 2008a
	5LP171	Limited activity site	Potter (ed.) 2008a
	5LP176*	Early Pueblo I habitation	Yoder and Potter 2007
	5LP177*	Early Pueblo I habitation	Yoder and Potter 2007
	5LP182	Historic corral	Gilpin and Yoder 2007
	5LP192	Historic ranch	Gilpin and Yoder 2007
	5LP237	Early Pueblo I habitation	Potter and Yoder (eds.) 2008a
	5LP245	Early Pueblo I habitation	Chuipka 2009
	5LP246*	Early Pueblo I habitation	Potter and Yoder (eds.) 2008b
	5LP248	Early Pueblo I habitation	Potter and Yoder (eds.) 2008b
	5LP477	Historic homestead	Gilpin and Yoder 2007
	5LP494	Historic schoolhouse	Gilpin and Yoder 2007
	5LP502	Historic site	Gilpin and Yoder 2007
	5LP517	Historic town	Gilpin and Yoder 2007
	5LP588	Limited activity site	Potter (ed.) 2008a
	5LP608	Limited activity site	Potter (ed.) 2008a
	5LP614	Early Pueblo I habitation	Potter and Yoder (eds.) 2008b
Bodo Canyon	5LP1095	Limited activity site	Potter (ed.) 2008a
	5LP2264	Limited activity site	Potter (ed.) 2008a
	5LP2265	Limited activity site	Potter (ed.) 2008a

* Stabilized only

Table 1.6. ALP Project Volume Series, Volumes I–XVI

Author/Editor	Year	Title *Animas–La Plata Project:*	Volume Number
Potter, James M.	2006	*Cultural Resources Research and Sampling Design*	I
Perry, Elizabeth M., and James M. Potter	2006	*Cultural Affiliation Study*	II
Chuipka, Jason P., and James M. Potter	2007	*Blue Mesa Excavations*	III
Yoder, Thomas D., and James M. Potter (editors)	2007	*Ridges Basin Excavations: Eastern Basin Sites*	IV
Gilpin, Dennis	2007	*Miners, Railroaders, and Ranchers: Creating Western Rural Landscapes in Ridges Basin and Wildcat Canyon, Southwestern Colorado*	V
Gilpin, Dennis, and Thomas D. Yoder	2007	*Historic Site Descriptions*	VI
Potter, James M., and Thomas D. Yoder (editors)	2008a	*Ridges Basin Excavations: North-central Sites*	VII
Potter, James M., and Thomas D. Yoder (editors)	2008b	*Ridges Basin Excavations: Western Basin Sites*	VIII
Potter, James M. (editor)	2008a	*Ridges Basin Excavations: Archaic, Basketmaker II, and Limited Activity Sites*	IX
Potter, James M. (editor)	2008b	*Environmental Studies*	X
Railey, Jim A., and Alex L. Wesson	2009	*Lithic Studies*	XI
Chuipka, Jason P.	2009	*Ridges Basin Excavations: The Sacred Ridge Site*	XII
Potter, James M. (editor)	2009	*Special Studies*	XIII
Allison, James R.	2010	*Ceramic Studies*	XIV
Perry, Elizabeth M., Ann L. W. Stodder, and Charles A. Bollong (editors)	2010	*Bioarchaeology*	XV
Potter, James M.	2010	*Final Synthetic Report*	XVI

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Chapter 2: A History of Archaeological Work in the Durango Area

James M. Potter

The Northern San Juan region is bounded by the San Juan River on the south, the Colorado River on the west, and the San Juan Mountains on the east. The northern boundary of the region is defined as the 9,000-foot elevation mark of the San Juan River drainage. A portion of the Dolores River, a tributary of the Colorado River, is also included in the Northern San Juan region. The eastern portion of the Northern San Juan region is often referred to as the Upper San Juan region, and more recently as the Eastern Mesa Verde subregion (Potter et al. n.d.; Wilshusen et al. n.d.), and it contains the drainages of the La Plata, Animas, Los Pinos, and Piedra rivers, as well as the uppermost reaches of the San Juan River drainage (Figure 2.1). This subregion has been subdivided into archaeological districts: the La Plata District, the Durango District (referred to throughout this volume as the Durango area), the Piedra District, and the Navajo Reservoir District (Figure 2.1). This chapter describes the history of archaeological work in the Durango area. It is not meant to be an exhaustive report of every project conducted in the area but rather a synopsis of major excavations conducted in and around the ALP project area, with specific focus on the previous archaeological excavations and surveys conducted in Ridges Basin and on Blue Mesa that led to SWCA's work on the ALP project.

EARLY ARCHAEOLOGY: FROM FLORA TO MORRIS

The Durango area covers the Animas River drainage north of the Colorado–New Mexico state line (Figure 2.1). Much of the early research in the Durango area was conducted by members of two general groups: professional archaeologists interested in documenting early Basketmaker culture in the Northern San Juan and expanding the tree-ring chronology of the area, and amateur archaeologists interested in amassing large, personal collections of artifacts. One of the earliest and most active of these early amateurs was the Reverend Homer Root, who would later conduct some of the most extensive excavations in Ridges Basin. According to Lister (1997:4), "during a three-year period from 1932 through 1934, Root and his wife spent many hours probing trash mounds associated with archaeological sites on Blue Mesa and nearby terraces along both sides of the Animas River south of town." The Roots amassed a large collection of pots and other artifacts and sold them to at least four institutions (Vivian 1990:164), which encouraged further vandalism of archaeological resources by inspiring other "hobbyists" to seek similar rewards (Lister 1997:11). The most notorious of these enthusiasts was I. F. "Zeke" Flora. Flora arrived in Durango in 1933, and within a year he had accumulated a large collection of prehistoric artifacts. The collection soon came to the attention of noted professional archaeologist Earl Morris. Morris arranged for the sale of more than 100 of Flora's ceramic vessels to Harold Gladwin of Gila Pueblo in Arizona. Gladwin hired Flora to excavate in and around the Durango area to gather tree-ring samples for dendrochronological dating. From 1935 to 1940 Flora excavated sites throughout the Durango area, recovering thousands of tree-ring samples, which were subsequently sent to the tree-ring laboratory at the University of Arizona for analysis (Dean 1975:4).

Unfortunately, most of these samples lacked provenience information and were thus of limited utility.

In 1936 Flora and Gladwin conducted a survey of Blue Mesa (see Figure 1.2) and excavated an unknown number of sites there. In his book *A History of the Ancient Southwest*, Gladwin (1957) provides a brief description of the results of these excavations and notes that in 1934 Gila Pueblo acquired more than 500 vessels from the Durango area, primarily from Blue Mesa. The book presents details of only one excavated feature, a subrectangular pit structure measuring more than 10 m across and containing a 60-cm-wide bench around the entire circumference. The structure also had adobe wing walls, a tunnel ventilator shaft, and four large main-support post holes in the floor. According to Dean (1975), one of the Blue Mesa sites excavated by Flora (Ignacio 16:1) yielded a non-cutting date of A.D. 754.

Following their work on Blue Mesa, Gladwin and Flora excavated an early Pueblo I site approximately 2 km south of Durango on the east bank of the Animas River (Gladwin 1957:55–57). The site contained a large subrectangular pit structure and a row of jacal surface rooms, all within a wooden enclosure. In addition, Flora excavated six pit structure sites in Ridges Basin on the Harper Ranch along the Basin Creek drainage and two sites (Ignacio [Ign.] 11:1 and 11:4) on the saddle between Basin Creek and the Animas (Dean 1975). Tree-ring records at the University of Arizona indicate that Flora excavated numerous other early Pueblo I sites in the area and collected tree-ring samples from them, but since details of these excavations, including provenience, were not recorded, the precise location of these sites is still not known.

Helen Sloan Daniels was another amateur archaeologist who was active in the Durango area in the 1930s. Working for the Durango Public Library and funded by the Works Progress Administration (WPA), Sloan conducted a three-year excavation and survey program to gather artifacts for display at the library. The project began with a survey of mesa tops in and around Durango and concluded with the excavation of eight early Pueblo I habitation sites, five of which (Ign. 12:1, 12:17, 12:23, 12:58, and 12:59) were within Durango city limits. Details of the excavations were spottily reported in a pamphlet (Daniels 1940) and a series of newspaper articles (Daniels 1941a, 1941b). In 1936 Daniels excavated at Ign. 12:18 on the east side of the Animas River near its confluence with Junction Creek. These excavations concentrated on the midden area and encountered a number of human burials. In 1938 three more sites were excavated through the Durango Public Library project, but only one, Ign. 12:1, was described. Located along the floodplain of the Animas, this site contained a large pit structure with jacal surface rooms; it had received heavy damage from pot hunters and amateur archaeologists, including from Flora in 1934.

Although these early investigations by Flora and Daniels were generally poorly documented, they did help bring the Durango area to the attention of well-established archaeologists. This was particularly the case with their work at Falls Creek, a tributary of the Animas River located several miles north of Durango. In 1936 both Daniels and Flora explored a large rockshelter in the Falls Creek area and found pictographs on its ceiling and rear wall. The following summer Flora excavated there and exhumed 19 human burials and associated grave goods. Due to the dry conditions of the shelter, these burials were exceptionally well preserved to the point of appearing mummified. Flora contacted three noted experts—Harold Gladwin, Paul Martin, and Earl Morris—about this find. Upon viewing the specimens, Earl Morris determined them to be Basketmaker remains and immediately began planning his own excavations at the Falls Creek rock shelters.[1]

[1] By 1940 professional archaeologists broke with Flora. It had become obvious to Morris, Haury, and Gladwin that Flora's ethics were not in line with archaeological goals and that Flora had an intense disdain for the academicians (Lister 1997:68–69).

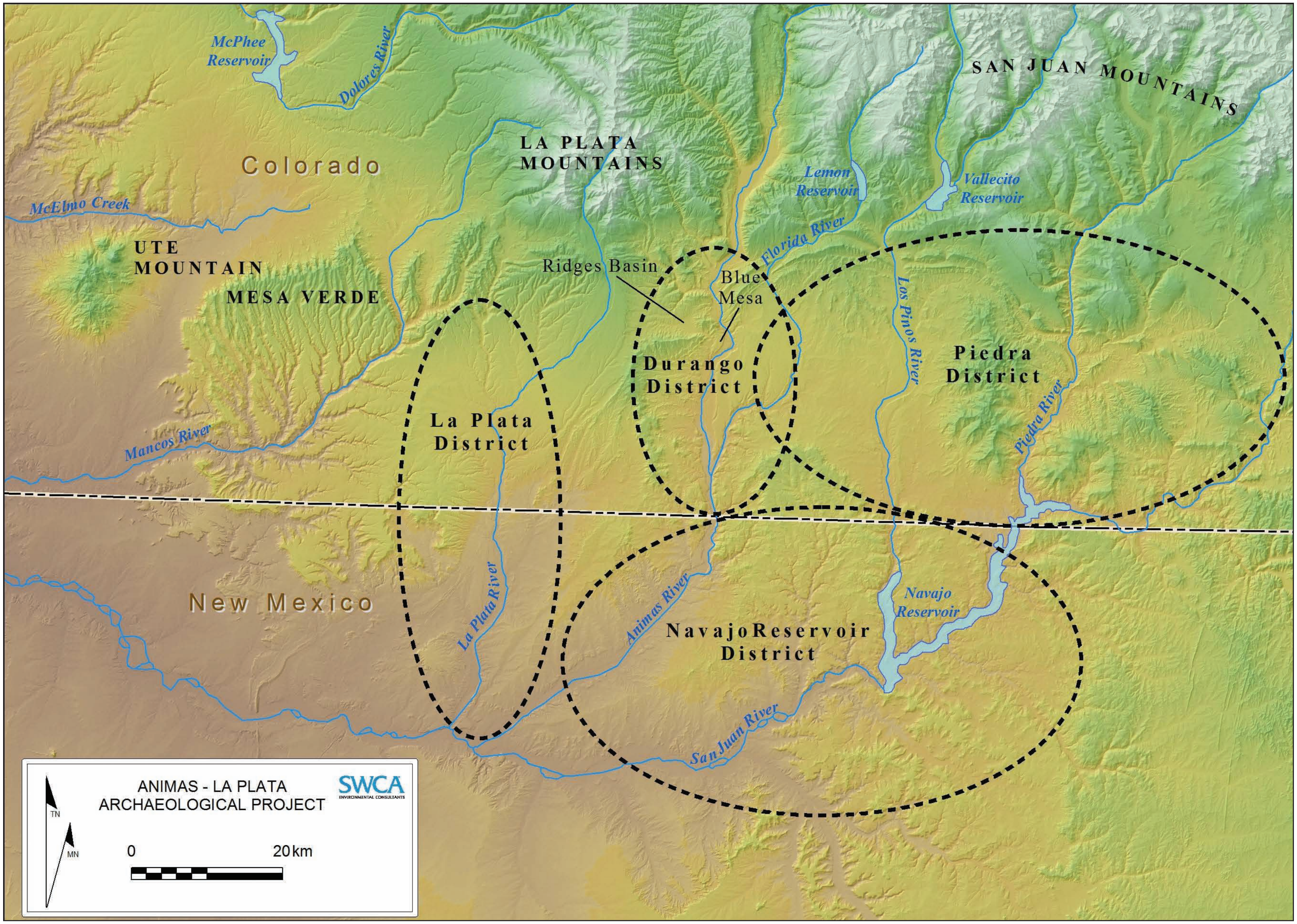

Figure 2.1. The Northern San Juan region and the approximate boundaries of the four archaeological districts composing the Upper San Juan region (also called the Eastern Mesa Verde subregion).

Morris's excavations at Falls Creek began during the summer of 1938. Although no further human remains were encountered in two and a half months of excavation, Morris did uncover evidence of 13 houses, including subfloor storage cists; circular, clay-lined fire pits; and numerous tree-ring samples that would date the houses to the late Basketmaker II period (A.D. 1–500) (Morris and Burgh 1954). Morris returned to the Durango area the following summer and excavated six early Pueblo I sites (dating to approximately A.D. 760) in nearby Hidden Valley. These sites (Ign. 7:22, 7:23, 7:25, 7:30, 7:31, and 7:36) were part of a large cluster of Pueblo I houses located at the northern end of Hidden Valley. Written up decades later by Carlson (1963), these excavations revealed four pit structures with tunnels to the southeast that were used as entrances or ventilators, or both. The pit structures were backed by small surface rooms, and two of them were enclosed by low cobble walls. Two exhibited unusual six-post roof support systems, which Carlson suggests was evidence of a cribbed roof design.

In the summer of 1940 Morris conducted his third and final excavation in the Durango area at the Basketmaker II site of Talus Village. There Morris uncovered evidence of 38 separate basin-shaped house floors, similar in appearance and date to those uncovered at the nearby Falls Creek rock shelters two years prior. Most significantly, Morris found evidence of the cribbed roof technique used for these early houses (Morris and Burgh 1954).

Morris's work at Falls Creek and Talus Village provided the earliest tree-ring dates and the earliest evidence of architecture in the northern Southwest at that time (Ware 1986b:83). In addition, prior to Morris's work, Basketmaker II research had focused primarily on cave sites used as burial areas. Morris excavated the first Basketmaker II domiciles and was the first to recover strictly habitation assemblages (Lister and Lister 1968:165–168). As significant as the actual finds at Talus Village and Falls Creek were, though, it was the high quality and usability of Morris and Burgh's report that set these excavations apart from other early work conducted in the Durango area. Published in 1954, this report remains one of the most detailed and thorough documents on the excavations of large Basketmaker II sites ever to be produced.

THE FORT LEWIS COLLEGE FIELD SCHOOLS

The next two decades saw little work in the area. In 1965, however, Fort Lewis College began conducting field schools in Ridges Basin. From 1965 to 1969 the Fort Lewis College archaeological field schools excavated 11 sites in Ridges Basin and conducted surface collections at a number of other sites.

1965

Under the direction of Homer Root, the 1965 field school excavated an early Pueblo site containing a large pit structure, 12 jacal surface rooms, and a midden. Although Bonan's (1985a) description of the Fort Lewis College excavations indicates this site may have been 5LP171, and Ware (1986b:85) suggests that it was 5LP246, a more likely candidate is 5LP237[2]. When SWCA conducted excavation in the early 2000s, all three sites had suffered disturbance in surface room areas by either previous excavation or pot hunting. But 5LP237 was the only one with a previously excavated pit structure, and its location and attributes were consistent with Root's description.

Homer Root compiled ledger notes for the 1965 Fort Lewis College excavations (Root 1965). He described the structure as intensely burned with a large number of artifacts left in place. The structure was circular with eight posts set into the bench just behind the wall. The bench encircled the entire structure, and small stringer post holes were set into it. The bench and lower wall were well plastered. According to Root, interior features included two sand pits for heating the structure, and three holes in the bench and the wall of the structure, one lined with stone and one with a slab in front of it. Clusters of pine needles were found in the roof fall (Root 1965:111). According to Root, "the

[2] The confusion stems from the fact that these Smithsonian numbers were assigned well after Root's excavations and thus were not referenced by Root in his notes.

entire structure has been well covered and protected by the college for future study" (Root 1965:113). Homer Root's excavations of Feature 1 are summarized in two volumes (Duke 1985; Duke and Matlock 1999), although in both sources they are mislabeled as occurring at 5LP171. An inventory of artifacts collected on the site can be found in Duke 1985. "Root recovered a variety of decorated grayware vessels, ceramic pipes, and grinding stones. A tree-ring date of A.D. 707–749 was taken from one of the beams in the pithouse" (Duke and Matlock 1999:96).

When SWCA encountered the feature it was a burned, circular pit structure that measured 6.3 m in diameter. Since Root's excavations the structure had filled entirely, leaving a depression less than 0.5 m deep. SWCA's excavations exposed milled lumber and nails on the floor—undoubtedly the remains of the covering set up by the college—indicating that the structure had been completely excavated. Prehistoric posts were relocated, and one was collected as a tree-ring sample that produced a non-cutting date of A.D. 632. Based on the spacing of the posts and Root's notes, it is believed there were originally eight posts. Root described them as having been set into the bench, but SWCA did not identify a bench. The only floor feature identified was a hearth in poor condition. The hearth, which appeared to have been excavated, does not appear on Root's map of the structure. Root also did not record a ventilator shaft that was present in the structure, which, when located by SWCA, was oriented to the south.

1966–1967: The Sacred Ridge Site

In 1966 and 1967 Root directed excavations at 5LP245 as part of a Fort Lewis College field school. He termed this work the Ridges Basin Project, and it was at this time that the site was first referred to in the literature as Sacred Ridge. Root focused his work on the ridgetop architecture and the extensive middens on the surrounding slopes, excavating three pit structures, two dance plazas, 28 surface rooms, and 40 human burials over the course of four months in 1966 (Root 1967:3–61). He returned to the site for a short time in the summer of 1967 to further explore the middens for additional burials.

Although Root employed some standard archaeological procedures—using a grid to establish horizontal provenience and screening fill from features—his excavations were poorly controlled and documented. The only existing record of these investigations is Root's hand-written ledger with unscaled drawings of selected artifacts and burials (Chuipka 2009:5). Root used the ledgers primarily to keep track of the pots he found. This was common practice among pot hunters of this time to help in recognizing patterns to find more pots or to aid in getting a higher price from collectors, such as museums (personal communication, Richard Wilshusen 2010). The site and structure maps were presented in a slightly more formal manner, although evidence suggests they were drawn after the fact in the Fort Lewis College museum rather than in the field (Figure 2.2). A handful of 35-mm slides and a short 16-mm film represent the only existing photographic documentation of the excavations. Most of the slides and a large portion of the film appear to have been taken on the same day at the end of the 1966 field season. It is unclear whether Root or any of the students kept field notes while conducting the excavations (Chuipka 2009:5). Chapter 11, Settlement Clusters, presents the results of SWCA's excavations on the knoll of Sacred Ridge.

1967–1968

Root conducted excavations at four sites in 1967: Pasture Ruins I, II, and III on an alluvial fan at the east end of Ridges Basin, and North Ruin I northeast of Ridges Basin in what is now Bodo Industrial Park (Ware 1986b:87). Bonan (1985b:129) suggests that the Pasture Ruins sites are 5LP177, 5LP179, and 5LP243. The site records describe these sites as jacal habitation units, but the field school excavated only surface rooms and midden units. The field school removed three burials from the midden at Pasture Ruin I. Root also conducted further excavations at 5LP245 (the Sacred Ridge site) in 1967, but he made no record of the exact location or the extent of this work.

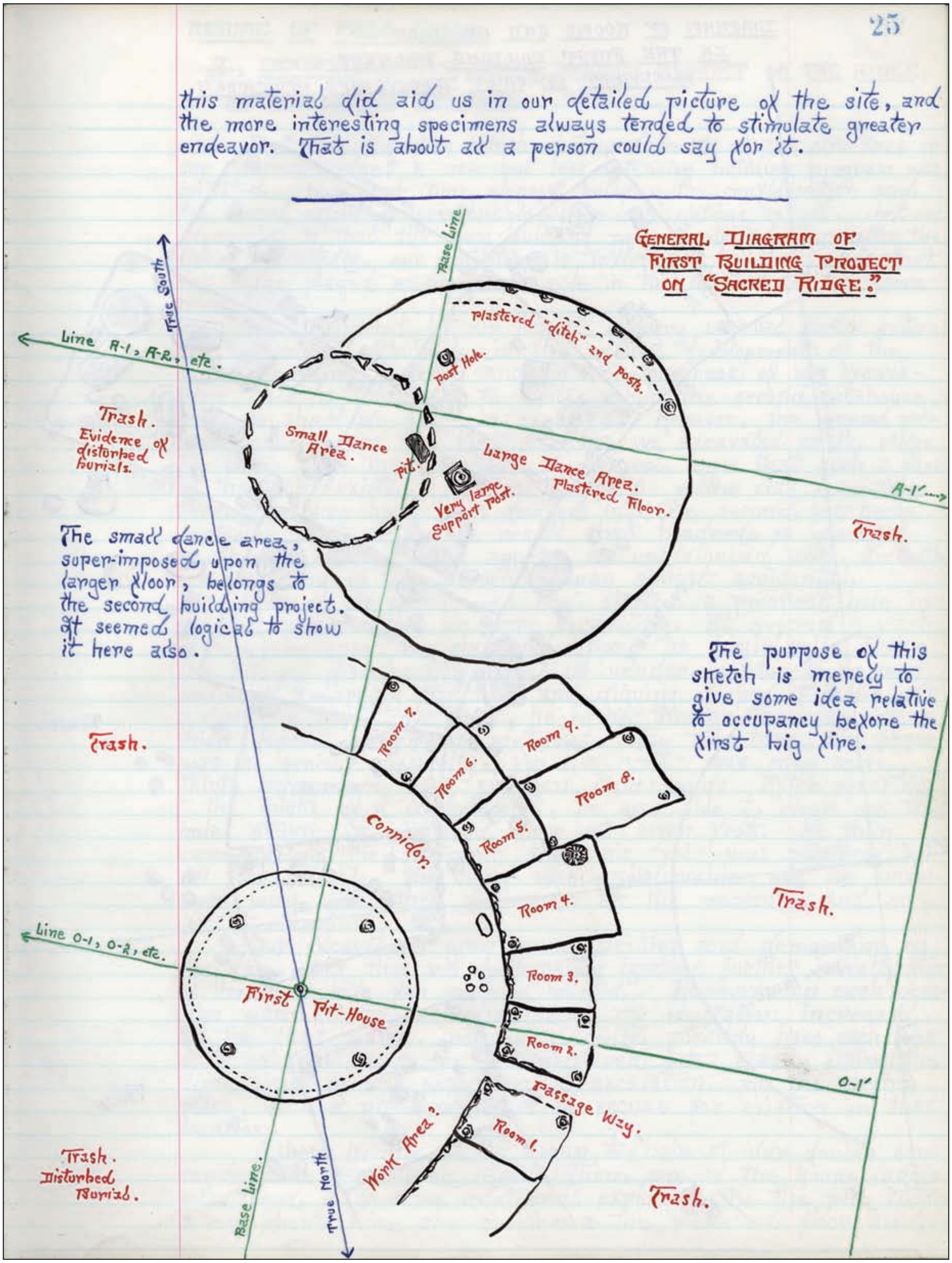

Figure 2.2. Page from Root's ledger depicting features at Sacred Ridge (used by permission of Fort Lewis College, Center of Southwest Studies).

Dr. John "Doc" Ives also conducted a Fort Lewis College field school in Ridges Basin in 1967, at 5LP238, a habitation site near the Bodo ranch house. The site consisted of a jacal room block and a pit structure, which apparently contained a number of disarticulated human skeletal remains. No further details of the pit structure or rooms have been reported, although a detailed site map from the excavation exists.

In 1968 Ives targeted surface rooms at three sites on the same alluvial fan as Homer Root's Pasture sites. According to Ware (1986b:88), these sites were 5LP240, 5LP241, and 5LP242. Ives interpreted them as field houses, but SWCA's work indicates these sites were habitation units with pit structures. No reports of Ives's excavations were completed.

1969: Hoodoo Ruin

In 1969 Root returned to Ridges Basin for a final season, focusing on a single site on the northern slopes of Ridges Basin. Site 5LP236, the Hoodoo Ruin consisted of a jacal room block, a pit structure, and trash scattered southeast of the pit structure. Root briefly described the room block in his notes as 10 contiguous jacal rooms, each measuring 3.5 × 3.0 m, and all plastered and well constructed. Apparently, no detailed descriptions or drawings of the room block architecture were made, although Root described the room blocks as a semicircle of rooms. Root did mention that a quantity of ground stone was recovered from the room block.

Root's sketch map of the pit structure portrayed a perfectly circular structure with an encircling bench and seven recessed "pilasters" as well as a "plastered entrance-way into the kiva-type dwelling at the floor level" (Root 1969:107–115) (Figure 2.3). He described the pit structure as a circular structure measuring over 8.0 m in diameter and 2.4 m deep and containing a bench, seven main-support post holes, a two-hole ventilator shaft, and plastered wing walls. A sand-filled "heating pit" was noted in the floor but no formal hearth. Burned human remains were recovered from the floor. A "field observation" by Zeke Flora of a tree-ring sample yielded a construction date of A.D. 712 for the pit structure, but this date cannot be substantiated. Root noted the presence of associated midden deposits, but he did not investigate them due to the short length of the field season (Root 1969:109).

When SWCA investigated the site in 2002, the previously excavated pit structure was clearly evident as a deep depression; it had not been backfilled in 1969 (Figure 2.4). SWCA re-excavated the eastern half of the structure to assess the accuracy of Root's 1969 documentation (Chuipka et al. 2008).

Removal of the fill revealed that, contrary to his notes and drawings, Root had not completely excavated the structure. There was also no evidence for Root's suggested floor-level entry. Furthermore, Root claimed that the roof was supported by seven equally spaced vertical posts (Root 1969:107,115). SWCA's excavations revealed three primary supports recessed into the lower wall. Based on the spacing of these posts, it is likely that six rather than seven uprights formed the basis of the superstructure. Finally, Root illustrated and described the feature as "nearly round" (Root 1969:115) (see Figure 2.3), but, because it had shallow corners, the shape of the structure is better described as subrectangular (Figure 2.5).

In stark contrast to Morris's Durango area work in the 1930s and 1940s, none of the Fort Lewis College excavations directed by Root and Ives between 1965 and 1969 was thoroughly documented. It is clear, though, based on subsequent work in the area, that all of the sites they excavated dated to the early Pueblo I period (A.D. 700–850) and that each consistently comprised a pit structure with associated jacal rooms and a trash area. The number, orientation, and arrangement of these elements were variable, however.

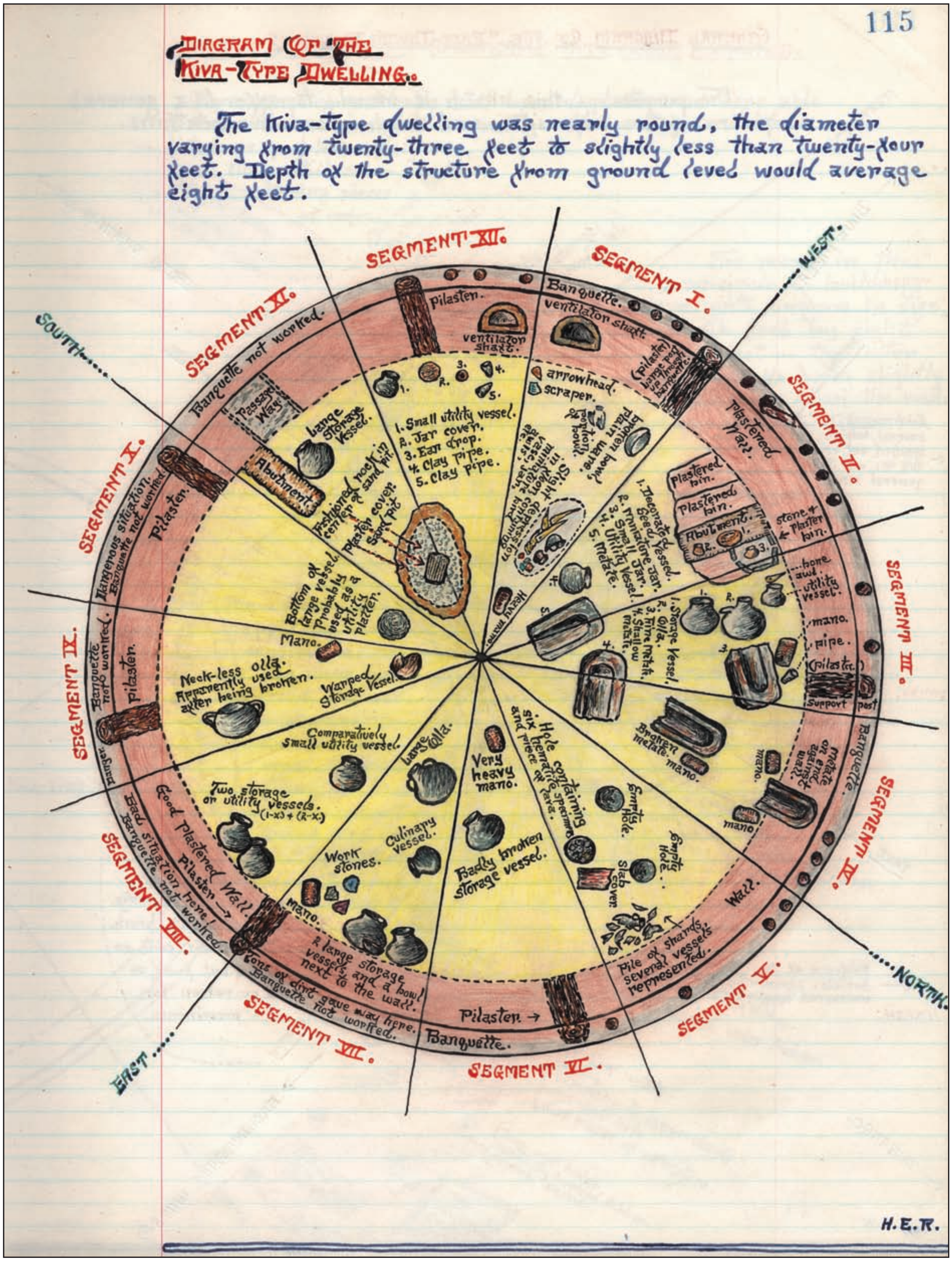

Figure 2.3. Root's drawing of his excavations of the pit structure at Hoodoo Ruin (used by permission of Fort Lewis College, Center of Southwest Studies).

Figure 2.4. Photograph of the Hoodoo Ruin prior to re-excavation by SWCA in 2002.

Figure 2.5. Photograph of the large pit structure at Hoodoo Ruin after SWCA's 2002 excavations. Darker burned areas on the floor and bench indicate areas never exposed by Root, including the small portion of the wing wall jutting out of the main wall and bench.

1974–1975

In 1974 and 1975, under the direction of Ives, the Fort Lewis College field school excavated two early Pueblo I sites on Blue Mesa. The results were never published. Also in 1975 Ives and Barry Hibbets of Fort Lewis College directed the Blue Mesa survey in the same area surveyed by Gladwin and Flora in 1935, recording 46 early Pueblo I sites with pit structure depressions.

1976 TO THE PRESENT: CONTRACT ARCHAEOLOGY

In addition to the Ives and Hibbets survey, another large-scale survey was conducted in 1975, representing the earliest contract archaeology to occur in the Durango area. Conducted by the University of Colorado in advance of a highway realignment in the southern part of the town of Durango, the Ridges Basin survey was an intensive inventory of the eastern portion of the basin below the 6,960-foot elevation line, during which 37 sites were recorded and surface-collected (Leidy 1976). This survey was the first of many professional archaeological surveys that included significant surface collecting in Ridges Basin.

In 1976 Gooding excavated two early Pueblo I sites for the Colorado Division of Highways along La Posta Road (Gooding 1980). Called the "Durango South Project," these excavations revealed both sites to contain typical Pueblo I pit structures. Site 5LP110 contained a jacal surface structure and subrectangular pit structure with a slab-lined fire pit, wing walls, and a three-quarter bench. Ten tree-ring samples recovered from the floor fill of the pit structure produced dates between A.D. 752 and 776. Although none of the dates are bark dates, their tight clustering suggests a roof construction date of 776 (Gooding 1980:22). Site 5LP111 contained two pit structures; a large house similar in size, shape, and attributes to that of 5LP110; and a small pit structure adjacent to the larger one. The smaller structure contained a hearth but lacked a bench and measured less than 3 m in diameter.

In 1979 and 1980 Woods Canyon Archaeological Consultants conducted investigations in the segment of the Mid-America Pipeline Company corridor that extended through Ridges Basin and over Blue Mesa (Fetterman and Honeycutt 1982). They recorded eight sites and excavated two—5LP378 and 5LP379—on the mesa. Site 5LP378 contained three burned surface room blocks and one probable pit structure. Excavation of one of the surface room blocks revealed that it consisted of at least three, and possibly five, contiguous rooms. A tree-ring sample from the site yielded a bark date of A.D. 790. Site 5LP379 contained a surface room block, a pit structure, and a shallow midden, all of which were excavated. Tree-ring dates from the site place the occupation in the early 800s. The site also produced two near-cutting dates in the 830s (831 and 839), indicating a reoccupation of the site after a hiatus of more than a decade (Chuipka and Potter 2007b:239). These are the latest known tree-ring dates recorded in the Durango area, and they suggest that Blue Mesa was not entirely abandoned until the 840s.

In 1980 and 1981 ESCA-Tech Corporation and their subcontractor, the University of New Mexico's Office of Contract Archeology (OCA), conducted an intensive Class III survey of Ridges Basin (Winter et al. 1986). This survey marked the beginning of archaeology work in support of the Animas–La Plata reservoir project. Of the 196 sites identified, 105 sites contained Pueblo I ceramics, 12 had late Pueblo I–Pueblo III ceramics, 25 produced Basketmaker II or earlier projectile points, and 36 were Euroamerican sites (Winter 1986:231). The work included magnetometer investigations at 30 of the Pueblo I and possible Basketmaker sites (Bennett and Weymouth 1986). Several important results emerged from this survey. The first was the systematic identification and recording of all site types in Ridges Basin. Previous archaeological work had tended to focus exclusively on large habitation sites with surface room blocks, pit structures, and refuse deposits—sites with a high likelihood of yielding whole pots, datable charcoal, and tree-ring samples. The ESCA-

Tech-OCA survey provided some of the first data on prehistoric sites and activities outside the range of primary habitation. The Pueblo I sites documented by the ESCA-Tech-OCA survey were of two main types: 1) habitation sites with surface rooms, at least one pit structure, and midden deposits, and 2) limited activity sites lacking architecture. A second result of the survey was the identification of a bimodal size distribution for aceramic lithic scatters. As a result, Archaic period sites became a significant aspect of the archaeological record and research potential of Ridges Basin.

In 1981 and 1982 Fort Lewis College conducted yet another field school in Ridges Basin. In 1981 Phil Duke directed excavation of 5LP630 near Root's Pasture Sites. The site contained an unburned early Pueblo I pit structure, a burned surface room block, and a shallow midden. Scattered human remains were recovered from the pit structure. In addition, the field school tested 5LP240 (referred to as 5LP242 in Duke's report), a site that had been excavated by Ives, but uncovered no additional features (Duke 1985).

In 1982, under the direction of Duke and Susan Riches, the Fort Lewis College field school tested three limited activity sites: 5LP491, 5LP493, and 5LP593. The only subsurface features discovered were three slab-lined cists at 5LP593 (Duke 1985).

In the 1980s Complete Archaeological Services Associates (CASA) conducted various projects in the Animas–La Plata project area. CASA relocated, re-recorded, and once again surface-collected the 196 sites recorded by ESCA-Tech-OCA, and, in the process, updated all of the Colorado site cards. They also systematically surveyed the Wheeler and Koshak borrow areas, which were part of an early version of the Animas–La Plata reservoir project area, east of Ridges Basin, recording 46 sites in the Wheeler borrow area and three in the Koshak borrow area (Fuller 1988b).

CASA also conducted excavations at 11 sites in Bodo Canyon, adjacent to the north edge of Ridges Basin, as part of the Uranium Mill Tailings Remedial Action Project, or UMTRA (Fuller 1988a). These sites consisted of two late Archaic hunting camps, four early Pueblo I habitations, and five early Pueblo I non-habitation sites (three artifact scatters and two possible field house sites). In addition, two of the Bodo Canyon sites (5LP478A and 5LP1104) contained Basketmaker II components, both with shallow, basin-shaped pit structures; hearths; storage pits; and midden deposits. Radiocarbon dates for the Basketmaker II components ranged from A.D. 180±70 to 440±60 at 5LP478A, and from A.D. 270±80 to 280±80 at 5LP1104. Fuller (1988a) proposed that these sites represented permanent habitations. However, it has been suggested that seasonal occupation during the winter months may be more consistent with the quantity and diversity of artifacts recovered from these sites and with models of Basketmaker II settlement in the San Juan Basin (Hogan 1985; Hogan et al. 1991). Fuller's work constituted the first investigations on Basketmaker II sites in the project area, and brought to light the potential of this area to yield significant data on sites dating to this time period.

In 1990 the Bureau of Reclamation synthesized survey and excavation work undertaken up to that time, and had the project area designated an archaeological district eligible for the National Register of Historic Places. In 1992 and 1993 Northern Arizona University (NAU) and their subcontractor, La Plata Archaeological Consultants, mapped and surface-collected 42 archaeological sites in Ridges Basin. NAU and the Bureau of Reclamation published seven volumes on the results of this work (Allison 1995; Gregg et al. 1995; Gregg and Smiley 1995a and 1995b; Smiley 1995; Smiley and Folb 1997; Smiley and Robins 1997), further documenting the variation represented by the artifact assemblages in Ridges Basin.

Finally, in the late 1990s Woods Canyon Archaeological Consultants excavated three sites—5LP203, 5LP379, and 5LP515—in or near the ALP project area as part of the Mid-America Pipeline Project (Horn et al. 2003a). Site 5LP203, on the southeastern slope of Blue Mesa just above the Animas River, contained a single pit structure, a room block remnant, a cobble apron, a trash midden, a roasting pit, and a low-density artifact scatter. Site 5LP379, on Blue Mesa, contained two pit structures (one of which yielded the late tree-ring date reported by Woods Canyon in the early 1980s), a poorly preserved room block remnant, and a midden. Site 5LP515, in Ridges Basin near the proposed dam site at the eastern end of the basin, consisted of a pit structure, a room block with two surface structures and three extramural features, and a trash midden. Each of these sites dated to the early Pueblo I period.

THE EFFECTS OF PREVIOUS ARCHAEOLOGY ON THE ALP PROJECT

One of the challenges that SWCA faced for the ALP project was sorting through disturbance caused by decades of looting by local pot hunters and also the results of the many previous legitimate excavations in Ridges Basin and on Blue Mesa. Compounding this challenge was misinformation or lack of information about many of these excavations, including sites being labeled with the wrong site number. Particularly frustrating were the numerous incidents of surface collection that had occurred at many of the sites—some had been surface-collected as many as five times. In most cases, the artifacts from these earlier collections—or, more importantly, the data collected from the artifacts—were not available. When they were available, often the methodologies and type definitions employed for earlier analyses were not, rendering the data useless. In light of these difficulties, SWCA made two important decisions early in the project. The first was that, given the lack of thoroughness and documentation of previous excavations at sites such as Hoodoo Ruin (see above), it was well worth reinvestigating previously excavated sites or portions of sites; intact deposits and preserved architectural features often remained. This turned out to be particularly true at the Sacred Ridge site. The second decision was to focus analysis and interpretation on well-controlled, screened assemblages of artifacts, rather than on previously collected surface assemblages, unless excavated sample sizes were so small that inclusion of these earlier assemblages was deemed necessary. In general, artifact assemblages proved to be sufficiently large, and only one previously collected Basketmaker II site assemblage (5LP570) was reanalyzed and included in the site interpretation.

In other ways, however, the ALP project directly benefited from much of the work conducted in the area. SWCA certainly benefited from NAU's highly detailed work in the 1990s at sites such as Sacred Ridge. Moreover, by including on the SWCA team several individuals who had worked in Ridges Basin for NAU, we were able to capitalize on their experience and expertise. James Allison had conducted the ceramic analysis for NAU (Allison 1995). Allison supervised SWCA's ceramics team and brought with him not only his knowledge of Durango-area ceramics but also all of the raw data from his previous analyses. He was thus able to build directly on his previous work in the area. James Neal Morris provided the ALP project with NAU's electronic base maps for many of the sites NAU mapped in 1992 and 1993, including 5LP245, the Sacred Ridge site. Working for the ALP project three of our four field seasons, Morris was able to tie into many of the old NAU datums and build on these previous maps.

Of course, the ALP project also benefited tremendously from the massive survey efforts of ESCA-Tech, OCA, and CASA in the 1980s (Winter et al. 1986). Not only did these surveys correctly plot the location of most sites in Ridges Basin, but their consistently accurate site descriptions allowed SWCA to implement effective excavation strategies for the majority of these sites. Furthermore, Ware's (1986a) survey report contained exceptionally useful information, most notably the analysis of settlement patterns. An environmental reconstruction of Ridges Basin (Reith 1986b) was used as a basis to build the final modern plant communities database and maps (Murray et al. 2008).

The methods and results of previous excavations by Fuller in nearby Bodo Canyon (Fuller 1988a) and Fetterman in Ridges Basin and on Blue Mesa (Fetterman and Honeycutt 1982; Horn et al. 2003a and 2003b) were instrumental in helping SWCA develop a field methodology for the ALP project. Fuller's report not only describes the results of his excavations in detail but provides a lengthy discussion of research issues, many of which were incorporated into the ALP project research design (Potter 2006). From Fetterman's experience SWCA acquired an appreciation for the importance of spending sufficient effort locating and documenting extramural features such as Pueblo I enclosures; the difficulty of excavating early Pueblo I surface architecture to any great effect, regardless of time and energy spent; and the effectiveness of using a bucket-auger to locate buried features in the project area. We also benefited by having Fetterman as a field director during our first two field seasons and by having as a crew chief one of his company's archaeologists, Jason Chuipka, who had worked in Ridges Basin and on Blue Mesa previously. Chuipka proved to be an invaluable member of the field team for the duration of the project, particularly at the Sacred Ridge site.

The ALP project inherited the accumulated knowledge not only of archaeologists who had worked in the Durango area but also of those involved in large Pueblo I projects throughout the northern Southwest. Chapter 6, Pueblo I Research in the Northern Southwest, summarizes some of the most influential Pueblo I work conducted throughout the northern Southwest, including that of Dolores Archaeological Program (DAP), which had a profound impact on the questions asked of the archaeological record of Ridges Basin and Blue Mesa and the methods employed to address those questions. Before we delve into that important subject, though, the next three chapters explore the discoveries in Ridges Basin and Blue Mesa that pre-date the Pueblo I remains.

Section II: Paleoindian to Basketmaker II

Chapter 3: Paleoindian and Archaic Sites

James M. Potter

This chapter describes Paleoindian and Archaic sites, features, and artifacts in Ridges Basin and on Blue Mesa. Although the focus is on sites excavated and dated as part of the ALP project, context for these finds is provided through descriptions of previous relevant research in Ridges Basin, comparisons across the region, and assessment of the period-specific questions posed in the ALP project research design (Potter 2006).

PALEOINDIAN PERIOD

Following Lipe and Pitblado (1999) and Pitblado (1999), the period known as Paleoindian is that time before approximately 7500 B.P.[1] This definition includes what others would term the Early Archaic, which represents the earliest of the hunting and gathering lifeways in the New World. There is no mention of Paleoindian sites, features, or artifacts in the ALP project research design (Potter 2006) because these sites are extremely rare in the Northern San Juan region and, prior to the ALP project, none had been uncovered in the Durango area. Indeed, prior to the ALP project, Lipe and Pitblado (1999:4-1) noted the distribution of the 44 occurrences of Paleoindian projectile points in the Northern San Juan region, and none were located in the Durango area (Figure 3.1). Smiley (1995:58), on the other hand, describes one point collected by NAU in Ridges Basin as characteristic of a High Plains Hell Gap point, which would date to approximately 10,000 B.P. He suggests this point is similar to one found during the Durango South Project (Smiley 1995:58; Love-dePeyer 1980:55). However, no Paleoindian points were collected by SWCA during the ALP project, and only one excavated feature dated to the Paleoindian period.

The rarity of Paleoindian remains in the Durango area is remarkable given the relative abundance of Paleoindian evidence to the west (Lipe and Pitblado 1999; Stirniman et al. 2003) and especially to the east of the Animas River (Jodry 1999). To the east, across the continental divide, Jodry (1999) documents 117 Paleoindian components—including 12 Clovis and 40 Folsom components—and 98 Paleoindian localities in the Rio Grande Basin, many of which represented encampments and large kill sites. To the west of the Animas, Angostura points, which date from 9700 to 7500 B.P., and Great Basin stemmed points, which date from 10,700 to 7500 B.P. (Lipe and Pitblado 1999:102; Pitblado 1999:198) are the most common Paleoindian evidence. Fluted points are rare, as are point types that predate 10,000 B.P. (i.e., early Paleoindian).

Other evidence of Paleoindian sites to the west of the Animas River consists of adobe-filled pits. Twenty-three of these pits dating to the late Paleoindian and early Archaic periods were found and excavated at several sites along a section of the Rocky Mountain Expansion Loop Pipeline north of Mesa Verde and west of the La Plata Mountains (Stirniman et al. 2003) (Figure 3.2). Charcoal recovered from seven of the pits at 5MT5454, 5MT7191, 5MT11431, 5MT13680,

[1] To remain consistent with the literature, radiocarbon dates for the Paleoindian period are reported as B.P. dates, and Archaic period dates are reported as B.C. dates. Unless noted, dates do not assume calibration.

5MT13681, and 5MT13682 yielded 2-sigma calibrated radiocarbon dates that ranged from 9730 B.P. to 7290 B.P. The pits were filled with charcoal, burned adobe, and post-occupational sediments. No artifacts or charred economic plant taxa were recovered in the excavated pits, but juniper wood was identified in several radiocarbon samples (Stirniman et al. 2003).

The elevations of these sites are between 6,870 and 7,010 feet, and all sites are in areas of deep reddish brown loess soils, often adjacent to drainages. Blood residue analysis of three separate adobe pieces from some of these features resulted in one sample testing positive for human blood, one for deer blood, and one for dog blood. One interpretation is that these features were used to roast meat, possibly including human flesh, over a bed of hot adobe "coals" (Stirniman et al. 2003:2-19).

On Blue Mesa SWCA found and excavated an adobe-filled pit (Figure 3.3) similar to those found on the Rocky Mountain Expansion Loop project to the west. Site 5LP2029 on Blue Mesa (Figure 3.4) was a multicomponent limited activity site consisting of a Pueblo I artifact scatter, a Basketmaker II roasting pit, and an adobe-filled pit (Feature 2) that contained charcoal yielding a 2-sigma calibrated date of 10,510–10,180 B.P. (conventional radiocarbon age 9140 ± 80 B.P.) (Table 3.1). This feature originated 20 cm below the modern ground surface and measured 64 × 52 cm across and 21 cm deep (Figure 3.3). The fill was a compacted silty clay with charcoal fragments and several large fragments of burned earth, which appeared as fired angular globs of adobe. Oxidation of the surrounding earth and charcoal within the feature indicated that it was used as a hearth or fire pit. No artifacts were recovered from the fill within the pit or from the surrounding surface (Chuipka et al. 2007:124). As with the sites along the Rocky Mountain Expansion Loop corridor that contained adobe-filled pits, 5LP2029 was associated with reddish brown loess soil and was at an elevation of 6,700 feet, slightly below the 7,000-foot line. This is the only documented feature of this type east of the La Plata Mountains.

ARCHAIC PERIOD

The Archaic period has been defined as extending from about 7500 B.C. to the time of the local introduction of maize between 1000 B.C. and 500 B.C. (Lipe and Pitblado 1999:106). In this definition, then, the Archaic is equated with a post-Paleoindian, pre-agricultural, hunting and gathering lifeway. Although the beginning of the period is somewhat arbitrary, it is the endpoint that is most problematic, because horticulture appeared in different areas at different times, or not at all (Hoefer 1999:115). For the purposes of this report, the end of the Archaic is extended to A.D. 1, when formative ancestral Pueblos represented by Basketmaker II populations replaced Archaic populations (Cordell 1997; Duke 1997; Sesler and Hovezak 2002:112).

In general, the Archaic record in southwest Colorado is much sparser and less well understood than that of adjacent regions. The area to the southeast, for example, contains numerous Archaic sites. Eighteen late Archaic components were uncovered at 46 sites in northern New Mexico as part of the Fruitland project; 16 components date from 800 B.C. to A.D. 1, and two predate 800 B.C. Fourteen of these components contained structures and were classified as habitations or residential bases; three were limited activity sites; and one was a rockshelter (Sesler and Hovezak 2002:112–113). And, although controlled excavations and chronometric data are generally lacking from Archaic contexts in the Rio Grande Basin to the east, there does appear to be heavier use and occupation there during the Archaic period than in Ridges Basin, particularly in Closed Basin and the eastern drainages of the San Juan Mountains (Hoefer 1999:125).

Despite the comparative paucity of Archaic sites in southwest Colorado, there is evidence of Late Archaic occupation in and around Ridges Basin, as well as ephemeral Early and Middle Archaic use of the area (Fuller 1988a; Smiley 1995).

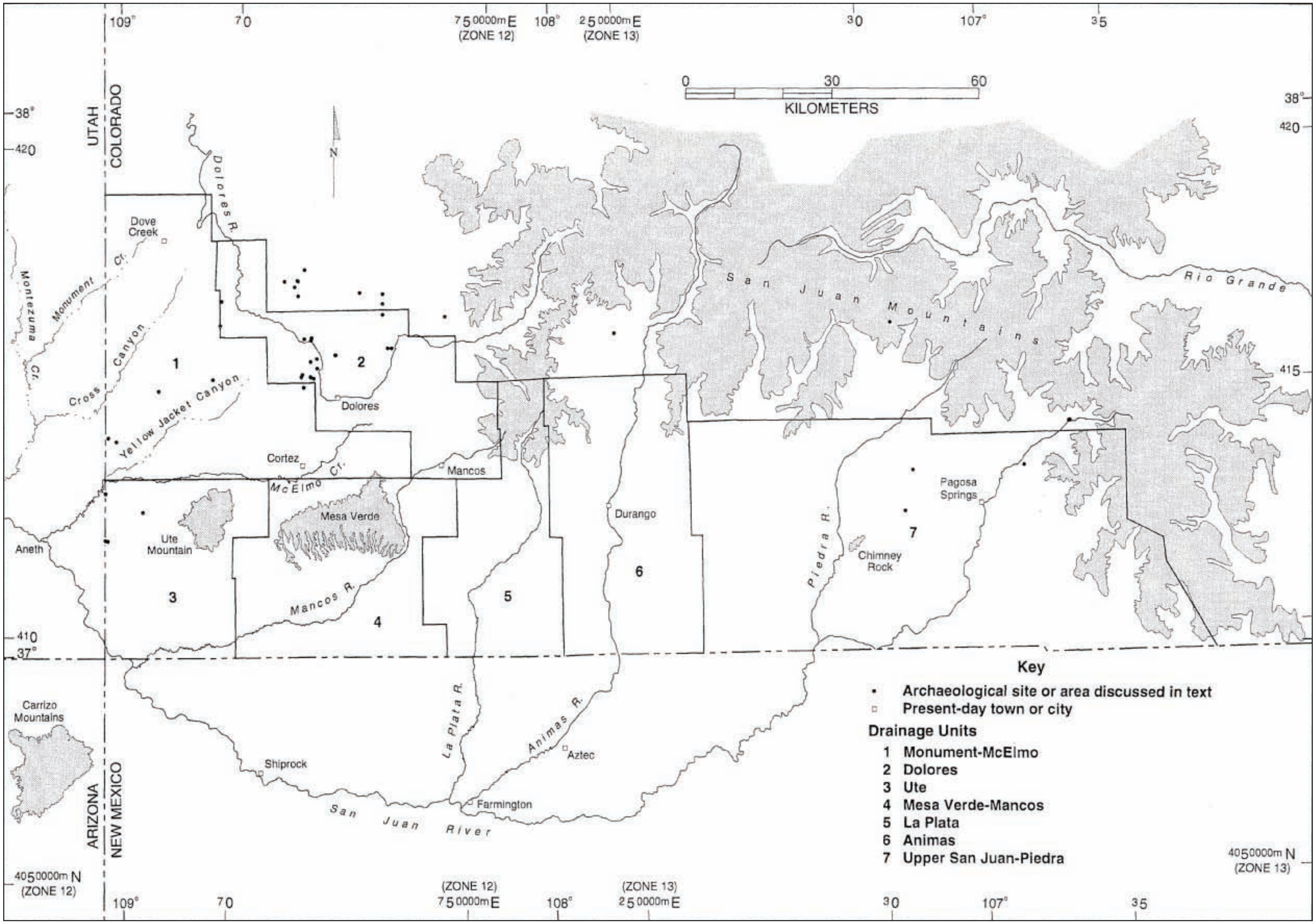

Figure 3.1. Distribution map of known Paleoindian projectile points in the Northern San Juan region prior to the ALP project (reproduced from Lipe and Pitblado 1999:4-1).

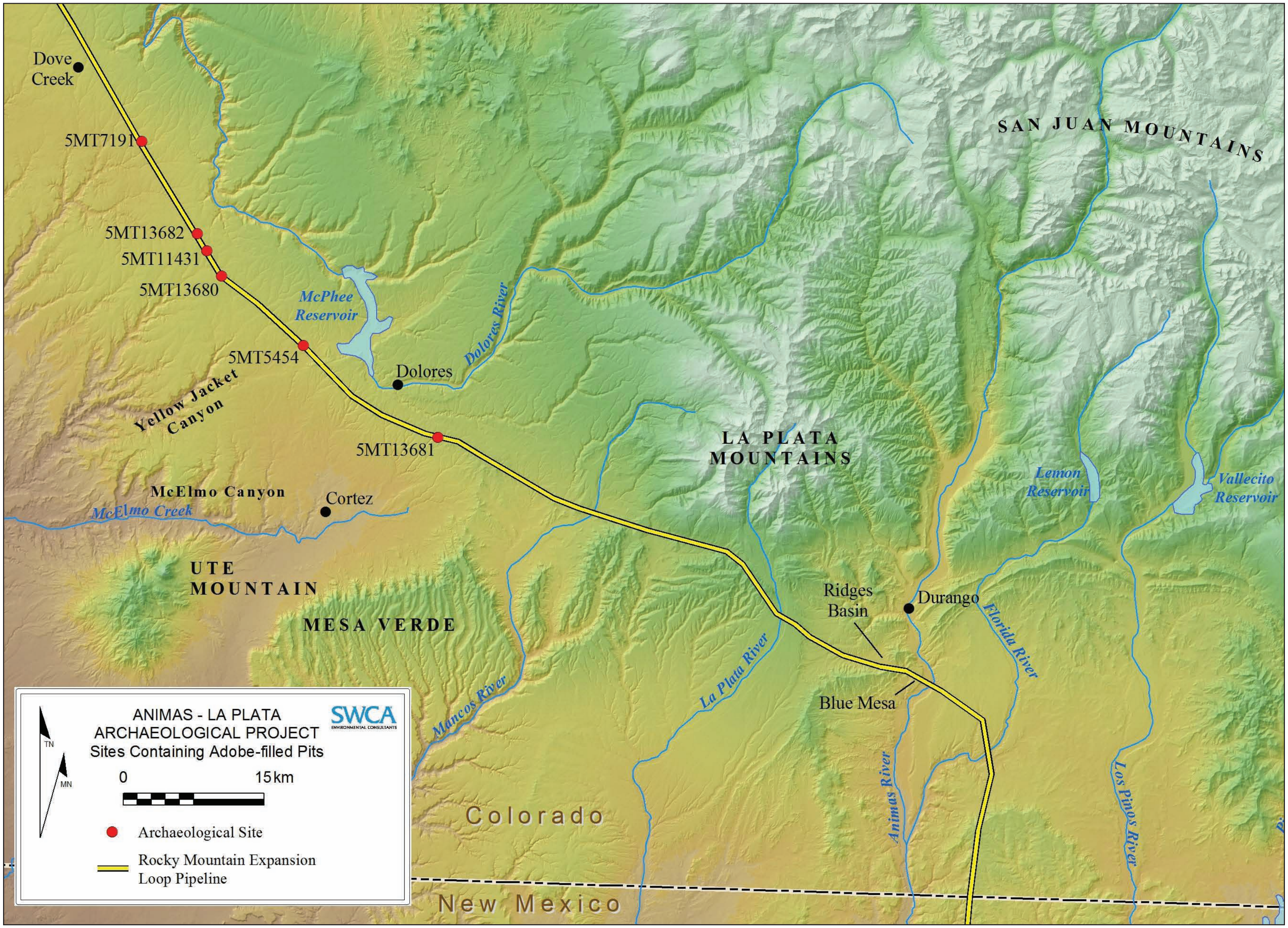

Figure 3.2. Map of sites containing adobe-filled pits (adapted from Stirniman et al. 2003:Figure 2-13).

Table 3.1. Radiocarbon Analysis Results for Paleoindian and Archaic Samples

SWCA Sample Number	Analyst Sample Number	Radiocarbon Age B.P.	2-sigma Dendrocalibrated Date Range	Analysis	13C/12C Ratio o/oo	Context	Quality
5LP2029-PD4-2	Beta-175856	9140±80	8560 to 8230 B.C.	Standard	-25.0*	Hearth	Large charcoal chunk
5LP175-PD3-1	Beta-175852	2700±70	1000 to 790 B.C.	Extended count	-25.0*	Hearth	Scattered charcoal

* Estimated

Figure 3.3. Site 5LP2029, Feature 2, after excavation.

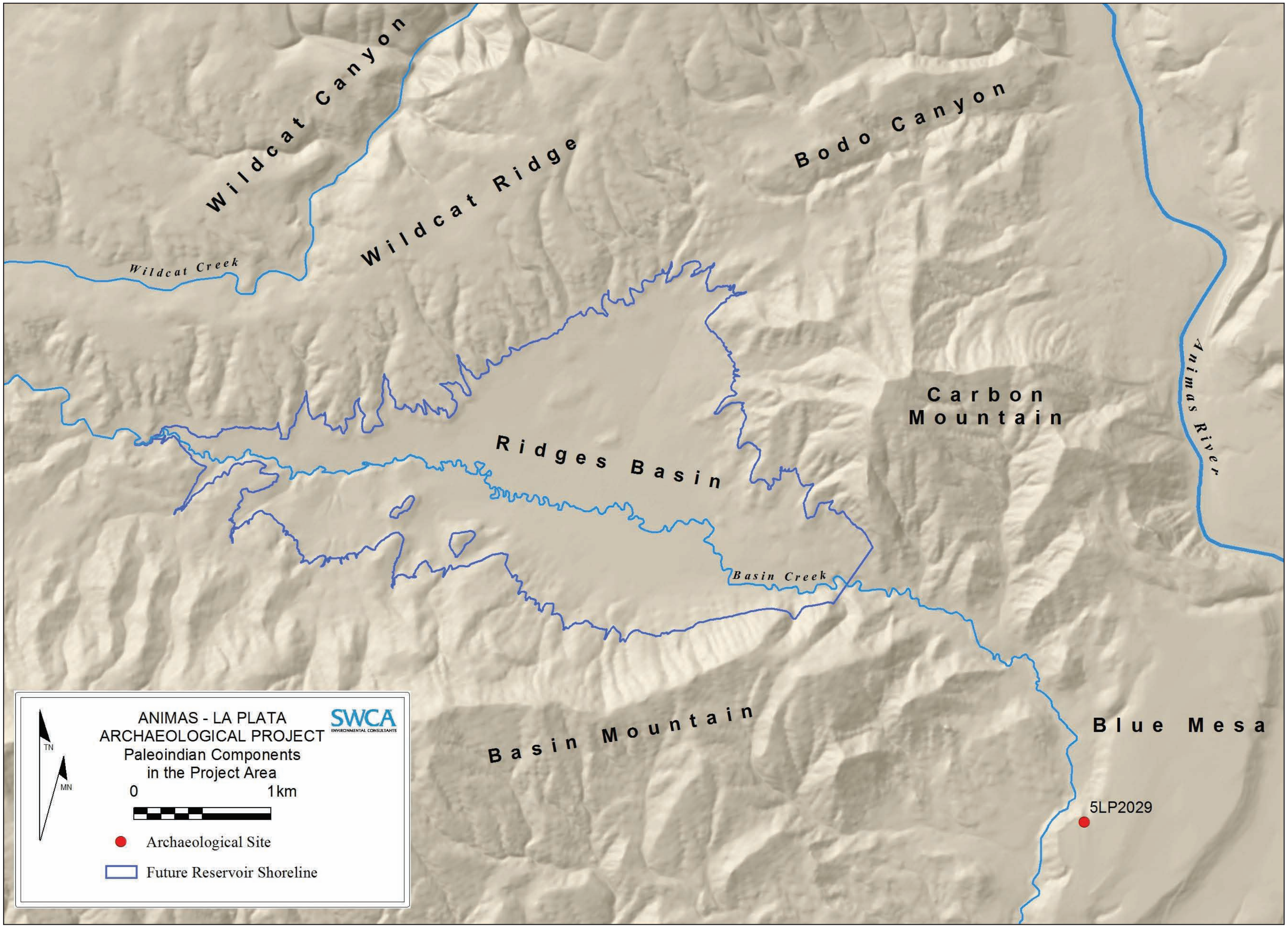

Figure 3.4. Map showing the location of 5LP2029, which contained the single Paleoindian component (Feature 2) found in the ALP project area.

Previous Research on Archaic Sites in Ridges Basin

Prior to the survey of Ridges Basin conducted by ESCA-Tech and OCA in 1980 and 1981 (Winter et al. 1986), no Archaic sites or artifacts had been reported in the Durango area. The ESCA-Tech-OCA survey recorded 54 sites in Ridges Basin that were tentatively assigned to the Archaic period (Ware 1986a).

Ware (1986a) defines two basic Archaic site types for Ridges Basin: large and small lithic artifact scatters (Figure 3.5). The large sites were extensive scatters of flaked stone debris, ground stone items, and projectile points; these sites may have had features and tended to occur in the west end of Ridges Basin. To Ware (1986a:159), "the size, character, and time depth of the large lithic sites suggest a pattern of occupation involving the gradual accumulation of refuse from small, ephemeral encampments over a long period of time." He views these large sites as primarily loci that were used repeatedly for hundreds of years as seasonal hunting camps for procuring deer and elk during their seasonal migrations through the Wildcat Canyon area.

Based on projectile point analysis and discriminant function analysis on debitage, Ware (1986a) suggests that most small lithic scatters in Ridges Basin were associated with ceramic period use:

> As additional support for this hypothesis, the 23 small lithic sites of less than 1000 m^2 were compared with a group of 20 small lithic and ceramic scatters of the same size. The two site groups were virtually identical in a number of dimensions (both groups had an average size of 380 sq m), the primary difference being that the lithic scatters without ceramics tend to be more widely distributed than the lithic-ceramic scatters, which tend to cluster close to the large Basketmaker III-Pueblo I habitation sites in the east end of Ridges Basin.

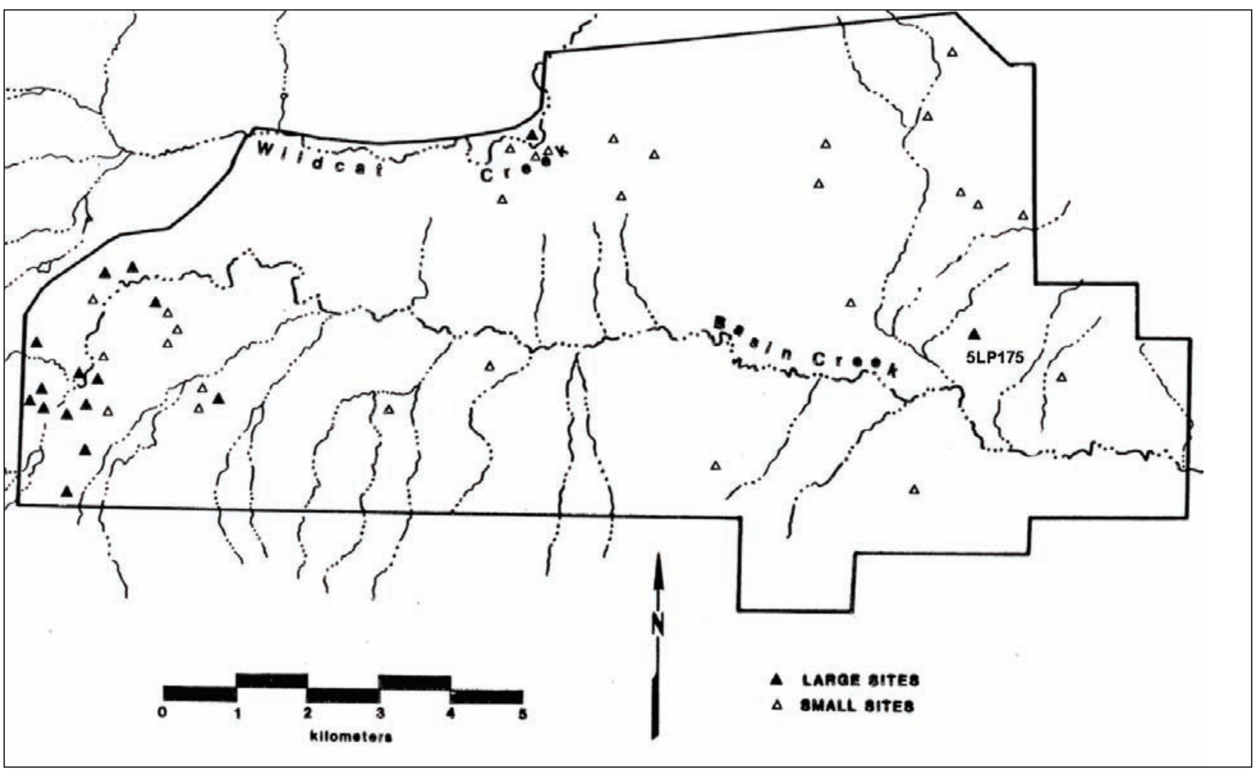

Figure 3.5. Map of large and small lithic sites in Ridges Basin with label added to 5LP175 (adapted from Ware 1986a:Figure 9.1).

In the mid 1980s, as part of the Uranium Mill Tailings Remedial Action (UMTRA) project, Complete Archaeological Services Associates excavated two small Archaic sites in Bodo Canyon[2] (Fuller 1988a) (Figure 3.6). Both were interpreted as short-term, Late Archaic hunting camps. Site 5LP1102 contained a possible small structure, Archaic-style points, and large game remains, including deer. Two conventional radiocarbon dates were recovered from this site: 440 ± 70 B.C. and 140 ± 70 B.C. Fuller considered the occupation or use of this site to date sometime between 500 B.C. and A.D. 1. Nearby 5LP1114 contained an ephemeral domestic structure lacking a hearth. The structure produced a single conventional radiocarbon date of A.D. 30 ± 60. This site yielded an atlatl weight, a hammerstone, several biface-reduction flakes, and projectile points of a wide variety of materials. Like 5LP1102, it is considered a short-term, Late Archaic hunting camp.

Using his more recent excavation data and Ware's survey data, Fuller constructed an alternative model of Archaic use of the area. He suggested, in contradistinction to Ware's hypothesis, that large Archaic lithic artifact scatters represent winter base camps for relatively large groups. These types of sites are expected to be located near water, fuel, and game—all of which are present in or near the west end of Ridges Basin, where Ware's large lithic scatters are located (Fuller 1988a:340). According to Fuller, then, the large size of the sites was due to their function as base camps rather than their repeated use over a long period for a narrow range of activities. Moreover, if large lithic scatters represent seasonal base camps, a particular set of small lithic scatters, such as those excavated in Bodo Canyon, may represent satellite procurement sites associated with the larger base camps (c.f. Binford's [1980] collector model).

> Sites such as 5LP451, 5LP453, 5LP457, and 5LP459 [all at the west end of Ridges Basin] served as aggregated upland base camps, whereas sites such as 5LP1102 and 5LP1114 [both in Bodo Canyon]…served as satellite extractive camps that were utilized by task or family groups. (Fuller 1988a:344)

Fuller (1988a) further argues that variation among some of these smaller sites reflects functional differences: Some are hunting camps whereas others are plant procurement sites. He also notes, however, that differentiating the two site types based on surface characteristics is difficult, and that the small lithic artifact scatters are likely to represent other site types as well.

Smiley (1995) identified several Archaic points collected by NAU (n = 17) and others (n = 26) in and around Ridges Basin, including Bajada, Armijo, Pinto/San Juan, and Archaic side-notched types. These point types span the interval from Early to Late Archaic. Archaic side-notched points, such as Sudden Side Notched, San Rafael Side Notched, and Northern Side Notched types, generally date from the Middle to Late Archaic. Most of these points were recovered through surface collection by NAU and others, and many were unprovenienced or associated with later, ceramic period sites (Smiley 1995:56–78).

Archaic Research Questions

SWCA's Archaic research design included three main research topics: settlement, subsistence, and mobility and interregional relationships. The following is a summary of the questions posed in the research design (Potter 2006).

[2] Fuller (1988a) excavated a third site, 5LP1097, that was interpreted as a Middle Archaic to Late Archaic limited activity site based on the presence of an Archaic side-notched point recovered during survey. No reliable chronometric dates were recovered from this site, however, and it is thus excluded from this analysis.

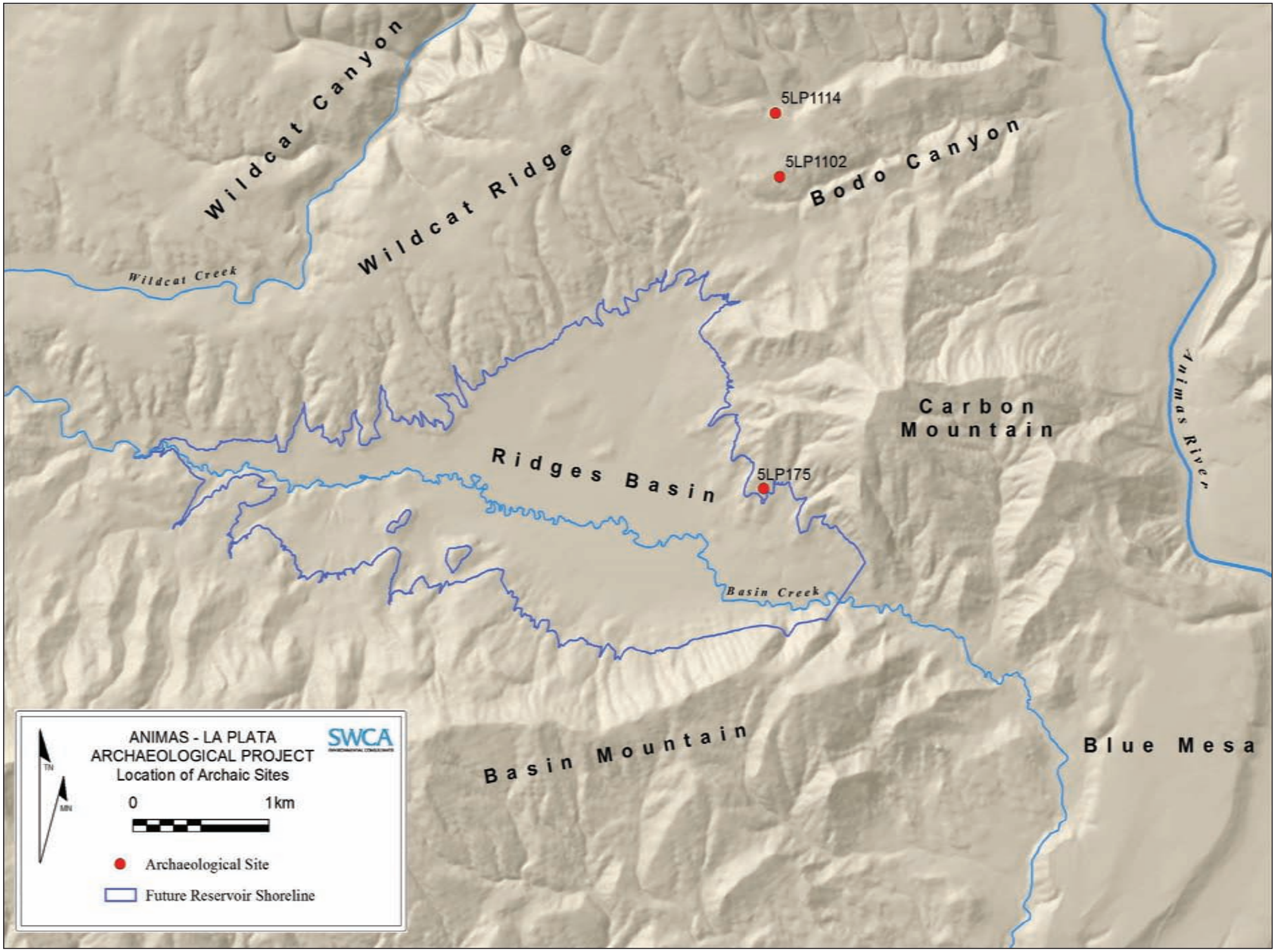

Figure 3.6. Map of dated Archaic sites in the ALP project area. Site 5LP175 was excavated by SWCA.

Settlement

One of the primary settlement issues SWCA hoped to address through excavation was the differing hypotheses for large Archaic sites. If Ware's hunting camp hypothesis is correct, we expected to see the following traits at the large lithic sites: 1) remains from manufacturing and repair of hunting tool kits (including a large proportion of projectile points), 2) uniformity of flaked stone assemblage characteristics across each site (reflecting their narrow focus), 3) a similarly narrow range of species and bone elements in faunal assemblages, and 4) placement on the landscape to maximize access to large game. If Fuller's base camp hypothesis is true, we would expect 1) diverse artifact assemblages, 2) multiple features (possibly including storage features to hold food for the lean months), 3) ground stone, 4) a diverse faunal assemblage, and 5) positioning on the landscape to maximize access to a variety of resources. A third possible scenario, of course, is that multiple site types are represented in the Ridges Basin sample, and functional variation may be much more complex than the two models suggest. Documenting the full range of functional variation in large Archaic lithic artifact scatters—and how that variation might have changed—was therefore of primary concern.

The research design also proposed a geographical information systems (GIS) study of the distribution of ALP project Archaic site types relative to plant communities, water, other resources, and other contemporaneous sites as a way to address which variables were structuring the location of site types on the landscape. In addition, it was hoped that this study would aid in assessing which particular land use model best accounts for the observed variation, the possibilities being a "vegetative diversity model" versus a "serial-forager model" (Fuller 1986a), or perhaps some other model that considers social as well as ecological variables. SWCA therefore proposed to implement a GIS analysis of Ridges Basin settlement, drawing on new site function data obtained through excavation.

Subsistence

Although archaeologists have known for several decades that Archaic period groups ate a variety of wild plant and animal foods, the exact make-up of this diet and the timing of various dietary mixes has yet to be resolved. This is especially the case when cultigens are added to the subsistence system. Previous research on this topic has shown that Archaic period groups made use of a variety of wild plant foods; members of the Chenopodiaceae family and *Amaranthus* genus (known together as Cheno-ams) were especially important in Archaic subsistence. Maize was apparently introduced during the Middle Archaic, perhaps as early as 1800 B.C., and became more widespread during the Late Archaic. Squash was part of the Archaic diet by at least 1000 B.C., although its cultivation or use was apparently even more limited than that of maize. What is clear is that the date of arrival of domesticates is far earlier than the date of commitment to maize agriculture, which is still debated (Huckell 1995; Matson 1991; Wills 1996).

We proposed in the research design to examine three primary issues regarding Archaic subsistence: 1) subsistence mix through time, 2) the timing of the introduction of maize agriculture into the diet, and 3) the conditions under which hunter-gatherers incorporated agriculture into their subsistence system. Addressing the first and second issues would depend heavily on chronometric control. Conventional radiocarbon and accelerator mass spectrometry (AMS) dating of annuals, in conjunction with obsidian hydration and relative dating techniques, would be conducted on as many samples as necessary or possible. Reconstructing subsistence mix through time could be approached through the identification and quantification of floral and faunal remains, analysis of catchment areas, analysis of assemblage characteristics, analysis of processing or other facilities, use wear studies, and analysis of residue on tools. Dating the earliest maize in the project area would require radiocarbon dating of maize samples recovered from Archaic hearths or other pit features. Small samples of maize remains could be dated using AMS methods. Finally, understanding the conditions under which maize was introduced into the subsistence mix required consideration of regional population levels, settlement organization, environmental conditions, the status of hunted and gathered resources, mobility options, changes in technology (including storage technology), and the nature and direction of nonlocal relations.

Mobility and Interregional Relationships

During the Archaic period, residential mobility played a significant role in the use of lithic resources. Unlike the settled ancestral Pueblo people, who generally relied on local materials, Archaic period groups used a broader mix of local and nonlocal resources. They also made a variety of different projectile point styles, which might have reflected cultural affiliation. Thus, identifying lithic assemblage characteristics, lithic sourcing studies, and stylistic analyses of projectile points can help define patterns of mobility, territoriality, and interregional interaction during the Archaic period.

Basic morphofunctional analysis of Archaic lithic assemblages would be an important part of identifying site function, including the possible range of resources exploited at or from a given site. Beyond this, however, we would focus on various attributes of Archaic lithic assemblages.

Most of the local tool stone in Ridges Basin probably originated as cobbles collected in or near the basin. We expected that local origin to be obvious in the assemblages, and we expected to see that the local stone would have been used more expediently because of its greater availability. For example, flakes of local stone may have a high proportion of surface cortex derived from the exterior of the source cobbles. Nonlocal stone (Smiley 1995; Warren 1986) probably entered the archaeological record by several means, including direct quarrying, collection from secondary sources such as cobble deposits, and exchange. Analysis of artifacts made from these materials can indicate whether the artifacts were created from prepared cores acquired in forays or whether they were finished tools acquired through exchange, and thus would shed light on patterns of mobility and exchange.

Raw material diversity indices are another important source of information on tool stone acquisition and use. The number of raw material sources represented in an archaeological setting, along with the physical characteristics and relative abundance of each material, is a highly interpretable dataset independent of the source locations, their precise petrographic/chemical signatures, and their distances from the archaeological context. Diversity measures on recognizable material groupings can be used as a proxy for the number of raw material sources for a given archaeological assemblage. We could therefore expand our analysis beyond the usual question—“Where did these items come from?”—to ask, “How many raw material sources contributed to this assemblage, and in what proportions?”

One of the more interesting patterns of the Archaic period is the development of regional historical traditions. Previous discussions of the Archaic in southwest Colorado have been based largely on Irwin-Williams’s (1973, 1979) proposed Oshara tradition and phase sequence for the San Juan Basin (see, for example, Eddy et al. 1984). Irwin-Williams argues that the Oshara tradition extended across much of the Colorado Plateau during the Archaic and that the ancestral Pueblo tradition developed in place from this earlier pattern. It is becoming clear, however, that southwest Colorado was home to a variety of groups and exhibited a complex array of sociocultural ties during the Archaic period.

As noted above, Smiley (1995) reported on Archaic period projectile points associated with aceramic sites in Ridges Basin. Most of the Middle Archaic points tended to resemble the high side-notched Sudden types of the northern Colorado Plateau rather than the points associated with the Middle Archaic in the Oshara sequence—suggesting at least some affiliation with northern groups during this period. SWCA was particularly interested in understanding where the Ridges Basin area groups fit with respect to the regional traditions that were developing at this time. Documenting mobility, range, and exchange patterns for Archaic groups and refining projectile point typologies should shed light on cultural affiliations and inter-areal relationships. These patterns are important because they set the stage for future interactions, developments, and, ultimately, the historical trajectory for the occupation of the Ridges Basin area by agricultural groups.

Archaic Period Research Results

As part of the ALP project, SWCA excavated one site in Ridges Basin that produced an Archaic period chronometric date. Site 5LP175 was an extensive site near the floor of Ridges Basin (see Figure 3.6) that returned a 2-sigma calibrated radiocarbon date of 1000–790 B.C., placing it solidly in the Late Archaic period (Eisenhauer et al. 2008a) (see Table 3.1). The site contained several concentrations of surface artifacts and two features. Feature 2 was a deflated fire pit with no cultural inclusions present. Feature 3, on the other hand, though exposed on the modern ground surface, contained dark, grayish brown silty clay with fragments of charcoal, ash, and oxidized soils. No artifacts were collected from the feature, but the charcoal from this fire pit produced the single radiocarbon date for the site.

Settlement and Subsistence

As did small hunting camp sites excavated by Fuller, the large site of 5LP175 contained Archaic-style projectile points and flaked stone debris consistent with bifacial reduction (Eisenhauer et al. 2008a; Railey 2009a:142–143; Smiley 1995:56–59). In addition, SWCA recovered five ground stone artifacts from 5LP175—three slab metates, one cylindrical mano, and one indeterminate mano. The slab metates and one-hand manos are characteristic of the Archaic period (Wesson 2009:197–198). In 1992 NAU collected 95 ground stone artifacts from this site (Morris 1995:35). None of these artifacts is described in detail in NAU's site description volume (Gregg et al. 1995) or lithic assemblage volume (Smiley 1995), and SWCA was unable to re-analyze the ground stone collected by NAU.

One flotation sample and one pollen sample were recovered and analyzed from Feature 3. (No faunal remains were recovered.) Charcoal from the flotation sample was identified as juniper and oak. No other plant remains were evident in the flotation sample. The pollen sample contained a number of arboreal and non-arboreal species, including maize. The presence of maize pollen within the sample indicates that people in this Late Archaic camp had access to maize. The Cheno-am pollen signature suggests a nearby disturbed environment, such as a maize field. These weedy wild plants grow readily in disturbed soils, and people likely gathered them for their greens and seeds (Adams and Murray 2008:194). Atypical Cheno-am pollen percentages are often present in sites with evidence of maize agriculture and indicate both landscape disturbance and the use of harvested weedy plants for food (Adams and Murray 2008:194). Other likely foods at this site included sagebrush in the sunflower family, grasses, and marsh elder. The wood and stems from juniper, oak, and greasewood were used as fuel for warmth and cooking. Evidence also indicates the use of ponderosa pine wood or boughs at this site (Adams and Murray 2008:194).

The maize pollen recorded in the hearth and radiocarbon dated to 1000–790 B.C. is the earliest known evidence of domesticated maize in southwest Colorado. Earlier evidence has been found in Utah, New Mexico, and Arizona (Cordell 1997:140), but evidence for maize dating before A.D. 1 is starkly lacking in southwest Colorado. Archaeologists have explained this dearth of maize evidence by suggesting it took some time for maize to become adapted to Colorado's shorter growing season, higher elevations, and more northern latitudes (personal communication, Mark Varien 2007). Most, if not all, of the early dates (more than 2,000 years old) for maize from Utah, New Mexico, and Arizona have derived from maize kernels dated by AMS. Unfortunately, direct AMS dates on early maize were not available in the Ridges Basin data. Yet, the fact that the same hearth produced both the early radiocarbon date and the solid evidence of maize pollen makes it difficult to refute the early presence of maize at 5LP175.

According to Adams and Murray (2008:195), this site was most likely occupied during the summer and fall:

> The plant record generally indicates use of plants from summer through fall. If maize fields were located nearby (the interpretation of which is based in part on the local disturbance implied by the Cheno-am pollen record) people would have been in residence through the agricultural growing season, and possibly earlier to prepare the fields. Plants in the genus *Chenopodium* can start to pollinate in the early summer, whereas plants in the genus *Amaranthus* usually pollinate following the start of the summer monsoon rains. The low spine Asteraceae pollen, if it represents marsh elder, is a late summer/early fall indicator. Poaceae pollen cannot help with seasonality, because (1) it cannot be identified to genus or species, and (2) some grasses flower in the cool (spring/fall) seasons, and others flower in the warm (summer) season. Greasewood flowers in the summer. The presence of Late Archaic people in the basin at other times during the year cannot easily be inferred from the archaeological plant record, which is often mute on late fall, winter, and early spring occupations (Adams and Bohrer 1998).

The data recovered from this site, including the ground stone assemblage and the evidence for maize pollen, suggest that this site was a seasonal base camp, rather than a palimpsest of small, specialized extraction camps. Moreover, whereas the previously excavated small hunting camps were positioned high on a ridgetop in piñon-juniper forest, 5LP175 was situated lower in the basin, optimally sited for the exploitation of a variety of resources, including lithic raw materials, plants, and water (see Chapter 5, A Comparison of Archaic and Basketmaker II Site Catchments). For these reasons, this site is interpreted as a place used for a variety of tasks and activities, including seasonal habitation. Whether this site was representative of the large, lithic sites at the west end of the basin is unclear (see Figure 3.5), but it does seem to represent something more than simply a collection of small, short-term hunting camps used repeatedly for the same tasks.

It is possible the ALP project data show a shift in settlement and use in the Late Archaic. The pre–500 B.C. site, 5LP175, may represent an earlier settlement and use pattern in which families occupied seasonal base camps in Ridges Basin and exploited a wide variety of resources in the area during their stay. After 500 B.C., a shift may have occurred whereby the area was primarily exploited by hunting parties seeking large game, as represented by 5LP1102 and 5LP1114 (Fuller 1988a). Of course, the excavation dataset is quite small as of this publication, so this scenario is only a hypothesis to be tested with additional data.

Mobility and Interregional Interactions

Geological outcrops between Blue Mesa and Ridges Basin contained a wide variety of lithic raw materials, including metaquartzites, jaspers, cherts, petrified wood, and chalcedony (Railey 2009b:21). The diversity of locally available raw materials means that Archaic groups could pick and choose from a variety of local material types. As a consequence, most raw materials were obtained locally, and raw material diversity indices are probably not related to mobility patterns per se but rather to selection for local use as bifaces. ALP project data suggest that Archaic groups favored precipitates of silica and rare, nonlocal material types, such as obsidian, which derived almost exclusively from the Jemez Mountains in northern New Mexico (Railey 2009c). This pattern is consistent with regional trends across much of the Southwest, which involved a shift from cherts and other fine-grained materials in Archaic times to more durable and/or coarser material types in Pueblo times (Railey 2009a:142).

Archaic projectile point styles recovered by SWCA indicate not only significant time depth (5000–1000 B.C.) but also diverse affiliations or origins for the Archaic occupants of Ridges Basin. San Jose/Pinto and Armijo types are diagnostic Archaic types for the Oshara Tradition of northern New Mexico (Railey and Erhardt 2009:147–149). A San Jose point was recovered at an early Pueblo I site, 5LP240, during the ALP project. An Armijo Stemmed A point was collected from 5LP2264 on Blue Mesa. And an Armijo Corner Notched, also diagnostic of the Archaic in New Mexico, was recorded at 5LP187. Previous investigations have recovered a number of San Jose/Pinto and Armijo types as well (Fuller 1988a; Leidy 1976; Smiley 1995). These point types and their geographic origins are consistent with Fuller's model of Archaic groups moving seasonally back and forth between the San Juan Basin in northern New Mexico and upland areas such as Ridges Basin: "Our interpretation is that Archaic groups left the Northern San Juan Basin in the early fall and made their way into the upland peripheries of the San Juan Basin, such as the mesas near the New Mexico-Colorado border [e.g., Ridges Basin]" (Fuller 1988a:343). The Fruitland Project recently documented two Archaic components that represented habitations or residential bases and predated 800 B.C., making them roughly contemporaneous with 5LP175 in Ridges Basin (Sesler and Hovezak 2002:Table 5.1, Figure 5.3). These sites are interpreted as winter camps based on the lack of plant remains and a high proportion of medium-sized to large mammal bones (Sesler and Hovezak 2002:117). The seasonal complementarity of the winter-focused biotic and faunal data for Fruitland sites predating 800 B.C. and the summer-to-fall subsistence record at 5LP175 in Ridges Basin suggest seasonal mobility between the two areas.

In addition, Archaic types diagnostic of areas north of the project area were also recovered during the ALP project. The Northern Side Notched point type is diagnostic of the Northern Rocky Mountains by 6000 B.C. and appears in the northern Southwest sometime after 5000 B.C., possibly as a result of migration southward in the wake of the Mount Mazama (Crater Lake) eruption in Oregon at about this time (Justice 2002; Railey and Erhardt 2009:149). Durango represents the southeastern edge of the geographic distribution of this point type (Justice 2002), and the occurrence of this point type in the project area indicates interactional links with or migration of peoples from Utah and the Great Basin (Railey and Erhardt 2009:149). A Northern Side Notched specimen was recovered from the Sacred Ridge site (5LP245) during the ALP project. Two additional northern Archaic types, Sudden Side Notched (n = 2) and San Rafael (n = 1), were also recovered during the ALP project. Previous investigations recovered a number of these northern types as well (Fuller 1988a; Smiley 1995:59–73). In fact, Smiley (1995), looking at both the assemblage collected by NAU and that collected by Homer Root, found that northern side-notched forms outnumbered those associated with the Oshara sequence in the ALP project area. This is in stark contrast to the pattern exhibited by the numerous Archaic assemblages recovered as part of the Fruitland project in northern New Mexico. In that project, of 61 points identified as Archaic, only three were of the northern stylistic tradition (i.e., Sudden Side Notched), and these all were recovered from one site, LA74802 (Hovezak and Sesler 2002a:78–80).

The meaning and significance of point typologies is notoriously ambiguous, and there are several possibilities to account for the co-occurrence of both southern and northern types in the ALP project area. An overlap of ranges could have occurred whereby both northern and southern groups intermittently ranged into the northern Southwest. Because chronology during the Archaic is poorly controlled, there could certainly be a temporal component to this overlap that is currently undetectable. Another possibility is that the range of Archaic hunters and gatherers was much greater than has been previously modeled for Durango-area Archaic groups, and included vast areas to both the north and south. According to Vierra (1994) the overall territory used by hunter-gatherer groups over many years may be four to 12 times the size of the annual round (Lipe and Pitblado 1999:107). Binford (1983:42) terms this the “lifetime range.” As an example, he notes that a Nunamiut band in northern Alaska relocated its annual range every nine years due to resource depletion or other variations in resource supply, and that, cumulatively, this would encompass an estimated area of up to 25,900 km^2. A lifetime range of this extent might have brought Archaic groups in contact with numerous other wide-ranging groups using various point style traditions, and over time this would have influenced or mixed the traditions of some groups. Finally, as suggested above, a large-scale southward migration of northern Archaic groups after 5000 B.C. into the northern Southwest may have contributed to this mixture of people and traditions in the Durango area. Regardless of the specific causes, it is clear that influence, interaction, and/or migration occurred between the greater Durango area (as exemplified by Ridges Basin and Blue Mesa) and areas both to the north and to the south during the Archaic period. The co-occurrence of northern and southern types suggests an intriguing mix of people and traditions in the area during this early time period.

Chapter 4: Basketmaker II Sites

James M. Potter

The temporal span of the Basketmaker II period is a matter of interpretation. The creators of the original Pecos Classification, of course, did not assign dates to the phase and described it as the agricultural, atlatl-using, non-pottery-making stage. Yet, as Matson (2006:152) notes,

> what is meant by "agriculture" and "agricultural" in the Pecos synthesis is not clear. It is clear that at a minimum maize was grown, but whether the Pecos conferees meant that the Basketmaker II people were dependent on maize, that it provided more than a minor portion of their diet, is not known.

This lack of clarity has allowed for a variety of definitions for the period. Some have characterized the phase as the time span between the introduction of maize and the introduction of pottery, beans, and the bow and arrow, between about 1000 B.C. and A.D. 500 (Lipe 1999:132; Potter 2006:12). Others, such as Matson (2006) and Fuller (1988a), consider the period to start not when maize was introduced but rather when Basketmaker II people became dependent on, or committed to, maize. For Matson (2006:150) this occurred after 500 B.C. For Ware (1986c:99) and Fuller (1988a:347) it occurred even later, due ostensibly to the fact that in the Durango area maize apparently was not present to any great extent until after A.D. 1. Indeed, sites traditionally referred to as Basketmaker II in the Durango area (e.g., the Falls Creek rock shelters and Talus Village, located along the Animas River just north of Durango; Figure 4.1) date primarily from about A.D. 1 to 400 (Morris and Burgh 1954). This is the period of focus in this chapter.

ALP project excavations resulted in the recovery of data from four Basketmaker II sites: three open-air habitations in Ridges Basin and one non-habitation component on Blue Mesa (see Figure 4.7). Chronological data from these excavations revealed an occupation dating slightly later than the main occupations at Talus Village and the Falls Creek rock shelters, which together date from about A.D. 1 to 400. The Ridges Basin sites date primarily between A.D. 300 and 550, making them some of the latest Basketmaker II sites in the Durango area and largely contemporaneous with Basketmaker II sites to the southeast along the Los Pinos River and to the southwest in the Fruitland project area (Hovezak and Sesler 2006).

This chapter briefly describes previous Basketmaker II research in the Durango area and presents the results of excavations at Basketmaker II sites in the ALP project area. In light of these new data, this chapter then discusses the chronology of the Basketmaker II occupation in Durango and addresses issues of Basketmaker II cultural origins; settlement, seasonality, and subsistence in Ridges Basin; the relationship of these sites to Talus Village and the Falls Creek rock shelters; and the Basketmaker II regional depopulation.

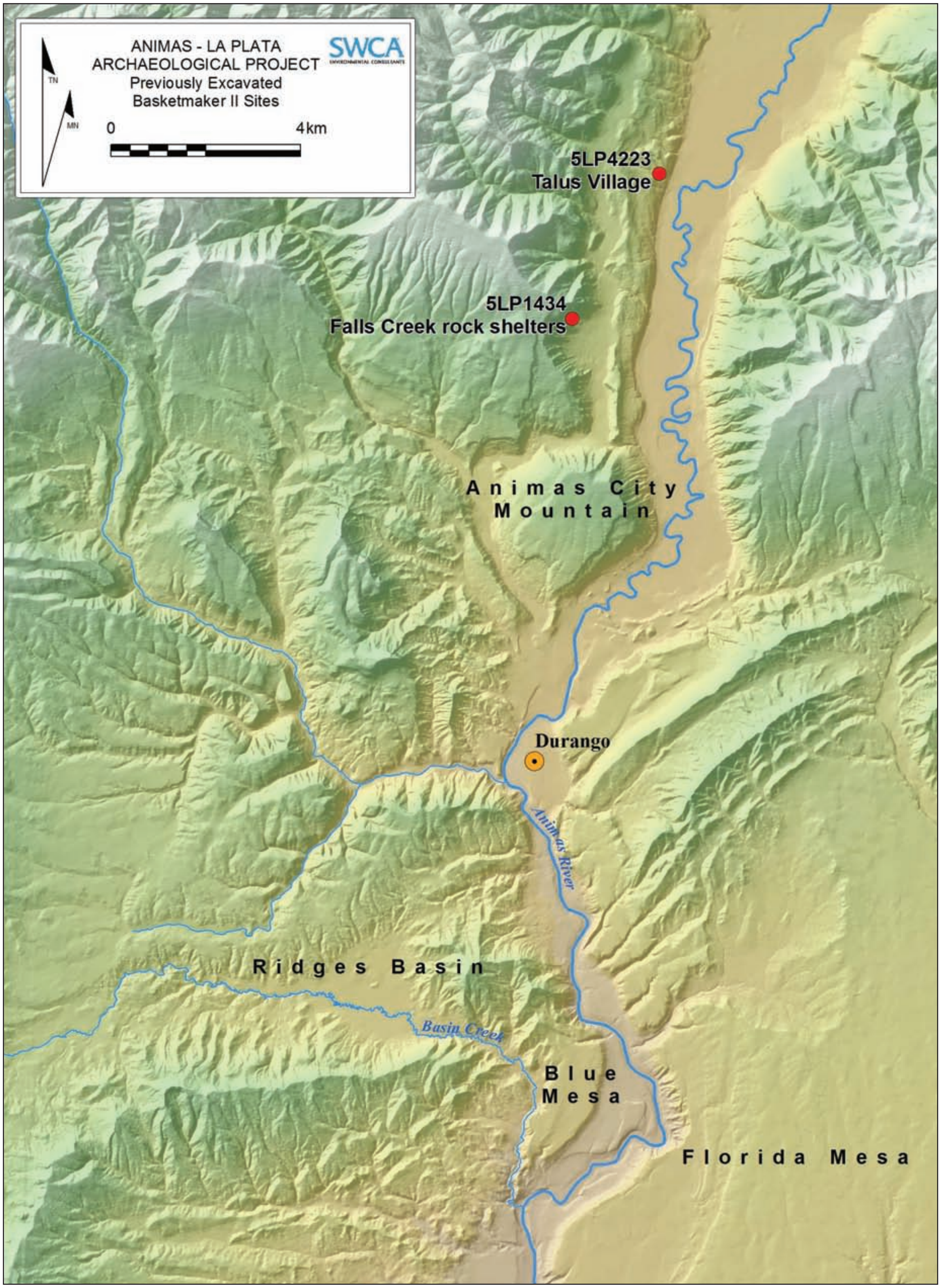

Figure 4.1. Map of the Durango area showing the locations of Talus Village (5LP4223) and the Falls Creek rock shelters (5LP1434).

PREVIOUS RESEARCH ON BASKETMAKER II SITES IN THE DURANGO AREA

As described in Chapter 2, A History of Archaeological Work in the Durango Area, the earliest and most famous work on Basketmaker II sites in the Durango area was conducted by Morris in the 1930s at the Falls Creek rock shelters (5LP1434, which has two areas, the North Shelter and South Shelter) and at Talus Village (5LP4223) (Figure 4.1). At these sites Morris discovered the first evidence of Basketmaker II houses, and documented three of the largest Basketmaker II sites in the region. In all, 48 house floors—35 at Talus Village, nine at the North Shelter, and four at the South Shelter—were reported; many of them were superimposed (Morris and Burgh 1954). Dean (1975:26, 32) notes that the houses are clustered into "house units," six at Talus Village, four at the North Shelter, and two at the South Shelter, and that the numerous house floors documented by Morris and Burgh are due to recurrent remodeling of these 12 house units. The preservation of these house floors was poor, rendering it difficult to determine the contemporaneity of any of the floors and to estimate momentary population levels. Regardless, these sites represent substantial clusters of Basketmaker II habitation structures.

The best preserved of the house floors, Floor 1a at Talus Village, was dug into the side of a slope such that the upslope portion was preserved and the downslope section had eroded (Figure 4.2). The preserved portion of this house contained six slab-lined cists, each of which had apparently had clay dome coverings. A seventh cist was a clay beehive dome with no pit. A hearth or "heating pit" was located in the center of the house, and six metates were also found on the floor, including one built into a pedestal of clay (Figure 4.3) (Morris and Burgh 1954:12). Floor 1a was 9 m in diameter at its widest point (Morris and Burgh 1954:10). The edges of the house were delineated by clay trenches into which had been set the first row of logs for, presumably, a cribbed roof. Tree-ring dates from preserved roof beams indicate that the structure was built shortly after A.D. 330 (Dean 1975:33). Morris and Burgh (1954:12) suggest that this was one of the last houses to have been built and occupied on the site.

Morris and Burgh (1954) also presented one of the earliest well-described Basketmaker II artifact assemblages. The discussion of the perishable artifact assemblage is particularly noteworthy (Morris and Burgh 1954:64–68, Figures 33–42). Although much of the material culture was similar to previously documented Basketmaker II assemblages, the perishable artifacts from Talus Village and the Falls Creek rock shelters exhibit considerable differences. For example, four woven sandals are of a twilled type (Morris and Burgh 1954:Figures 33 and 34) not described before (see, e.g., Kidder and Guernsey 1919) (Figure 4.4). The coiled basketry at the sites was also different from basketry found at other published Basketmaker II sites at the time. Rather than the standard two-rod-and-bundle foundation, most of the baskets from the Durango area sites have a half-rod-and-bundle foundation with noninterlocking stitch construction (Morris and Burgh 1954:Figure 42).

Morris and Burgh were intrigued by these differences and noted that of 93 recordable traits from the Durango area sites, 27 were not present on "Classic" Basketmaker sites (Morris and Burgh 1954:78). This study set the stage for later work by Matson, who argued that the Durango Basketmaker assemblage represented a "culture with a similar way of life, but a different origin" (Matson 1991:48) and defined an eastern Basketmaker group distinct from those occupying areas to the west, such as Cedar Mesa and Glen Canyon in Utah (Figure 4.5).

The next large project to encounter significant eastern Basketmaker II remains occurred as part of the Navajo Reservoir Project, during which archaeologists identified 23 Basketmaker II sites, most located along the Los Pinos River (Eddy 1966). Five radiocarbon dates derived from wood charcoal placed the sites in the interval from A.D. 1 to 400, which Eddy defined as the Los Pinos phase.

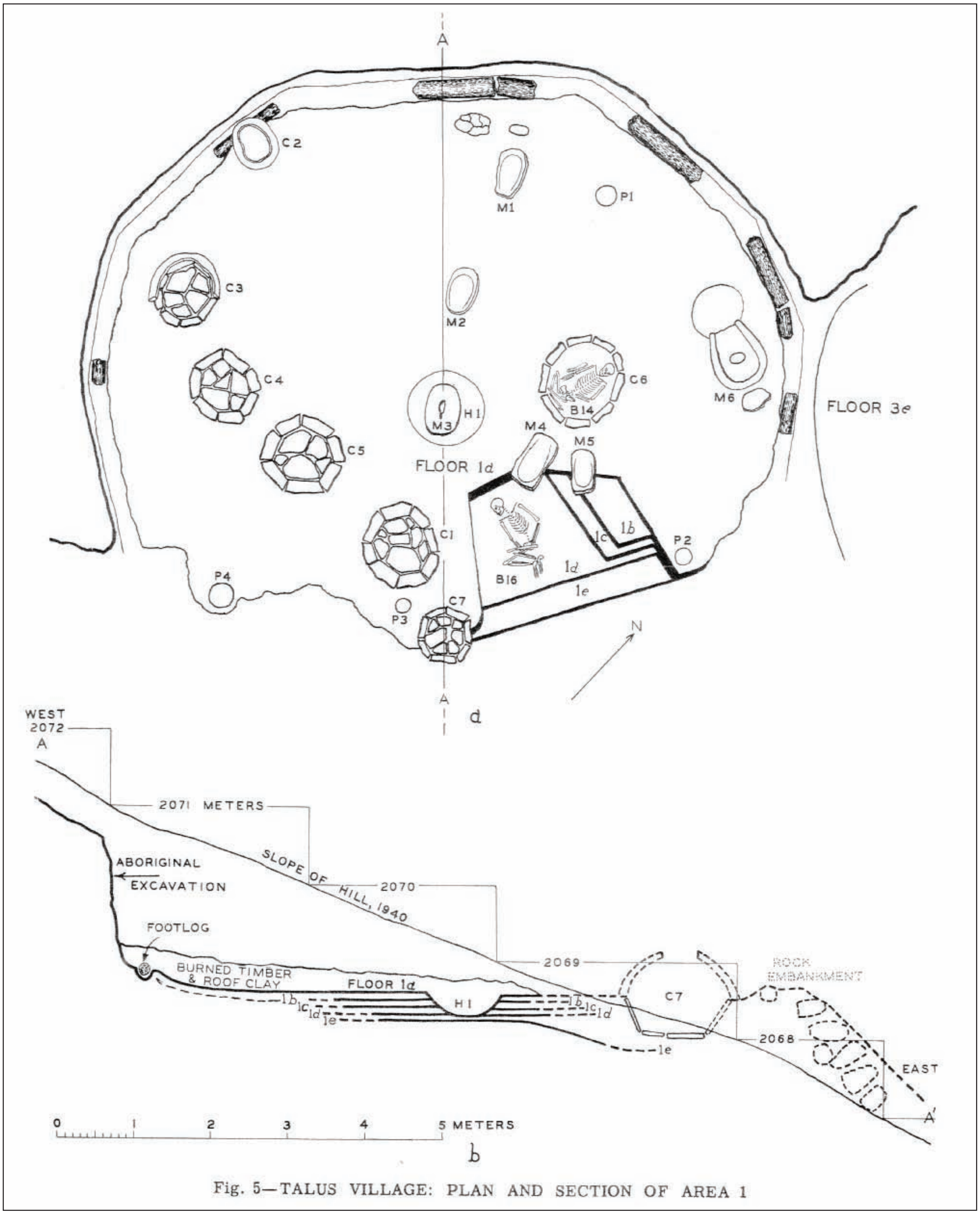

Figure 4.2. Plan and profile of Floor 1a at Talus Village (reproduced from Morris and Burgh 1954:Figure 5).

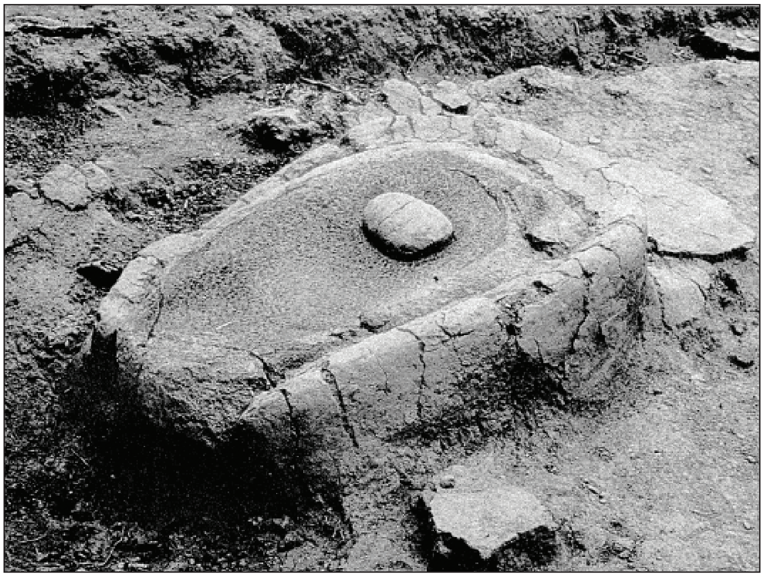

Figure 4.3. Metate in a "pedestal of clay" at Talus Village (reproduced from Morris and Burgh 1954:Figure 85).

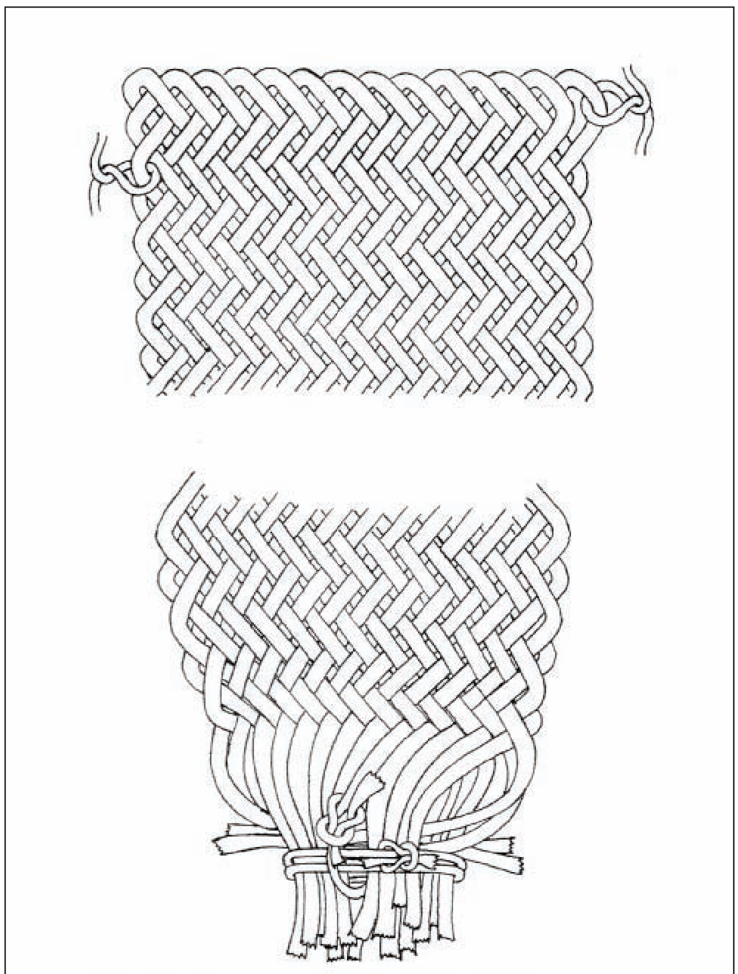

Figure 4.4. Twilled sandal from Talus Village (reproduced from Morris and Burgh 1954:Figure 33).

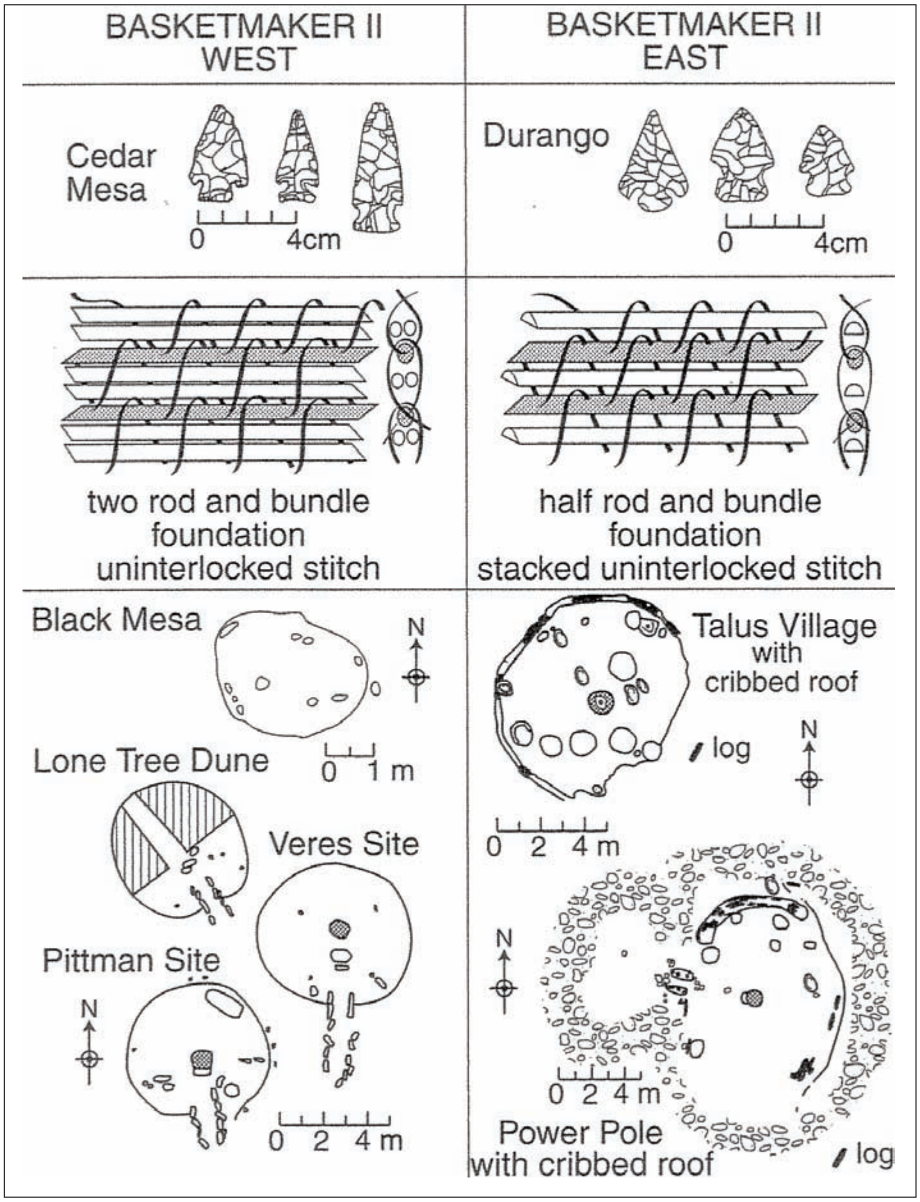

Figure 4.5. Traits from western (Matson's "Classic") and eastern (i.e., Durango area and Navajo Reservoir area) Basketmaker II sites (adapted from Matson 2006:Figure 2).

Most of the sites were small single-unit habitations and small aggregations of houses, several of which have been interpreted as small villages, although this designation has been disputed (Hovezak and Sesler 2002c:50). These open-air sites generally consisted of shallow pit houses often enclosed by rings of cobbles and frequently containing evidence of maize, trough metates, storage features, and brownware ceramics.

More recent reporting as part of the Fruitland project on sites just west of Eddy's Los Pinos sites describes them as basically conforming to Eddy's (1966) descriptions of Los Pinos phase sites, but additional radiocarbon dates derived from annuals indicate that most Los Pinos phase sites date later than originally indicated, from about A.D. 400 to 550 (Hovezak and Sesler 2006; Sesler and Hovezak 2002:140).

Several additional projects in the area have uncovered data on Basketmaker II sites, but none at the scale of the Talus Village or Navajo Reservoir projects. Most have occurred in northwest New Mexico in the Fruitland Coal Gas Development area in San Juan County, New Mexico (Brown and Gish 1991; Bunker 1994; Demar et al. 1994; Demar and Wilcox 1995; Hovezak and Sesler 2002c). In the Durango area, few additional Basketmaker II sites have been investigated and adequately reported. The Tamarron site, located north of Durango in the Animas River valley, contained a saucer-shaped house floor and slab-lined storage pits similar to those found at Talus Village (Reed and Kainer 1978). In addition, horseshoe-shaped metates, one- and two-hand manos, and maize pollen were recovered. Unfortunately, no chronometric dates were recovered, but based on similarities in the architecture and artifacts, Reed and Kainer argue that it is close in age to Talus Village. The Darkmold site, another open-air Basketmaker II site along the Animas River north of Durango, has yielded nine radiocarbon dates indicating occupation from about A.D. 75 to 335 (Charles et al. 2006:220), numerous burials (Charles 2000), and apparently architectural remains and pottery (Charles and Cole 2006:174, 175).

In the mid 1980s Basketmaker II sites were identified in Ridges Basin. Fuller (1988a:351) recorded 20 possible Basketmaker II components in Ridges Basin and adjacent Bodo Canyon, comprising 14 habitation sites and six non-habitation sites (Figure 4.6). These sites were classified based on the following surface indications: an absence of ceramics, a high frequency of fragmented cobbles, and the presence of Basketmaker II style projectile points (i.e., broad, large, corner-notched points with prominent tangs). Additionally, the presence of very fragmented pieces of adobe and magnetometer data indicating the possible presence of structures suggested possible Basketmaker II habitations.

In 1985 and 1986 Fuller (1988a) excavated two sites (5LP478 and 5LP1104) in Bodo Canyon with components that were radiocarbon dated to A.D. 100–400 (see below for calibrated date ranges (Figure 4.7). The Basketmaker II component at 5LP478 consisted of four shallow, dish-shaped houses, three of which contained cylindrical or bell-shaped storage pits. Maize pollen and plant remains were recovered, as were very few Basketmaker II artifacts, which resembled those from the Falls Creek rock shelters and Talus Village. A high frequency of cracked igneous cobbles at this site may reflect Basketmaker II cooking activities (Fuller 1988a:350).

Site 5LP1104 consisted of a large, shallow, dish-shaped house and a large, deep midden. The midden contained mostly charcoal, ash, and fire-cracked rock. In the house were a bell-shaped storage pit and a central hearth. Two radiocarbon samples dated to A.D. 280 ± 80 and 270 ± 80.

Northern Arizona University's work in the early 1990s in Ridges Basin included a focus on Basketmaker II research issues (see chapters in Smiley and Robins 1997). However, because work in the basin was limited to surface recording, no additional well-dated Basketmaker II data were obtained.

BASKETMAKER II RESEARCH QUESTIONS

SWCA's Basketmaker II research design included four main topics: settlement, subsistence and seasonality, cultural origins and interregional relationships, and regional depopulation of the area at the end of the period (ca. A.D. 400) (Potter 2006).

Chronology

Improved chronologies are key in establishing feature contemporaneity and understanding settlement patterns through time. Matson (1991) has argued that the earliest Basketmaker II settlements should be associated with floodplain farming and that by the late Basketmaker II period (A.D. 1–500), varieties of maize had been developed that permitted upland dry farming, as well.

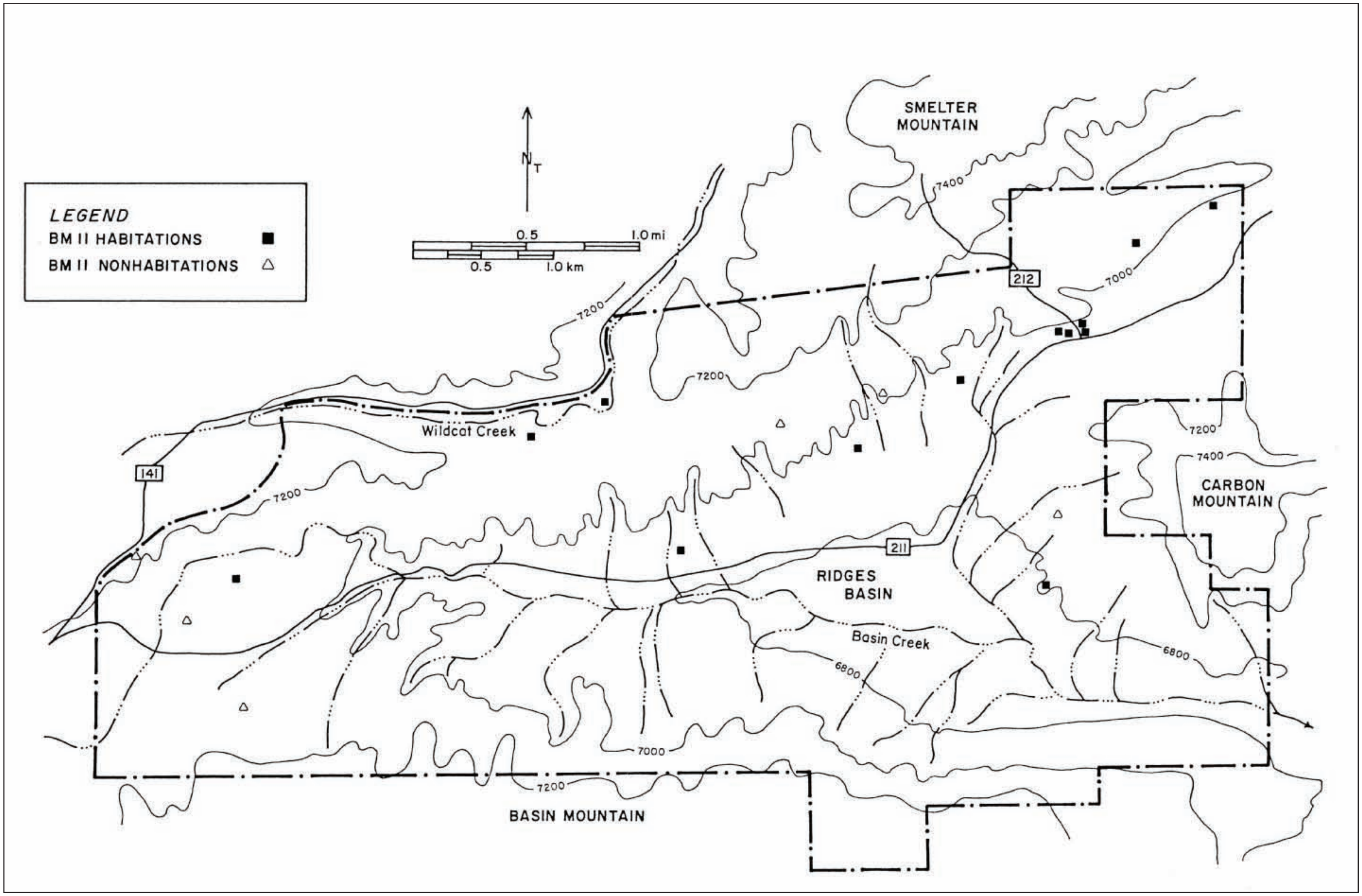

Figure 4.6. Map of possible Basketmaker II habitation and non-habitation sites in Ridges Basin and Bodo Canyon (reproduced from Fuller 1988a:Figure 183).

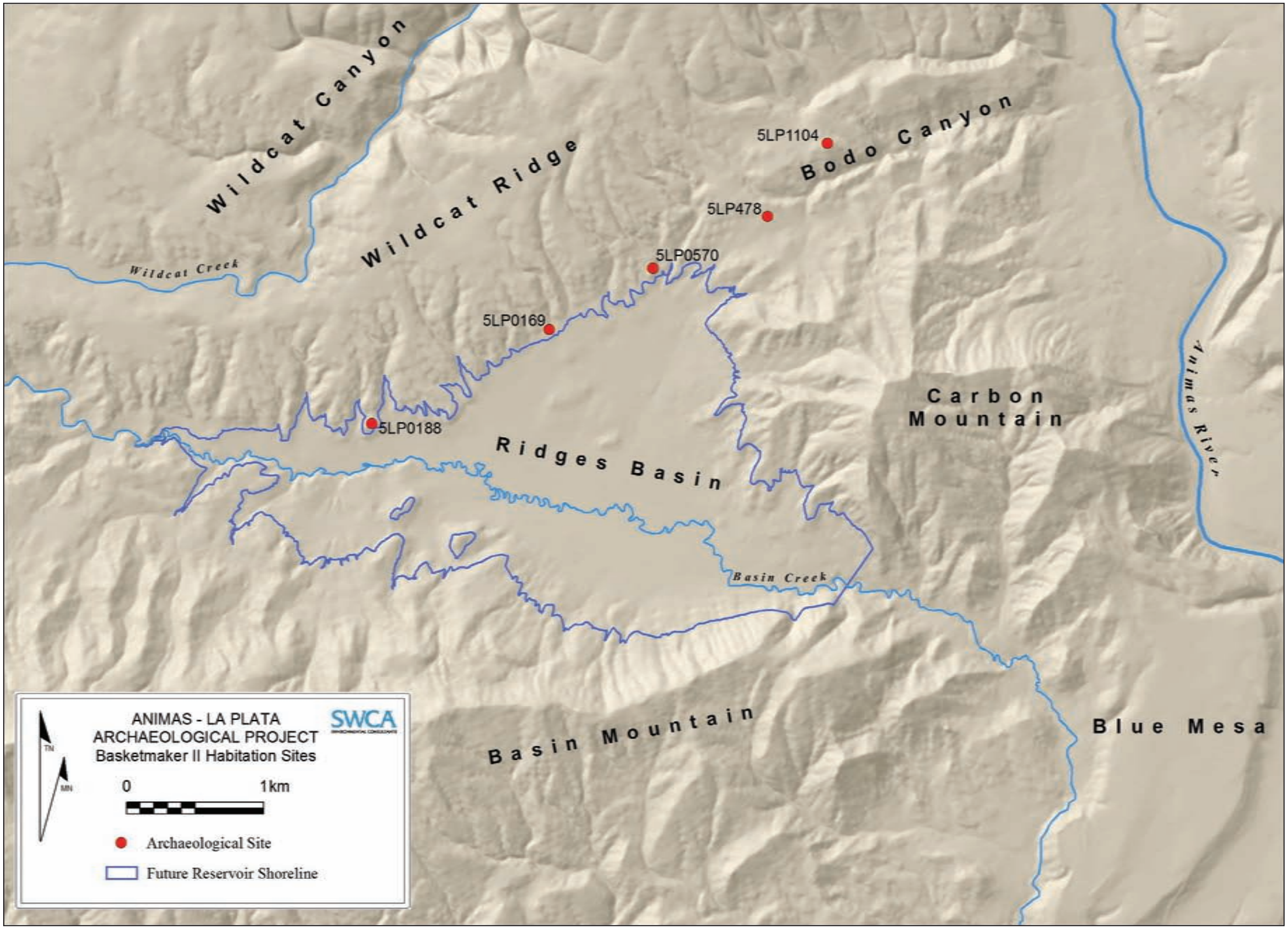

Figure 4.7. Map of dated Basketmaker II habitation sites in the ALP project area. Sites 5LP478 and 5LP1104 were excavated by Fuller (1988a). Sites 5LP169, 5LP188, and 5LP570 were excavated by SWCA.

Many Basketmaker II sites in the Durango area appear to be oriented to floodplain settings in valleys with perennial streams. The exception to this pattern seemed to be Ridges Basin, which had Basketmaker II sites in upland farming areas with good southern and eastern exposures. Prior to the ALP project, however, the dates of these sites were in question. Dating the Basketmaker II and Late Archaic components in the project area, therefore, would be of primary concern for ALP project researchers because it would be essential for determining whether early Basketmaker II sites existed in the study area, and if so, whether their distribution countered or supported Matson's hypothesis. Refined chronological controls would also allow for the construction of better models of Basketmaker II settlement and community patterns. Further, the excavation of Basketmaker II pit structures had the potential to yield tree-ring and radiocarbon dates, which could be used to extend the Four Corners area tree-ring chronology back in time.

Settlement

Based on his work on Cedar Mesa, Matson recognized four site types for the Basketmaker II period: habitations, campsites, limited activity sites, and lithic reduction sites (Matson 1991:81–82; Matson et al. 1988). Limited activity sites contain tools and "ash hearths" (hearths without a slab lining). Campsites, on the other hand, served a more residential function than did limited activity sites, and they often contain slab-lined hearths and ash hearths, limestone boiling stones, ground stone, and storage cists. Habitation sites contain pit structures.

In the Durango area, prior to the ALP project, only six non-habitation sites had been documented and none had been excavated or solidly dated. Moreover, Fuller (1988a:351) noted that the six sites assigned to this category are "less secure regarding their temporal placement, mainly due to their small size." He suggested that the locations of Basketmaker II non-habitation sites were selected to take advantage of wild resources rather than for their proximity to the kinds of resources, such as good agricultural soils, required for maize agriculture. He observed that they are "variably located and may represent hunting camps, gathering camps, or possibly seasonal horticultural camps." In contrast, the "majority of the 14 possible habitation components are distributed around the upland margins of Ridges Basin and Bodo Canyon where the cold-air drainage would insure the longest possible growing seasons required for corn agriculture" (Fuller 1988a:351) (see Figures 4.6 and 4.7). For the ALP project SWCA wanted to confirm through excavation and chronometric dating the presence of Basketmaker II non-habitation sites in the project area, their distribution relative to resources and habitation sites, their type (e.g., campsite vs. limited activity site), and their function (e.g., hunting vs. plant gathering).

Sizes of Basketmaker II habitation sites are extremely variable in the Durango area. Sites commonly contain only one habitation structure, but some have as many as 35 (Fuller 1988a:353). The considerable size variation in these sites is perhaps related to social differences, temporal differences (e.g., greater aggregation through time), or variable reuse of specific locations. Talus Village has house units that exhibit evidence of repeated reoccupation, indicating movement in and out of the same site over a long period. Although seasonal movement is a possibility, the site's location near both river bottomland and upland wild resources make longer-term residence another possibility. The two Basketmaker II sites excavated by Fuller (1988a) had shallow basin-shaped pit houses, hearths, storage pits, and midden deposits. He proposed that these sites may represent permanent habitations, particularly 5LP1104, which had a large, deep midden. This interpretation, though, is at odds with models of Basketmaker II settlement in the San Juan Basin (e.g., Hogan 1985; Hogan et al. 1991).

SWCA hoped to address these Basketmaker II settlement issues by obtaining additional excavation data on Basketmaker II habitation sites in the ALP project area. Emphasis was placed on documenting variation in architectural traits, site size, occupation duration and seasonality, and spatial distribution relative to agricultural resources. Additionally, SWCA wanted to demonstrate the potential impact of the cold-air pool on site location, as suggested by Fuller (1988a:351). Finally, what was the relationship of Basketmaker II settlements in Ridges Basin to the habitations at Falls Creek and Talus Village? Were they occupied contemporaneously and, if so, were they culturally linked or seasonally complementary? Were they earlier or later than these larger sites?

Subsistence and Seasonality

Early maize from Durango area Basketmaker II sites expresses characteristics of a variety of maize types (Jones and Fonner 1954:111). Documented characteristics include the higher row numbers, starch caps, denting, and pyramidal cob shape of Mexican Pyramidal; the lower row numbers, row pairing, grooved cobs, flaring butts, and large shanks of Eastern types; and possibly even some Tropical Flint traits. Clearly, early Basketmaker II maize encompassed a surprising diversity that might reflect multiple or heterogeneous strains. In examining Basketmaker II subsistence in Ridges Basin, SWCA proposed to focus on 1) the degree of dependence on maize through time, 2) the diversity of maize varieties through time, and 3) the possible relationship between these two factors. Fortunately, chronological analysis of maize is highly practicable, because any cob fragment or kernel that is large enough for morphological studies is also large enough for AMS dating.

Of particular interest was whether maize was as important in early Basketmaker II times as it evidently became after A.D. 1. As Lipe (1999:164) has noted,

> if maize was introduced by San Pedro–related colonists from farther south, it is likely that these settlers were already dependent on this crop. In this scenario, populations would have remained small and scattered because initially the introduced maize was not well adapted to the Four Corners area and could be grown only in a limited number of environmental settings (Matson 1991). On the other hand, if maize was adopted by indigenous farmers [as has been suggested for the Durango area in particular], it could either have rapidly become important, or it could have been used for a long time as a supplemental food source.

Specific questions to address were as follows: 1) When do cultigens appear in the project area and how soon after are groups fairly dependent on them? 2) Are there changes in the ground stone assemblage, and if so, when do these occur? 3) Do site locations reflect a dependence on agriculture or wild resources? 4) Are structures more substantial, and are storage features added to the inventory?

As Lipe (1999:165) notes, understanding Basketmaker II dependence on maize is a key to understanding Basketmaker II subsistence in general. For example, did population growth in late Basketmaker II times eventually force groups to relegate foraging to a fallback role, setting in motion a greater dependence on dry farming and long-term storage of maize? Were these changes set off by the introduction or development of new varieties of maize and the beginnings of successful bean cultivation? Did warfare or some other social process promote a reduction in foraging and a commitment to greater dependence on stored maize, new land-tenure systems, and stronger communities?

Cultural Origins and Interregional Relationships

The distinctive character of the Durango area Basketmaker II sites and material culture compared to the classic, western Basketmaker II sites of the Cedar Mesa area has led Matson (1991) to suggest that they represent two related but different cultural traditions. This raises the question of the origins of Basketmaker II groups in the Durango area: Did these groups have a fundamentally different history than that of Basketmaker II groups to the west? Matson (1991) suggests that the Durango area Basketmaker

II manifestation may have had cultural origins in indigenous Late Archaic groups, whereas Basketmaker II groups farther west may have descended culturally from migrants from the Sonoran Desert. Investigating the cultural origins of Basketmaker II groups in the Ridges Basin area was therefore an important research goal for the ALP project.

To address Matson's (1991) proposal that Durango area Basketmaker II groups developed locally as a result of Late Archaic foragers adopting maize farming by diffusion, SWCA asked the following questions: 1) Do Archaic and Basketmaker II sites overlap in time? 2) Are they situated in the same or different ecological niches? 3) Is there evidence, such as an increase in the use of a particular projectile point style, for intrusive populations?

As do those from the Archaic period, Basketmaker II lithic assemblages often consist of a wide variety of stone materials from nonlocal sources. In addition, Basketmaker II sites frequently contain ornaments made of exotic materials such as shell. Identifying the sources of these materials and understanding how they made their way into Basketmaker II sites would allow inferences regarding the direction and intensity of interregional relations, either through direct movement across the landscape (mobility) or through exchange with other groups. Projectile point styles might also provide information about the cultural affiliations of the Ridges Basin Basketmaker II groups and the direction of their social interactions. Establishing the direction and intensity of inter-areal relationships through time is critical for understanding a group's cultural-historical connections, why a group left an area when it did, and where the people went when they left. Further, understanding inter-areal relationships might help to address Lipe's (1999:165) question: "Did Basketmaker II groups maintain wide networks of trading partnerships to facilitate rapid movement into different areas if crops failed and local resources were inadequate?"

Regional Depopulation

Assessing local environmental conditions during the late Basketmaker II period is essential for understanding the depopulation of the area. Did a decrease in effective moisture force the Basketmaker II occupants of Ridges Basin to leave, or were other factors such as forest clearing for maize farming, soil depletion, and over hunting among the motivations to leave? Was social conflict an issue? Is there evidence of violence in Basketmaker II settlements or of defensive structures such as enclosures in the project area during this time, or are enclosures solely a Basketmaker III phenomenon (Chenault and Motsinger 2000)?

By taking a long-term historical approach to the Archaic and Basketmaker occupations of the Ridges Basin area—looking at environmental changes, demographic and settlement organization changes, subsistence changes, and affiliation trends through time—SWCA hoped to reconstruct the particular trajectory of the Ridges Basin area hunter-gatherers and develop a well-documented study of early agricultural adaptations in the northern Southwest. It might then be possible to compare this historical case study to research in other areas of the world and contribute significantly to general cultural evolutionary models of the transition from a hunting and gathering lifeway to an agricultural lifeway.

BASKETMAKER II RESEARCH RESULTS

Features and Artifacts

SWCA excavated three Basketmaker II habitations: 5LP169, 5LP188, and 5LP570 (see Figure 4.7). Site 5LP169 was a multicomponent Basketmaker II and Pueblo I site (Eisenhauer et al. 2008b). The Basketmaker II component (Loci 2 and 3) consisted of an artifact scatter and pit structure (Feature 9) that included several subfeatures (Figure 4.8). The structure measured 4.6 × 3.8 m and extended 10 cm below prehistoric ground surface. The 12 subfeatures consisted of seven pits, two bell-shaped pits, two post holes, and a hearth. Burned adobe was present on the floor, and the roof fall and walls of the structure exhibited burning, indicating the structure burned. No chronometric data were obtained from this site, but attributes compare favorably with other well-dated Basketmaker II habitation sites in the project area. Very few artifacts were recovered from this site, including 28 flaked stone and five ground stone items.

Site 5LP188 was also a multicomponent site dating to the Basketmaker II and Pueblo I periods (Eisenhauer et al. 2008c). The Basketmaker II component (Locus 1) contained a pit structure (Feature 13) and numerous thermal and storage pits (see Figure 4.8). The pit structure was a shallow oval, measuring 7.5 × 5.5 m. The floors and walls in the northern end were well plastered; those in the southern end had eroded. The high density of large pieces of burned adobe in the feature fill and the large number of post holes around the perimeter of the floor indicated that the structure was roofed and burned at the time Basketmaker II people vacated Ridges Basin. These posts may have supported walls of horizontally stacked logs (Eisenhauer et al. 2008c:42), an arrangement similar to that of a pit structure at Talus Village where basal beams were found in situ around the perimeter of Floor 1a (Morris and Burgh 1954) (see Figure 4.2). A stratum of charcoal and oxidation in the preserved portion of the structure indicated that it burned. The floor assemblage contained a variety of artifacts, including flaked stone, ground stone, faunal remains, and charred basketry. Plain grayware and unpainted whiteware sherds were also found on the floor, but these were interpreted as intrusive (Eisenhauer et al. 2008c:44).

Features associated directly with the floor of the Feature 13 pit structure at 5LP188 were a hearth, a bell-shaped pit, two slab-lined pits, a rock alignment, four bins, and eight post holes (see Figure 4.8). In addition, five slab-lined pits, three fire pits, and eight pits lined the southern and eastern edge of the structure. Most of these features appeared to have been storage features. Several fragmented pieces of charred basketry—probably part of the same basket—were recovered from the floor. The basket was coiled, with a two-rod-and-welt bunched foundation with non-interlocking stitches. The stitches and rods were made of sumac, and the bundles were made of yucca. Both materials were prehistorically available, and the basket was likely locally made.

With two shallow pit structures (Features 3 and 4), 5LP570 was the largest Basketmaker II habitation excavated by SWCA (Eisenhauer et al. 2008d). The pit structures contained a variety of subfeatures, including slab-lined pits, bins, and a hearth (see Figure 4.8).

Feature 3, the northern structure at 5LP570, consisted of two parts: a circular main chamber and a smaller antechamber attached by a narrow passageway. The main chamber measured 5.0 × 4.3 m and the antechamber was 2.3 × 1.8 m. The floor level on the north side was about 25 cm below the ground surface, and the south half of the feature floor was near the modern ground surface. The structure had burned intensely, and there was an abundance of oxidized adobe in the floor fill. The majority of this burned daub was found in situ around the inside periphery and was positioned parallel to the structure edge, suggesting it had covered beams set horizontally around the structure. No remains of walls were found due to erosion. Erosion had also obliterated any post holes that may have been placed around the edge of the structure to support the walls and roof. Slabs observed in the structure fill near the periphery may have been used to line the pit edge.

The floor had eroded away on the south half of the structure. The floor and wall on the northwest side were plastered and well preserved by intense burning. Five subfeatures were present in Feature 3: a hearth, a bin formed by soil footers topped by reed and adobe walls, and three small slab-lined pits that may have been post holes. Only eight artifacts—all flaked stone and some of them expedient tools, including scrapers, choppers, and used flakes—were recovered from the floor.

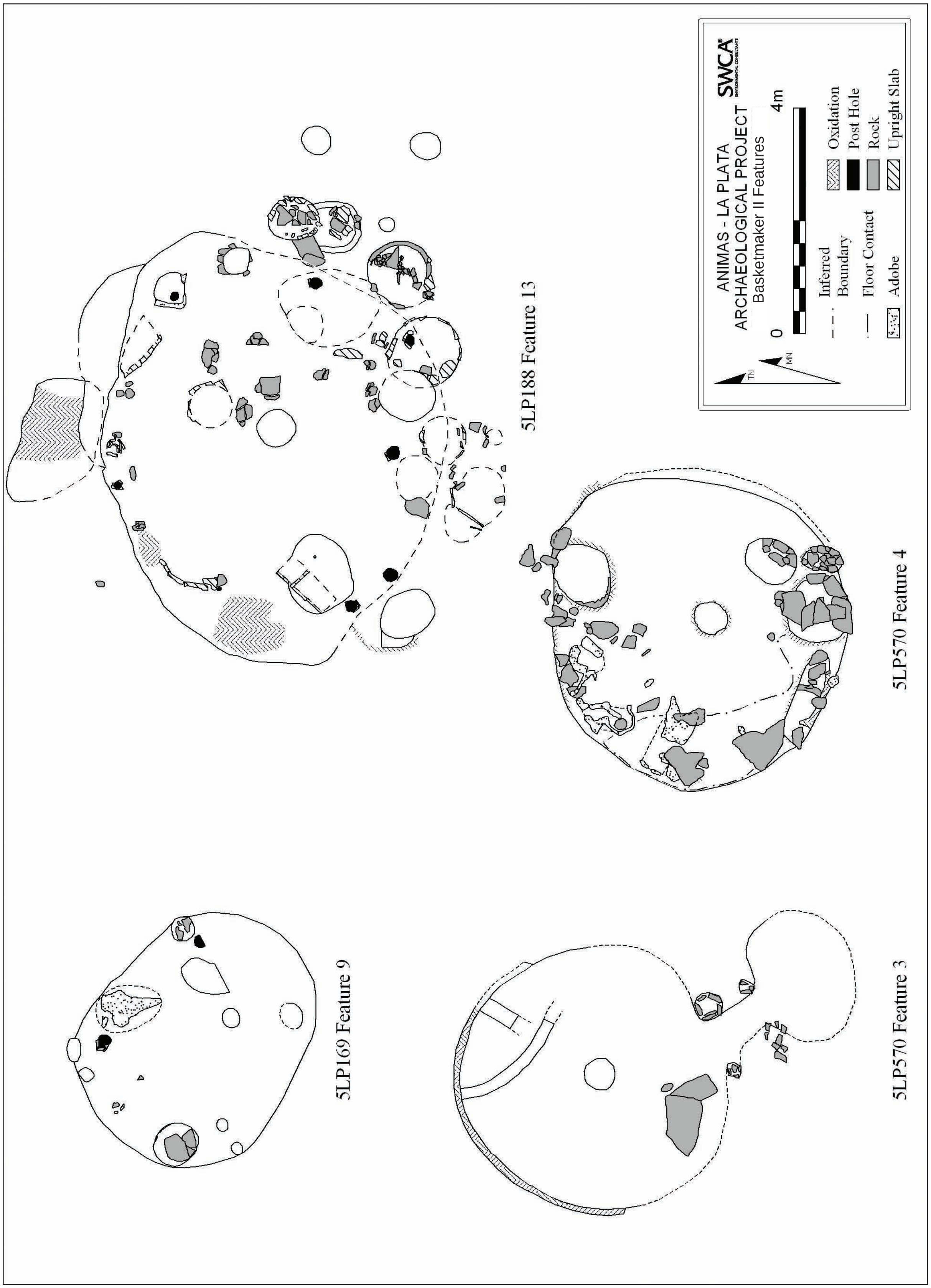

Figure 4.8. Plan maps of Basketmaker II pit structures excavated by SWCA.

Feature 4, the second pit structure at 5LP570, was a shallow, circular structure similar to Feature 3 and located 17 m south of it. The structure was visible on the modern ground surface as a circular area of charcoal-stained soil with an upright slab on one side. The structure measured 5.8 × 4.8 m and was 20 cm deep. The feature fill was dominated by burned wall fall and roof fall. Excavation revealed a plastered floor surrounded by slabs set at an angle. Many of the slabs had slid down into the feature after the site was vacated. This structure did not contain any internal post holes. It is probable the roof was supported by the walls themselves with horizontally stacked wood.

Nine subfeatures—a central hearth, three bins, and five pits—were present in the Feature 4 pit structure (see Figure 4.8; Figure 4.9). Two of the three bins were located along the north and west walls of the structure. Possible mealing bins, they were constructed of adobe and sandstone slabs and appeared to have had metates incorporated into them at some point. A mano was found within one of these features. The third bin was actually a mound of adobe that appeared to have melted around a pile of maize. The mass was then hardened when the structure burned, leaving behind numerous maize cob impressions. This may have been a beehive-shaped dome used for storage similar to that found at Talus Village on Floor 1a.

Most of the pits lined the southern and western wall of the structure, and many were slab-lined. One slab-lined pit was conical and contained adobe chunks in the fill. The adobe pieces were part of a clay dome constructed of large coils of clay (approximately 5 cm in diameter), forming a beehive-shaped superstructure above the slab lining.

Only seven artifacts were present on the floor. Most, including four manos and an unusual bowl-shaped mortar pecked out of a cobble, pertained to food preparation.

Chronology

Two of the sites produced dates. Site 5LP570 yielded nine radiocarbon dates from two structures (Table 4.1). Site 5LP188 produced three radiocarbon dates (see Table 4.1) and three non-cutting tree-ring dates (A.D. 287, 314, and 314) (Table 4.2). Considered together, these data indicate the sites were occupied sometime between about A.D. 300 and 550.

The radiocarbon dates cluster into three groups: an early group in the A.D. 100s (Samples 202837 and 202830 from 5LP570, and Sample 197183 from 5LP188), a middle group in the 200s to 400s (Sample 175857 from 5LP2029, and Samples 202838 and 202831 from 5LP570), and a late group in the 400s and 500s (five samples from 5LP570 and two from 5LP188) (Figure 4.10). It is likely that most of the early and middle samples represent old wood, given three factors: 1) most of the early and middle dates are from charcoal samples from construction timbers and fuel (with the exception of Sample 197183 from 5LP188); 2) all features with early dates also yielded samples that dated in the A.D. 400s (with the exception of Feature 3 at 5LP2029 and Feature 14 at 5LP188); and 3) more than half of the dates fall into the late group. Four samples analyzed were annuals, three of which dated to the A.D. 400–550 interval (see Table 4.1).

Complete Archaeological Services Associates (CASA) reports eight radiocarbon dates from Basketmaker II contexts in Bodo Canyon, six from 5LP478, and two from 5LP1104 (Fuller 1988a:71, 304), noting that the range of dates is between A.D. 100 and 400. But the dates are reported as conventional uncalibrated dates. Figure 4.11 shows the calibrated ranges of several of the dates extending into the A.D. 500s; this was particularly true for dates from 5LP478. This pattern is consistent with the radiocarbon dates from Ridges Basin.

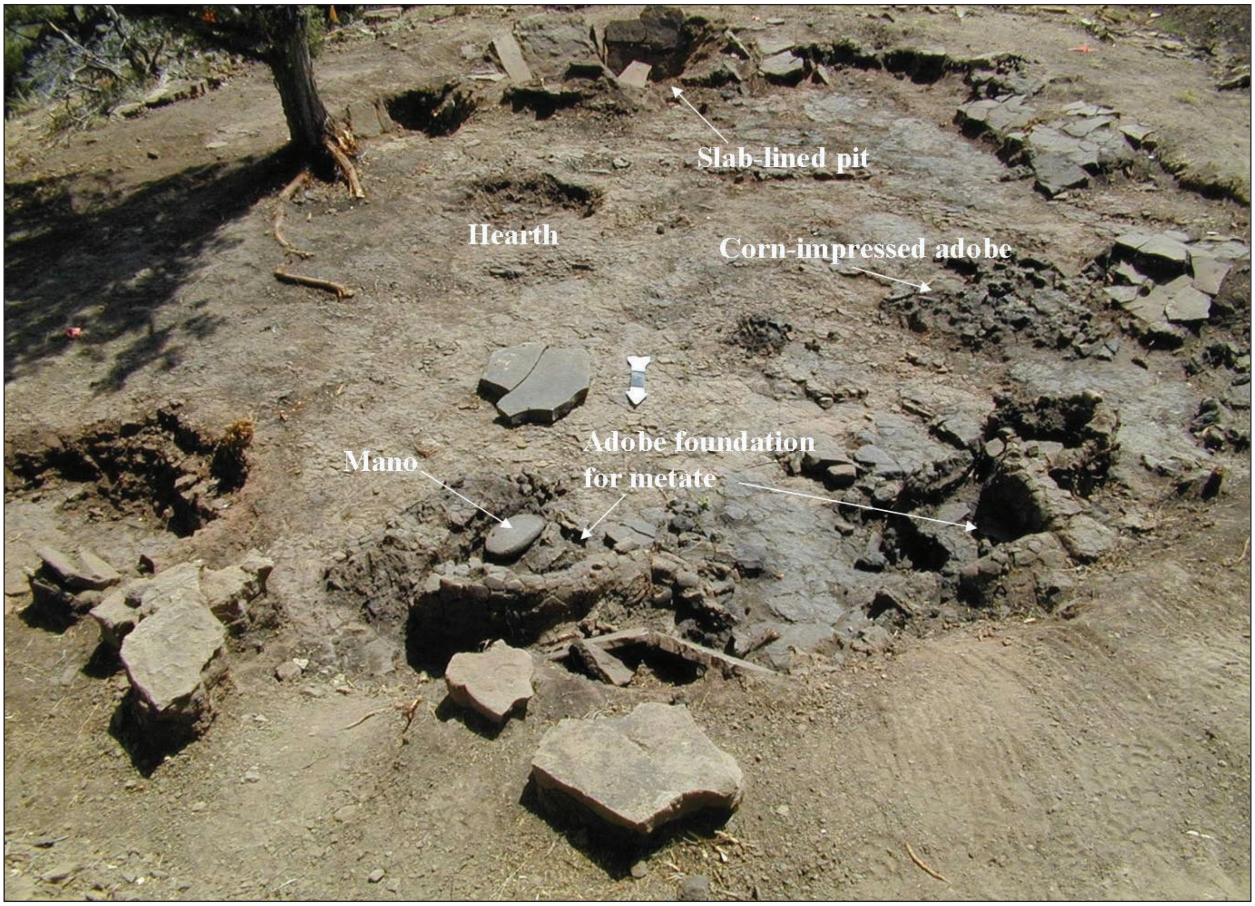

Figure 4.9. Photograph of 5LP570, Feature 4, view facing south.

Tree-ring dates from 5LP188 overlap with tree-ring dates recovered from Talus Village (Charles et al. 2006; Dean 1975; Morris and Burgh 1954; Shulman 1949, 1952). Figure 4.12 plots cutting and near cutting tree-ring dates from Talus Village and the North and South shelters at the Falls Creek rock shelters ("v," "vv," and non-designated dates excluded). Two major periods of construction are evident. The first began just before A.D. 1 at both the North Shelter and South Shelter and ended at about A.D. 50. The second included Talus Village and started at A.D. 170 and ended at about 330. The non-cutting dates from Ridges Basin of A.D. 287 and 314 indicate that Ridges Basin sites were occupied, at the earliest, near the end of the Talus Village and Falls Creek occupations. Radiocarbon dates, as indicated above, suggest that occupation of the Ridges Basin Basketmaker II sites continued well past the occupation of Talus Village, through the A.D. 400s and into the 500s.

Settlement

The Ridges Basin Basketmaker II habitations, each containing from one to four pit structures, were located along the northern edge of the basin at its interface with Wildcat Ridge and into Bodo Canyon (see Figure 4.7). This is a markedly different settlement pattern from that of the Late Archaic hunter-gatherers in Ridges Basin (see Chapter 3, Paleoindian and Archaic Sites). Basketmaker II habitation sites appear to have been positioned adjacent to the sandy soils at the interface between Wildcat Ridge and the bottomlands of Ridges Basin, rather than in proximity to wild resources. These soils would have been the most suitable in the basin for farming (Anderson 2008b) (Figure 4.13).

Another factor that likely influenced the distribution of Basketmaker II habitation sites and encouraged

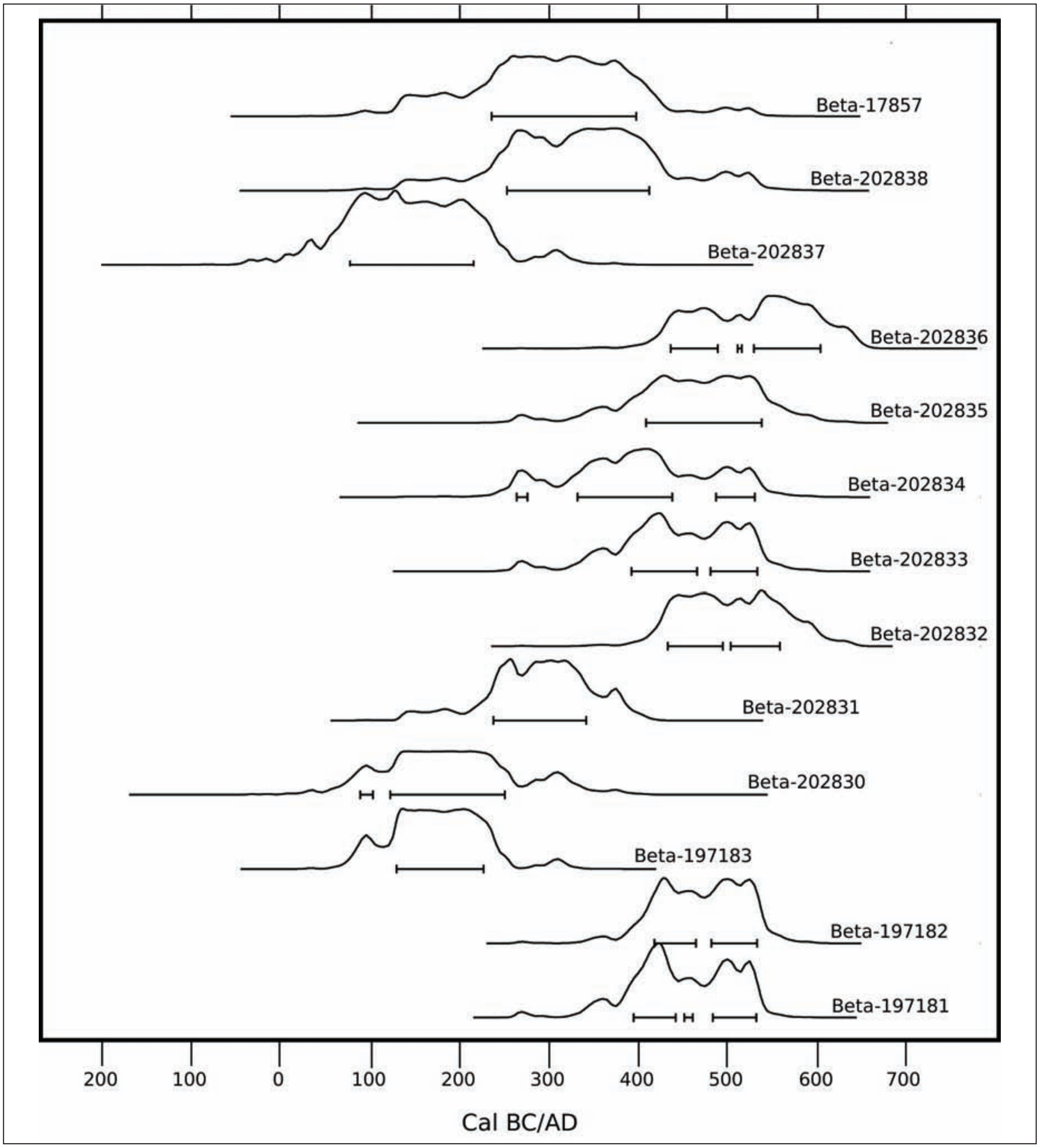

Figure 4.10. Plot of radiocarbon date ranges (2-sigma calibrated results) and probability distributions for samples recovered by SWCA from Basketmaker II components at 5LP188, 5LP570, and 5LP2029.

Basketmaker II settlement along the northern edge of Ridges Basin and in Bodo Canyon is the presence of a substantial cold-air pool in Ridges Basin below about 6,800 feet. Table 4.3 presents temperature monitor data collected at various elevations within Ridges Basin from 2003 to 2005 (Bellorado 2007:202). Note that the monitor positioned below 6,800 feet above mean sea level (ALP-2) consistently recorded substantially fewer than 120 cumulative growing degree days, which is generally acknowledged as the minimum necessary for maize to adequately mature.

Table 4.1. Radiocarbon Analysis Results for Basketmaker II Samples Collected by SWCA

Site Number	SWCA Sample Number	Beta Analytic Sample Number	Conventional Date (YBP±1σ)	Calibrated Age Estimates (2σ)	Analysis	δ13C (‰)	Feature Number	Context	Sample Type
5LP188	5LP188-PD17	Beta-197181	1620±40	A.D. 370–540	AMS	-10.7	1	Slab-lined pit fill	Maize kernels
	5LP188-PD80	Beta-197182	1600±40	A.D. 390–550	AMS	-10.8	13.18	Slab-lined pit fill	Maize kernels
	5LP188-PD87	Beta-197183	1840±40	A.D. 80–250	AMS	-10.5	14	Slab-lined pit fill	Maize kernels
5LP570	5LP570-PD19-2	Beta-202830	1830±60	A.D. 60–350	Extended count	-21.7	4.08	Slab-lined pit fill	Wood charcoal
	5LP570-PD20-1	Beta-202831	1750±40	A.D. 220–400	AMS	-24.7	4.09	Slab-lined pit fill	Wood charcoal
	5LP570-PD35-5	Beta-202832	1550±-50	A.D. 410–620	Standard	-21.1	3	Floor fill	Wood charcoal
	5LP570-PD36-1	Beta-202833	1620±50	A.D. 340–550	Extended count	-20.3	3	Floor fill	Wood charcoal
	5LP570-PD37-3	Beta-202834	1650±60	A.D. 250–540	Standard	-21.1	4	Floor fill	Wood charcoal
	5LP570-PD37-10	Beta-202835	1600±40	A.D. 390–550	AMS	-10.4	4	Floor fill	Maize kernels
	5LP570-PD41-2	Beta-202836	1620±60	A.D. 260–570	Extended count	-23.0	4.03	Pit fill	Wood charcoal
	5LP570-PD43-2	Beta-202837	1870±60	A.D. 20–260	Standard	-22.7	3.01	Hearth fill	Wood charcoal
	5LP570-PD51-2	Beta-202838	1700±70	A.D. 150–530	Extended count	-22.6	4.05	Hearth fill	Wood charcoal
5LP2029	5LP2029-PD12-3	Beta-175857	1730±70	A.D. 130–440	Standard	-25.0*	3	Pit fill	Wood charcoal

* Estimated

Table 4.2. Dendrochronological Dates Recovered from Basketmaker II Sites by SWCA and Analyzed by the University of Arizona Laboratory of Tree-ring Research

Site Number	Tree-ring Laboratory Sample Number	Provenience	Species	Inside Dates A.D.	Outside Dates A.D.
5LP188	ALP-71	Feature 13 pit structure, SE 1/4, floor fill	Ponderosa pine	174	287 vv
	ALP-65	Feature 13 pit structure, SW 1/4, floor fill	Ponderosa pine	223	314 +vv
	ALP-69	Feature 13 pit structure, SE 1/4, floor fill	Ponderosa pine	223	314 +vv

vv = A ring count is necessary because beyond a certain point the specimen could not be dated.

+ = One or more rings may be missing near the end of the ring series whose presence or absence cannot be determined because the specimen does not extend far enough to provide an adequate check.

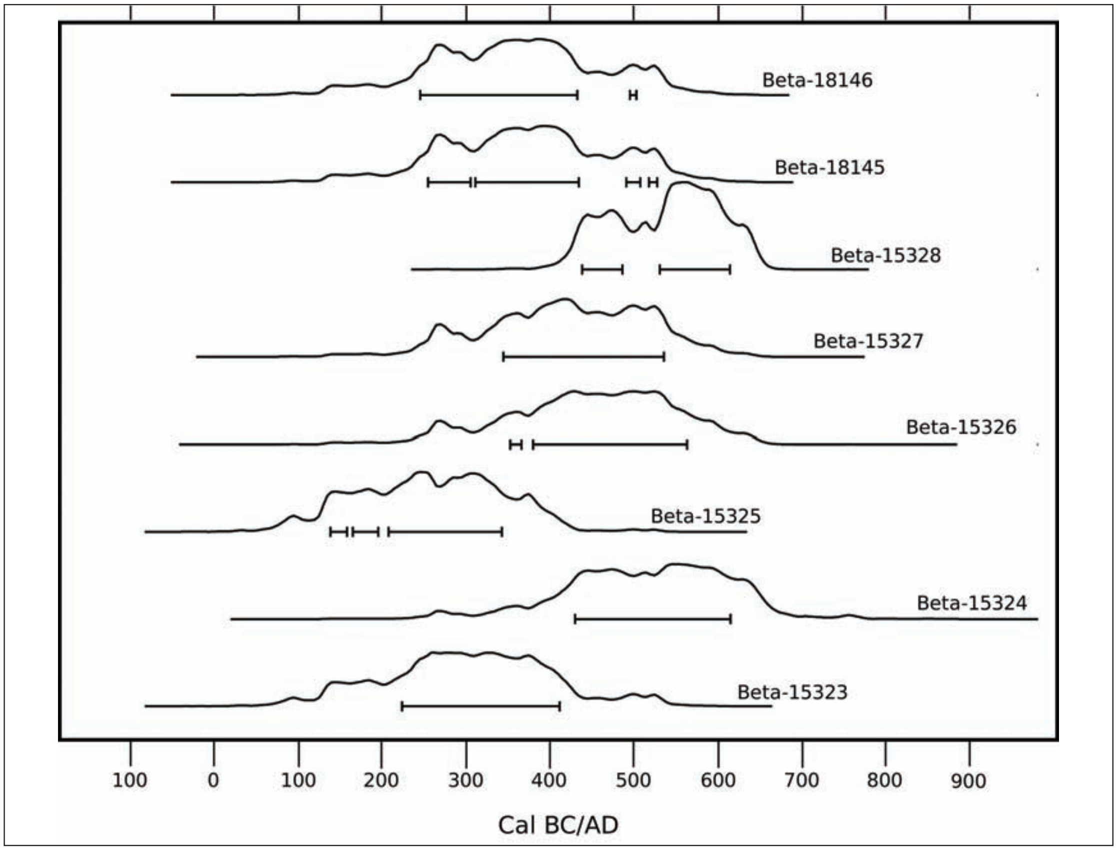

Figure 4.11. Plot of radiocarbon date ranges (2-sigma calibrated results) and probability distributions for Basketmaker II sites excavated by Fuller (1988a).

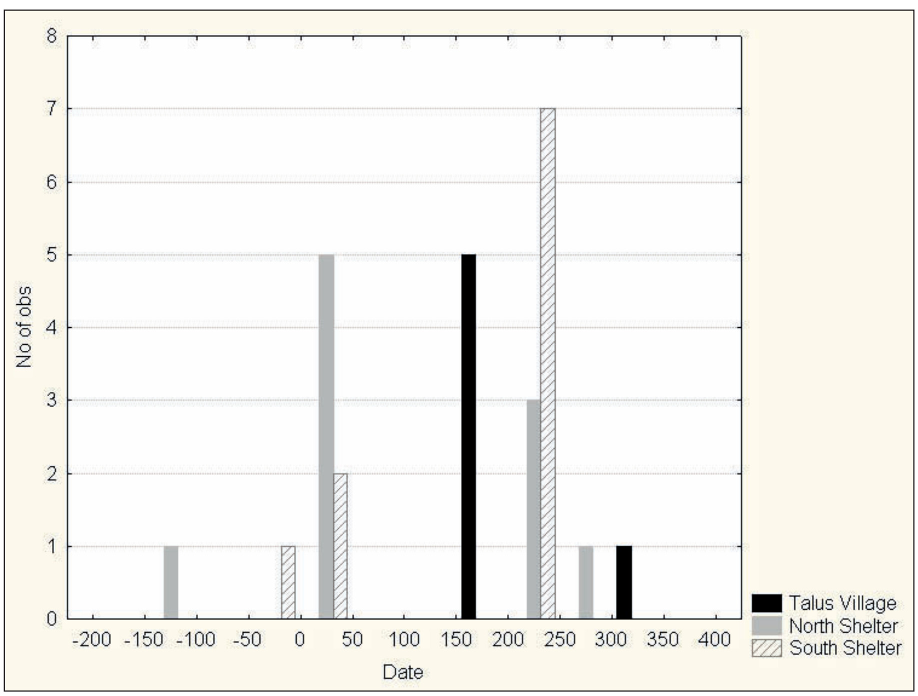

Figure 4.12. Histogram of tree-ring cutting and near-cutting dates from Talus Village and the Falls Creek rock shelters.

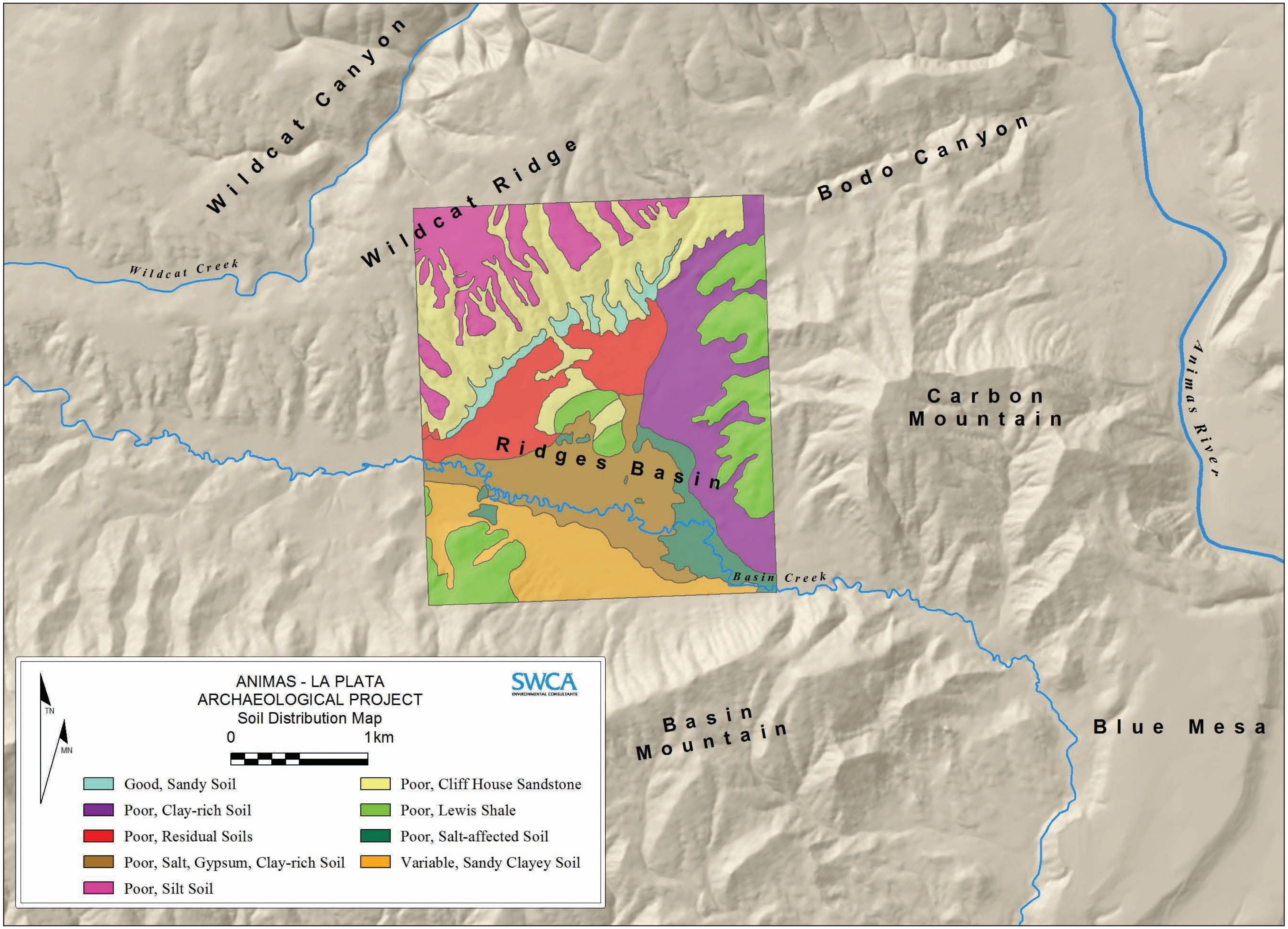

Figure 4.13. Agricultural soil distribution map for Ridges Basin (adapted from 1981 Soil Conservation Service map; Anderson 2008b:Figure 5.2). Note that the sandy soil depicted in light blue matches the distribution of Basketmaker II habitations.

Table 4.3. Frost-free Days at Various Elevations in Ridges Basin

Temperature Monitor	Elevation (feet)	Number of Years Recorded	Min. Frost Free Days	Max. Frost Free Days	Mean Frost Free Days
ALP-1	7,221	3	127	130	128
ALP-2	6,765	3	95	116	107
ALP-3	6,806	1	133	133	133*
ALP-4	6,890	3	140	144	141

* Based on only one observation
Source: Bellorado (2007:202, Table 6.2)

Bellorado's experimental garden research (2007, 2009) demonstrated that, compared to garden plots placed well above the cold-air pool in Ridges Basin, those garden plots placed in or near the cold-air pool showed substantial decreases in the total number of cumulative growing degree days available for maize development and a 40–50 percent reduction in yields. "In all locations, the main factor that appears to affect frost-free growing season length is the proximity of arable land to cold air drainage" (Bellorado 2009:123). Bellorado's research presents quantitative data in support of Fuller's (1988a:351) contention that Basketmaker II habitation sites were situated above the cold-air pool. Table 4.4 provides elevation data for confirmed Basketmaker II habitation sites, showing them without exception to be above 6,900 feet in elevation.

In addition to being next to good agricultural soils and above the cold-air pool, Basketmaker II habitation sites were in a part of the basin well suited to take advantage of run-off irrigation. Bellorado's (2009) experimental garden research demonstrated that the northern edge of the basin at the base of Wildcat Ridge provided an ideal context in which to direct the flow of run-off to fields placed within the zone of good agricultural soils (see Figure 4.13). This appears to have been the preferred technique used by Basketmaker II farmers in the Durango area. Dry-land farming techniques, on the other hand, were more favored (or successful) in the Pueblo I period, ostensibly allowing an expansion of settlement into areas such as Blue Mesa, which does not have good run-off catchments but does have better soil conditions than Ridges Basin and is well positioned above the cold-air pool.

Blue Mesa did contain the only non-habitation Basketmaker II component excavated by SWCA as part of the ALP project. Site 5LP2029 on Blue Mesa contained a roasting pit (Feature 3) that yielded a 2-sigma-calibrated radiocarbon date of A.D. 130–440 (see Table 4.1). Feature 3 was a straight-sided hole dug into the reddish brown loess to a depth of 1.45 m with no further preparation. The stratigraphic profile revealed that the pit had been reused after it had partially filled with secondary deposits. One 2-liter flotation sample yielded one fragment of mountain mahogany charcoal, one charred pine bark fragment, three pine charcoal fragments, one charred goosefoot/pigweed seed, and 16 juniper charcoal fragments (Chuipka et al. 2007:126–130). The absence of maize is notable.

Table 4.4. Elevations of Basketmaker II Habitation Sites in Ridges Basin

Site Number	Elevation (feet)
5LP169	6,926
5LP188	6,933
5LP570	6,985
5LP1104	7,130
5LP478	7,000

No other Basketmaker II non-habitation sites have been confirmed in the project area, so the distribution of these sites in association with hunted and gathered resources cannot be demonstrated at this time. However, Feature 3 at 5LP2029 on Blue Mesa contained numerous plant processing tools such as manos, and is the only Basketmaker II component to exhibit an absence of maize. This suggests that the feature was used exclusively to process and roast wild plants, supporting Fuller's (1988a:351) that the locations of Basketmaker II non-habitation sites were selected for their proximity to wild resources rather than to agricultural resources.

Subsistence and Seasonality

Flotation samples, macrobotanical samples, and pollen samples yielded evidence of maize and a wide array of wild plant foods, including sunflower, sage, goosefoot, pigweed, wild legumes, portulaca, and cholla, indicating a varied diet and signifying that the Basketmaker II people occupied the area from early summer through late fall (Adams and Murray 2008:195–197). Farmers would have needed to be present in the area fairly early in the summer in order to plant maize soon after the last spring frost. Unfortunately, the botanical record is silent on whether they also spent their winters in Ridges Basin because most usable plants, including maize, would have been available in the spring and summer.

Faunal remains indicate that ungulate-sized animals were the preferred game (Potter and Edwards 2008) (Table 4.5). Fuller (1988a:70) found a similar pattern at 5LP478 in Bodo Canyon—all faunal remains recovered from this site were identified as large mammal, medium-sized to large mammal, artiodactyls, or mule deer. Because deer and elk are best acquired in fall and early winter, it is possible that Basketmaker II sites in Ridges Basin and Bodo Canyon were occupied year-round or at least for much of the year, perhaps, for example, from early summer to early winter.

The Basketmaker II ground stone assemblage from Ridges Basin contained mostly one-hand manos and lapstone/grinding stones. The one metate that was recovered at 5LP570 was a shallow basin metate. No two-hand manos or trough metates were present in the Basketmaker II assemblage (Wesson 2009). The ground stone assemblage from the two Bodo Canyon sites, 5LP478 and 5LP1104, were similarly dominated by one-hand manos and grinding/abrading stones and basin metates. Ground stone assemblage data from these sites have prompted Wesson (2009:236) to suggest that maize was one element of a diverse spectrum of food resources that was dominated more by gathered plants than by cultivated crops.

This conclusion is consistent with ubiquity indices for flotation samples. Only 39 percent of samples (11 of 28) from Basketmaker II habitation sites contained evidence of maize cupules or cob fragments (Adams and Murray 2008:195–196). This is a little more than half the percentage of Pueblo I samples from the project area that contained maize cupules or cob fragments (62%). Moreover, 11 percent of Basketmaker II flotation samples contained maize kernels compared to 28 percent for Pueblo I habitation samples. In comparison to other eastern Basketmaker II assemblages, however, this is a relatively high percentage. In

Table 4.5. Taxonomic Counts for Assemblages from Basketmaker Sites

Common Name	5LP169	5LP188	5LP570
Ungulate-sized mammal	10	30	114
cf. deer/elk	–	3	–
Dog-sized mammal	–	2	2
Rabbit-sized mammal	4	17	5
Cottontail	1	2	–
Prairie dog	–	1	–
Unidentifiable remains	–	–	2
Total	**15**	**55**	**123**

Basketmaker II sites in the Fruitland project area (Sesler and Hovezak 2002:144–149), maize exhibited an overall (all parts combined) ubiquity of 20 percent. In general, the Ridges Basin, Bodo Canyon, and Fruitland project data indicate that Basketmaker II people made settlement decisions based on the requirements of agricultural production, but, as noted by Sesler and Hovezak (2002:144), the botanical or ground stone assemblages do not reflect the importance of agriculture.

The presence of multiple storage features on Basketmaker II habitations is evidence of a subsistence strategy that relied heavily on winter storage (Sesler and Hovezak 2002:147). Moreover, the consistent association of maize macrobotanical remains with the fill of slab-lined pits (e.g., Eisenhauer et al. 2008c:Table 4.14) indicates that these features in particular were used to store this domesticate. The high frequency of these features at 5LP188 (n = 7) and their relatively large size (mean volume = 0.182 m^3) indicates a reliance on the storage of domesticates. With an average storage capacity of 1.6 m^3, the large bell-shaped pits at 5LP188 and 5LP169 also appear to have been used to store maize. The fill of Subfeature 9.04 at 5LP169 contained maize in two of the three flotation samples collected. These data from Ridges Basin are consistent with Hovezak and Sesler's (2006:244) interpretation that at least some Basketmaker II habitation sites in the Fruitland project area were year-round habitations, and that sites with formal architecture and considerable storage capacity may represent full-scale residences, albeit ones with very short occupations.

Cultural Origins and Interregional Relationships

There are no data to suggest either a continuation or break from late Archaic occupation in Ridges Basin (as proposed in the research design) because the Archaic "occupation" was limited to sporadic and seasonal use of the area (see Chapter 3, Paleoindian and Archaic Sites). Beginning just before A.D. 1, initial settlement at Falls Creek, however, appears to have predated the Basketmaker II occupation of Ridges Basin (see Figure 4.12). It is possible that these early occupants of Falls Creek were the maize-growing descendants of Archaic groups who had moved through Ridges Basin. One question that remains is whether the earlier Basketmaker II farmers at Falls Creek were as dependent on maize as the later Basketmaker II groups were at Falls Creek, Talus Village, and Ridges Basin. Additional data on this might help sort out a possible relationship between Late Archaic groups and early Basketmaker II groups in the area.

In general, Basketmaker II houses in Ridges Basin were shallow and circular with a central hearth and numerous storage pits, some of which were slab-lined. Feature 4 at 5LP570 also contained unusual features (see Figure 4.9), including a pile of maize-impressed chunks of adobe that were heavily burned, likely the remains of an earthen storage container or covering for maize. It is possible the occupants of the sites piled up the maize and packed wet adobe around it, sealing it in a kind of unfired pot. When the house burned, the earthen container and its contents also burned and collapsed, preserving the impressions of the maize cobs inside. This feature may be a version of what Morris and Burgh (1954:51) observed in Talus Village houses and referred to as above-floor, beehive-shaped mud domes. Also found were adobe foundations, or sockets, for metates, an interpretation based on the presence of manos nearby and comparison with an intact, adobe-socketed metate found at Talus Village (see Figure 4.3).

Basketmaker II houses in Ridges Basin were architecturally similar to those at Talus Village. They were roughly round or oval, basin-shaped, quite shallow, and likely crib-roofed. They contained a central hearth, clay-covered storage pits, and slab-lined pits. Given similarities in architectural form and in basket-weaving techniques, and given the proximity and chronological overlap of the houses, it is likely the groups occupying them were related. Indeed, Ridges Basin and Bodo Canyon could have been areas into which Basketmaker II farmers moved as they ended their occupation of Talus Village and the Falls Creek rock shelters.

Berry (1982), Matson (1991), and Sesler and Hovezak (2002) have noted similarities in the architecture and material culture of the Durango area Basketmaker II sites and the Navajo Reservoir Basketmaker II sites, prompting the use of the Los Pinos phase to describe both groups of sites. The Ridges Basin Basketmaker II sites date primarily between A.D. 400 and 550, placing these sites in the recently proposed La Boca subphase of the Los Pinos phase (Charles et al. 2006:232), and making them largely contemporaneous with Basketmaker II sites to the southeast along the Los Pinos River and in the Fruitland project area (Hovezak and Sesler 2006). The apparent stylistic cohesiveness of the material remains at Basketmaker II habitations in the Durango and Navajo Reservoir areas lends support to Matson's (1991) contention that the Durango group as a whole represented an ethnicity distinct from that of Basketmaker II groups residing west of the Animas River valley. With the ALP project data added to the picture, the pattern of an east–west cultural divide between Basketmaker II populations appears even stronger. Matson (1991) and Varien (2008) suggest that this boundary was the by-product of distinct ethnic or linguistic groups with different cultural origins settling these separate areas, and that it was maintained over time as a way to mitigate conflict—through the creation of a buffer zone—between these eastern and western groups. Whatever the reasons for the boundary's origins and persistence throughout the Basketmaker II period, its presence seems to have set the stage for a similarly demarcated cultural landscape in the early Pueblo I period.

Regional Depopulation

By about A.D. 550 Basketmaker II people had moved out of the Durango area. Cooler temperatures after A.D. 400 may have played a role in this exodus (Petersen 1988). Higher-than-average temperatures between A.D. 200 and 400 may have allowed for extended growing seasons and facilitated movement into areas of higher elevation, such as the Animas River valley and Ridges Basin. The end of this warming trend at around A.D. 400 more than likely encouraged migration to lower elevations. The northern slopes of Ridges Basin—with their southern exposures, significant solar gain, and position above the cold-air pool—may have been some of the few attractive places in the Durango area to settle and grow crops in the A.D. 400s and early 500s.

Sites dating to the subsequent Basketmaker III period, specifically the A.D. 500s and 600s, are present to the west and south of Ridges Basin. The Basketmaker III sites west of Durango may be unrelated to the Durango sites, though. For example, a Basketmaker III basket recovered by Morris in the La Plata Valley was constructed of spaced coiling with a one-rod foundation and intricate stitching, and was similar to one found at Cowboy Cave in southeastern Utah. Webster (2009) sees this as a western Basketmaker technique, which is wholly different from the eastern Basketmaker techniques exhibited by the Durango area assemblages, and she believes the sample from the La Plata valley is the easternmost example of this artifact type.

Areas south of Durango also saw population increases in the A.D. 500s. Two of the largest and earliest Basketmaker III sites—Shabik'eshchee Village and Site 423—were founded near Chaco Canyon during the A.D. 500s, and may be related to the population decrease seen in Durango at this time. If this is the case, the pattern known as the Chaco Meridian may have its beginnings not in Chaco Canyon in the Basketmaker III period, as suggested by Lekson (2008:129–130), but rather in the Durango area at earlier sites such as Talus Village and Ridges Basin, both of which are due north of Chaco Canyon.

SUMMARY: ADDRESSING THE RESEARCH DESIGN

Of the four Basketmaker II site types identified by Matson (1991:81–82)—habitations, campsites, limited activity sites, and lithic reduction sites—only two were recognized in the ALP project area. Habitation sites were found around the upland margins of Ridges Basin above the cold-air drainage and near the best agricultural soils. A single limited activity site was found on Blue

Mesa—a solitary roasting pit that appeared to have been used exclusively for processing wild plants.

Architecturally similar to the houses at Talus Village, Basketmaker II houses in Ridges Basin were roughly round or oval, basin-shaped, quite shallow, and likely crib-roofed. They contained a central hearth, clay-covered storage pits, and slab-lined pits. The presence of substantial storage features suggests that these sites were occupied at least for much of the year and probably year-round. Archaeobotanical and faunal remains indicate occupation at least from early summer to early winter. Radiocarbon and tree-ring dates suggest occupation ranged between A.D. 100 and 550, but most radiocarbon dates (7 of 13) recovered from Basketmaker II habitations fell within the interval between A.D. 350 and 550, placing these sites in the recently proposed La Boca subphase of the Los Pinos phase (Charles et al. 2006:232) and indicating that Ridges Basin Basketmaker II habitation sites were occupied, at the earliest, near the end of the Talus Village and Falls Creek occupations and more likely through the A.D. 400s and into the 500s—well past the occupation of Talus Village.

The farming techniques preferred by Ridges Basin Basketmaker II people likely involved directing run-off to fields placed within the zone of good agricultural soils, rather than the floodplain or upland dry farming techniques used by western Basketmaker II people (Matson 1991). Settlement appears to have been influenced greatly by agricultural variables, particularly proximity to good soils and position above the cold-air pool; this, along with the presence of substantial storage features, suggests that by A.D. 200 eastern Basketmaker II people were largely dependent on maize. However, ubiquity indices for maize in flotation samples were about half those of Pueblo I samples, and the ground stone assemblage appears to have been oriented toward the processing of wild plants, indicating a mixed economy. No data were available for use in addressing the research questions about maize varieties grown in the Basketmaker II period, possible changes in the maize varieties used through time, and changes in the degree of Basketmaker II dependence on maize through time. We were able, however, to make comparisons between Basketmaker II and Pueblo I dependence on maize.

There is no evidence to suggest a hiatus after the late Archaic occupation of Ridges Basin; use of the area by Archaic people appears to have been sporadic and seasonal (see Chapter 3). Given the cooler and drier conditions during the Archaic period (Cordell 1997:114-118), lower elevations and more temperate settings to the south appear to have been more attractive prior to about A.D. 1. It is only as conditions shifted to those similar to the current climate, during the Basketmaker II period, that groups were apparently able to expand north and establish the first real semi-permanent habitations in this region at sites such as Falls Creek. Chronological data suggest Basketmaker II people moved into Ridges Basin near the end of the Talus Village occupation and perhaps represents a continuation of that Basketmaker II occupation in the Durango area into the sixth century A.D. Similarities in architectural and weaving styles suggest a connection between Ridges Basin and Talus Village and that these Basketmaker II people were part of a cohesive ethnic group distinct from those residing west of the Animas River. Very few lithic data were recovered to address the issue of Basketmaker II cultural origins; the vast majority of lithic materials were acquired locally. No exotic materials, such as shell, were recovered from Basketmaker II contexts.

Evidence of conflict or warfare was lacking in Ridges Basin Basketmaker II sites. No human skeletal data were collected, and none of the habitation sites exhibited defensive traits such as enclosures or positioning on hilltops. The depopulation of the basin in the sixth century A.D. most likely was due to a decrease in effective moisture or average temperature, or both. Once the Basketmaker II people left Durango, the area remained devoid of inhabitants for about two centuries, until Pueblo I groups began moving into Ridges Basin in the A.D. 700s.

Chapter 5: A Comparison of Archaic and Basketmaker II Site Catchments

James M. Potter and Trent Reeder

A catchment analysis is a quantitative evaluation of the range of available resources reasonably accessible from a home base (Vita-Finzi and Higgs 1970). For the ALP project, Adams and Reeder (2009) developed a method for comparing three catchment areas across the project area: one centered on the Sacred Ridge site (5LP245) at the west end of Ridges Basin; one centered on the so-called Eastern Cluster, a group of Pueblo I habitation sites at the eastern end of Ridges Basin; and one centered on Blue Mesa. The habitations involved in Adams and Reeder's analysis were all occupied in the early Pueblo I period (A.D. 750–820), and thus it was a comparative study of the catchments of relatively contemporaneous settlements. The analysis presented in this chapter, in contrast, compares Archaic and Basketmaker II catchments using two representative sites: the Archaic seasonal camp site 5LP175 and the Basketmaker II habitation site 5LP570. A comparison of the catchments of these sites may inform on the types of resources targeted from a home base or camp during these two time periods and illuminate any differences between them. Because gathered plants composed a larger proportion of the Archaic diet than the Basketmaker II diet, it was expected that the Archaic site would be positioned more strategically than the Basketmaker II site with respect to the collection of wild plants.

METHODOLOGY

The methods for the catchment analyses conducted for ALP project sites are published in detail in Adams and Reeder (2009), therefore only a cursory treatment of methods is presented in this chapter. Adams and Reeder's analysis evaluated plant communities in catchment areas with three different radii: 1 km, 2 km, and 7 km. These distances were based on ethnographic data that suggest agriculturalists "tend to reach a threshold distance of 3 to 4 km, after which daily trips for routine cultivation activities are sharply reduced" (Adams and Reeder 2009:221). Although Adams and Reeder also acknowledge that gathering groups may travel up to 10 km from a base camp to acquire plant resources (Gardner 1969; Lee 1969; Schrire 1972; Silbauer 1972), in Ridges Basin catchment areas larger than 2 km of different sites overlap to such a degree that a comparative analysis of catchments becomes meaningless. For this reason, this analysis of Archaic catchments and Basketmaker II catchments focuses on only the 1-km catchment around each site in order to maximize the illumination of possible distinctions between them.

Several labor-intensive steps underlie these analyses. The first involves assessing which wild plants were potentially available to a group in a given area and scoring the wild plant species on their economic value. Each wild plant taxon is considered a sum of its usable parts, and quantitative values for the seasons of availability, dependability, and energy return are systematically assigned (Adams and Reeder 2009:239).

Following this,

> the catchment analysis linked the total food scores for each plant with every plant community it was known to occupy (within a GIS one-to-many relationship). This linkage allowed calculation of total plant community food scores for every Ridges Basin plant community, and those values were placed within a Ridges Basin plant community GIS layer. (Adams and Reeder 2009:239)

Once the total plant community food score, which is "the sum of all plant food scores of all wild plant species within each studied plant community" (Adams and Reeder 2009:223), is calculated, both the catchment area and the proportion of each plant community present in the defined catchment are determined, enabling the computation of a total food score for the catchment. The total food scores calculated for various catchments can then be compared. The derivation of these calculations is presented in greater detail in Adams and Reeder (2009).

In simplified terms, the catchment area is calculated by creating a cost surface using a geographic information system (GIS) approach to model travel movement across the terrain of the area. "A cost surface is derived from variables that would impact movement through the landscape. Thus, cost surface algorithms dictate how the spreading function is performed by modeling each site catchment area" (Adams and Reeder 2009:224).

This calculation can produce somewhat irregularly shaped catchments, depending on the terrain around a given site or group of sites (Figure 5.1). Technical details of creating cost surfaces in GIS and determining catchment boundaries are provided in Adams and Reeder (2009).

ANALYSIS

For this analysis, two sites were the focus. Excavated by SWCA as part of the ALP project, 5LP175 was a late Archaic seasonal camp near the floor of Ridges Basin (see Figure 5.1). One of two hearths returned a 2-sigma calibrated radiocarbon date of 1000–790 B.C., placing it solidly in the Late Archaic period (Eisenhauer et al. 2008a; see Chapter 3, Paleoindian and Archaic Sites). Site 5LP570 was the largest Basketmaker II habitation excavated by SWCA. It contained two shallow structures, each with a variety of subfeatures, including slab-lined pits, bins, and a hearth (Eisenhauer et al 2008d; see Chapter 4, Basketmaker II Sites). The site was occupied between A.D. 300 and 550, and was located along the northern edge of Ridges Basin at the interface of Wildcat Ridge and Ridges Basin (see Figure 5.1).

The catchment around 5LP175 contained five plant communities: Gambel's Oak, two Basin Shrub communities, and two Piñon-juniper communities (Murray et al. 2008). The catchment around 5LP570 contained seven communities, three of which—Basin Bottom/Cultivated, Piñon-juniper/Basin Shrub, and Ponderosa Pine/Pine Oak Woodland (Murray et al. 2008)—were different from those in the 5LP175 catchment (Table 5.1). Not surprisingly, because the 5LP570 catchment contained more plant communities, it also contained more individual plant species with economic value (n = 207) than did the 5LP175 catchment (n = 151). (The specific species identified in each of these plant communities is presented in Adams and Reeder 2009 [Table 8.1]). However, when the overall economic value of each plant community (i.e., the plant community food score) is considered, and when the proportion of each plant community within each catchment is taken into account, the two catchments generate roughly equivalent total food scores—10,590 for 5LP175 and 10,326 for 5LP570. Although the 5LP175 catchment has a slightly higher overall food score, the difference is not as great as expected, given that a good portion of the Basketmaker II diet was composed of maize (see Chapter 4). This suggests that Basketmaker II habitation sites were positioned for proximity to agricultural resources, such as good agricultural soil, but also for ready access to collectible wild plant resources.

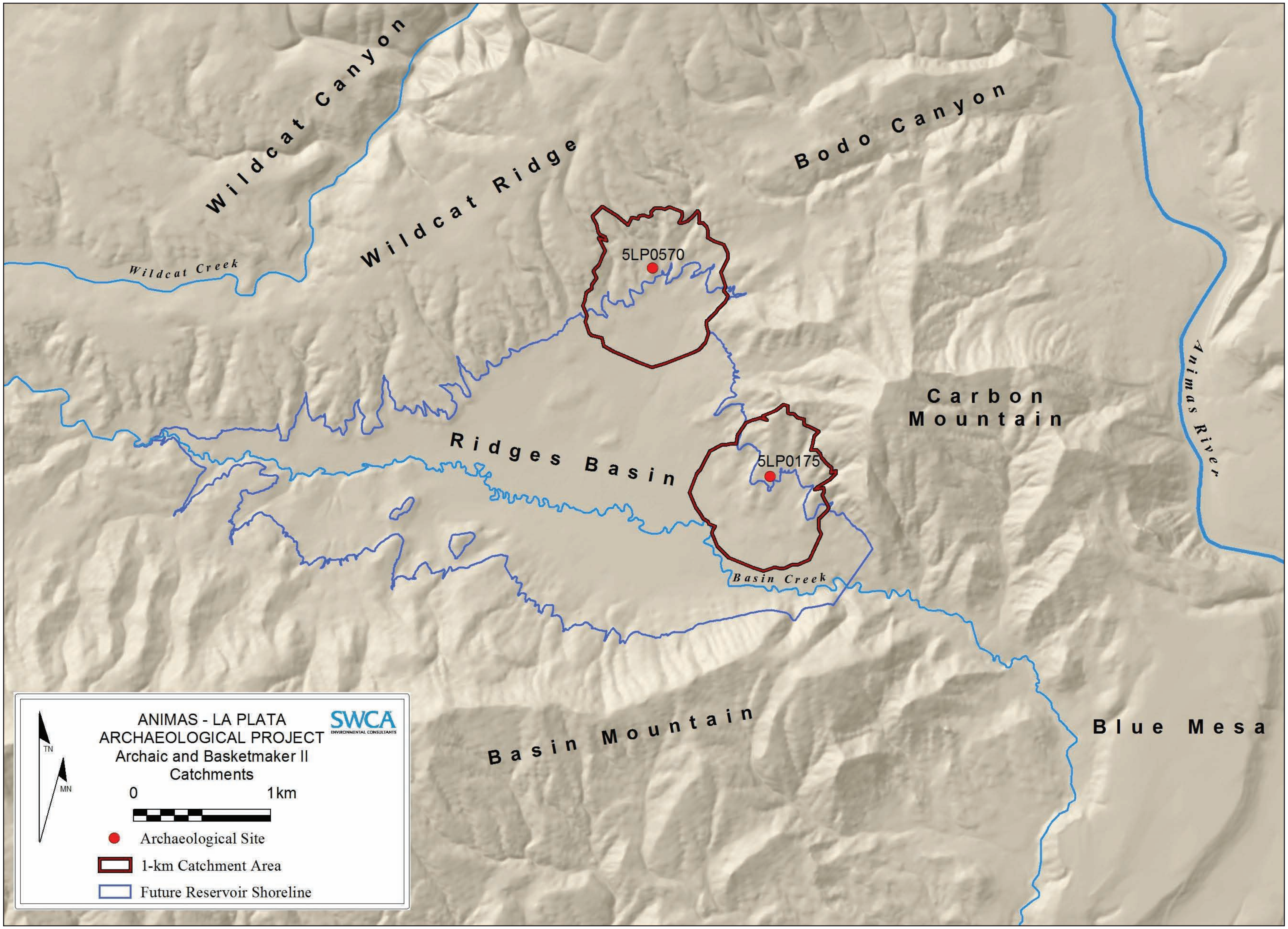

Figure 5.1. 1-km catchments for the Archaic site 5LP175 and the Basketmaker II site 5LP570.

The high overall food scores for the 1-km catchments of 5LP175 and 5LP570 contrast with the 1-km catchments of two of the most densely populated Pueblo I settlements in Ridges Basin—Sacred Ridge and the Eastern Cluster (Adams and Reeder 2009; see Chapter 11, The Settlement Clusters, and Chapter 12, Settlement Cluster Variation). Each of the catchments around these large settlements produced total plant community food scores well below 10,000 (Table 5.2). These data suggest that settlement location in the early Pueblo I period was less influenced by the distribution of wild plants species of high economic value than it was in the Basketmaker II and Archaic periods. Pueblo I settlement and subsistence is discussed further in the Pueblo I section of this volume.

Table 5.1. Detailed Results of 1-km Catchment Analyses for 5LP175 and 5LP570

Plant Communities* Represented in Catchment	Plant Community Food Score	Proportion within Catchment	Total Food Score for the Catchment	Number of Plant Species by Plant Community within Catchment
5LP175				
Basin Shrub/Saltscab and Basin Shrub/Greasewood	5,751	0.04	230	18
Basin Shrub/Sagebrush-rabbitbrush	11,289	0.37	4,218	33
Gambel's Oak/Oak Grove and Gambel's Oak/Oak (post-fire) Scrub	8,227	0.10	835	27
Piñon-juniper with No Understory	12,123	0.05	630	37
Piñon-juniper/Mountain Shrub	10,804	0.43	4,677	36
Total	**48,194**	**0.99**	**10,590**	**151**
5LP570				
Basin Bottom/Cultivated	4,323	0.09	386	15
Basin Shrub/Sagebrush-rabbitbrush	11,289	0.29	3,328	33
Gambel's Oak/Oak Grove and Gambel's Oak/Oak (post-fire) Scrub	8,227	0.08	659	27
Piñon-juniper with No Understory	12,123	0.05	497	37
Piñon-juniper/Basin Shrub	13,286	0.09	1,305	36
Piñon-juniper/Mountain Shrub	10,804	0.34	3,690	32
Ponderosa Pine/Pine Oak Woodland	8,380	0.06	463	27
Total	**68,432**	**1.00**	**10,326**	**207**

* Species within each plant community are listed in Adams and Reeder (2009:Table 8.1).

Table 5.2. Results for 1-km Catchment Analyses for 5LP175, 5LP570, 5LP245 (Sacred Ridge), and the Eastern Cluster

Catchment Center-point	Time Period Represented	Total Plant Community Food Score	Number of Plant Species with Total Food Scores Per Plant Community
5LP175	Late Archaic	10,590	151
5LP570	Basketmaker II	10,326	207
5LP245 (Sacred Ridge)*	Pueblo I	9,207	147
Eastern Cluster*	Pueblo I	8,275	219

* Data from Adams and Reeder (2009)

Section III: Pueblo I

Chapter 6: Pueblo I Research in the Northern Southwest

James M. Potter

The Pueblo I period was first described at the inaugural Pecos Conference in 1927. In the Pecos Classification, which emerged from that conference, it was called the "Proto-Pueblo period," and was defined as the period in which cranial deformation was first practiced, cooking vessels had banded necks, and villages with aboveground masonry rooms were first established. Originally, the Pecos Classification periods were conceived of as stages of development. Emphasis was given to changes in skeletal characteristics, pottery, and architecture, but no chronological or temporal points were necessarily attached to the stages, although they were often assumed. Over time, and due in part to refined chronological controls and to the realization that the "developments" were not synchronous across the Southwest or present in every area, the Pecos Classification became strictly a chronological scheme, with the Pueblo I period in the northern Southwest being the interval from A.D. 750 to 900 (Wilshusen 1999b).

This shift in definitions is evident in Durango area archaeology. Early researchers such as Carlson (1963) and Gooding (1980) referred explicitly to sites in the Durango area dating to the A.D. 760s as Basketmaker III, because these sites looked more like Basketmaker III habitation sites than the classic Pueblo I sites to the west of the La Plata River (e.g., they lacked substantial surface architecture). In the late 1980s Fuller (1988a) and Ware (1986a) classified these and other Durango area sites dating to the mid and late A.D. 700s as transitional Basketmaker III–Pueblo I. Even as late as the late 1990s, archaeologists from Northern Arizona University (NAU) considered the Pecos Classification a descriptor of lifeways rather than a chronological framework, and characterized the Durango area people as being somewhere between Basketmaker III and Pueblo I in their development. Smiley (1997:7), for example, describes the people who lived in the Durango area from A.D. 750 to the early part of the 800s as "peoples transitional between the Basketmaker III and Pueblo I lifeways." Ironically, the last half of the 1990s was, itself, a time of transition in the labels Durango area archaeologists chose to apply to the people who lived there in the late eighth and early ninth centuries. Allison, in reporting the results of NAU's ceramic analyses (Allison 1995), refers to them simply as "early Puebloans," deftly avoiding the trappings of classification.

It was not until the publication of *Colorado Prehistory: A Context for the Southern Colorado River Basin* (Lipe et al. 1999), in which the Pueblo I period was explicitly defined as the chronological interval between A.D. 750 and 900, that archaeologists working in and around the Durango area began to consistently use the term Pueblo I (or early Pueblo I) to refer to prehistoric sites dating after A.D. 750 (e.g., Chuipka 2008a; Horn et al. 2003a and 2003b). The ALP project has followed suit and refers to all sites dating to this period as early Pueblo I.

EARLY RESEARCH ON PUEBLO I SITES

Early research on Pueblo I sites focused on three main goals: solidifying the chronology of this early period; developing and refining phase sequences, including the Pecos Classification scheme; and understanding the origins, relations, and migration histories of these early Pueblo peoples. One effect of this early archaeological work was the documentation of the wide-ranging variation in architecture and settlement layout at sites dating from A.D. 750 to 900 across the northern Southwest. Another was the development of local phase sequences, devised to make sense of all that variation. By the 1960s, a number of local sequences had been established, each describing developments in material culture and settlement patterning for a fairly circumscribed, and often arbitrarily defined, area (Brew 1946; Eddy 1972; Hayes 1964; Kane 1984; O'Bryan 1950; Reed 1958; Rohn 1977; see Wilshusen 1999b:Figure 7-1).

1913–1930: Pioneers in the East

The earliest significant research on Pueblo I sites in the northern Southwest was conducted by Earl Morris. Although he could not excavate in 1913 because a drought made it impossible to stable his horses at nearby ponds and seeps (he used horses then for packing in supplies, packing out artifacts, and excavating with Fresno plows at sites), he did conduct limited surveys of the mesas between the Mancos and La Plata rivers, and recorded Sites 9, 11, 12, 13, and 17 (Morris 1919). But in the wetter year of 1914, he did conduct testing and a few extensive excavations at these and six additional early Pueblo sites in the area (personal communication, Richard Wilshusen 2010). This work set the stage for later excavations in the area, which would provide the first documentation of Pueblo I villages and prompt discussions about a potential transitional type between Basketmaker sites and the later cliff dwellings of Mesa Verde (Wilshusen 1999b:196).

From 1922 to 1929 Morris excavated at eight Pueblo I sites in the La Plata District: Sites 18 and 25 in Red Horse Gulch, Sites 23 and 34 along the La Plata River, and Sites 12, 13, 27, and 33 on a mesa top between Johnson and Geasewood canyons (Figures 6.1 and 6.2).

The first of these excavations occurred in Red Horse Gulch in 1922. Site 18 was a small village consisting of at least three surface room blocks, a refuse mound, and two pit structures described as "protokivas" (Morris 1939:57–62). This site contained "banded-necked" vessels and thus likely dates to Pueblo I period.

Site 25 was a cluster of pit houses and arcing rows of surface rooms extending about 1,000 m along the slope of a ridge. The site was heavily eroded but appeared to Morris to contain numerous room blocks. During his 1922 excavations of the site, he obtained tree-ring samples, most of which were unprovenienced. (Although these timbers were collected in 1922, they were not dated until the early 1930s, once the tree-ring sequence had been pieced together.) The latest of these revealed a cutting date of A.D. 876 (Robinson and Harrill 1974:33). Coupled with a tree-ring date of A.D. 836 derived from Morris's Building IV (Morris 1939:63), it places this site in the late Pueblo I period.

Five years after his initial experience with Pueblo I sites, Morris excavated two sites along the La Plata River that dated to the Pueblo I period. A "small amount of digging" revealed Site 34 to contain at least one long room block and several neck-banded vessels (Morris 1939:75, plates 214c through 217c), likely placing it in the Pueblo I period. The second site, Site 23, was the largest and most thoroughly investigated of Morris's Pueblo I sites (Figure 6.3). Here Morris excavated five habitation units (Buildings I–IV and Protokiva 7) (Morris 1939:67–75). Excavations at Building 1 yielded tree-ring dates in the mid and late A.D. 700s. Up to 70 structures were identified, most of which appeared to date to the mid and late 700s.

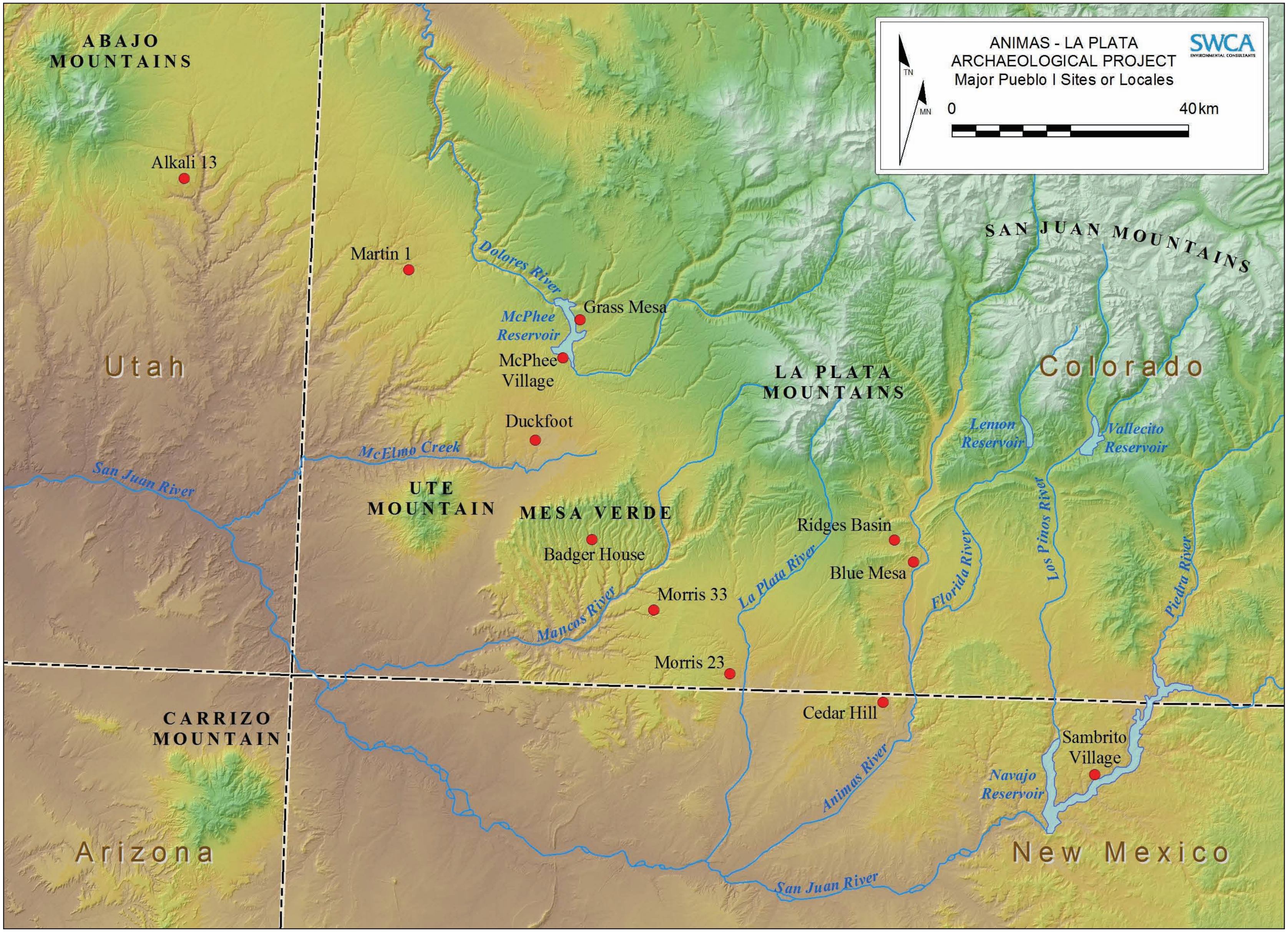

Figure 6.1. Map of the Four Corners region showing the major Pueblo I sites or locales discussed in this chapter.

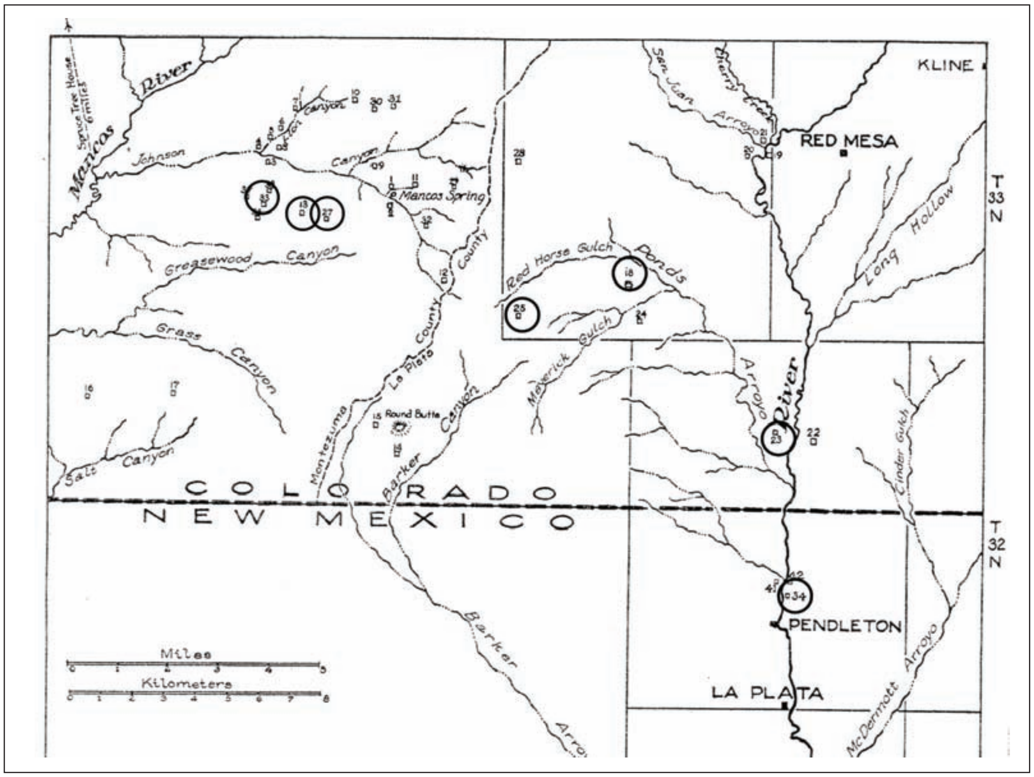

Figure 6.2. A portion of Morris's 1939 map of the La Plata District. Pueblo I sites excavated by Morris are circled (adapted from Morris 1939:Figure 2).

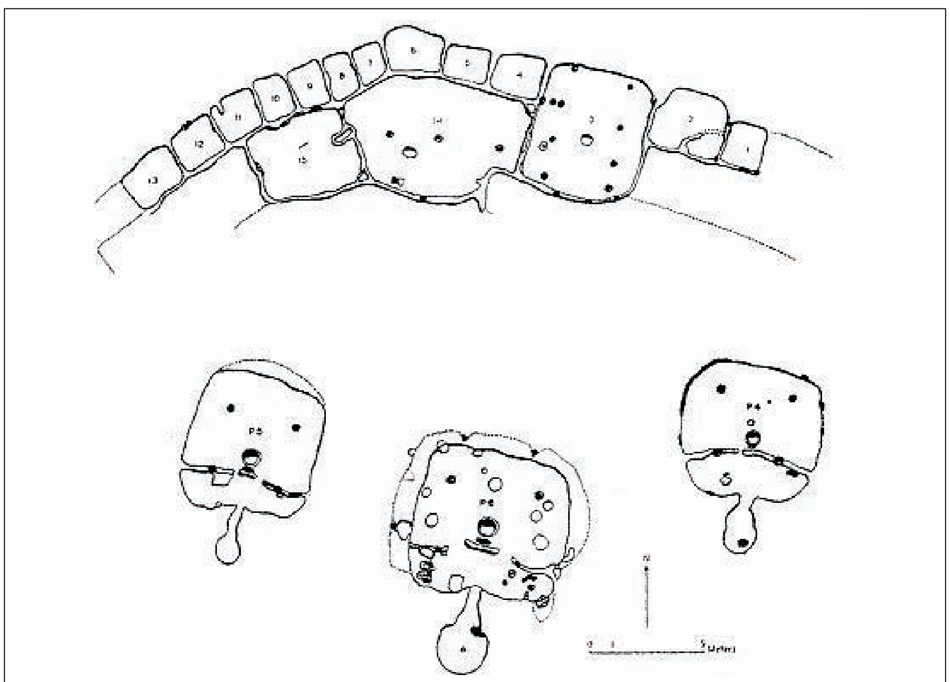

Figure 6.3. Plan of Site 23, Building 1 (reproduced from Morris 1939:67).

In 1929 Morris returned to the mesa top between Johnson and Greasewood canyons to conduct work at Sites 13, 27, and 33. Work at Sites 13 and 27 was extremely limited and thus most excavation occurred at Site 33, which had both Pueblo I and Pueblo III components. The Pueblo I component consisted of several arc-shaped, two-room-deep room blocks; associated small pit structures (referred to as "proto-kivas"); and a great kiva, a large circular structure, that measured 19.2 m in diameter (Figure 6.4). Wishusen and Blinman (1992) suggest that Morris probably did not recognize the large size and contemporaneity of these villages.

According to Lister and Lister (1968:63), with these excavations Morris

> became the first to excavate and publish upon a pit-house type of architecture in the northern San Juan, the first to describe the regional variation of the plain and poorly decorated pottery, the first to put forth the idea of the germ of Pueblo I culture being localized in the San Juan Basin and later distributed from there.

Morris was also one of the first to refer in print to the sites as Pueblo I *in date*. Interestingly, in his early work in the area, Morris "called his newly found culture the Pre Pueblos" (Lister and Lister 1968:63); but, by the publication of the work in 1939, he had adhered to the Pecos Classification and referred to these sites as Pueblo I. It is also of note that Morris explicitly recognized the inherent problems of conceiving the Pecos Classification simultaneously as a description of developmental stages and as a chronological sequence. This did not discourage him from using it to describe chronology, however (Morris 1939:3–4).

Another early program that involved the excavation of Pueblo I sites was conducted by Frank H. H. Roberts on Stollsteimer Mesa along the Piedra River. This project resulted in the excavation of three sites: "A Village," "B Village," and "C Village," which consisted of more than 30 houses on the top and slopes of Stollsteimer Mesa (Jeançon 1922; Roberts 1925, 1930). Tree-ring dates from these pit house clusters range from A.D. 597 to 1011. As noted by Dean (1975:16), "evaluation of the Piedra Villages dates is hampered by the poor provenience control on the samples and by the lack of cutting dates."

Mera (1935) first coined the term Piedra Black-on-white to describe the pottery found by Roberts along the Piedra River. But it was Reed (1958) who first defined the Piedra phase to which he applied an A.D. 750–900 date range. He also formally described Piedra Black-on-white as a distinctive pottery type (Reed 1958:79–80). Interestingly, the Piedra River, where the pottery was first associated with Pueblo I sites, is now viewed as the eastern periphery of the pottery's distribution, and the central Mesa Verde area is considered the core of Piedra Black-on-white production and the Piedra ceramic tradition (Wilshusen 1999b:208).

1930–1950: Pioneers in the West

Although Roberts's work at Stollsteimer Mesa suffered for a lack of cutting dates, poor and over-generalized documentation of excavations, and unfounded assumptions regarding the chronology of Pueblo I architectural traits,[1] his work did influence another young archaeologist looking to contribute to Southwestern archaeology. In the introduction to his Alkali Ridge report, J. O. Brew acknowledges Roberts's work on expanding the Pecos Classification and his own desire to fill some of the holes of this classificatory scheme, particularly regarding the Pueblo II period.

[1] As discussed by Wilshusen (2009), the chronology of Stollsteimer Mesa was largely based on three classes of surface room construction. According to Roberts, "A" and "B" type dwellings were Pueblo I in date, while "C" type buildings were either Pueblo I or Pueblo II in date. "A" rooms have deeply excavated pits, are generally one room deep, and are contiguous at the base but have separate superstructures. "B" buildings are shallowly dug, and share a superstructure and roof with contiguous rooms. "C" buildings have some masonry construction. As Wilshusen (2009) notes, it is not clear how useful this classification is in chronologically placing this architecture.

> The force of this…gap, beckoning to be filled, was itself sufficient to attract consideration. Consequently, after lengthy discussion and after consultation with A. V. Kidder, who suggested Alkali Ridge as a likely location in which the gap might be filled, the Peabody Museum Southeastern Utah Expedition was inaugurated with the aim to define the culture of Pueblo II or to eliminate it from the Pecos Classification. (Brew 1946:3)

From 1931 to 1933 Brew conducted excavations at Alkali Ridge in southeastern Utah. Although Pueblo II materials were indeed found, Brew's excavations proved to be as important, or perhaps more important, for defining and understanding Pueblo I settlement in the region. Alkali Ridge Site 13 was the largest site investigated by Brew, and although it was occupied almost continuously from the sixth to the thirteenth centuries A.D., the major occupation of the site occurred during the early Pueblo I period. Brew excavated 118 storage rooms, parts of 25 living rooms, and 14 pit structures dating to the late Basketmaker III and early Pueblo I periods (Brew 1946:152–197). The pit structures were situated within four plazas bounded on the north and west sides by four large curvilinear room blocks (Figure 6.5).

Five years after Brew's work on Alkali Ridge, Martin, sponsored by the Field Museum, excavated two habitation sites in the Ackmen-Lowry area of southwestern Colorado that he referred to as dating to the "Modified Basket Maker" period (Martin 1939). Both sites had multiple structures, including a great kiva. Tree-ring dates indicate that these sites date primarily to the Pueblo I period. Martin's Site 1 (5MT2108) contained four room blocks and about 23 structures (Martin 1939).

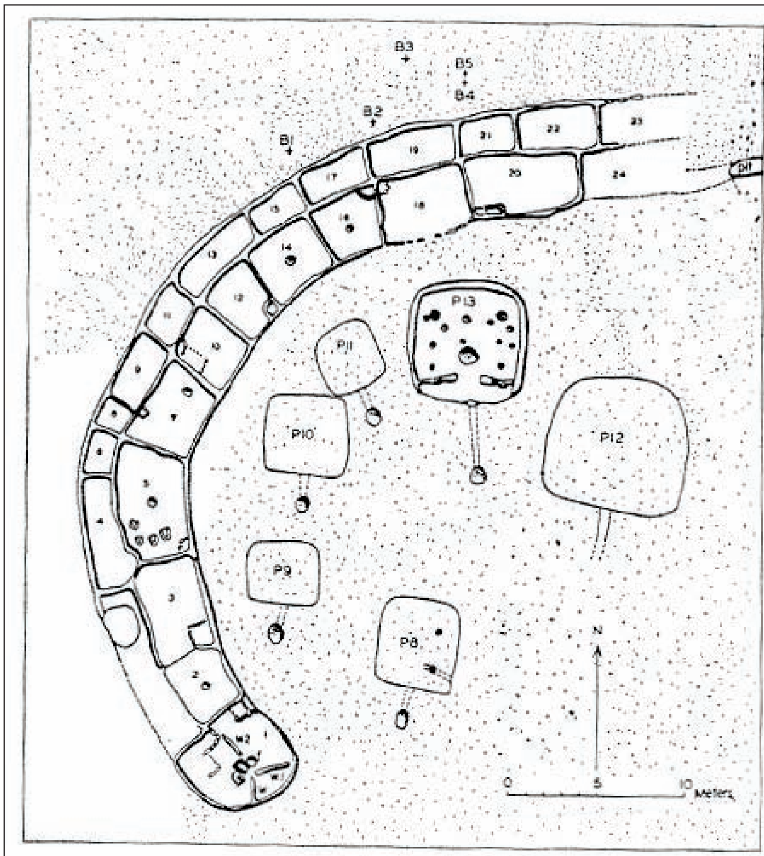

FIG. 19—PLAN OF BUILDING I, SITE 33

Figure 6.4. Plan of Site 33, Building 1 (reproduced from Morris 1939:78).

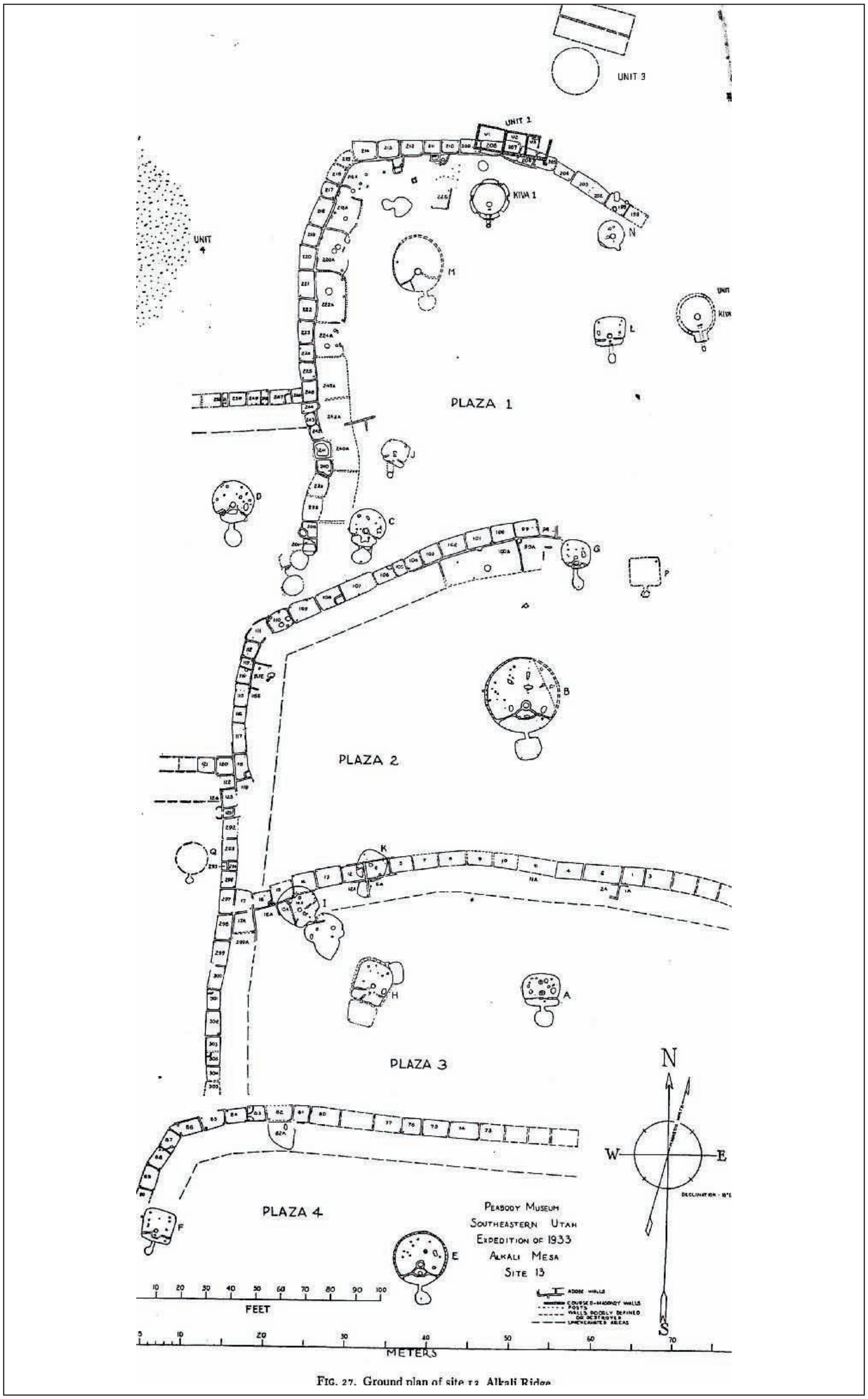

Figure 6.5. Plan of Alkali Ridge Site 13 (reproduced from Brew, copyright 1946 by the President and Fellows of Harvard College).

1950–1970: From Navajo Reservoir to Wetherill Mesa

In the early 1940s, E. T. Hall investigated a series of sites near Gobernador, New Mexico (Hall 1944a). Tree-ring dates from these sites provided some of the first absolute dating for the Pueblo I period in the area that would become the Navajo Reservoir District (see Figure 2.1). Results from Hall's Sites 1 (LA2120), 11 (LA2121), and 12 (LA2122) indicated occupation in the mid ninth century for these sites and for Pueblo I occupation in general (Hall 1944a; Robinson et al. 1974). Following Hall's work, in the late 1950s excavations occurred in association with the construction of Navajo Reservoir in northern New Mexico (Eddy 1966). This was the first of three reservoir projects in the northern Southwest to uncover significant Pueblo I remains. Sites that were excavated and that produced tree-ring dates included Sambrito Village (LA 4195), Mascarenas Site (LA4198), and Bancos Village (LA 4380). This project, building on Hall's work, established the Rosa phase as a recognizable phenomenon dating from A.D. 750 to 850. In addition to developing a local phase sequence for the area, which is still used today, Eddy (1974) put forth a model of culture change that was explicitly tied to environmental changes. In his model, favorable environmental conditions from A.D. 300 to 900 allowed expansion of cultural traits and population, culminating in the Pueblo I period with an intensified economy and population maximum, after which deteriorating environmental factors caused a contraction of population and ultimately migration out of the area. Although more recent models are more dynamic and sophisticated (e.g., Wilshusen et al. 2000), Eddy's was the first study to reconstruct past environments through geomorphological, palynological, and faunal analyses, and to combine such reconstructions with archaeological data to model settlement and social organization in the Pueblo I period.

In 1963, as part of the Wetherill Mesa Archaeological Project, Hayes and Lancaster excavated a large Pueblo I site (Site 1676) 200 feet west of Badger House. One of the stated goals of the project was to locate and excavate a multiple-component site "with a long history of remodeling or rebuilding and stratified trash deposits which tell us more about changing material culture" (Hayes and Lancaster 1975:1). Additionally, it was hoped dates would be recovered that could be correlated with a phase sequence developed during survey of the mesa (Hayes and Lancaster 1975:3) (Table 6.1). Site 1676 consisted of eight room block arcs and 18–20 pit structures. According to Hayes and Lancaster (1975:63), Site 1676 represented 200–250 years of continuous occupation, from the La Plata phase (Basketmaker III) through the Piedra phase (Pueblo I).

1970–1995: A SHIFT IN FOCUS

By the 1970s the focus on formalizing distinctions between developmental phases in various locales across the northern Southwest and assigning them dates had given way to a growing interest in interactions between humans and the environment, social organization (particularly as gleaned from settlement patterns and architectural remains), and large-scale population shifts (Berry 1982; Cordell 1979; Plog 1974). A number of projects in the 1970s and 1980s set out to address these and other research questions, including the Black Mesa Archaeological Project (Christenson and Parry 1985) and the Chaco Project (Hayes 1981). However, Pueblo I research was only a minor component of these projects, and it was not until the Dolores Archaeological Program (DAP) in the early 1980s that the Pueblo I period became a renewed focus of research in the Northern San Juan region.

From 1979 to 1983 archaeologists of the DAP excavated over 50 Pueblo I sites in the Dolores River drainage to mitigate the effects of McPhee Reservoir construction. Though sites dating to the early Pueblo I period (A.D. 750–840) were found and excavated, the largest and most numerous sites dated to the mid and late ninth century A.D. (840–900). Seven large villages, each with a minimum of 50 rooms, dated to this late Pueblo I period. The project reported not only the formation and organizational variation of these early villages, but also their short occupation span and rapid depopulation.

The significance of the massive DAP project cannot be over stated. It profoundly affected field methodologies, modeling of settlement and the desertion of houses and communities, and in understanding the dynamics of early village formation and organization in the Southwest. Lasting contributions of the DAP include the refinement of probabilistic sampling methods for recovering representatives samples from sites (Kohler 1988); modeling the effects of large aggregated populations on local resources (Kohler and Matthews 1988); developing methods for identifying site functions based on surface collections (Schlanger 1991); recognizing the effects of occupation duration and abandonment behavior on assemblage variability (Schlanger 1991); developing methods for measuring local population fluctuations at relatively fine temporal scales and modeling the effects of climate on mobility and desertion (Schlanger 1988); refining techniques for determining ritual and nonritual activities in pit structures (Blinman 1989; Varien and Lightfoot 1989; Wilshusen 1989); estimating labor costs for constructing communal architecture (Lightfoot 1988); recognizing the importance of communal ritual structures for socially integrating nonranked aggregated populations (Adler 1989; Lipe and Hegmon 1989); documenting the tremendous variation among large Pueblo I villages in the Dolores River drainage (Kane and Robinson 1986, 1988; Lipe et al. 1988; see also Wilshusen and Ortman 1999); and demonstrating that Pueblo I momentary village populations were larger than most had previously supposed (Kane 1989; Schlanger 1985; Wilshusen 1991). And, this is by no means an exhaustive list of accomplishments of the DAP. But even more telling of the DAP's influence on Pueblo I research are the numerous studies inspired by or based on the program decades after its completion.

Following on the heels of the DAP, from 1983 to 1987, archaeologists of the Crow Canyon Archaeological Center excavated at the Duckfoot site, a Pueblo I hamlet comprising 19 rooms and four pit structures just west of Cortez, Colorado. Dating from A.D. 850 to 880, Duckfoot was one of the most completely excavated and best dated Pueblo I sites in the Mesa Verde region, and is one of the best reported, with a description volume (Lightfoot and Etzkorn 1993) and a study of household archaeology (Lightfoot 1994). The studies of Duckfoot are unprecedented in their consideration of formation processes, the designation of the household as an analytical unit, the use of the discard equation to evaluate household occupation duration, and the use of construction patterns, features, and artifact refitting to reconstruct the size and organization of the Pueblo I household. The findings that emerged from the Duckfoot excavations relied significantly on the DAP results, a fact acknowledged by Lightfoot and Etzkorn. "The importance of Duckfoot as a research site is enhanced by earlier work conducted by the Dolores Archaeological Program…[which] produced the most extensive Pueblo I database in the history of archaeological research in the Four Corners area" (Lightfoot and Etzkorn 1993:9).

Wilshusen's work in northwest New Mexico in the 1990s at Cedar Hill and his interpretations of two late Pueblo I communities there (Wilshusen 1995) were also heavily influenced by the DAP. Schlanger and Wilshusen (1993) had documented a nearly complete depopulation of the Dolores area in the late ninth century A.D.

Table 6.1. Mesa Verde Phases and Their Pecos Classification Equivalents

Mesa Verde Phases	Pecos Classification
La Plata phase	Basketmaker III
Piedra phase	Pueblo I
Ackmen phase	Early Pueblo II
Mancos phase	Late Pueblo II
McElmo phase	Early Pueblo III
Mesa Verde phase	Late Pueblo III

Source: Hayes and Lancaster (1975:3)

At Cedar Hill, tree-ring data indicate an occupation from A.D. 890 to 916. The presence of few Basketmaker and early Pueblo I components in that area suggests that the Cedar Hill communities represent immigrants into the area. Wilshusen suggests that these communities were part of a major settlement shift south from the Dolores area in the late ninth century and a "reformatting" of the Pueblo I landscape from one composed of tightly aggregated villages to one of highly dispersed communities integrated by isolated communal ritual facilities (Wilshusen et al. 2000).

1997–2001: AGENCY, POWER, AND IDENTITY IN PUEBLO I RESEARCH

In the late 1990s and early 2000s, several studies re-evaluated some of the DAP data to explain variation in and among large Pueblo I villages, and recast the period as more socially and culturally dynamic than previously thought.

In 1997 Potter built on Blinman's (1989) examination of feasting at McPhee Village, a large Pueblo I village excavated as part of the DAP. Blinman (1989) had observed that redware bowls were more abundant at houses associated with oversized pit structures, and he interpreted this as evidence that feasting occurred as part of rituals conducted in the large structures. He further argued that redware bowls were used to serve some of the food during these feasts, and suggested these feasts were like pot luck meals that served to integrate the larger community rather than potlatch-type feasts used to enhance prestige. Potter (1997a) documented patterns in the distribution of faunal remains within McPhee Village, and these patterns paralleled those Blinman saw in the ceramics and architecture. Households associated with oversized pit structures and high proportions of redware sherds contained the highest relative frequencies and diversity of wild bird remains, ostensibly due to the ceremonial importance of these animals and their use in communal rituals associated with the oversized structures. In addition, Potter (1997a:Table 2) documented significant variation in the proportions of artiodactyl remains among the various room blocks composing McPhee Village, suggesting differential access to large game (and a certain level of social power differentiation) within the community.

In an article published in 1999, Wilshusen and Ortman argued that the differences between two of the largest Pueblo I communities investigated during the DAP—McPhee Village and Grass Mesa Village—were due in part to the differing cultural and historical backgrounds of the founding populations of each. Dissimilarities in architecture, settlement history, ceramics, and demographic patterns reflected "cultural differences that developed in the more distant past and were materialized when people from distinct cultural backgrounds were brought in close contact" (Wilshusen and Ortman 1999:391). They suggested that villages on the east side of the Dolores River (represented by Grass Mesa Village) were organized similarly to later Mesa Verde communities, whereas villages on the west side of the river (represented by McPhee Village) were precursors to early Bonito phase great houses of Chaco Canyon (Wilshusen and Ortman 1999:391).

Schachner's (2001) article revisiting DAP materials, as well as other Pueblo I sites in the Northern San Juan region, argued that stressful environmental conditions in the ninth century A.D. created contexts in which powerful individuals could deliberately manipulate political structures (sensu Aldenderfer 1993). In particular, he interpreted the rapid development of new kinds of ritual structures in the Dolores River valley as a deliberate attempt by strategic actors to change the ritual organization, which he suggested was the locus of power in these communities.

These three articles shifted the focus of Pueblo I research to considerations of structure and agency, ethnic identity, and social power, and they created an agent-based problem orientation and theoretical backdrop for SWCA's ALP project research design (Potter 2006) for the Pueblo I period in Ridges Basin.

Chapter 7: Pueblo I Research Questions

James M. Potter, Karen R. Adams, James R. Allison, Elizabeth M. Perry, and Carl J. Phagan

SWCA's research design for the ALP project (Potter 2006) stressed the equal importance of human adaptation to changing environmental conditions, the role of human agency, and the historical contingency of evolutionary change. This tripartite perspective recognizes that the organization of actors and groups within a region, their perception of the landscape, the decisions they make at the household and community levels, and the actions they ultimately take are largely structured by the immediate environmental and social conditions in which they live and by what has come before—their history. Thus, although environmental and social conditions affect or constrain human behavior and influence the ideologies of a given group, that group's history, its place of origin, its established connections to places and other groups, and the ways it has coped with environmental, population, and resource stresses all directly affect its response to these stimuli at any given point. In addition, human agency—the choices people make as they take action to realize their goals (Varien and Potter 2008:7)—plays a role in their responses. In other words, individuals are not just passive receptacles of culture and norms; they are conscious actors, or agents, with diverse aims who draw upon and manipulate resources to their strategic advantage. Yet these actors are socially constituted beings who are embedded in sociocultural structures and ecological surroundings that both define their goals and constrain their actions. In this view, cultural patterning is a long-term process resulting from the interplay of historically constituted structure(s), human agency, and environmental adaptations, rather than simply an adaptive response to particular environmental stimuli.

The research design acknowledged two unique aspects of the Pueblo I sites in the ALP project area. The first was the project's areal extent and the fact that it encompassed two adjacent, densely occupied, roughly contemporaneous locales—Ridges Basin and Blue Mesa. This circumstance allowed not only a comparison of the two areas but also an intensive study of broad settlement patterns through excavation that is rarely possible anymore. The second unique aspect was the short but intensive occupation of the area during the early Pueblo I period (A.D. 750–825), ending a two-century-long occupational hiatus following the Basketmaker II period. The Pueblo I occupation is thus not an example of long-term adaptation to a specific set of environmental conditions. Rather, it appears groups migrated into Ridges Basin, potentially from different areas of the Southwest, at about A.D. 750 and organized themselves into one or more large, dispersed communities that apparently lasted only a generation or two. A primary focus of the prehistoric research design was to understand how these early Pueblo groups came together and organized themselves on the landscape, and why in a fairly short time they left, never to return. Although environmental variables undoubtedly were factors in these processes, SWCA was interested in the social and historical factors that also must have been at play.

With these ideas as theoretical foundations, the ALP project research design posed questions regarding Pueblo I site structure and settlement; subsistence; local and regional population growth and desertion; mobility, sedentism, and land use; and patterns of social and economic organization. These larger questions were put forward at four scales of analysis: the household, the settlement cluster, the community, and the region.

THE PUEBLO I HOUSEHOLD

A household is defined as a group of individuals who share a single residence and who cooperate on a regular basis in a number of basic economic and social activities. Households are thus defined primarily in terms of what they do rather than by kin relations among household members, providing a more effective basis for the comparative analysis of household organization (Varien 1999:16–17). Based on Lightfoot's (1994) work at the Duckfoot site, a Pueblo I hamlet in the Mesa Verde region in southwestern Colorado (see Chapter 6, Pueblo I Research in the Northern Southwest), we expected that the architectural expression of the household for Pueblo I sites in Ridges Basin would be the individual pit structure and its associated surface rooms. However, it is important that the notion of the house not be conflated with the household. The household is the social group the house *holds.* The house is the dwelling where a household lives. This distinction is critical in examining, for example, whether large houses always represent large households (or more than one household).

Most of the Pueblo I houses in Ridges Basin appeared to date to A.D. 750–825. The primary goals of work at these roughly contemporaneous houses would be 1) dating their occupation more precisely, 2) determining the composition and size of their households, and 3) identifying household organization.

Dates of Occupation

Based on the Uranium Mill Tailings Remedial Action (UMTRA) excavations in nearby Bodo Canyon (Fuller 1988a), excavations north of Durango by Morris (Ahlstrom 1985; Carlson 1963), excavations south of Durango by Gooding (1980), excavations on Blue Mesa for the Mid-America Pipeline Project (Fetterman and Honeycutt 1982), and ceramic data collected from Ridges Basin by Northern Arizona University (NAU) (Allison 1995), conventional wisdom prior to the ALP project was that the Pueblo I occupation of the area dated predominantly between A.D. 750 and 825. Assessing if and how individual households fit into this date range was deemed fundamental for understanding their economic and social organization; therefore, refining ceramic chronologies, recovering tree-ring samples, and obtaining radiocarbon and archaeomagnetic samples from individual structures were important research goals. In addition to determining construction and use dates, however, we wanted to establish the occupation duration of houses so their temporal overlap could be refined as much as possible.

We proposed to address this issue of occupation duration and temporal overlap from two perspectives: what might be termed a *relative* perspective and an *absolute* perspective. In the relative perspective, houses in the project area are ranked in terms of their relative occupation duration based on the accumulation of associated artifacts, stratigraphy and remodeling data, and the date ranges from datable materials. This method would allow us to identify major differences among settlement clusters or even communities in terms of the occupation duration of the households composing them (see below). The absolute method, on the other hand, would require that each depositional context in each house (or at least the associated midden) be sampled randomly and an artifact population proportion be estimated so that the total accumulation of artifacts (e.g., cooking-pot sherds) per household could be quantified. These values could then be compared directly to discard rates calculated for the Duckfoot site, a completely excavated, well-dated Pueblo I hamlet with an established use-life. From these comparisons a probable occupation date range could be calculated for each house sampled (e.g., Lightfoot 1994; Varien and Mills 1997; Varien and Potter 1997). This information is important for understanding and quantifying the overall variability of house occupation duration and is critical for establishing momentary population estimates within the project area, as well as for understanding the processes by which the area was initially populated and ultimately depopulated (e.g., by individual households over time or by larger groups more or less at once).

Refined chronological controls are also important for assessing models of occupation and abandonment of various regions during the Pueblo I period. For example, Schlanger and Wilshusen (1993) suggested that Pueblo I residential mobility patterns corresponded to intensified drought conditions. During periods of lower-than-average effective moisture, construction ceased in the Dolores area, and they interpreted these as episodes of desertion. These difficult periods in which population decreased were countered by wetter periods in which effective moisture was average or above average and in which construction dates clustered and population increased. While Schlanger and Wilshusen's (1993) proposal did tie early Pueblo mobility to periods of extended drought or good effective moisture, it did not suggest that decisions to desert an area for a century or more were environmentally determined; rather environmentally influenced household mobility was seen as a short-term strategy to reduce temporary risk. Based on data from the Dolores Archaeological Program (DAP), the drought periods that might be relevant to the Ridges Basin area occupation spanned the intervals A.D. 740–760 (the assumed beginning of occupation in Ridges Basin) and 810–830 (the assumed end of the Ridges Basin occupation) (Schlanger and Wilshusen 1993:89). Timing construction episodes and the desertion of individual houses relative to these 20-year intervals might help in understanding the effects of drought on mobility patterns and on household- and community-level decision making. SWCA was particularly concerned with similarities or differences in how people responded to drought conditions, both among various settlement clusters in the project area and in comparison to those in DAP communities. Variation within the project area and from the DAP pattern might signal cultural-historical differences in terms of decision structures and household and community organization.

Household Composition and Organization

As a group of people, a household is defined in terms of the activities that it conducts, including those associated with production, reproduction, exchange, subsistence, and ritual. Specific questions regarding household composition and organization were many: What would be the architectural expression of the early Pueblo I household in the Durango area? Did each household perform the same range of activities, or was there some level of socioeconomic interdependence among households within a settlement cluster or community? What function or functions occurred in surface rooms? Were all pit structures domestic, or did some serve ritual functions? What would assemblages associated with room floors tell us about the function and use of those rooms?

Debate over the architectural expression of the Pueblo I household emerged as a result of both the DAP and the Crow Canyon Archaeological Center's excavations at the Duckfoot site. Work conducted as part of the DAP in the 1980s suggested that multiple households occupied surface room suites and shared a pit structure. The evidence leading to this conclusion was primarily architectural—surface room suites tended to be segregated by a lack of connecting doorways between them, suggesting a segregation of activities and restricted social interaction (Kane 1986). Following the DAP, which sampled a number of large sites, Crow Canyon intensively excavated one Pueblo I hamlet containing four pit structures and associated surface rooms, and concluded that, instead of each pit structure and its associated rooms representing two or three nuclear families dwelling primarily in the surface rooms and sharing a pit house, the unit centered on the pit structure, which housed one large, extended family (Lightfoot 1994). Based primarily on artifact distributions and activity segregation, aboveground structures were interpreted as substantial, specialized rooms that increased storage for surpluses and provided more privacy for individuals. The practical consequence of this distinction is that population estimates are significantly lower if just one extended family occupied a pit structure unit rather than multiple nuclear families occupying surface rooms and sharing a pit structure.

Sparking this debate were the distinctions noted between the typical Basketmaker III and Pueblo I residential sites in the Dolores area. Basketmaker III (A.D. 500–750) sites generally consisted of a shallow pit structure and several shallow, isolated storage structures, or pit rooms, and were thought to have represented a single household. Pueblo I sites in this same area contained deeper pit structures and suites of contiguous aboveground domestic and storage rooms. This change is often referred to as the pit house–to–pueblo transition, and in the DAP model it signaled a change in social organization from single- to multiple-household occupation of unit pueblos. In addition, it has become clear that there is no one strategy for household organization at any one time—it differed by locale as well as through time. In the Pueblo I period some sites contained households centered in pit structures (such as at Duckfoot), while at other contemporary sites, such as the large villages along the Dolores River (less than 15 km away), it appears household living areas were primarily in substantial surface rooms. These differences are critical not only for estimating population but also for understanding the structure of households, and by extension, society. Wilshusen (1999b:212–214) has indeed argued that the structure and size of households was probably not the same in small hamlets and villages.

Importantly, the transition to more substantial aboveground rooms during the Pueblo I period did not occur in the Durango area. In fact, one of the striking patterns in the Ridges Basin area is the ephemeral nature of surface rooms at Pueblo I sites (Fuller 1988a; Gooding 1980). As noted above, in the Dolores area ephemeral surface rooms tend to be associated with Basketmaker III sites, which has led some researchers (e.g., Gooding 1980) to refer to sites in the Durango area as Basketmaker III even though they date solidly to the Pueblo I period (A.D. 750–825). Surface room architecture had not been well investigated in the Ridges Basin area because of poor preservation, so the ALP project offered an opportunity to investigate morphology, construction techniques, and function in Pueblo I surface architecture in the Durango area. Identifying use surfaces and sampling them for microartifacts, including microdebitage, very small faunal remains, and pollen, can be an effective strategy for characterizing activities within a room (Chenault 2002). It was expected that documenting variation in surface room architecture and the activities that occurred within rooms would help in understanding household organization differences and trends, as well as site population estimates, within the project area.

For the ALP project, we expected the architectural expression of the household to be the pit structure and its associated surface rooms and other extramural features. Pit structures in the Durango area appear to occur individually with room blocks. Prior to the ALP project, no excavated sites in the Durango area contained more than one pit structure per room block, further suggesting that the pit structure was the center of a single household. Pit structures in the Ridges Basin area appeared to have a suite of floor, bench, and roof support features similar to that of Pueblo I pit structures in other areas. Functional interpretations of pit structures ranged from purely domestic to ritual. Lightfoot (1994:148–149) has argued that in the case of the Duckfoot site both pit structures and room blocks were used by households as residential space, in contrast to the evidence from villages, where some “oversized” pit structures were clearly used by multiple households for community activities (Wilshusen 1989). Before the ALP project, it was unclear whether the large site in Ridges Basin, the Sacred Ridge site (5LP245), contained oversized pit structures or possibly even a great kiva, but it was expected that most pit structures in the project area had been used primarily as domestic living spaces.

Artifact and feature data have the potential to yield information on the range of activities conducted in pit structures. We deemed it particularly important to establish the functional differences of pit structures within and among sites when 1) documenting household organization within a community and 2) estimating site or regional population levels, a process that often uses the number of domestic pit structures as a proxy measure of site population. With this in mind, and given the ephemeral nature of surface architecture in the area, SWCA particularly wanted to measure the ratio of domestic activities to ritual activities in pit structures and address differences in organization of activities within pit structures in Ridges Basin relative to other areas, such as the Dolores area. Would the organization of activities within the Ridges Basin unit pueblo be more similar to what had been observed in other areas, such as the Northern San Juan Basin, than in the Dolores area? If so, why might this be the case? Would oversized pit structures, if present, appear to have functioned differently in the Ridges Basin area than they did in the Dolores area? If so, what would account for this variation?

Extramural features are important components of houses, as well. These features can reveal not only the activities conducted by a household but also the spatial arrangement of activities and the spatial boundaries in which a household operated. Enclosures constructed of posts, low adobe walls, and cobble aprons are especially important for defining space around residences in the Durango area. Enclosures of some form have been found at early Pueblo I sites on Blue Mesa (Fuller 1988a), in Bodo Canyon (Horn et al. 2003b), and in Hidden Valley, just north of Durango (Carlson 1963). These features tend to surround the pit structure, surface rooms, and extramural features and unambiguously define extramural space for the house. Middens are sometimes located outside the enclosure. SWCA planned to employ extensive mechanical stripping to document the presence, extent, and construction methods of enclosures in the project area. We expected that mechanical stripping would also expose other extramural features such as hearths, pits, roasting pits, and burials.

Production and Exchange in Ceramics

Two of the most important activities that households participate in are production and exchange of material items. Recent studies suggest that ceramic production throughout the Southwest was specialized at a relatively low level, with variation in the ratios of producing to nonproducing households and in the degree to which producers were spatially clustered. Most ceramics were made at the household level, but not every household made enough pottery to meet its needs. Some households produced only certain kinds of pottery or none at all, and acquired from others what they did not make themselves. Although variation in producer/consumer ratios and spatial distribution of producers is continuous, it is useful to think in terms of three modes of production: 1) unspecialized production, in which every household produces enough to meet its own needs; 2) dispersed specialization, in which ceramic producing households are distributed evenly across the landscape, producing pottery for their own needs and the needs of their nonproducing neighbors; and 3) community or regional specialization, in which ceramic producers are spatially clustered into one or more communities and trade their surplus to consumers living in different communities.

Previous studies in the Dolores area have recorded ware-specific patterns of ceramic production as well as temporal variation in those patterns (Blinman 1986, 1988; Blinman and Wilson 1988; Wilson and Blinman 1995). Prior to A.D. 800, grayware production was widespread but not ubiquitous, whereas whiteware production was more specialized. Thus, a majority, but probably not all, of households in the Dolores area produced grayware, whereas a much smaller number of households produced whiteware. During the latter part of the Pueblo I period, after A.D. 840, grayware ceramics were probably produced by every household or interhousehold group in the Dolores area, whereas whiteware production continued to be specialized. Redware production was thought to be regionally specialized, with all redwares found in Dolores area sites originating in southeastern Utah. There is little evidence on the spatial distribution of whiteware producers in the Dolores area, but regional variation in whiteware pigments and designs suggests that whiteware producers were more dispersed than redware producers.

Similar complexity in ceramic production was expected among Pueblo I households in Ridges Basin. Documenting those patterns was expected to be important in understanding variability (or the lack thereof) in the activities of different households, as well as interaction among households. Evidence of ceramic production in the form of kilns; raw materials such as unfired clays, pigments, or temper; and pottery making tools such as scrapers or polishing stones would provide information on the number and spatial distribution of pottery-producing households.

Preliminary studies of pottery from Ridges Basin had demonstrated variability in the clays and tempers used to make both graywares and whitewares (Allison 1995). Grayware sherds, in particular, oxidized to a wide variety of colors, suggesting that many different clay sources were used. Several possible reasons for this variation in tempers and clays exist; but whatever the cause, we believed we could use this variation to infer patterns of interaction among households, although detailed study would be required to determine the precise nature of the interactions. By implication, many different potters were involved in producing the ceramics observed in Ridges Basin, but it was unclear how much of the pottery was actually produced there. Pottery made from different clays might reflect different choices by potters within Ridges Basin. It might also indicate that a relatively high proportion of the ceramics used in Ridges Basin was made in surrounding areas.

To address these issues, SWCA would attempt to document the sources of the raw materials used in ceramic production as specifically as possible using several methods. Binocular examination of temper, thin-section analysis, and oxidation studies of recovered ceramics would be combined with surveys to locate potential clay and temper sources in Ridges Basin and surrounding areas.

In the ideal case, we would find spatial variation we could use to infer that ceramics with certain clays or tempers were made in different parts of the project area. If so, the distribution of ceramics made with these raw materials outside of their production areas should indicate fairly direct interaction with the households that produced them. However, given the small size of Ridges Basin, it might not be possible to segregate ceramics made in different parts of the basin. If clay resource surveys suggested that most of the pottery was made in the basin, any differences in oxidized colors would probably reflect the use of different clay recipes or sources within the basin, even if these differences were not based on geographic residence. Instead, they would most likely reflect learning traditions and hence interactions among potters, with potters tending to use the raw materials used by their teachers and close associates. The distributions of ceramics made with different clays or clay recipes should thus reflect patterns of interaction among pottery-making households and between producing and nonproducing households.

Finally, if most of the variation turned out to indicate importation of ceramics from a variety of sources outside the project area, the distribution of pottery made from different clays and tempers would then indicate interaction between Ridges Basin households and ceramic producers in other areas. Interactions among households within the project area could still be inferred, however, because similarities in the kinds of imported pottery can be used to identify households that maintained similar exchange networks (see Allison 2000).

Seasonality

Winter et al. (1986) identified a pattern in Ridges Basin in which upland Pueblo I habitation sites generally appeared to be smaller and less clustered than lowland sites. Ware (1986a) proposed that these patterns were the result of seasonality—lowland sites were used in the winter and upland sites were occupied during the spring, summer, and fall. SWCA intended to explore this possibility by documenting how consistent the size distinction would be, how substantial the occupations appeared to have been, and how specialized the artifact assemblages would be in upland versus lowland sites. SWCA also proposed to systematically collect charred plant and faunal data that might shed light on seasonality at both upland and lowland sites.

THE SETTLEMENT CLUSTER AND THE COMMUNITY

Although it was suspected that multiple-household room blocks might be relatively rare in the Ridges Basin area, Fuller (1989) had identified nine spatial clusters of Pueblo I houses before the start of the ALP project. Fuller mapped eight such clusters within Ridges Basin and one on Blue Mesa (Figure 7.1). What these settlement clusters represented socially and economically remained to be explored. Assuming rough contemporaneity among settlement clusters, several important questions arose: 1) Did these clusters represent villages? 2) Was the placement of a cluster on the landscape structured by environmental or catchment variables (e.g., arable land and water) or by social variables (e.g., proximity to other clusters or defensibility concerns)? 3) Were all clusters similarly organized, or was there an organizational hierarchy? 4) Was there another level of organization above the cluster?

In framing the SWCA research design, we agreed with Lekson (1991:42) that "if the unit house is the fundamental element of Anasazi architecture, the community is the fundamental unit of Anasazi settlement." This is especially true for the Mesa Verde region, where archaeological survey has consistently shown that residential sites do not occur in isolation but rather are grouped together into settlement clusters (Varien 1999). Given that settlement is clustered at a number of inclusive levels, which level of settlement clustering represents a community?

We define a community as a spatially delimited group of people who interact on a fairly intensive and regular basis (see Murdock 1949). As Varien (1999:19–20) has pointed out, a community possesses temporal, spatial, and social dimensions. The temporal and spatial aspects are fairly straightforward: People must live at least some of the time in relative proximity in order to interact on a regular basis.

The social dimension arises from the fact that community members share in access to local material resources, such as land and hunted game, as well as social resources, such as labor and communal rituals. Thus, a community may consist of hamlets or villages dispersed across a landscape, as long as the defined criteria are met. A fundamental question then was whether the clusters in Ridges Basin formed a number of small individual communities or one or more large ones. It would also be important to compare the Ridges Basin clusters to the very large one on Blue Mesa. With a mean of eight houses, the eight clusters in Ridges Basin were demonstrably smaller. With more than 15 pit structures, one of these clusters, the Sacred Ridge site, was a village-sized aggregate.

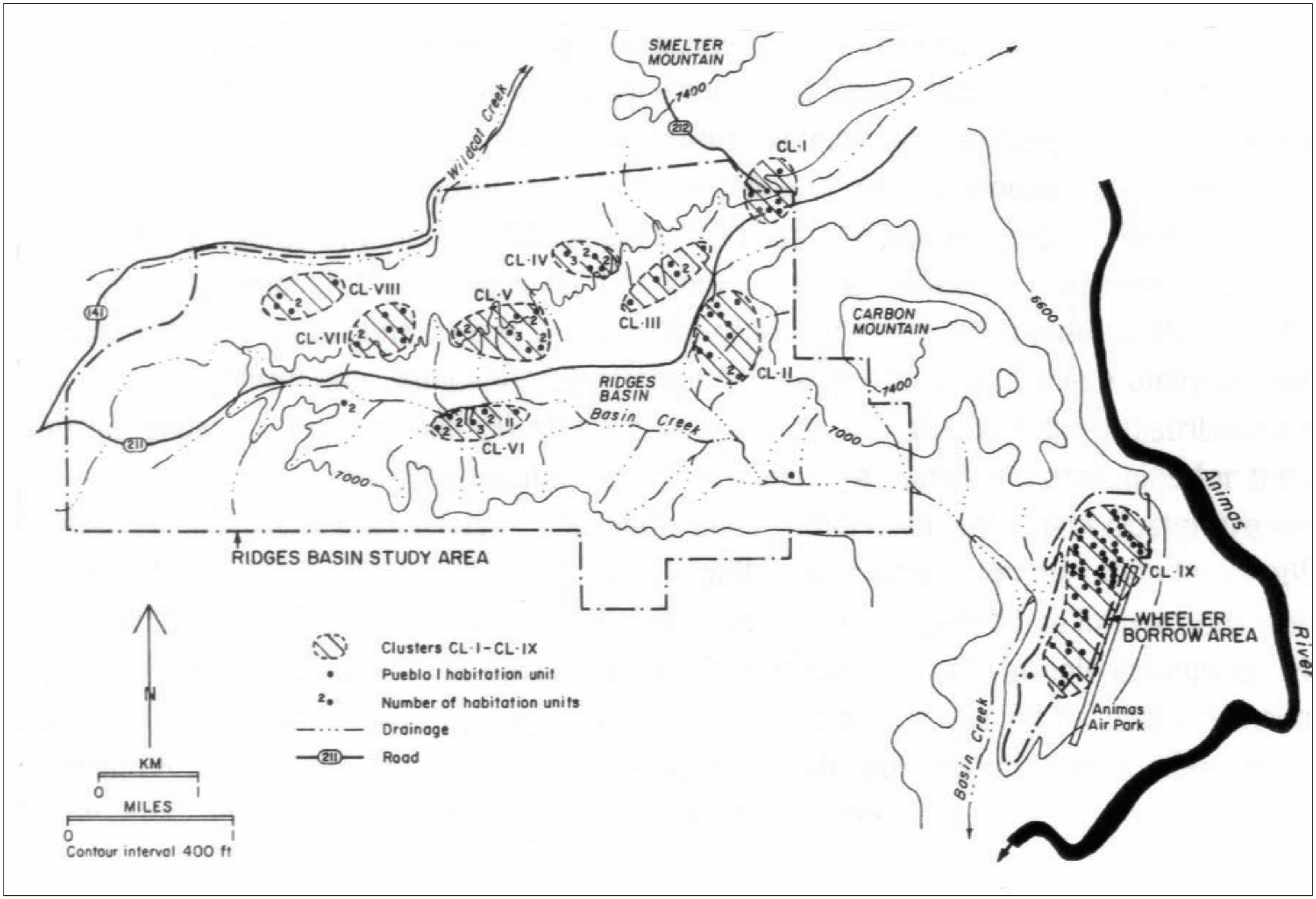

Figure 7.1. Pueblo I settlement clusters in the ALP project area as identified by Fuller (reproduced from Fuller 1989).

Given the information available at the time, at least three types of community organization appeared possible for the Pueblo I occupants of Ridges Basin. The first possibility was that Ridges Basin and Blue Mesa together made up one large, complex community, with the Ridges Basin community dispersed in multiple subcommunity clusters. The second was that Ridges Basin and Blue Mesa were the loci of two distinct, possibly contemporaneous, communities. The Ridges Basin community would have been more dispersed, with a small village at its core. The third possibility was that Ridges Basin and Blue Mesa were examples of Lipe's (2002) concept of "first-order, face-to-face communities," which might be analogous to Fuller's clusters. One feature of this model is that communities can form alliances with other similar communities but these alliances are conceptually distinct from the communities themselves. Lipe further argues that these supracommunity alliances need not exhibit formal political hierarchy or a regional polity, which implies that they may not be as persistent through time as the first-order communities that constitute them. To assess these three possible community organization models, SWCA proposed to collect data related to three important social and economic dimensions: population, interaction, and interdependence (or integration).

Momentary Population Levels

Based on a Monte Carlo simulation, Wobst (1974) suggested that human mating networks among Paleolithic hunters and gatherers required a face-to-face population of 175–475 individuals to ensure that everyone could find an unrelated marriage partner. More recently, Mahoney (1998) has argued that the conservative figure of 475 might be close to the minimum size for a horticultural community. This number may be too high, however, and a more realistic minimum population size may be around 150–200. Many of the early reconstructions of early horticultural communities treated them as closed systems when the numbers of marriageable partners were computed. Communities were viewed as being ethnically homogeneous, and population growth rates were thought relatively small. Both of these assumptions have been challenged over the last decade; there appears to have been much more mobility, greater ethnic diversity, and at times higher birth rates in these early farming communities than previously assumed (see Varien and Potter (eds.) 2008; Wilshusen and Perry 2008). Community composition was much more dynamic and varied than assumed in the closed models of culture. As a result many more possible partners and alliances were likely available than originally predicted by the models.

Cross-cultural research indicates that there is also an upper limit to the population of communities in politically non-stratified societies. In a worldwide sample that included examples from the American Southwest, Adler (1990, 1994) and Adler and Varien (1994) observed that such communities do not exceed 1,500 people. Thus, there are population thresholds as well as spatial thresholds that can help define the upper limits for the size of communities in the Northern San Juan region. Establishing momentary populations within Ridges Basin during the Pueblo I period was of primary concern in determining the spatial scale of "community" in the Durango area.

Interaction among Households

As with issues of production and exchange, some of the best tools for measuring interaction involve ceramic sourcing. If local groups used different geologic sources for either clay or temper, interaction could be quantified based on how much of a given material was being exchanged between different groups. Initial refiring of Ridges Basin sherds by Allison (1995) suggested that both temper and clay varied widely from site to site, although the reasons for this variation are unclear. To address this issue, SWCA proposed to 1) conduct clay and temper source analyses on numerous sherds (and, if found, on unfired clay samples), 2) attempt to link the results of these analyses with specific geologic sources, and 3) statistically evaluate the archaeological distribution of sourced sherds vis-à-vis their probable loci of manufacture. Sampling strategies for these studies would ensure representation of a variety of houses within each settlement cluster. If the geology was distinct enough, patterns of interaction might then be identifiable, and it might be possible to establish the nature and variation of interaction among clusters. Even if the geology within Ridges Basin turned out to be homogeneous to indicate patterns of interaction among settlement clusters, there should be enough difference between Ridges Basin and Blue Mesa to address differences in production and exchange in these areas and assess patterns of interaction between them.

Another method for evaluating interaction among settlement clusters is to quantify functional attributes of household ceramic assemblages, such as proportions of different pottery forms and wares, in order to derive inferences about range and intensity of behaviors. For instance, Blinman (1989) documented an inverse relationship in the proportion of redware serving bowls and grayware cooking vessels among households within McPhee Village. He suggested that potluck-style feasting was primarily the cause of this pattern, as food preparation behaviors (cooking in grayware jars) occurred more often at many households, but food consumption behaviors and serving in redware bowls (i.e., feasting) occurred more often in others. Allison (1995) noted that redware sherds were rare in Ridges Basin surface assemblages, especially at larger habitation sites. This pattern suggests that redware bowls and the behaviors associated with them were not as important in Ridges Basin as they were in the Dolores area, but excavation data would be needed to corroborate this. However, it is possible that other ceramic wares and types may have served similar functions in this area, or communal behaviors may have been organized differently or involved a different range of activities.

A third measure that SWCA intended to use to assess levels of interaction is the distribution and exchange of large game within the project area as a whole and between Ridges Basin and Blue Mesa. If certain anatomical portions of large game were found to be proportionately more common in some clusters and if other anatomical portions were found to be more common in other clusters, consistent exchange of animal portions, as seen in other Pueblo I communities (Potter 1997a), might account for this pattern.

Interdependence of Households

SWCA proposed to pursue several measures of interdependence (or community integration) among settlement clusters. These measures fell into two categories: the *complementarity* of resource access and production behaviors, and the *shared use* of resources, both environmental and social.

Resource and Activity Complementarity

Use of resource and activity complementarity as a measure of interdependence is based on two possibilities: that certain households have access to particular resources and that they produce certain items that complement those of other households, thereby encouraging interaction, or at least exchange, among groups. Indicators of complementarity may be related to agricultural productivity, wild resource availability, and production of pottery, tools, and other goods.

The agricultural potential of soils in the project area varies widely due to many factors, including aspect, elevation, the types of bedrock outcrops, and soil quality and quantity. Fuller (1989:79) suggested that the size or scale of a community should directly correlate with the productivity of the agricultural catchment surrounding that community. A lack of correlation between community scale and agricultural catchment might imply some sort of functional differentiation at the community level.

According to preliminary analyses, only two clusters within the ALP project area were in locales with high agricultural potential (Fuller 1989:64). Five clusters were in soils with moderate potential, and one—the largest in Ridges Basin, consisting of the Sacred Ridge site—was associated with low-potential soils extending to a 0.5-km radius. This distribution suggested the possibility that some clusters were more active in agricultural production than others and that some food-sharing interdependence existed among the clusters.

SWCA planned to conduct detailed catchment analyses of both domesticated and wild resources around each cluster, using both systematic on-the-ground observations and GIS analysis. Four strategies were to be employed to assess the spatial variation of plants and soils within the basin and to determine catchment values. The first step was detailed geomorphic analysis of soils within the project area and production of a detailed soils map for use in a GIS analysis. The second step was a complete plant inventory and preparation of a plant-community distribution map that would be linked with the soil map. Using the method outlined in Adams (1978), individual plant types would be ranked based on their potential economic returns and abundance across the landscape, and economic values would be assigned to definable areas within the basin. Third, experimental dry-farm gardens would be placed across the basin at various elevations and aspects to assess variation in growing potential. The multiyear aspect of the ALP project would also allow an assessment of the correlation between variations in precipitation from year to year and garden productivity. And fourth, we would establish computerized weather stations in the garden plots to measure precipitation, soil moisture, wind, and temperature for a number of years to assess these variables within the basin from season to season and year to year.

If agricultural production was distributed unevenly among clusters, then we might expect storage of agricultural products to be distributed unevenly, as well. Quantifying storage space relative to living space within settlement clusters would help in evaluations of the level of agricultural productivity among clusters. Surface-room area might be the best measure of storage space because of the supposed storage function of these structures. This association remained to be demonstrated, however.

Uneven distribution of other resources among clusters might signal a certain level of economic interdependence. At McPhee Village, for example, the assemblage from one large settlement was dominated by artiodactyls, whereas another was heavily dominated by lagomorphs (Potter 1997a). This complementarity of seasonally acquired faunal resources may relate to larger community economic dynamics, such as the division of the "hunting year" among villages. Would we see evidence that some Ridges Basin households had more access to long-distance hunted resources, such as large game, whereas others might have focused more on garden hunting?

Finally, variation in the distribution of production activities related to pottery, lithic artifacts, bone tools, or other goods might also have promoted greater interdependence among households. Blinman (1988) noted that pottery production tools and raw materials (unfired clays and tempers) at Dolores area Pueblo I villages were not clustered enough to indicate that pottery production was centralized or that it involved specialists, but he also noted that some households did not make pottery, suggesting some level of interdependence. Because agricultural productivity was apparently so patchy within Ridges Basin, it is possible that pottery production was a way for some households to hedge against this resource deficiency and participate in a system of interdependence. One hypothesis that would explain why the Sacred Ridge site—the largest Pueblo I site in Ridges Basin—was located in an area of low agricultural potential is that it specialized in pottery rather than in agriculture. This might also account for the low proportion of redwares at the site, relative to local wares. SWCA hoped to recover evidence of pottery production from each house investigated and compare the distribution of these data to other economic data within and among clusters. The distribution of Pueblo I limited activity, non-habitation sites on the landscape might also aid in assessing the consistency of the range of activities conducted by members of each settlement cluster.

Shared Resources

Documenting the shared use of resources also had the potential to illuminate other aspects of communities within Ridges Basin. One of the more significant breakthroughs in the last 15 years has been in our understanding of the role public architecture plays in integrating households into communities in small-scale agricultural societies (Adler 1989; Adler and Varien 1994; Lipe and Hegmon 1989; Varien 1999). Identifying shared architectural space in which communal or integrative activities occurred is important in defining a community. Studies by Adler (1989) and Adler and Wilshusen (1990) indicate that public structures used by entire communities tend to have the largest floor areas and the most specialized uses of any buildings in the community. These cross-cultural patterns help us identify particular buildings in the Mesa Verde region as public architecture. In Ridges Basin, the nature and abundance of public architecture were unclear. The Sacred Ridge site was thought to contain possible public architecture in the form of oversized pit structures and a great kiva or a plaza, or both. SWCA planned to assess the presence or absence and nature of these features by locating and excavating them. We would investigate through excavation whether other public structures existed in Ridges Basin and, if so, the nature of their relationship to the settlement clusters. In addition to their larger size, these features were expected to yield artifact, faunal, and feature evidence indicating a range of ritual and feasting activities (Blinman 1989; Potter 1997a, 2000; Wilshusen 1989).

Shared burial areas can also indicate levels of integration above the household. A distributional study of burial location and basic composition might add substantial information to studies of community.

We identified conflict and defense as topics that deserved greater attention than they had received in the past. Were the Ridges Basin households clustered for purposes of defense, and, if so, what would this tell us about interactions among these clusters? Martin and Goodman (1995) had documented traumatic lesions and associated pathologies on a number of human skeletons recovered from Ridges Basin. Assessing the distributions, causes, and pervasiveness of skeletal evidence of violence would help determine the effects of these behaviors on settlement patterns and interaction among settlement clusters. Defensive architecture also provides evidence of possible conflict. Chenault and Motsinger (2000) documented a number of Basketmaker III hamlets with associated protective enclosures in the Mesa Verde region, and similar features are also common in early Pueblo I sites to the south of the project area. SWCA's field methods would include extensive excavations to recover any available data on defensive architecture. The temporal and spatial distribution of any defensive structures would provide information on the pervasiveness of conflict and the nature of relationships among settlement clusters.

The Sacred Ridge Site

The Sacred Ridge site was a Pueblo I (A.D. 750–850) village at the west end of Ridges Basin. As its name suggests, the site occupied the top and sides of a small ridge. Prior to the ALP project, it had been recorded many times, most recently by Northern Arizona University, who mapped 10 room block units (Morris 1995) (Figure 7.2), each likely comprising at least one pit structure and a series of surface rooms. It was believed the extent of subsurface remains was probably greater than the surface evidence indicated. For our research design, SWCA estimated that 10–15 pit structures and associated surface architecture remained to be excavated on the eastern and western flanks of the ridge.

The site had been a favorite of local artifact collectors and looters for nearly a century. Homer Root, who directed the Fort Lewis College field school in the 1960s, noted that "as many as fifty people might be counted on the site during a week-end, searching

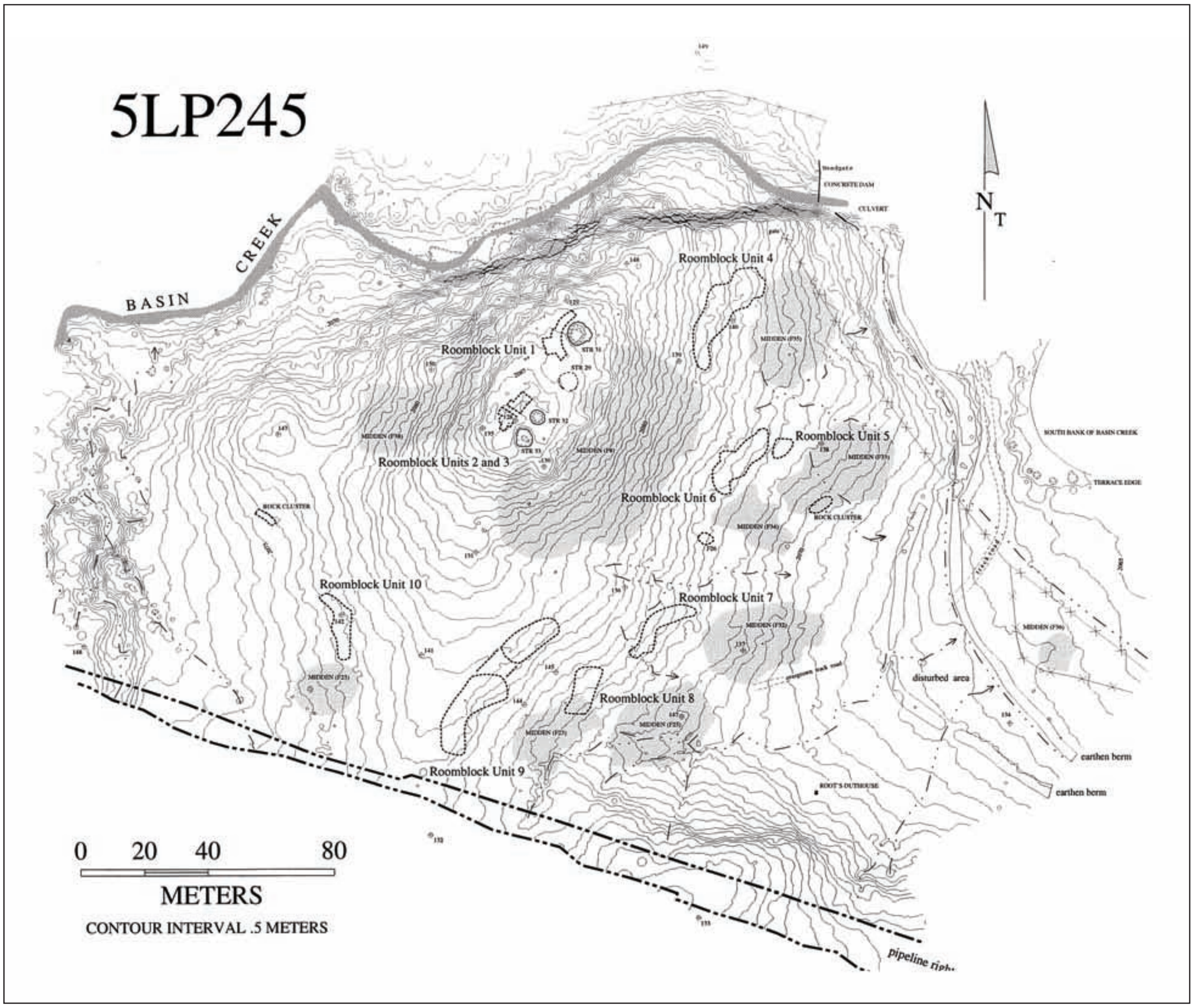

Figure 7.2. Map of the Sacred Ridge site (courtesy of James N. Morris).

and digging for relics" (Root 1967:12). The site was first officially recorded in 1975 (Leidy 1976), and subsequently re-recorded by ESCA-Tech (Winter et al. 1986) and Complete Archaeological Services Associates (state historic preservation office site card updates only) before NAU's recordation (Morris 1995). Each recordation of the site involved some type of surface collection, but the largest and most systematic was done by NAU and included comprehensive mapping.

One of SWCA's goals was to re-explore the areas excavated by Homer Root and recover any additional information that might remain. The Fort Lewis College field school had conducted excavations at the Sacred Ridge site under Root's direction in 1966 and 1967 (Root 1967), and it was at this time that the site was first referred to as "Sacred Ridge" in the literature. The 1966 field school investigated the deposits on top of the ridge and the trash deposits on the lower slopes, and his journal describes the excavation of three pit structures, two "dance areas," 28 surface rooms, and 40 human burials (Root 1967). The descriptions of unique features in Root's notes suggested this area may have been an important ritual area for the village and perhaps for the entire basin.

In addition, SWCA planned to excavate the houses around the ridgetop and assess the degree to which they were similar to or different from houses in other site clusters in the project area. Several questions guided this part of our research. Were the houses associated with the village contemporaneous with the architecture on top of the ridge? Would Sacred Ridge's architecture be contemporaneous with other Pueblo I sites in Ridges Basin and on Blue Mesa? What would be the range of variation among houses at Sacred Ridge? Would they be morphologically different from houses in other site clusters? Would they all be purely domestic structures, or would some appear to have been the locus of ritual activities? Would we find evidence that this site had been the ritual center for the entire basin? Would there be, for instance, evidence of communal feasting or communal ritual not evident elsewhere? Was a great kiva associated with the site? What other activities would be evident at Sacred Ridge that might not be evident elsewhere? It was already known that the site was in an area of low agricultural productivity; this being the case, what role did Sacred Ridge play in the larger Ridges Basin community? Would the burial population at this site be unique in any way?

Because of the multiscalar aspect of settlement clustering in the area and the potential to firmly establish contemporaneity among residential units, we knew the ALP project had tremendous potential to add to our understanding of early Pueblo community organization in the region eastern of Mesa Verde. Analysis of this variability would be essential for a full understanding of Pueblo I society and of the societies that ultimately evolved from these cultural and historical patterns.

Settlement Aggregation

Several models would be explored as possible reasons for settlement aggregation in the project area. The first model held that aggregation was a result of local population increase and a subsequent shortage of agricultural land. Under this model, households would cluster near, but not on, prime agricultural land. In this model one would see a more dispersed pattern initially and then more clustering through time as population increased and the landscape filled up with people. Evaluating the distribution of highly productive soils and the placement and number of habitation sites would be crucial for evaluating this model.

The second model stipulated that the main cause of household aggregation was the presence of strong or charismatic leaders who encouraged households to cluster near them for a number of reasons, including protection, social status, and other social, ideological, and economic benefits that such associations could provide. In this model one would expect to see 1) elaborate architecture and behaviors (e.g., competitive display), 2) aggregation at the outset of or quickly after initial occupation of the area rather than gradually through time, and 3) very large, tight aggregation (i.e., village aggregation). This scenario could be associated with increased violence encouraging households to aggregate. (It should be noted that violence could certainly be a factor in aggregation independent of strong leadership).

A third model predicts that aggregation occurred as a result of the development of matrilocal residence rules. Ware (2002) has suggested that aggregation of households can occur when men move to live with their wives' families and yet need to maintain connections with and live close by kin groups, as well. In this model, clustering of houses is a simple function of logistical efficiency in the face of adhering to certain residence rules. According to Ware, matrilocality arises most often in matrilineal endogamous communities. Skeletal data might allow for the reconstruction of relatedness and marriage and residence rules within and among clusters, and it might be possible to test this model with ALP project data.

The final model predicts that aggregation occurred as a result of escalating violence. Household aggregation can provide safety in numbers in a competitive and potentially violent environment. In this model we would expect to find a concern about violence reflected in things such as palisades around houses and human skeletal evidence of increased violence.

It is important to stress that these models are not mutually exclusive, and scenarios of all models probably played a part in encouraging aggregation. The goal of SWCA's research would be to tease out the strongest and most important factors underlying the aggregation process.

COMPARING RIDGES BASIN AND BLUE MESA

One of the more promising aspects of the ALP project was that it offered the opportunity to investigate two large, roughly adjacent areas of dense prehistoric occupation: Ridges Basin and Blue Mesa. Interesting differences were already known to exist between the two areas, including much better soils and much denser occupation on Blue Mesa. It had also been suggested that Blue Mesa might have been occupied slightly later than Ridges Basin. Although we would not be able to access or investigate as many sites on Blue Mesa and therefore its sample would be less complete than the Ridges Basin sample, general comparisons would be possible in terms of architectural variability, pottery production and exchange, agricultural and hunting practices, chronology and processes of desertion, and chronology of occupation.

Fuller (1988a) posited that Blue Mesa served as a refugium for people when they left Ridges Basin between A.D. 800 and 830. To test this model, SWCA planned to conduct detailed studies of chronology and desertion strategies at each house excavated in Ridges Basin. Schlanger and Wilshusen (1993) had modeled four desertion strategies that vary with the distance of a residential move and the occupants' intention to return. They used floor artifact assemblages and roof treatment at desertion to determine which desertion strategy characterized each of four desertions in the Dolores Valley between A.D. 600 and 910. They concluded that the first three desertions were short-term and that the people anticipated reoccupying the locality. The last desertion, in the late A.D. 800s, appeared to be part of a regional depopulation with no plan to return.

It is important to recognize that in Wilshusen and Schlanger's model, drought might have caused the migration of *communities*, but it was not the sole reason for desertion of residential sites by *households*. Many residences were vacated during episodes of increased moisture (Schlanger and Wilshusen 1993:94). In fact, Pueblo I houses had a use-life of 15–25 years, whereas many Pueblo I communities lasted 25–40 years (Wilshusen 1999b:232), so some desertion of small habitation sites is to be expected within a large community. Varien (1999) documents a similar pattern of household mobility within more persistent communities during the Pueblo II and Pueblo III periods in the Mesa Verde region. Thus, documenting whether Ridges Basin was vacated in favor of Blue Mesa would require detailed desertion studies examining whole communities, not just the few houses that had been examined up to that time.

CULTURAL ORIGINS, INTERREGIONAL RELATIONSHIPS, AND DEPOPULATION OF THE AREA

It appears that Pueblo I people in the Durango area were influenced by different but contemporaneous culture groups. To the west, in the Mesa Verde region, some people made an early and full transition to surface habitation and built large room blocks with both habitation and storage rooms. Their pit structures tended to be square or rectangular in plan, with wing walls in the southern halves. They produced pottery with crushed andesite-diorite temper and painted whiteware bowls with mineral paint in the Piedra style (Allison 1995). Groups to the southeast, in the Upper San Juan drainage and up into parts of the Durango area, apparently did not make the early transition to surface habitation. Surface rooms were often built entirely aboveground (leading to poor preservation) and often seem to have been used primarily for storage. Pit structures tended to be circular in plan, have bifurcated ventilator openings, and lack wing walls. People in this area produced a pottery with crushed quartz-feldspar temper and painted whiteware bowls with an organic binder and lead glaze paint in the Rosa style (Allison 1995) (Table 7.1).

Originally used to describe phases, the terms Piedra and Rosa have come to refer to these contemporaneous but spatially distinct groupings of Pueblo I traits. *Piedra* now also refers to those sites in the Mesa Verde area where Piedra Black-on-white is produced; *Rosa* refers to sites in the area in which Rosa Black-on-white is produced (Wilshusen 1999b:Figure 7-4).

Sites in the Durango area exhibit characteristics of both the Piedra and Rosa traditions, and perhaps others as well. Sites 5LP478 (Fuller 1988a), Ignacio 7:31 and 7:36 (Carlson 1963), and 5LP171 and the Sacred Ridge site (Duke 1985) contain multiple large room blocks that resemble those from the Piedra area, whereas at 5LP481 (Fuller 1988a), Ignacio 7:23 and 7:30 (Carlson 1963), and 5LP110 (Gooding 1980), the room blocks share similarities with Rosa area sites. The local ceramics also exhibit characteristics of both areas: They commonly contain either andesite-diorite temper or quartz-feldspar temper, or a combination of the two. Painted designs are most often of the Rosa style, but designs of the Piedra style are also present (Allison 1995).

The cultural trait showing the most variation in the Durango area, however, is pit structure morphology, including not just the size and shape of the structures but functional attributes as well, such as the presence or absence of benches, two-hole vents, and a four-post roof support system. Pit structure shape is particularly variable in the area (Figure 7.3), suggesting that two, and possibly more, ethnic or cultural groups occupied the area during the early Pueblo I period.

The variation in cultural attributes prompted several questions in the research design. How many different ethnic or cultural groups made up the Pueblo I population of Ridges Basin? Where did they come from? How did the geographical origin of various groups affect how they organized themselves on the landscape? Did certain groups arrive first? Were the occupants of the Sacred Ridge site the earliest occupants of the area, and was their cultural make-up heterogeneous or homogeneous? What mechanisms were used to integrate a community of households from various cultural and ethnic backgrounds? And finally, what role did the Sacred Ridge site play in this community integration?

To address three of these issues—1) whether individuals recovered from burial contexts in the project area were nonlocal, 2) the number of nonlocal groups that resided in Ridges Basin during the Pueblo I period, and 3) where these groups originated—we planned to conduct radiogenic isotope analysis (Ezzo and Price 2002). This type of analysis measures strontium isotope ratios (87Sr/86Sr) in human molar enamel to document and compare provenance of human populations. Because 87Sr/86Sr in the calcified tissues of an organism is a reflection of the geological province where that individual obtained food, this type of study is effective in examining human movement between distinct geological provinces. In this analysis one compares the strontium signature of first molar enamel, which forms in the first year of life and does not remodel thereafter, with the signature in local faunal bone (particularly of rodents or other animals with very restricted ranges), which provides a baseline for local variation. For example, if an individual buried at a site has an 87Sr/86Sr signature in first molar enamel that is significantly different from the local signature, it can be inferred that this person was nonlocal and may have migrated from a considerable distance. By analyzing fauna from surrounding regions, it might be possible to determine the individual's area of origin.

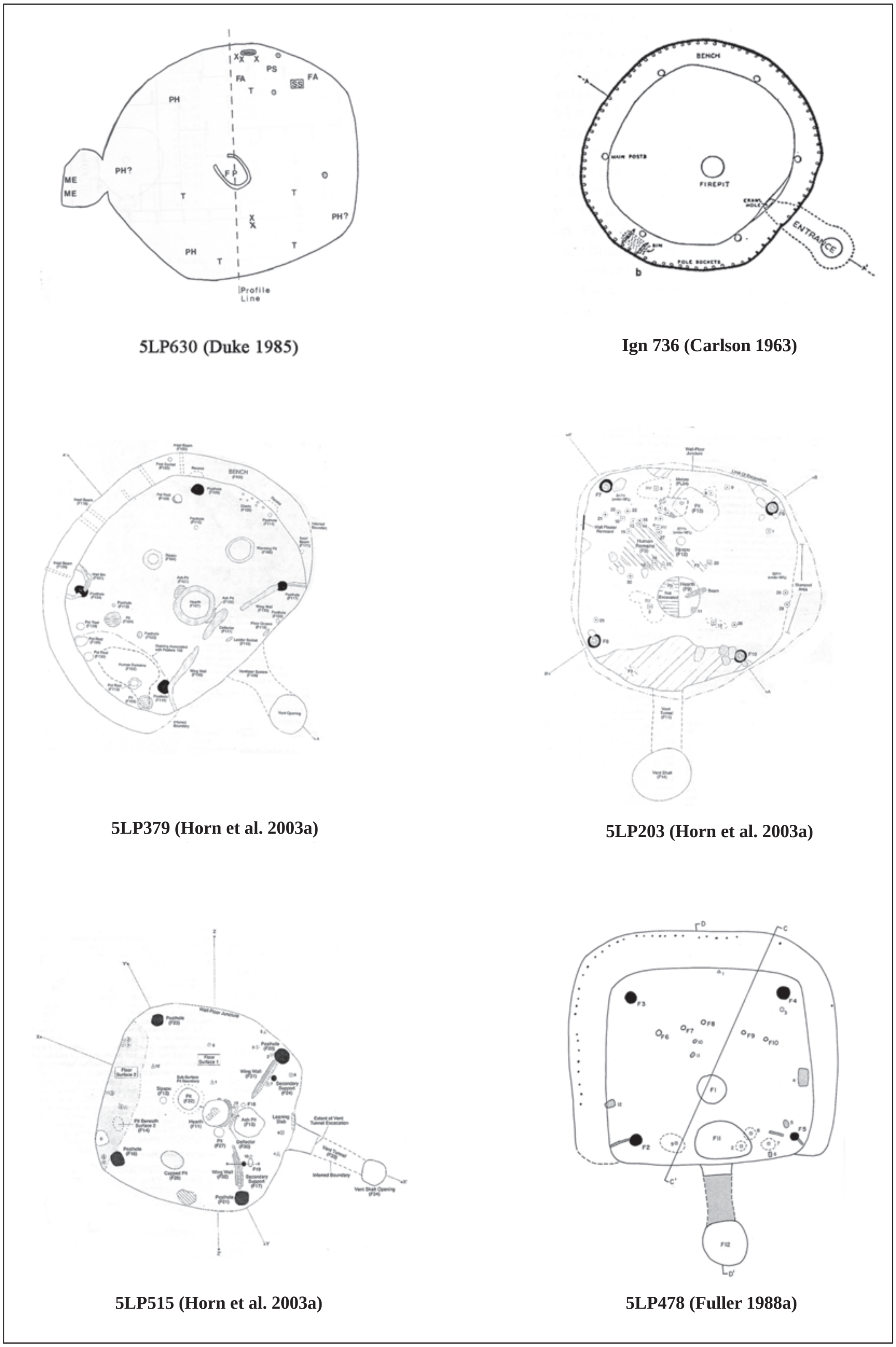

Figure 7.3. Plan maps of selected pit structures showing early Pueblo I pit structure variation in the Durango area, prior to ALP project excavations.

Table 7.1. List of Attributes Commonly Associated with the Piedra and Rosa Traditions

Attribute	Piedra Tradition (Northern San Juan)	Rosa Tradition (Upper San Juan)
Black-on-white pottery	Lino, Chapin, or Piedra	Rosa
Redware ceramics	Relatively common to rare	Rare
Temper	Andesite-diorite	Quartz-feldspar
Paint	Organic	Glaze with organic binder
Surface architecture	Substantial, habitation and storage	Insubstantial, storage only?
Pit structures	Rectangular, wing walls, nonbifurcated ventilator system, abundant floor features	Round, no wing walls, bifurcated ventilator system, paucity of floor features
Site layout	Formal, northwest-southeast orientation	Informal
Settlements	Often aggregated	Often dispersed
Enclosures	Present	Present

Additionally, analysis of the presence and distribution of nonmetric skeletal traits might provide complementary information relating to cultural origins through the assessment of biological distance. Primary nonmetrics under observation in this study would be cranial sutural bones, proliferative ossifications (hyperostotic traits), and ossification failure (hypostotic traits) (Buikstra and Ubelaker 1994). It is accepted that such traits are inherited and often population-specific in humans and other species, and the differential distribution of such traits in individuals across habitation sites constitutes strong evidence of the existence of discrete genetic groups.

Incidence of dental opacities would also be evaluated with respect to cultural origins. Martin and Goodman (1995) found that skeletal material recovered from previous excavations in Ridges Basin exhibited high frequencies of dental opacities. These defects were not clearly related to any physiological stress or deficiency, but rather were likely caused by “high fluoride intake or an unusual pattern of intake of other trace minerals, which affected the calcification of enamel hydroxyapatite” (Martin and Goodman 1995:17). The formation of opacities is thus tied to the consumption of minerals that may be differentially present in various natural environments or it may have a genetic component, or both. A group of individuals with a high frequency of dental opacities may have resided in the same environment during the process of dental development. Thus, tracing the distribution of opacities across communities in Ridges Basin might provide information about the composition, movement, and relatedness of people residing in this area. With the methods described above, SWCA hoped to measure genetic or isotope variation in individuals to address questions of cultural diversity and origins in Ridges Basin.

Certain learned cultural practices also vary across different Pueblo groups, and some of these practices leave observable signatures on the skeleton. For example, traditional sitting or squatting postures are often different across cultural groups and lead to skeletal modification of leg and foot bones. Sitting and squatting postures involve varying degrees of ankle flexion, including dorsiflexion, hyperdorsiflexion, and plantar flexion. Habitual dorsiflexion of the ankle produces distinctive facets on the anterior surface of the distal tibia from pressure at the articulation with the talus (Merbs 1983). In contrast, sitting postures involving hyperdorsiflexion involve flexion of the toes as well as the ankle, putting pressure on the metatarsal-phalangeal joints (Ubelaker 1979). Such pressure can result in an expansion of the distal articular surfaces of the metatarsals involving the superior surface, “forming a flat facet that may extend into a ridge connecting the lateral tubercles” (Ubelaker 1979:74). The articular surface of the first metatarsal appears to be particularly sensitive to hyperdorsiflexion (Molleson 1994). Investigating the distribution of skeletal signatures of different sitting postures across sites and site clusters in Ridges Basin and on Blue Mesa might signal the existence of discrete groups of people engaging in different learned cultural practices.

Osteological analyses of human burials in the prehispanic Southwest indicate that cranial deformation resulting from the cultural practice of cradleboarding first occurred during the Pueblo I period (Brew 1946). Across the Southwest, communities adopted and engaged in this practice differentially, and different methods of cradleboarding left specific cranial signatures. It is possible that cultural variation relating to this practice existed among the Ridges Basin and Blue Mesa communities. If so, evidence of different cultural groups might be seen in the presence or absence of cranial deformation. The primary forms of cranial deformation in the prehistoric Southwest involved lambdoidal or occipital flattening, although frontal flattening occurred, too (Buikstra and Ubelaker 1994). Variation in cradleboarding offers a promising area of investigation for identifying different prehistoric culture groups.

Variations in health profiles among the occupants of different habitation sites can provide information regarding differential access to nutritional resources, exposure to violence, tendency toward disease and infection, and morbidity and mortality. Along these lines, the Ridges Basin skeletal population will be studied for evidence of porotic hyperostosis, systemic infections, stature, dental pathology, osteoarthritis, and trauma.

These data can be combined with evidence such as ceramics, projectile points, and architecture toward the identification of different groups of people. For the ALP project SWCA proposed to use architectural stylistic data to explore the cultural origins of the Ridges Basin area occupants. In the first model the population would be mostly locally derived, with a few immigrant groups influencing the variation in pit structure morphology over time. In the second model the population would be entirely immigrants from different areas. Of course, many possible variations on this second model exist. It is possible, for instance, that the Ridges Basin population consisted primarily of Rosa people (from the east), who were influenced by the Piedra (and potentially other) people, or that they were primarily Rosa people with a few Piedra people living among them. Of particular interest would be the degree of homogeneity or mixing in the stylistic and biological traits of the population within and between settlement clusters, including the large village, Sacred Ridge.

The issue of cultural origins and interaction during the Pueblo I period in the Durango area is not a trivial one. The respective histories of these groups influenced not only how they organized themselves on the landscape but also the groups they interacted with, the nature of those interactions, and, ultimately, where they chose to go when they vacated the area. All of these factors have significant ramifications for early Pueblo population and community dynamics throughout the northern Southwest and into later time periods, such as the Chacoan era. Most likely destinations for the populations leaving the Ridges Basin area would have been the Dolores area to the west and the Fruitland area of northwest New Mexico to the south. Population size in both areas appears have to risen sharply at about A.D. 850 (Fetterman and Honeycutt 2001; Wilshusen 1999b:235). To address this issue, SWCA would attempt to refine the desertion chronology of Ridges Basin and Blue Mesa, assess which cultural affiliation and interaction models best fit the project area data, and refine population estimates for donor and recipient populations.

Chapter 8: Pueblo I Chronology and Population

James M. Potter

One of the overarching goals of the ALP project was to build a chronology for the Pueblo I occupations of Ridges Basin and Blue Mesa. In conjunction with the chronological information, we also wanted to generate momentary population estimates for both areas. To accomplish the chronology, we employed five techniques: radiocarbon dating, tree-ring dating, archaeomagnetic dating, ceramic cross-dating, and stratigraphy. Not surprisingly, the most successful of these techniques was tree-ring dating. Radiocarbon, ceramic, and archaeomagnetic dating (Appendix A) placed the sites and features generally in the Pueblo I period, but due to the coarse-grained nature of these techniques and the short duration of the occupation, they afforded little in the way of chronological refinement. Stratigraphic super-positioning was also limited by the short-term, single-component nature of most sites. The Sacred Ridge site (5LP245) in Ridges Basin and 5LP2026 on Blue Mesa were the only sites where this technique proved useful, and it was used solely for the relative positioning of features and deposits within sites (see Chapter 11, The Settlement Cluster).

GENERAL CHRONOLOGY FOR THE PROJECT AREA

Radiocarbon and tree-ring dates provided the most comprehensive chronological datasets for Pueblo I sites in the project area. Although many of the dates fell before A.D. 750, which marks the somewhat artificial division between the Basketmaker III and Pueblo I periods (see Chapter 6, Pueblo I Research in the Northern Southwest), all sites that generally date to the eighth century A.D. and that contain Pueblo I ceramics are considered Pueblo I sites. The reasons for choosing this terminology were twofold: It vastly simplified the labeling of sites to time period, and it acknowledged the coarse-grained nature of the dating techniques used, including tree-ring analysis, which primarily resulted in non-cutting dates (91%). Moreover, as will be demonstrated below, most of the tree-ring dates from Pueblo I habitation sites, including non-cutting dates, actually postdate A.D. 750.

Radiocarbon Dates

Radiocarbon dates were recovered from 10 Pueblo I sites (Table 8.1). Eight of these were habitation sites with pit structures; even without chronometric dates they were clearly of the Pueblo I period. Two sites (5LP171 and 5LP498) were limited activity sites with Pueblo I ceramics; they may indeed be Pueblo I in date, but early radiocarbon dates recovered from them calls this interpretation into question (see Table 8.1). Because of this ambiguity, 5LP171 and 5LP498 are excluded from further consideration in this analysis of the Pueblo I chronology in this area. Figure 8.1 plots the upper and lower boundaries of the 2-sigma dendrocalibrated date ranges for samples collected from the eight habitation sites. The median values for these ranges are A.D. 660 and 870 (see Figure 8.1), meaning that the majority of dates falls within this interval and more than likely actually falls within the eighth and early ninth centuries.

Table 8.1. Radiocarbon Analysis Results for Samples Recovered from Pueblo I Habitation Sites by SWCA and Analyzed by Beta Analytic Inc.

Site Number	SWCA Sample Number	Analyst Sample Number	Conventional Radiocarbon Age B.P.	2-sigma Dendrocalibrated Date Range	Analysis	13C/12C Ratio (o/oo)	Quality
5LP171	5LP0171-20-1	Beta-212088	1890±60	B.C. 10–A.D. 250	Extended count	-22.9	Wood charcoal
5LP177	5LP177-PD111-1-7	Beta-202515	1230±40	A.D. 690–890	AMS	-10.1	Maize
	5LP177-PD111-1-8	Beta-202516	1240±40	A.D. 680–890	AMS	-10.9	Maize
	5LP177-PD94-5-1	Beta-226299	1520±40	A.D. 430–620	AMS	NA	Wood charcoal
	5LP177-PD209-1-6	Beta-226300	1150±40	A.D. 780–980	AMS	-10.8	Wood charcoal
	5LP177-PD216-1-5	Beta-226301	1360±40	A.D. 620–690	AMS	-12.1	Wood charcoal
5LP178	5LP178-PD21-2	Beta-175853	1290±40	A.D. 660–790	AMS	-23.3	Wood charcoal
	5LP178-PD24-1	Beta-175854	1110±70	A.D. 770–1030	Standard	-25.0*	Wood charcoal
	5LP178-PD24-3	Beta-175855	1390±120	A.D. 420–890	Extended count	-25.0*	Wood charcoal
	5LP178-PD49-5-2	Beta-226302	1260±40	A.D. 660–880	AMS	-11.7	Wood charcoal
5LP185	5LP185-PD227-1-4	Beta-202517	1400±40	A.D.600–680	AMS	-11.9	Maize
	5LP185-PD257-1-6	Beta-202518	1310±40	A.D.650–780	AMS	-11.1	Maize
	5LP185-PD268-1-2	Beta-202519	1270±40	A.D.670–870	AMS	-11.0	Maize
	5LP185-PD277-1-4	Beta-202520	1300±40	A.D.660–790	AMS	-11.1	Maize
5LP186	5LP186-PD44	Beta-197180	1260±40	A.D. 670–880	AMS	-11.0	Wood charcoal
5LP239	5LP239-PD57-2-2	Beta-202521	1230±40	A.D.690–890	AMS	-10.2	Maize
	5LP239-PD75-2-3	Beta-202522	1270±40	A.D.670–870	AMS	-10.9	Maize
	5LP239-PD84-3-5	Beta-226303	1220±40	A.D.680–890	AMS	-10.2	Wood charcoal
5LP240	5LP240-PD116-1-2	Beta-202523	1300±50	A.D.650–810	AMS	-10.6	Maize
	5LP240-PD62-1-3	Beta-226304	1270±40	A.D.660–870	AMS	-10.8	Wood charcoal
	5LP240-PD91-3-3	Beta-226305	1220±40	A.D.680–890	AMS	-13.6	Wood charcoal
5LP242	5LP242-PD48-1-7	Beta-226306	1240±40	A.D. 660–780	AMS	-21.7	Wood charcoal
	5LP242-PD53-14-5	Beta-226307	1340±40	A.D. 640–770	AMS	-17.1	Wood charcoal
	5LP242-PD64-1-5	Beta-226308	1300±40	A.D. 650–780	AMS	-10.4	Wood charcoal
	5LP242-PD68-4-5	Beta-226309	1390±40	A.D. 600–680	AMS	-10.9	Wood charcoal
	5LP242-PD90-1-2	Beta-226310	1430±40	A.D. 560–660	AMS	-9.4	Wood charcoal
5LP245 (Sacred Ridge)	5LP245-PD39	Beta-197184	1240±40	A.D. 680–890	AMS	-10.9	Wood charcoal
	5LP245-PD45	Beta-197185	1440±40	A.D. 550–660	AMS	NA	Wood charcoal
	5LP245-PD135	Beta-197186	1250±40	A.D. 680–880	AMS	-10.4	Wood charcoal
	5LP245-PD143	Beta-197187	1310±40	A.D. 650–780	AMS	-11.3	Wood charcoal
	5LP245-PD145	Beta-197188	1320±40	A.D. 650–780	AMS	-12.0	Wood charcoal
	5LP245-PD174	Beta-197189	1330±40	A.D. 650–770	AMS	-11.4	Wood charcoal
	5LP245-PD181	Beta-197190	1260±40	A.D. 670–880	AMS	-12.0	Wood charcoal
	5LP245-PD203	Beta-197191	1250±40	A.D. 680–880	AMS	-11.9	Wood charcoal
5LP498	5LP498-11-3	Beta-212089	1520±70	A.D. 400–660	Standard	-22.8	Wood charcoal
	5LP498-55-1	Beta-212090	1480±40	A.D. 530–650	AMS	-23.6	Wood charcoal

Note: 5LP171 and 5LP498 are limited activity sites and were excluded from further chronological analysis in this chapter.
* Estimated

The five earliest dates derive from wood charcoal and may represent the use of old wood, that is, interior rings of an old tree may have skewed the date to be too early (see Figure 8.1). One early date (2-sigma calibrated date range of A.D. 600–680), however, derived from an annual recovered from 5LP185 (Case 5 in Figure 8.1). This date corresponds with early tree-ring dates recovered from the site, as well (Table 8.2). Site 5LP185 appears to have had an early habitation component that was occupied in the late seventh or early eighth century. At some point in the mid eighth century, the site was vacated and thereafter used as a cemetery (Potter 2008).

Tree-ring Dates

SWCA recovered 81 tree-ring dates from 15 Pueblo I habitation sites (see Table 8.2). Seven of these dates are cutting or near cutting dates: A.D. 808, 808, and 808 from 5LP244; A.D. 729, 802, and 803 from the Sacred Ridge site; and A.D. 788 from 5LP2026 (see Table 8.2). Due to the small number of cutting dates recovered from Ridges Basin, all comparisons within the basin include non-cutting dates. The limited utility of non-cutting dates is acknowledged here, but since only three sites in the project area produced cutting or near-cutting dates, even broad temporal comparisons within the project area were not possible without non-cutting dates. Comparisons between Ridges Basin and other areas near Durango, however, are based on only cutting and near-cutting dates (i.e., “r,” “v,” and “B” dates, see Table 8.2 note).

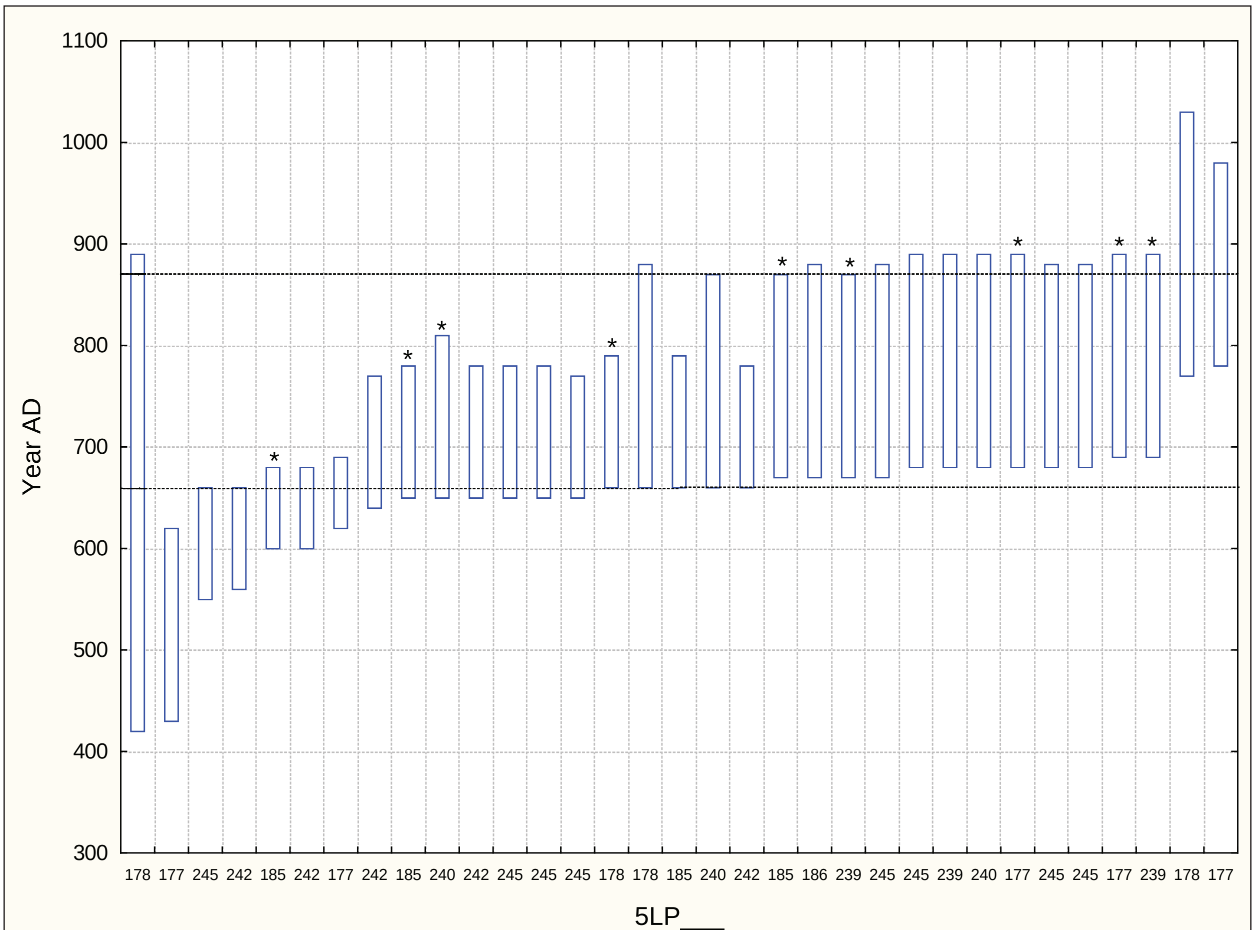

Figure 8.1. Range plot of radiocarbon dates from Pueblo I sites, upper and lower boundaries for 2-sigma range (from Table 8.1; excludes the dates recovered from limited activity sites 5LP171 and 5LP498). Dashed lines indicate the median for upper and lower 2-sigma values. Annuals marked with *.

Table 8.2. Dendrochronological Dates Recovered from Pueblo I Sites by SWCA and Analyzed by the University of Arizona Laboratory of Tree-ring Research

Site Number	Tree-ring Laboratory Number	Provenience	Wood Type	Inside Dates A.D.	Outside Dates A.D.
5LP174	ALP-11	Feature 1 pit structure, roof fall	juniper	571	649vv
	ALP-12	Feature 1 pit structure, roof fall	juniper	569	669vv
	ALP-14	Feature 2 pit structure, fill	ponderosa pine	565	678 ++vv
	ALP-13	Feature 2 pit structure, fill	juniper	477	543+vv
	ALP-16	Feature 2 pit structure, NW 1/4, feature fill	piñon	519	617+vv
	ALP-15	Feature 2 pit structure, SW 1/4, feature fill	juniper	536	730vv
5LP177	ALP-75	Feature 4 surface room, feature fill	ponderosa pine	553	606vv
	ALP-53	Feature 4 surface room, feature fill	ponderosa pine	482	574vv
	ALP-58	Feature 4 surface room, NE 1/4, roof fall	ponderosa pine	453	603+vv
	ALP-55	Subfeature 27.01 post hole, feature fill	ponderosa pine	574	619vv
	ALP-62	Feature 28 surface room, roof fall	juniper	571	642vv
	ALP-52	Subfeature 28.02 post hole, feature fill	ponderosa pine	444	533vv
5LP185	ALP-76	Feature 5 pit, feature fill	ponderosa pine	534	636+vv
	ALP-75	Feature 88 post hole, feature fill	ponderosa pine	613	685vv
5LP187	ALP-85	Feature 9 pit structure, feature fill	ponderosa pine	602	691vv
	ALP-78	Subfeature 9.14 post hole, feature fill	juniper	576	754vv
	ALP-92	Subfeature 1.02 stringer posts, feature fill	juniper	586	726vv
	ALP-97	Feature 1 pit structure, SW 1/4, floor fill	ponderosa pine	719p	759vv
	ALP-84	Subfeature 1.36 post hole, feature fill	juniper	355	585++vv
	ALP-80	Subfeature 1.36 post hole, feature fill	juniper	400	511vv
	ALP-88	Subfeature 1.4 post hole, N 1/2, feature fill	ponderosa pine	464	527vv
	ALP-82	Feature 9 pit structure, feature fill	ponderosa pine	737	760vv
	ALP-83	Feature 9 pit structure, feature fill	juniper	538	683vv
	ALP-90	Feature 9 pit structure, feature fill	ponderosa pine	676	755+vv
	ALP-79	Feature 9 pit structure SW 1/4, floor fill	ponderosa pine	611p	726vv
	ALP-77	Feature 9 pit structure, feature fill	ponderosa pine	611	726vv
	ALP-91	Feature 9 pit structure, floor contact	ponderosa pine	731	777vv
5LP236	ALP-17	Feature 3 pit structure, E 1/2, Fill	ponderosa pine	723	794++vv
	ALP-18	Subfeature 3.32 post hole, feature fill	juniper	538	684vv
	ALP-19	Subfeature 3.33 post hole, feature fill	juniper	643	720vv
	ALP-20	Subfeature 3.01 bench, surface contact	ponderosa pine	732	767vv
	ALP-21	Subfeature 3.01 bench, surface contact	ponderosa pine	738	764vv
5LP237	ALP-109	Subfeature 1.01 post hole, feature fill	ponderosa pine	572	632vv
	ALP-110	Feature 2 pit structure, SE 1/4,floor fill	ponderosa pine	727p	761vv
	ALP-108	Subfeature 2.03 post hole, feature fill	ponderosa pine	497p	601vv
5LP240	ALP-93	Subfeature 1.05 post hole, feature fill	juniper	458p	607vv
5LP241	ALP-51	Feature 6 pit structure, W 1/4, floor fill	ponderosa pine	734	778vv
	ALP-50	Feature 6 pit structure, E 1/4, floor fill	ponderosa pine	727	767vv
5LP242	ALP-02	Subfeature 1.06 post hole, feature fill	juniper	532	652++vv
	ALP-03	Excavation Unit 21, fill	juniper	583	643vv
	ALP-04	Excavation Unit 21, fill	ponderosa pine	570	618+vv
	ALP-01	Feature 1 pit structure, feature fill	ponderosa pine	679	731+vv
5LP244	ALP-120	Feature 15 pit structure, floor contact	ponderosa pine	734p	**808+v**
	ALP-119	Feature 15 pit structure, floor contact	ponderosa pine	740p	809+vv
	ALP-123	Feature 15 pit structure, floor contact	ponderosa pine	736	809+vv
	ALP-122	Feature 15 pit structure, floor contact	ponderosa pine	733±	809+vv
	ALP124	Feature 15 pit structure, floor contact	ponderosa pine	743p	809+vv
	ALP-118	Feature 15 pit structure, roof fall	ponderosa pine	727±	808vv
	ALP-113	Feature 15 pit structure, roof fall	ponderosa pine	726	789vv
	ALP-117	Feature 15 pit structure, roof fall	ponderosa pine	723p	787vv
	ALP-114	Feature 15 pit structure, roof fall	ponderosa pine	721p	**808v**
	ALP-116	Feature 15 pit structure, roof fall	ponderosa pine	728p	773vv
	ALP-121	Feature 15 pit structure, roof fall	ponderosa pine	732p	**808+r**

Table 8.2. Dendrochronological Dates Recovered from Pueblo I Sites by SWCA and Analyzed by the University of Arizona Laboratory of Tree-ring Research (continued)

Site Number	Tree-ring Laboratory Number	Provenience	Wood Type	Inside Dates A.D.	Outside Dates A.D.
5LP245 (Sacred Ridge)	ALP-46	Feature 19 pit structure, W 1/2,feature fill	ponderosa pine	619	673vv
	ALP-49	Subfeature 32.05 bell-shaped pit, feature fill	Douglas fir	160±	269vv
	ALP-36	Feature 41 pit structure, roof wall fall	ponderosa pine	714	782vv
	ALP-38	Feature 41 pit structure, roof/wall fall	juniper	578±p	**729++B**
	ALP-22	Subfeature 79.06 post hole, feature fill	juniper	566	685vv
	ALP-23	Feature 83 pit structure, roof/wall fall	ponderosa pine	706p	787vv
	ALP-28	Feature 83 pit structure, roof/wall fall	ponderosa pine	748p	798vv
	ALP-27	Feature 83 pit structure, roof/wall fall	ponderosa pine	746	**802r**
	ALP-33	Subfeature 83.15 stringer posts, feature fill	juniper	683p	**803B**
	ALP-39	Feature 117 pit structure, roof fall	juniper	686	746+vv
5LP246	ALP-42	Feature 2 pit structure, floor contact	ponderosa pine	726p	790vv
	ALP-44	Feature 2 pit structure, feature fill	ponderosa pine	544	607vv
	ALP-43	Feature 2 pit structure, feature fill	ponderosa pine	733	790vv
	ALP-41	Subfeature 2.03 post hole, feature fill	juniper	603±	767vv
	ALP-39	Subfeature 2.05 post hole, feature fill	juniper	489	746vv
	ALP-40	Subfeature 2.15 post hole, feature fill	juniper	644	765vv
5LP511	ALP-104	Feature 1 pit structure, feature fill	juniper	651p	776vv
	ALP-103	Feature 1 pit structure, floor fill	ponderosa pine	707	774vv
5LP536	ALP-97	Feature 3 surface room, floor contact	ponderosa pine	712	759vv
	ALP-95	Subfeature 3.02 post hole, feature fill	juniper	547	763vv
	ALP-96	Subfeature 8.03 post hole, feature fill	ponderosa pine	546	620+vv
5LP2026	ALP-07	Feature 3 pit structure, roof fall	juniper	683	781++vv
	ALP-10	Subfeature 4.23 post hole, feature fill	ponderosa pine	703	807vv
	ALP-08	Feature 3 pit structure, roof fall	ponderosa pine	728	790+vv
	ALP-09	Feature 3 pit structure, roof fall	ponderosa pine	725	792vv
	ALP-06	Feature 3 pit structure, roof fall	ponderosa pine	728	801+vv
	ALP-101	Feature 3 pit structure, roof fall	juniper	676p	**788+v**
	ALP-99	Feature 3 pit structure, roof fall	ponderosa pine	699p	774+vv

Notes:

Cutting and near-cutting dates bolded and shaded.

Symbols used with inside (innermost ring) date:

p = Pith ring present.

±p = Pith ring present; but due to the difficult nature of the ring series near the center of the sample, an exact date cannot be assigned to it.

± = The innermost ring is not the pith ring and an absolute date cannot be assigned to it. A ring count is used to estimate the date.

Symbols used with outside (outermost ring) date:

B = Bark present.

r = Less than a full section is present, but the outermost ring is continuous around available circumference.

v = A subjective judgment that the date is within a very few years of being a cutting date

vv = Due to the absence of attributes diagnostic of a true exterior surface on the sample, the outermost ring may not be the last ring grown by the tree. There is no way of estimating how many rings, if any, have been removed from the outside of the sample.

+ = One or more rings may be missing near the end of the ring series whose presence or absence cannot be determined because the ring series does not extend far enough to provide an adequate check.

++ = A ring count is necessary because beyond a certain year the ring series cannot be dated.

Figure 8.2 plots, in 20-year intervals, all tree-ring dates (including non-cutting dates) recovered from Pueblo I sites. One very early date, A.D. 269, was recovered from Sacred Ridge. This sample was recovered from a feature on top of the knoll of Sacred Ridge and was clearly associated with a Pueblo I component. It is thus interpreted as a reused timber perhaps originally used in the construction of a nearby Basketmaker II house. All other dates are after A.D. 500.

The tree-ring data recovered by SWCA suggest two or three possible spikes in tree harvesting, which likely correspond to widespread construction events in the project area. Although these spikes mark times of tree cutting, they additionally represent periods of significant building construction because many, if not all, of the samples came from collapsed structural contexts. The first spike appears between A.D. 600 and 620 (see Figure 8.2). It is unclear how real this pattern is, though, because none of the samples dating to this interval yielded cutting dates; the true harvesting dates of some or all of these timbers may have been much later. The next moderate increase in construction activity began in the A.D. 720s and continued to the mid 700s. The earliest cutting date in the assemblage (729) dates to this period, and was recovered from Sacred Ridge. After A.D. 750, construction increased dramatically, continuing to at least 809. Of all tree-ring dates recovered by SWCA, 51 percent (41 of 81) postdate 750. After 809, construction ceased altogether in Ridges Basin. Based on dates recovered by Woods Canyon Archaeological Consultants for an earlier project in the area (Horn et al. 2003a and 2003b), there was some additional construction on Blue Mesa into the A.D. 830s, but this appears limited in scope, perhaps involving only one or two sites (see below).

TEMPORAL VARIATION WITHIN THE PROJECT AREA

This section details the chronological information presented above and describes analysis of possible temporal variation within the project area. For this analysis the sites are grouped into five settlement clusters (Figure 8.3) based on the spatial proximity of habitation sites. The Sacred Ridge Cluster is composed of a single large site—the Sacred Ridge site—containing 22 pit structures. The other settlement clusters are less tightly aggregated, and some are rather arbitrarily bounded (e.g., the Western and North-central clusters). Blue Mesa is considered one large settlement cluster (Chuipka and Potter 2007a).

Tree-ring Dates

Figure 8.4 plots the median tree-ring dates for each cluster, as well as the distribution around that median (as box and whisker plots). According to these data, the Eastern and North-central clusters exhibit the greatest time depth and the fewest post–A.D. 750 dates. Sacred Ridge also appears to have had a relatively long occupation span, beginning in the early A.D. 700s and continuing until the early 800s. (The chronology of Sacred Ridge is addressed in more detail in Chapter 11). The Western Cluster and Blue Mesa had both the shortest spans of occupation and the latest dates. It should be noted that in this graph Blue Mesa is represented by a single site (5LP2026).

When only the latest date from each site is plotted, the Eastern Cluster again stands out as the earliest of the settlement clusters (Figure 8.5). Four of five sites in the Eastern Cluster appear to have been occupied prior to A.D. 750, although none of these dates are cutting dates and thus the actual construction dates may have been later than they appear on the plot. With the exception of 5LP185, all of the other sites have at least one feature that dates after A.D. 750 (see Figure 8.5). Again, the latest dates are associated with the Western Cluster, Sacred Ridge (which is also in the western part of Ridges Basin), and Blue Mesa. These patterns suggest a contraction of population into the western part of Ridges Basin and onto Blue Mesa in the late A.D. 700s and early 800s.

Ceramic Dating

Although most of the ceramics present in the project area can only be cross-dated to a very general time period, frequencies of two San Juan Red Ware types

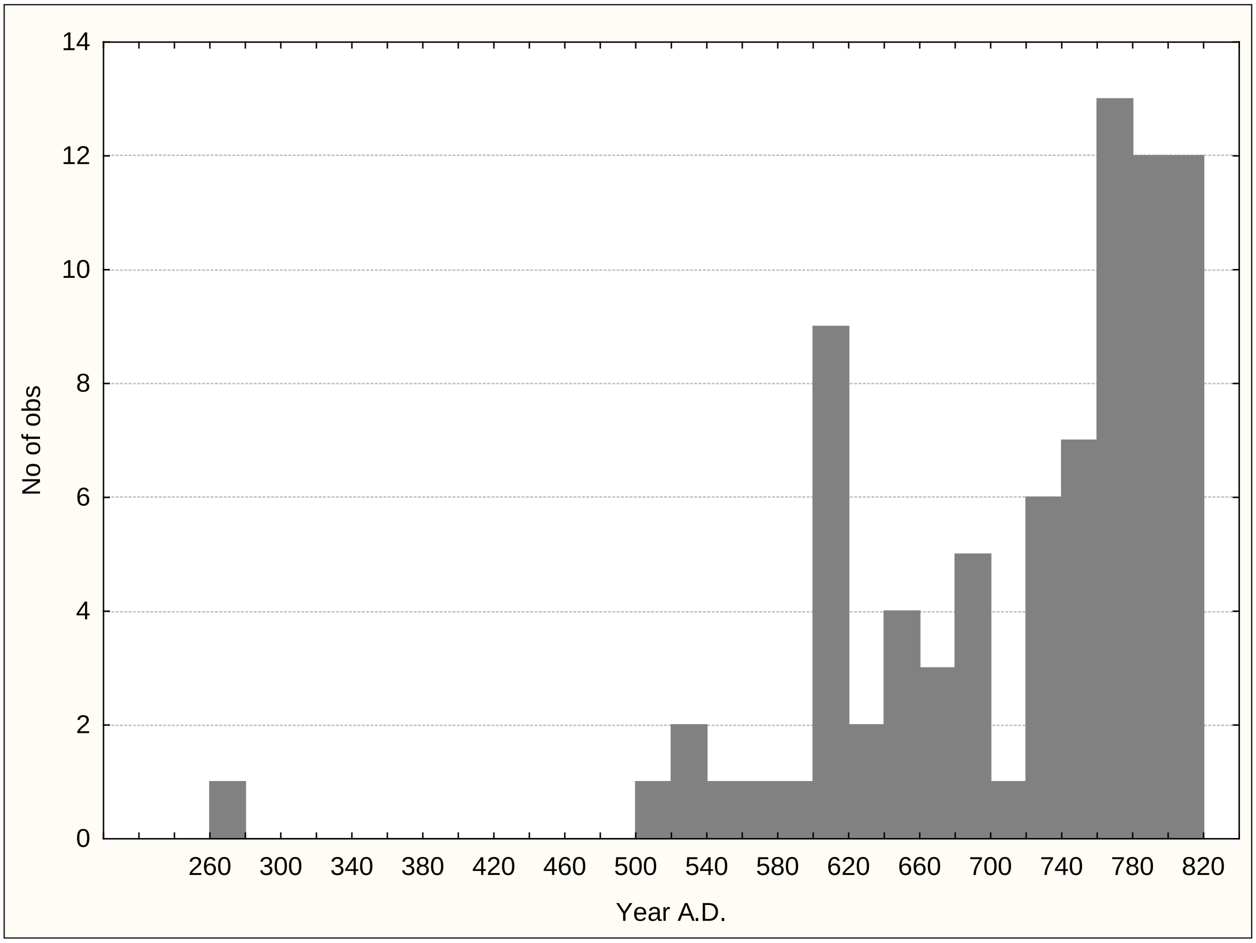

Figure 8.2. Histogram, in 20-year intervals, of all tree-ring dates recovered by SWCA from Pueblo I sites in Ridges Basin and on Blue Mesa.

may inform on temporal variation of habitation sites within the A.D. 750–850 interval. According to Allison (2010:31–32),

> the two San Juan Red Ware types common during the early Pueblo I period are Abajo Red-on-orange and Bluff Black-on-red, which are distinguished primarily by the use of red paint on Abajo and black paint on Bluff. Although the production dates for these types probably overlap by at least several decades, Abajo Red-on-orange production began shortly after A.D. 750, whereas Bluff Black-on-red was not made until around A.D. 780. Both types continued to be made into the A.D. 800s, but Bluff became more common than Abajo by approximately A.D. 800.

The data listed in Table 8.3 and plotted in Figure 8.6 indicate that, in each of the settlement clusters, Bluff Black-on-red was more common than Abajo Red-on-orange, suggesting a post–A.D. 780 date for most site assemblages containing redware sherds. Interestingly, this is also the case for the Eastern Cluster, suggesting that the non-cutting tree-ring dates recovered from the Eastern Cluster are not representative of the majority of its occupation. Indeed, the ratio of Bluff to Abajo in the Eastern Cluster (2.3:1) is comparable to that of the Western Cluster (2.4:1) and is greater than that from Sacred Ridge (1.46:1). The lower ratio from Sacred Ridge may be due to the earlier start date and longer occupation duration of this site (see Chapter 11).

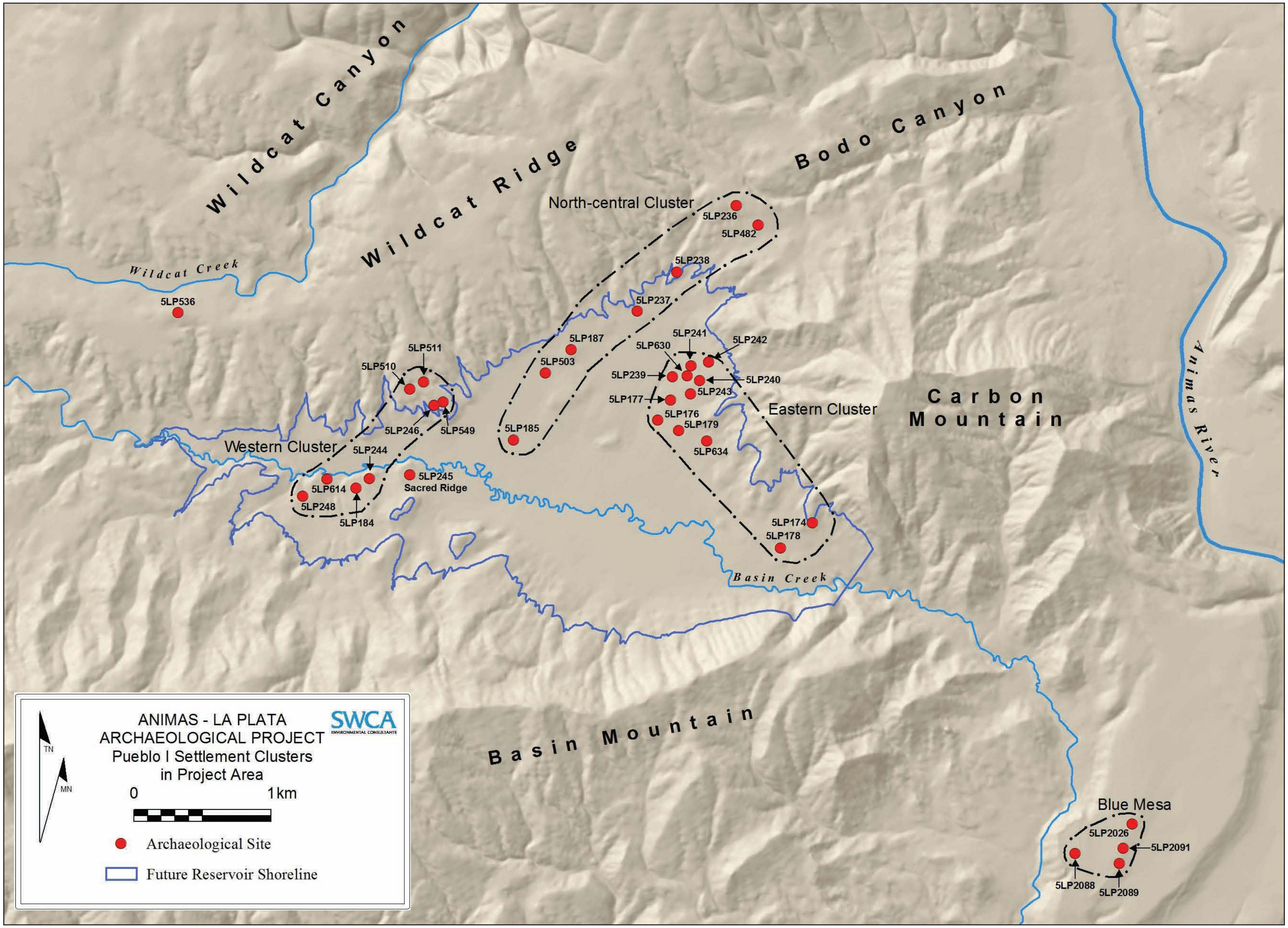

Figure 8.3. Map of Pueblo I settlement clusters in project area. Not all sites represented on this map produced tree-ring samples. Includes only sites excavated by SWCA as part of the ALP project. Site 5LP536 is considered part of the Western Cluster.

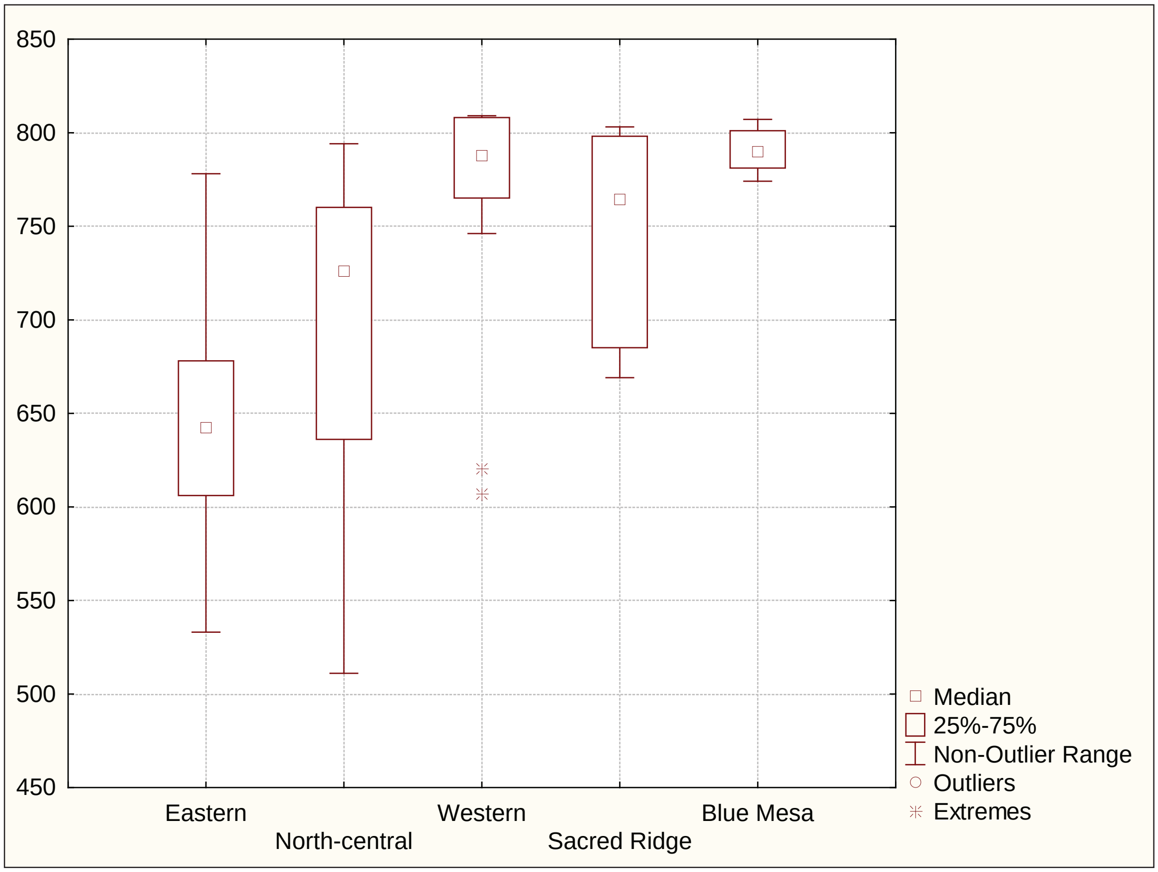

Figure 8.4. Box plots of tree-ring dates by settlement cluster; all tree-ring dates recovered from Pueblo I sites by SWCA. (The A.D. 269 date recovered from Sacred Ridge is excluded from this figure.)

The large number of Bluff Black-on-red sherds recovered from the North-central Cluster is due to the high frequency of this type at 5LP185 (see Figure 8.6 and Table 8.3). Although the tree-ring dates from this site were recovered from domestic features and indicate a relatively early occupation (see Figure 8.5), most of the redwares from this site were recovered from mortuary contexts (Potter 2010a, 2010b). These chronological data support the argument that the site function changed from a habitation site to a cemetery sometime in the late A.D. 700s (Potter 2008:316).

In this study, Blue Mesa is represented by a single site (5LP2026), and thus the high ratio of Bluff Black-on-red sherds relative to Abajo Red-on-orange sherds may not be representative of the entire mesa (see Figure 8.6). The ceramic pattern does support the tree-ring dates recovered from this site, though (see Table 8.2), and indicates an occupation from the late eighth and early ninth centuries A.D.

CHRONOLOGICAL COMPARISONS OF THE PROJECT AREA WITH OTHER LOCALES IN THE DURANGO AREA

Occupation in Ridges Basin and on Blue Mesa appears to have persisted slightly later than in other areas of the Durango area (Figure 8.7). Bodo Canyon (adjacent to Ridges Basin), Durango South (the modern Bodo Park area along the Animas River, south of the town of Durango) and Hidden Valley (along the Animas River, north of Durango), were occupied in the mid eighth century A.D. until about 775, a time that coincides with an increase in tree harvesting and construction in Ridges Basin and on Blue Mesa (see Figure 8.2). It should be noted that although Blue Mesa appears to have been occupied slightly later than Ridges Basin, based on cutting dates there is considerable overlap (see Figure 8.7).

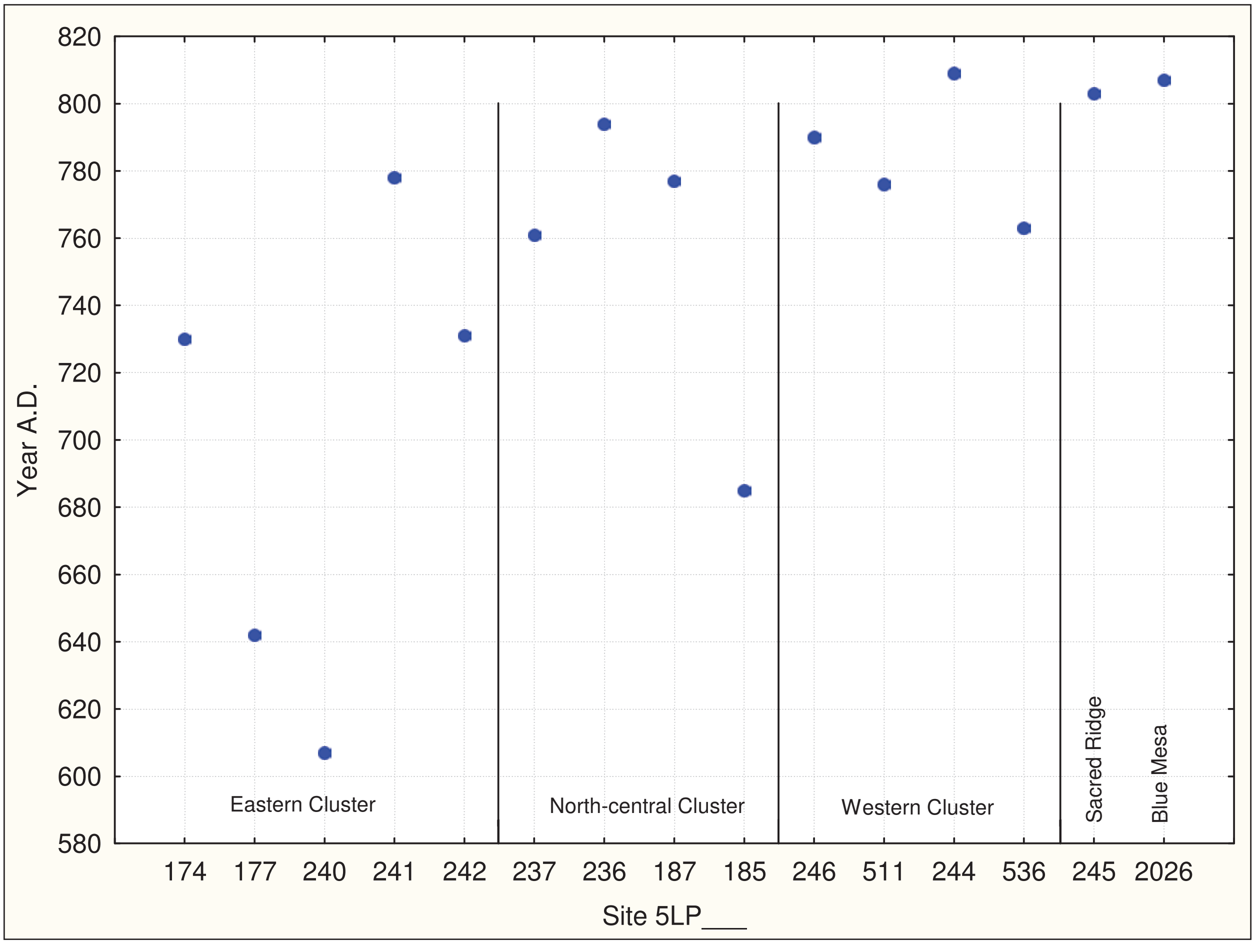

Figure 8.5. Plot of latest tree-ring date recovered by SWCA from each Pueblo I site, arranged by settlement cluster.

MOMENTARY POPULATION ESTIMATES

SWCA interprets the pit structure as the defining structure of a single household, and bases population estimates on this assumption. Laslett (1972) noted that, despite differences in household structure and rules of residence and inheritance, average household size worldwide has been relatively constant over time and space, ranging from 4.2 to 7.0 individuals. Although large, multifamily households have been noted historically, they are rare. Lightfoot (1994) suggested that the average size of a historic Pueblo household is consistent with these cross-cultural averages, and he concluded that the Pueblo I household consisted of five to eight individuals. He also suggested that if very large households did exist during the Pueblo I period, they would have been outliers and their size would have been offset by the more numerous smaller households, bringing the average back to the cross-cultural average (Lightfoot 1994:148). It seems reasonable, then, to use the pit structure as an estimate of a household ranging in size from five to eight individuals. The range in numbers of individuals derives in part from the fact that individuals may have been members of more than one household, and thus the larger number per household (eight) may, in fact, be a high estimate (Schlanger 1987:580).

Another common way to calculate estimated population based on architecture is to use roofed area as a measure. As Lightfoot (1994:149) notes, Brown (1987) documents a cross-cultural average of 6.2 m^2 of roofed area per person, whereas Dohm (1990:Table 3) estimates an average of 17.0 m^2 of roofed space per person in 22

Table 8.3. Counts of Abajo Red-on-orange and Bluff Black-on-red Sherds by Site

Cluster	Site Number	Abajo Red-on-orange	Bluff Black-on-red
Eastern	5LP176	5	10
	5LP177	2	5
	5LP239	6	13
	5LP240	2	13
	5LP241	0	5
	5LP243	0	1
	5LP634	1	6
North-central	5LP236	1	3
	5LP237	0	1
	5LP238	0	1
	5LP187	4	0
	5LP185	18	151
	5LP503	0	1
Western	5LP246	2	0
	5LP511	1	4
	5LP536	2	0
	5LP184	4	6
	5LP244	1	13
Sacred Ridge	5LP245	24	35
Blue Mesa	5LP2026	6	64

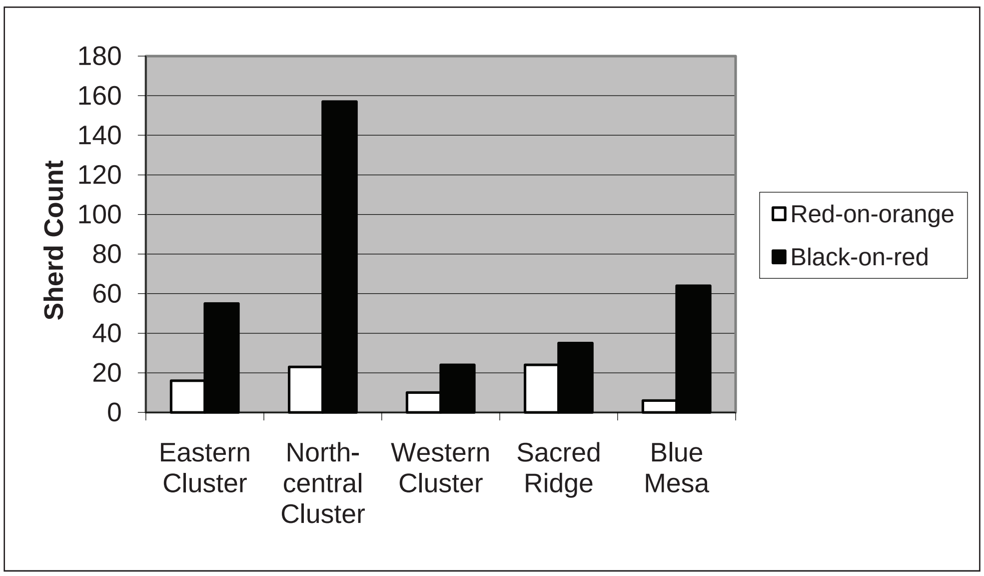

Figure 8.6. Frequencies of Abajo Red-on-orange and Bluff Black-on-red sherds by settlement cluster.

modern Pueblo villages and 9.7 m^2 of roofed space per person for nineteenth- and twentieth-century Navajo settlements. Lightfoot (1994:149) suggests that an amount of roofed space per person for Pueblo I settlement would fall somewhere between the modern Pueblo and Navajo estimates.

Unfortunately, using roofed living area in the ALP project area was hampered by the poor preservation of surface rooms, which probably mostly functioned as storage facilities but may also have been seasonal living rooms in some cases. Calculating roofed space per person based solely on pit structure area and not including surface rooms may have resulted in an underestimation of population. For this reason, the numbers of pit houses was the preferred unit used in this analysis.

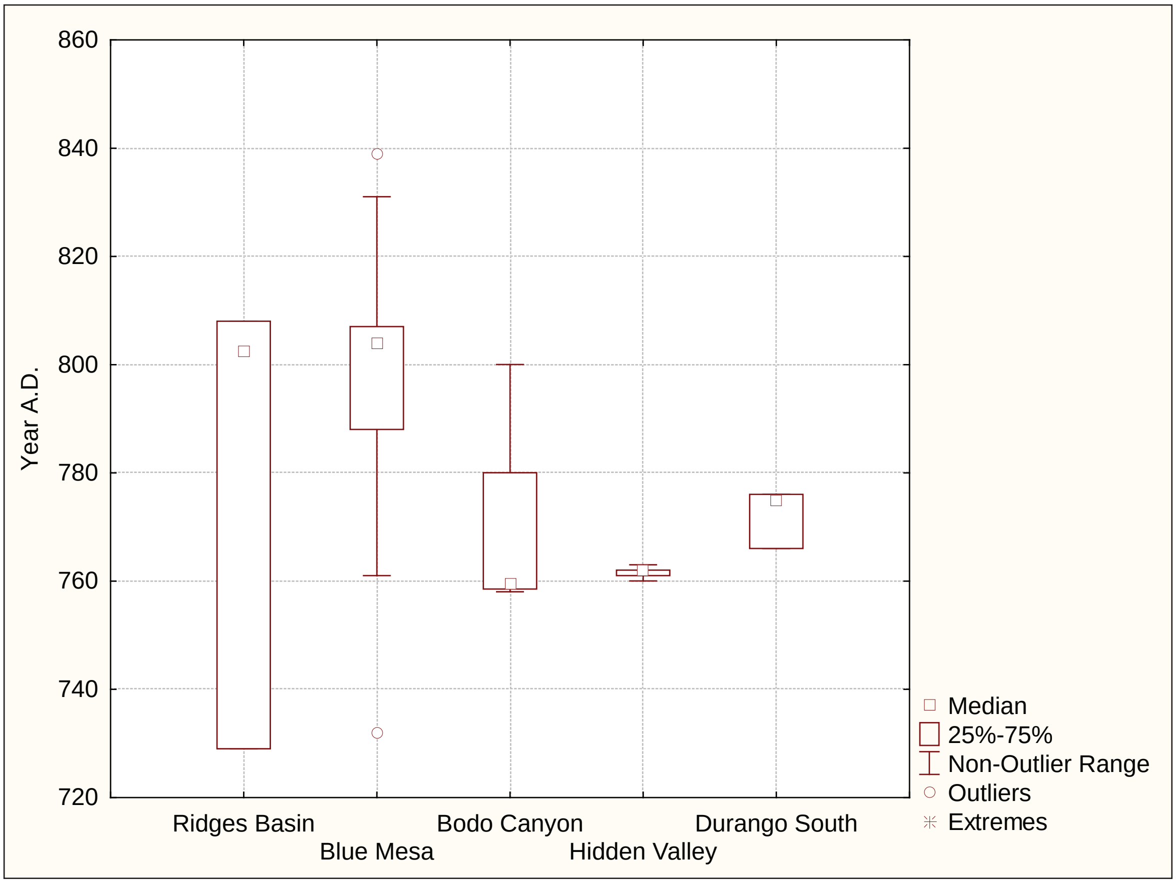

Figure 8.7. Box plots of cutting and near-cutting dates by area within the Durango area. Ridges Basin includes all cutting and near-cutting dates recovered in Ridges Basin by SWCA (see Table 8.2). Blue Mesa includes all cutting and near-cutting dates recovered from 5LP2026 by SWCA (see Table 8.2) and those recovered from 5LP378 and 5LP379 by Woods Canyon Archaeological Consultants (Chuipka and Potter 2007b:219). Bodo Canyon dates derive from 5LP481 and 5LP483 (Fuller 1988a:157, 199). Hidden Valley dates are from Ign. 7:23, 7:25, 7:30, 7:31, and 7:36 (Carlson 1963; Dean 1975:37–45). Durango South dates are from 5LP510 (Gooding 1980:22).

Ridges Basin

Based on survey and excavation data, SWCA estimates that there were 111 early Pueblo I pit structures built and occupied in and around Ridges Basin (Figure 8.8; Table 8.4). This estimate includes Bodo Canyon but does not include Pueblo I sites along the Animas River in the area known as Durango South due to a lack of information on many of these sites (see Figure 8.8). Assuming one pit structure represents a single household, and using Lightfoot's estimate of five to eight people per household results in an estimate of 555–888 people living in and around Ridges Basin during the entire early Pueblo I period. This is a higher estimate than would result from calculations based on roofed area. The average roofed area of pit structures in the ALP project area is 29.21 m^2 (Table 8.5), which generates a total population of 523 based on Brown's (1987) estimate and 183–334 based on Dohm's (1990) averages for modern Pueblo and Navajo settlements (see above). For the purposes of this analysis, the higher estimates provided by assuming five to eight people per household (i.e., pit structure) are used rather than roofed area.

Assuming that 75 percent of pit structures in Ridges Basin were occupied between A.D. 760 and 810 (which seems reasonable, given the tree-ring data [see Figure 8.2]) and that pit structures lasted for 15 years (the apparent maximum[1]), it can be calculated that approximately 25 pit structures were occupied at any given time within this 50-year interval, producing a momentary population estimate of 125–200 people. Assuming that all of the pit structures were occupied between A.D. 760 and 810, this would still generate a relatively small momentary population estimate. Again, assuming an average pit structure use-life of 15 years, about 34 pit structures would be occupied at any given time, producing a momentary population estimate of 170–272. Based on the assumptions outlined above, it is thus unlikely that population levels ever exceeded 300 in and around Ridges Basin.

Blue Mesa

Based on the descriptions and maps of sites recorded by previous surveys, along with some excavation data, Chuipka has estimated that the early Pueblo I occupation of Blue Mesa comprised 74 pit structures (Chuipka and Potter 2007b:239). Tree-ring data suggest that all 74 Pueblo I pit structures on Blue Mesa were occupied between A.D. 775 and 820 (see Figure 8.7). Data from multiple-unit habitation sites (5LP2026, 5LP378, 5LP379) excavated on the southern half of the mesa have demonstrated that pit structures in proximity to one another were occupied sequentially, not contemporaneously. Moreover, pit structures at single-unit sites (5LP1380, 5LP2088, 5LP2089, and 5LP2091) were salvaged at desertion, suggesting that the occupants established new houses elsewhere on the mesa. These sites were likely vacated relatively early in the occupation of Blue Mesa (Chuipka and Potter 2007b:242). It thus seems reasonable to assume, as a starting point, that approximately one-third of the structures (n = 25) were occupied at any given time, given a 15-year maximum use-life for structures. Again, Lightfoot's estimate of five to eight people per household would then yield a momentary population range of 125–200. Chuipka and Potter (2007b:243) suggest, however, that as many as half of the pit structures may have been occupied simultaneously during the A.D. 800–820 interval. This would result in a momentary population maximum of 296 (37 pit structures × 8 individuals). Even if there are more than 74 pit structures on Blue Mesa, it is likely that 296 is a high estimate, because it is based on the maximum household size. Therefore, it seems reasonable to conclude that the Blue Mesa population, like that of Ridges Basin, was never substantially over 300 people and was probably smaller.

Chuipka and Potter (2007b:242) suggest that occupation of Blue Mesa occurred in three stages. The first stage, which appears to have begun in the late eighth century A.D., consisted of widely scattered and relatively small pit structures with little or no midden deposits, such as those at 5LP2088, 5LP2089, and 5LP2091. The second stage of occupation is marked by a spike in population between A.D. 780 and 800 that persisted until 820. Pit structures dating to this stage are generally larger and more closely spaced, and have more extensive midden deposits, such as those at 5LP2026 and 5LP379. It is thought that the majority of the habitations on the northern half of the mesa date to this period. The third stage, represented by the fewest households, is the limited reoccupation of the mesa in the A.D. 830s indicated by Pit Structure 1 at 5LP379. The available data suggest that this reoccupation occurred after a hiatus of more than a decade. Only one structure has been identified to this third stage of occupation. As indicated above, Chuipka and Potter estimated that at least half (37 of 74) of the pit structures on Blue Mesa were occupied during the A.D. 800–820 time period and thus were contemporary, producing a peak population estimate of 300 people. As Chuipka and Potter (2007b:243) note, "this is less than half the number estimated by Wilshusen (1999b:225) and is similar to SWCA's estimates for the population of Ridges Basin at A.D. 800, suggesting that the Blue Mesa community was not the dominant community but was comparable in size to the Ridges Basin community at this time."

[1] Cross-cultural data suggest that use-lives of earth-walled structures range from four to 10 years, after which they require substantial rebuilding (Cameron 1991; Schlanger 1987). Schlanger (1987:588) notes that a reasonable use-life for an earth-covered pit structure with wood support posts is between two and 15 years, with a likely average somewhere between six and 12 years. Lightfoot's (1994) work at the Duckfoot site, the best-dated Pueblo I hamlet in the Northern San Juan region, corroborates this range.

Table 8.4. Estimated Number of Pueblo I Pit Structures by Site in Ridges Basin and Bodo Canyon

Site Number	Number of Pit Structures
5LP174	2
5LP176	1
5LP177	2
5LP178	1
5LP179	1
5LP184	3
5LP185	3
5LP187	4
5LP193	1
5LP236	2
5LP237	4
5LP238	1
5LP239	1
5LP240	1
5LP241	1
5LP242	1
5LP243	1
5LP244	2
5LP245	22
5LP246	3
5LP247	3
5LP248	3
5LP478	1
5LP481	1
5LP482	1
5LP483	1
5LP493	2
5LP497	3
5LP503	2
5LP510	1
5LP511	3
5LP513	1
5LP515	1
5LP536	1
5LP538	1
5LP539	1
5LP540	1
5LP544	1
5LP548	1
5LP549	1
5LP589	3
5LP592	2
5LP593	1
5LP599	1
5LP607	1
5LP609	2
5LP614	1
5LP621	1
5LP630	1
5LP631	1
5LP634	2
5LP1100	1
5LP1102	1
5LP1823	4
5LP4227	1
5LP4228	1
Total	**111**

Note: Data provided by the Bureau of Reclamation and updated where possible by SWCA.

Alternate Estimates

Alternate estimates of population have been offered for both Ridges Basin and Blue Mesa that are higher than those calculated above. For Ridges Basin, Bellorado (2007, 2009) derived a momentary population of 195–351 people from A.D. 760 to 810 based on the assumptions that 44 pit structures were simultaneously occupied during this interval and that each pit structure housed five to eight people (see Lightfoot 1994:148). Contrary to the estimates provided above, Bellorado assumes the existence of more than 111 structures in the basin and that pit structures are in use much longer than 15 years. For the interval from A.D. 790 to 810, he estimates a momentary population of 325–520 people. This assumes that more than half of the pit structures in the basin were occupied during the final 20 years of occupation, a pattern that is not supported by the tree-ring data. It should be pointed out that Bellorado's estimates may be purposely high in support of his argument that even with a population of 520 people (the highest of the high estimates), there would not have been a shortage of agricultural land in the basin: "…peak momentary population estimates of 325–520 individuals during the A.D. 790–810 period would have required only 40–104 of the estimated 221 hectares of primary agricultural land in Ridges Basin" (Bellorado 2009:228).

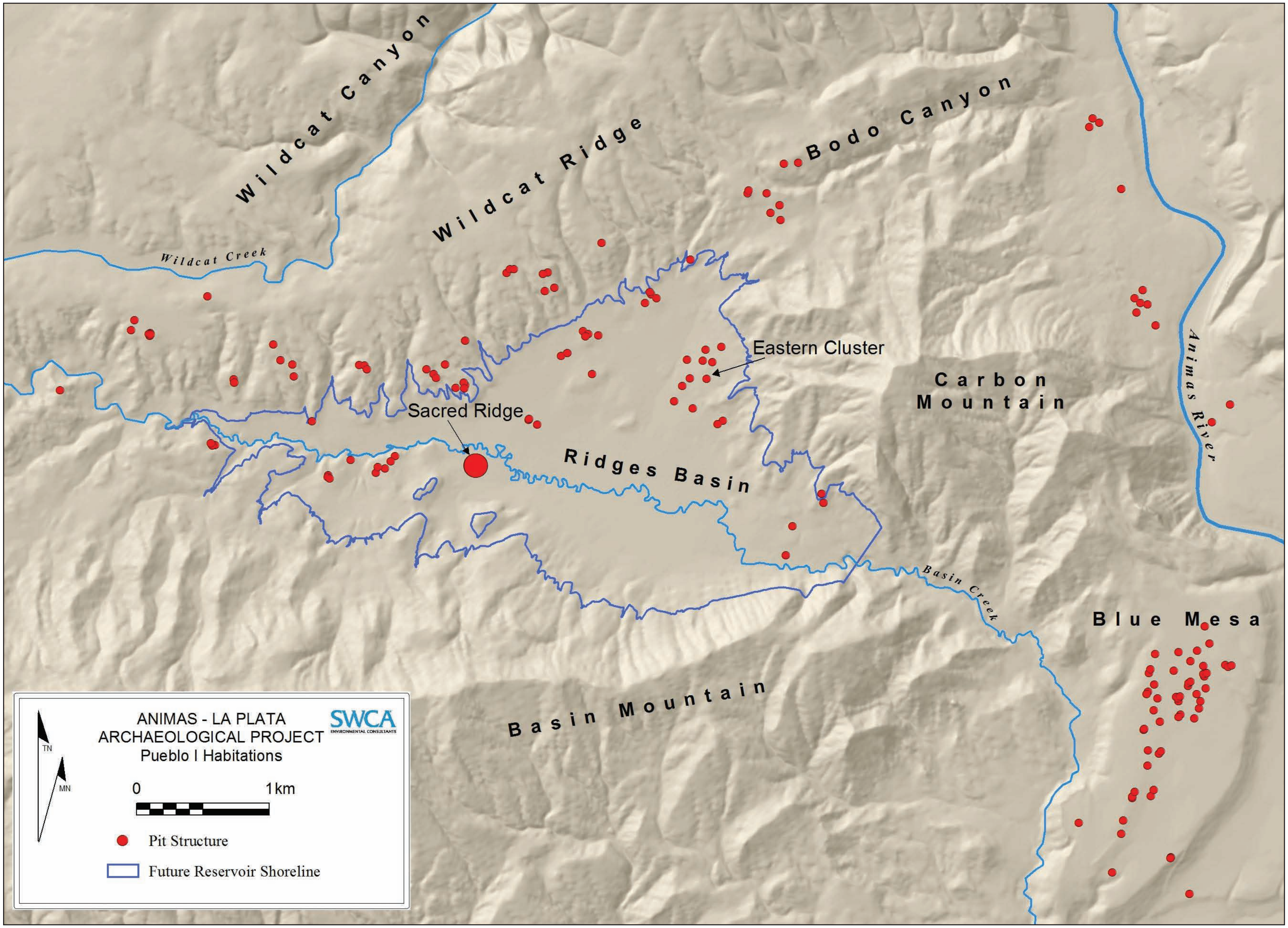

Figure 8.8. Map of the location of Pueblo I habitations in and around the ALP project area. All 22 pit structures at Sacred Ridge are represented by a single large dot; each of the other dots represents an individual pit structure. Includes sites not excavated by SWCA as part of the ALP project.

Table 8.5. Roofed Area (m^2) of a Sample of Completely Excavated Pueblo I Pit Structures in the ALP Project Area

Site Number	Feature Number	Area (m^2)
5LP178	2	8.44
5LP185	3	33.32
5LP187	1	36.54
	9	32.27
5LP188	13	35.25
5LP237	4	14.92
	2	27.18
5LP238	1	37.16
5LP242	1	33.53
5LP244	15	42.74
5LP245	83	38.67
	41	52.66
	49	52.97
	58	47.13
	104	35.52
	133	27.95
	134	34.51
	143	14.84
	117	56.62
	23	26.82
	19	13.81
	62	37.65
5LP246	26	14.85
	2	43.87
5LP503	4	10.53
	1	14.89
	4	25.44
5LP536	1	32.86
5LP549	2	18.55
5LP630	3	18.62
5LP634	2	16.72
5LP2026	2	36.17
	3	33.55
5LP2091	2	15.74
Mean Roofed Area		**29.21**

Wilshusen (1999b:225) used the presence and size of surface room blocks on Blue Mesa to suggest a momentary population of 123 households, or over 600 people. However, based on SWCA's excavations on Blue Mesa, Pueblo I surface rooms may not be accurate indicators of household size and, ultimately, of population size. Early estimates assumed the scatters of burned adobe on the surface were good measures of the size of the houses underneath. Moreover, on the field maps for the Blue Mesa sites, these room blocks appear twice as long as McPhee Village's in total length (personal communication, Richard Wilshusen 2010). Yet, when tested, the Blue Mesa room blocks were shown to be smaller than those at McPhee Village. Surface rooms at 5LP2026 on Blue Mesa, for example, appeared substantial prior to excavation, but they were actually ephemeral, small, and few. The room blocks' larger appearance prior to excavation was partly due to the presence of a cobble enclosure abutting them. This is likely the case for other surface architecture remains on Blue Mesa, as well.

One problem in earlier population estimates is that Blue Mesa was assumed to have been a village composed of households living in room blocks—like McPhee Village—rather than a community of pit structure–centered households. Early settlements east of Mesa Verde, it turns out, are more like the Basketmaker pit house settlements south of the San Juan River. Identifying in Ridges Basin and on Blue Mesa the presence of a pit house community—rather than a pueblo community oriented around room blocks—is one of the remarkable results of this project.

Chapter 9: The Natural Environment

James M. Potter, Karen R. Adams, Kirk C. Anderson, Joshua S. Edwards, and Shawn S. Murray

This chapter summarizes results of the environmental research conducted as part of the ALP project and reported in detail in *Environmental Studies*, Volume X of the ALP project report series (Potter ed. 2008b). For these studies, four types of data were used to characterize the project area's environment during the Pueblo I period: 1) archaeological data, 2) modern environmental data, 3) geomorphic data, and 4) paleoclimate data.

ARCHAEOLOGICAL DATA

Archaeological data about the natural environment consist of the remains of natural resources—faunal and botanical—used by people and preserved in the archaeological record. Archaeofaunal and archaeobotanical data are most useful for reconstructing past environments in conjunction with, or in comparison to, modern frequencies and distributions of plants and animals. For example, the presence of riparian plant and animal species in the ALP project archaeological record but not in modern observations indicates a wetter local environment in the past. Temporal shifts in the proportions of archaeofaunal and archaeobotanical species can inform on patterns of human impact on the local environment, such as over-harvesting of wood, over-hunting of large game, and the clearing of land for agricultural fields. Archaeofaunal and archaeobotanical remains were recovered from well-controlled excavated contexts during the ALP project.

Archaeofaunal Remains

SWCA recovered 17,788 vertebrate faunal specimens from 38 Pueblo I sites in Ridges Basin and 735 specimens from three Pueblo I sites on nearby Blue Mesa (Potter and Edwards 2008). At least 64 animal species were exploited by the Pueblo I people of Ridges Basin and Blue Mesa. All five vertebrate classes—amphibians, birds, fish, mammals, and reptiles—were identified in the assemblage. Mammals are by far the most numerous, composing 81 percent of the total assemblage[1]. Animals represented include deer, elk, bison, badger, black bear, bighorn sheep, bobcat, American marten, mountain lion, raccoon, ringtail, gray wolf, long-tailed weasel, and numerous wild bird species, including waterfowl. The assemblage also contains the remains of domesticated turkey and dog.

Ungulates compose 5.7 percent of the total assemblage. Of the ungulate assemblage, 79 percent are deer and the remaining 21 percent are elk, pronghorn, bison, and bighorn sheep. This is about half the percentage represented in the Dolores Archaeological Program (DAP) assemblages where, for example, the Grass Mesa assemblage contains 10.2 percent ungulates and the McPhee Village assemblage contains 12.8 percent ungulates (Potter 2009). In addition, if antler is excluded (because it can be acquired independently of hunted

[1] The total assemblage includes specimens identifiable to genus as well as unidentifiable remains. All percentages in this section are based on numbers of specimens (i.e., bones). For bones identified to species, this is the NISP (number of identified specimens).

carcasses), ungulate remains make up only about 3 percent of the total ALP project Pueblo I assemblage (Potter and Edwards 2008). Of the 735 bones recovered by SWCA from the three Pueblo I sites on Blue Mesa, 29 are ungulate, which is 3.9 percent of the assemblage and quite similar to the overall assemblage percentage.

Lagomorphs make up 12.4 percent of the total ALP project assemblage, a significantly lower proportion than in DAP assemblages, where the McPhee Village assemblage is 21.0 percent lagomorphs and Grass Mesa assemblage is 15.0 percent lagomorphs (Potter 2009). The ratio of cottontails to jackrabbits, however, is similar in the ALP project and DAP assemblages. The lagomorph index value (Sylvilagus/[Sylvilagus+Lepus]) (Driver and Woiderski 2008) for both the ALP project Pueblo I assemblage and the combined assemblage of McPhee Village, Grass Mesa, and Sagehen Flats is 0.56 (Potter 2009), suggesting that the environmental proportions (relative to each other) of these animals on the landscape were similar in both areas. Both areas are at elevations ranging between 6,800 and 7,000 feet above mean sea level, so this is not unexpected.

Within the ALP project area, Ridges Basin sites have significantly lower ratios of cottontails to jackrabbits than do the Blue Mesa sites. The lagomorph index for Ridges Basin is 0.54, and for Blue Mesa it is 0.72. The open, grassy environment of Ridges Basin may have been preferable to jackrabbits and more conducive to jackrabbit drives in the Pueblo I period than the brushy environment of Blue Mesa. Moreover, the openness of the Ridges Basin environment may have been enhanced by the longer-term occupation there and more extensive clearing for agricultural fields as a result. While momentary population levels of both areas appear roughly equivalent at around A.D. 800, based on available tree-ring data the occupation of Ridges Basin extended back further than that of Blue Mesa (see Chapter 8, Pueblo I Chronology and Population). This may have had a significant impact on the local environment of Ridges Basin, resulting in more open space due to field clearing and a corresponding increase in jackrabbit populations. Botanical remains corroborate changes in the local environment of Ridges Basin due to vegetation clearing in the Pueblo I period (see below).

Although Ridges Basin and Blue Mesa appear to have provided Pueblo I people with proportionately fewer ungulate and lagomorph resources than did the Dolores River Valley, they did provide more riparian and aquatic faunal resources. Water-dwelling birds, for example, are particularly abundant in the Ridges Basin assemblage (2.3% of the overall assemblage) and include swan, sandhill crane, whooping crane, wood stork, osprey, duck, kingfisher, teal, snipe, and harrier. The presence of these species supports the botanical and geomorphological data (see below) in suggesting a marshy local environment. Additional aquatic animal remains present in the Ridges Basin faunal assemblage include beaver, frog, and fish (Potter and Edwards 2008).

Archaeobotanical Remains

Archaeobotanical data derive from systematically acquired flotation and pollen soil samples from archaeological contexts, as well as opportunistically collected macrobotanical samples and pollen washes from artifacts. The Pueblo I people of Ridges Basin and Blue Mesa used at least 70 plant species, both domesticated and wild. The preponderance in the flotation assemblage of maize cupules and cob fragments and the greens and seeds of native plants in the Cheno-am group suggests that Pueblo I families regularly tended maize fields and gathered weeds from these same fields during the growing season. Some farmers also grew squash and common beans in their gardens. The Ridges Basin and Blue Mesa landscapes must have contained numerous agricultural fields and gardens, and extensive areas were undoubtedly cleared for these fields.

Indeed, increased clearing of land for agricultural fields throughout the Pueblo I occupation is implied by the charred wood record from Sacred Ridge (5LP245), where three separate building phases were identified (Potter and Chuipka 2007a; see also Chapter 11, Settlement Clusters).

> A focus on the charred wood record during the three Sacred Ridge building sequences also suggests shifts over time in wood use. Presence of pine charcoal in all contexts declines from Building Sequence I to Building Sequence III. Likewise, the presence of charred juniper wood declines over the occupation span of Sacred Ridge. In contrast, more contexts contained sagebrush wood at the end of the sequence than at the start, suggesting that pine and juniper trees were decreasing in availability and sagebrush plants were increasing in abundance due to the clearing of native vegetation for agricultural land. The implication is that as Sacred Ridge was occupied, the surrounding landscape was becoming increasingly open as trees were cut and land was cleared for farming. (Adams and Murray 2008:235)

This pattern of intensive clearing and harvesting of trees is further corroborated by the tree-ring record from the project area. Twenty-six of the 81 Pueblo I tree-ring samples collected as part of the ALP project were juniper; 53 were ponderosa pine; one was piñon; and one was Douglas fir. Interestingly, although both juniper and ponderosa pine were used in roughly equal proportions for construction prior to A.D. 750, after this date the use of juniper decreased dramatically and ponderosa pine became the predominant material used (Figure 9.1). One possibility for this trend is that by the mid eighth century over-harvesting of juniper—possibly partly for the clearing of agricultural fields—began.

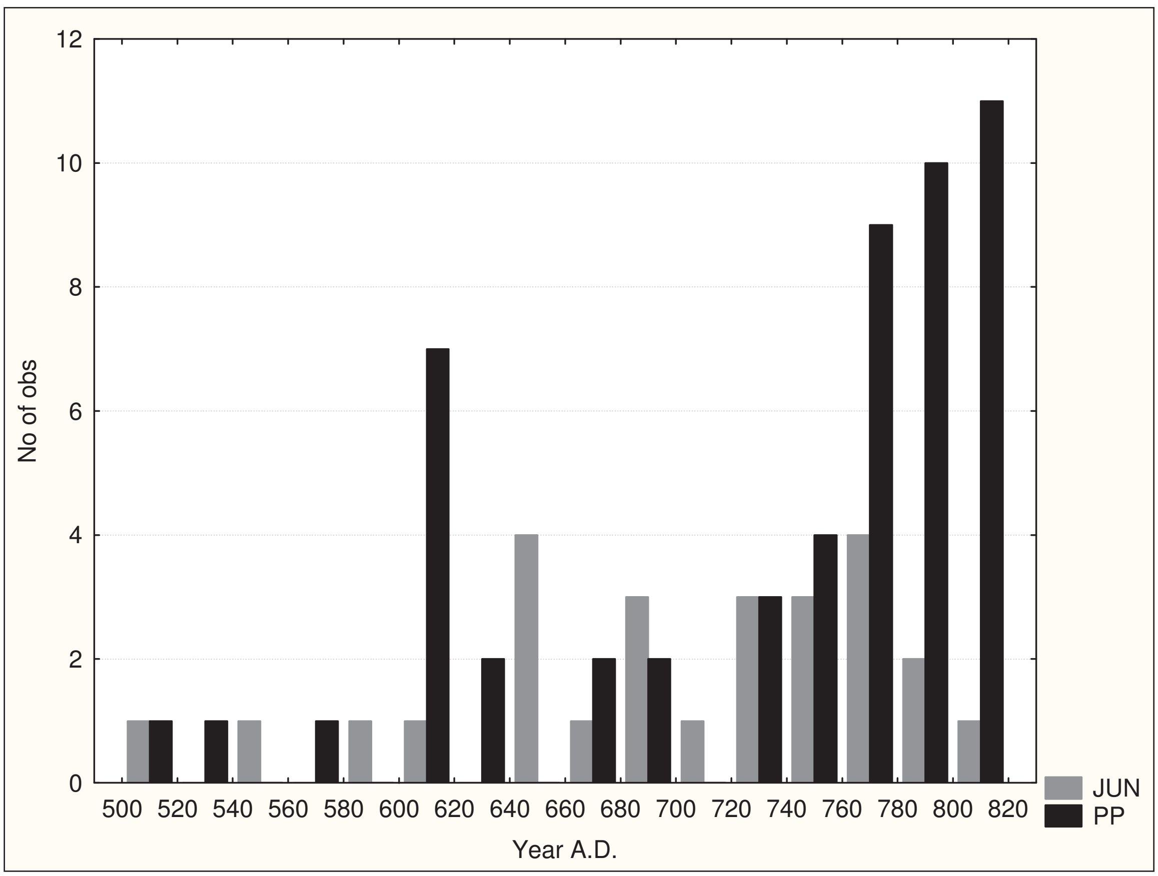

Figure 9.1. Histogram of dated juniper (JUN) and ponderosa pine (PP) samples recovered by SWCA from the ALP project area.

As the availability of juniper continued to decline, ponderosa pine was more intensively used for construction, even though these trees were located farther from habitation sites and at higher elevations (Figure 9.2). Another possibility is that since ponderosa pine is straighter and has a more regular internal composition, its increase in the record after A.D. 750 was related to an increase in pit structure size (as seen at Sacred Ridge after about A.D. 780, for example) and a concomitant shift in construction preference for ponderosa pine. If this were the case, however, we would expect a correlation between large structures and the increased use of ponderosa pine in the project area, which is not the case (Figure 9.3). In fact, the mean floor area of pit structures incorporating ponderosa pine is 25.6 m^2, which is *smaller* than those incorporating juniper (27.0 m^2). Finally, it is possible that cultural reasons guided preferences for particular species in construction. In this scenario we might expect spatial clustering of the various species along the same lines as the clustering of house styles and the spatial configuration of various ethnic groups (Potter and Yoder 2008; see also Chapter 11, Settlement Clusters, and Chapter 15, Pueblo I Ritual, Social Power, and Identity). But data presented in Table 8.2 indicate no such clustering of species within particular settlement clusters. For these reasons, it is proposed that the over-harvesting hypothesis is the most likely of the suggested possibilities.

The local environment also provided a variety of seeds and fruits from annual and perennial plants, including tansy mustard seeds, pepper grass seeds, ricegrass grains, purslane, sunflower, marsh-elder, beeweed, groundcherry, cactus fruit, and piñon nuts (Adams and Murray 2008:193). The preserved remains of fuel and construction materials indicate the presence on the Pueblo I landscape not only of ponderosa pine, piñon, and juniper, but also oak, sagebrush, and mountain mahogany. The fairly common presence of buckthorn (Rhamnaceae) pollen in Ridges Basin archaeological contexts suggests the presence of this species even though it is not present in the modern environment (Adams and Murray 2008:194). In addition to these terrestrial plant resources, reedgrass, cattail, bulrushes, and other riparian plants are evident in the Pueblo I archaeobotanical record, supporting other lines of evidence indicating a marsh in the basin bottom.

THE MODERN ENVIRONMENT

Plant Studies

Studies of the modern environment are valuable in that they can help document, in conjunction with archaeological and geomorphic data, the potential range of resources available to past peoples. The modern Ridges Basin environment (prior to the inundation of Lake Nighthorse) comprised a variety of distinct plant communities dominated by conifer woodlands (Murray et al. 2008) (see Figure 9.2). In all, 123 plant taxa were identified on the landforms examined during a plant survey for the ALP project. These consisted of 25 trees and shrubs, 79 herbaceous plants (perennials and annuals), and 19 species of grass, sedge, or rush. Twenty-three of these recorded species are considered non-native to the area (Murray et al. 2008:Tables 7.3a and 7.3b).

> As might be expected, there seems to be a correlation between elevation and the number of introduced species, with the Marsh and Streamside community in the basin bottom having the highest percentage of invasive species (28% of all species recorded in Ridges Basin), followed by Basin Shrub/Saltscab and Basin Shrub/Greasewood (for a combined 26%), and Piñon-juniper/Mountain Shrub and Ponderosa Pine/Pine Oak Woodland with the lowest percentages (7% and 3%, respectively). This correlation is most easily explained by the historical overgrazing and farming, as well as the exotic grass seedings that took place on the basin bottom in the early 1980s. The basin bottom communities also contain the highest percentage of non-native grasses (17%) as compared to other plant communities. It seems likely that native grasses, particularly rice

> grass and blue grama, were more abundant in the past (see Reith 1986 for a more detailed discussion). (Murray et al. 2008:120)

The detailed data documented as part of the plant survey allowed SWCA to conduct catchment analyses for settlements and their catchments and to compare the economic values of the various plant communities contained within these catchments (Adams and Reeder 2009) (see also Chapter 5, A Comparison of Archaic and Basketmaker II Site Catchments).

As indicated in Chapter 1, Introduction and Project Setting, the broad diversity of habitats represented by these biotic communities supports a rich vertebrate fauna. Reith (1986a:20) notes, for instance, that "the combination of forest, woodland, shrub, meadow, and streamside habitat provides for more than 50 species of passerine (perching) birds, as well as raptors, woodpeckers, hummingbirds, turkey, and dove." Deer, elk, rabbit, prairie dog, badger, weasel, squirrel, marmot, and porcupine are also common locally. In addition, 12 species of amphibians and reptiles have been recorded in the basin (Reith 1986a:20).

Other Resources

Lithic, clay, and water resources are also present on the modern landscape and would have been available to Pueblo I people. Clay suitable for making pottery was present in and around the basin as eroded shale (Allison 2010). High-quality cryptocrystalline lithic material was available in outcrops between Ridges Basin and Blue Mesa (Railey and Wesson 2009). And water was available in abundance from the marsh (see below) and also in the form of surface springs, which are present throughout the basin (Anderson 2008a).

Modern Soils

Extant soils were analyzed throughout Ridges Basin to quantify both the potential for growing crops in the basin during the Pueblo I period and the variation in soil quality throughout the basin, and to document any potential for soils to become depleted of nutrients if they were intensely farmed. Anderson (2008b) sampled and described 10 soil profiles from various basin locations, including alluvial fan, ridge, and floodplain positions. Potential limiting factors for crop production in semiarid soils, aside from water, include nitrogen and phosphorous content, clay content, and salinity (Anderson 2008b). The central focus of the fertility investigations was four experimental garden plots—the South Field, North Field, East Field, and West Field—all located on alluvial fans (Figure 9.4).

The experimental garden plots demonstrated that soils in the various settings of Ridges Basin were of sufficient quality to grow maize, beans, and squash for at least two years. Anderson (2008b:78–80) notes that the low values of phosphorous and nitrogen in some of the settings indicate that soils in the basin would have become depleted of nutrients, and he suggests that fallowing of certain fields would have been necessary. He also suggests that the low nutrient content of certain areas, if these areas had been farmed, may have been offset by the addition of materials over time as a result of their geomorphic positions as ak chin plots.

Anderson (2008b:80) points out that the eastern and central portions of the basin would have been particularly poor areas to grow crops:

> Soils of the [East Field] and floodplain showed toxic levels of salinity that would have limited or prohibited crop growth in those areas. During drought years, the effects of desiccation would have increased salinity in these soils, making the drought years worse for crop production. Pueblo I inhabitants growing crops on the Carbon Mountain fans (the Eastern Cluster) would have experienced particularly harsh conditions and crop failures during drought years, due to the high clay contents holding water and breaking plant roots, and due to the increasing salinities during drought episodes.

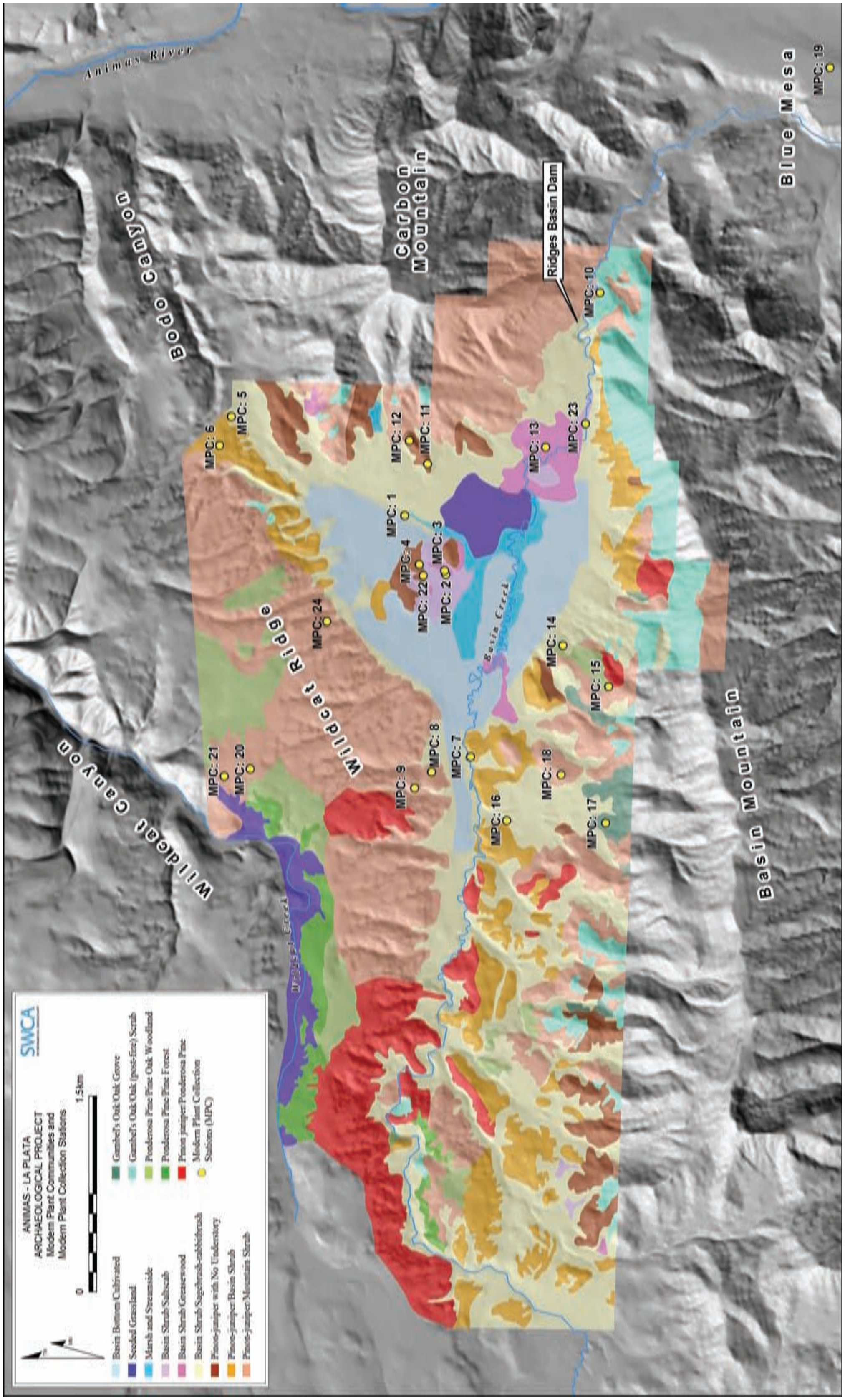

Figure 9.2. Map showing locations of modern plant communities in Ridges Basin and modern plant collection (MPC) stations (reproduced from Murray et al. 2008:Figure 7.15).

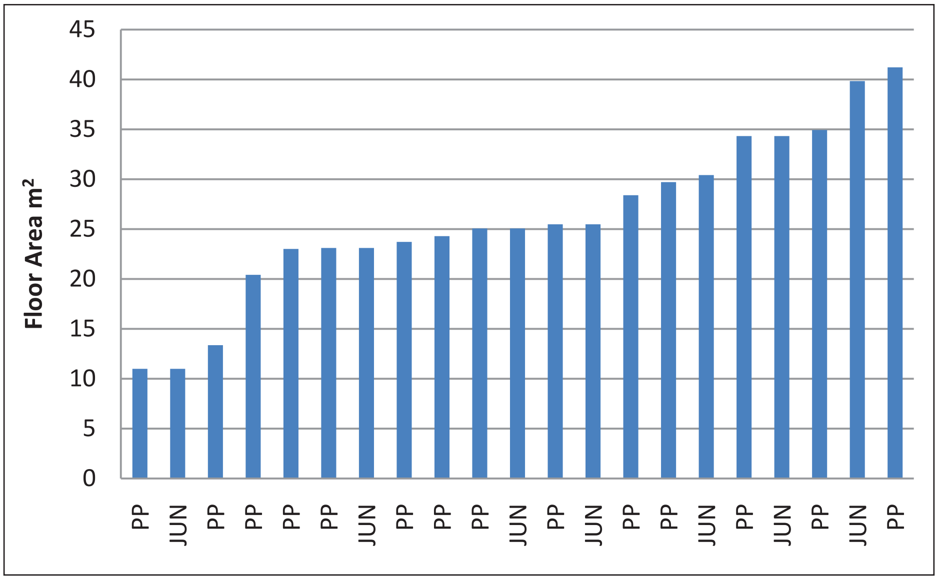

Figure 9.3. Timber species plotted against floor area of pit structures.

GEOMORPHIC DATA: THE MARSH

Geomorphic data collected as part of the ALP project (Anderson 2008a) indicate ponded deposits upstream from the narrowest part of the drainage out of Ridges Basin where the modern dam has been constructed (Figure 9.5). In the past, the Basin Creek outlet was constricted by alluvial fans, creating ponded layers (Figure 9.6). It should be noted that the profile in Figure 9.6 was recorded in an area that had been affected by arroyo down-cutting in the last century, and that these profiles had been buried until then. Near the basin margins these layers graded into alluvial fan gravels whereas upstream they graded into mainstream alluvial sands, and, according to Anderson (2008a:45), the grading of these layers indicates that local geomorphic constraints helped to restrict the flow of water out of the basin, creating a wetland for waterfowl, beaver, fish, and the leopard frog. As Anderson (2008a:45) describes,

> the presence of marshy habitat is further substantiated by particle-size and pollen analysis. Ponded layers are laminated and are 30–40 percent clay. Cattail pollen in the ponded and gravelly sediments indicates conditions from very moist ground to standing water.

Radiocarbon dates collected by Anderson and stratigraphic interpretations indicate that the constriction and ponding occurred prior to, during, and after the Pueblo I period, and is represented by stratigraphic Unit IIIb (see Figure 9.6).

> Unit IIIb was a soil horizon (buried at the time of the project, forming a paleosol) with 4.2–6.4 percent organic matter, and a texture ranging from loam to siltloam; radiocarbon ages placed this deposit (and limits on soil development) into the A.D. 680–870 range. The sandy alluvium of Unit IIIa fined upwards, eventually becoming a stable soil (Unit IIIb) at about the time Pueblo I people began to occupy the valley. (Anderson 2008a:40)

Two radiocarbon dates were recovered from stratigraphic Unit III. One sample from the top of Unit IIIa dated to (cal.) A.D. 770; one from Unit IIIb dated to 690. According to Anderson (2008a:41), "although they were in reverse stratigraphic order, they provided a reasonable age estimate for the Unit III deposits. Indeed, following the finely laminated deposits, these two ages were from about the same stratigraphic level."

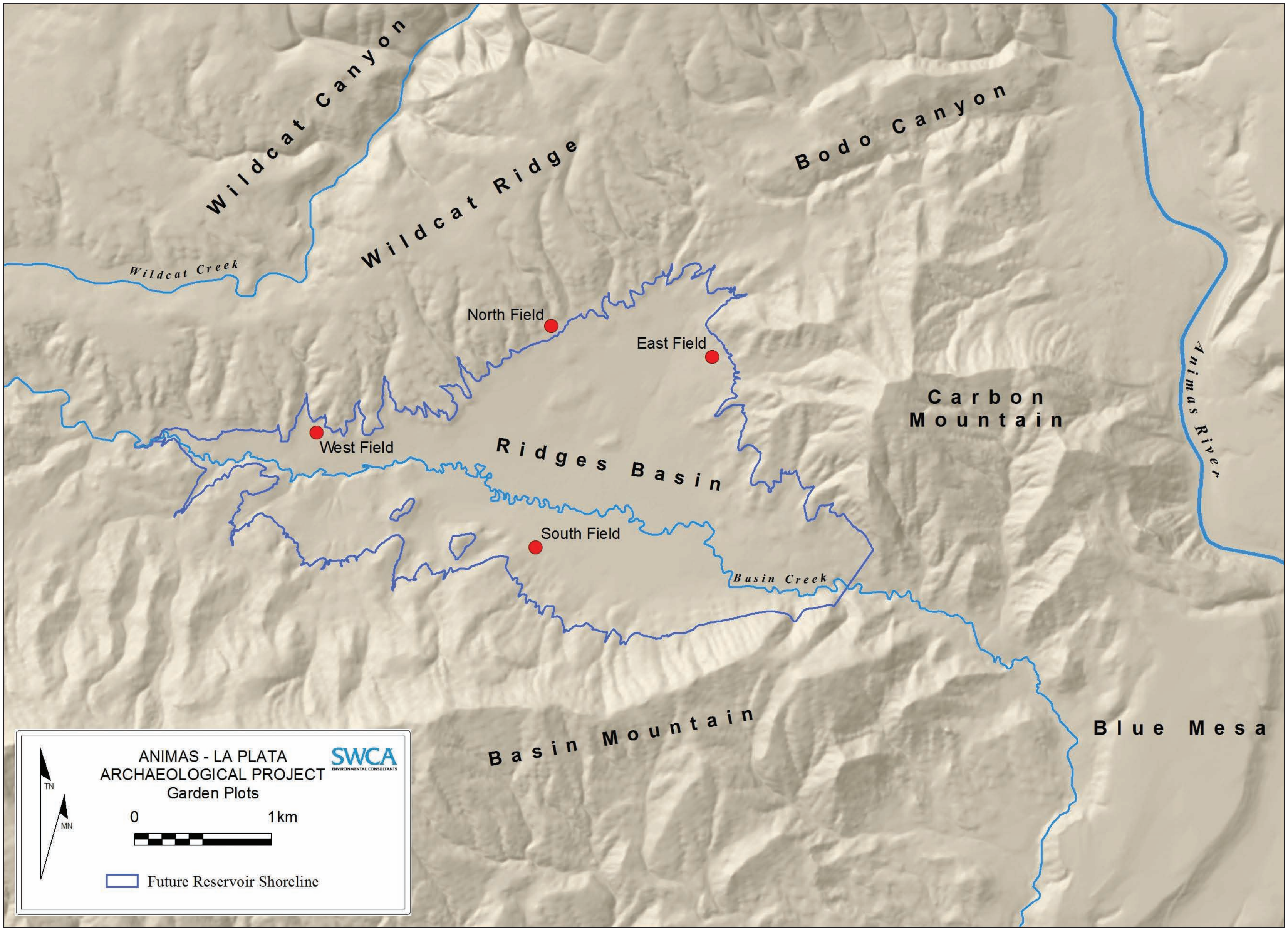

Figure 9.4. Map of the experimental garden plots in Ridges Basin.

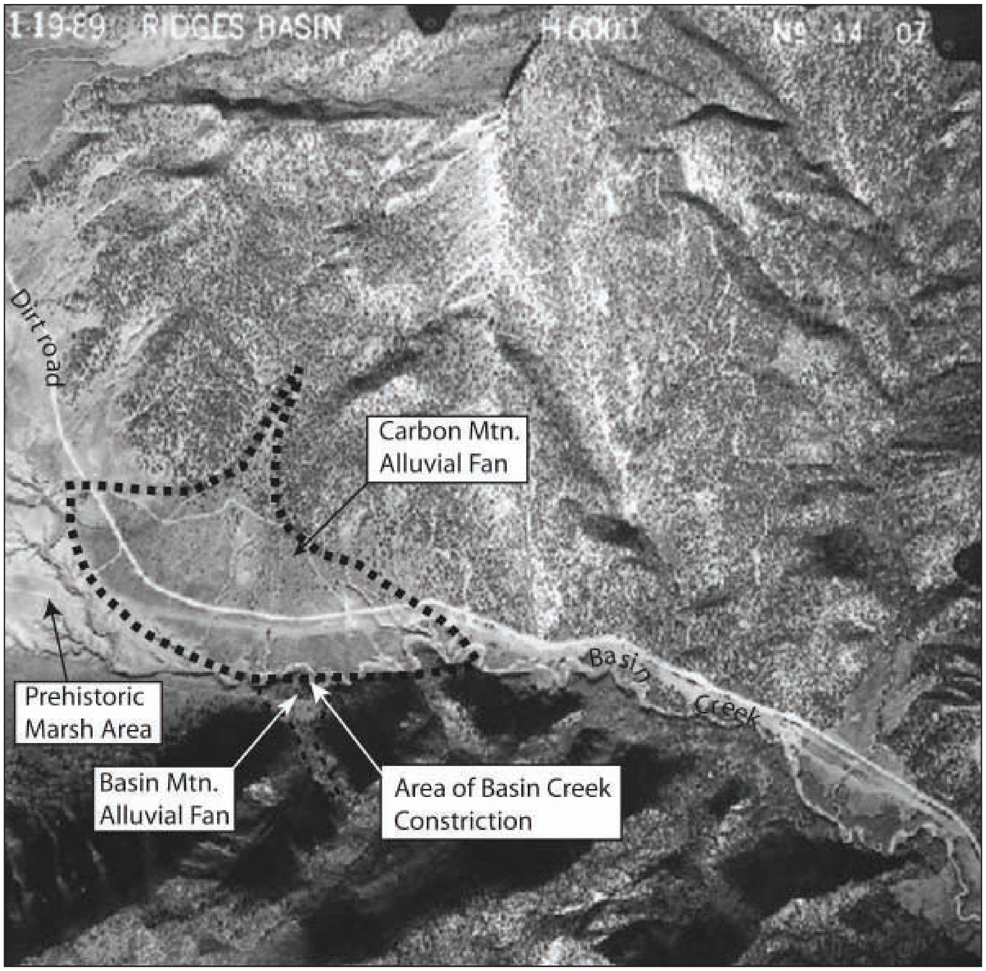

Figure 9.5. Aerial photograph of the easternmost part of Ridges Basin where Basin Creek leaves the basin through a narrow outlet. Alluvial fans from Carbon Mountain to the north and Basin Mountain to the south had constricted Basin Creek in the past to create ponded sediments and marshy habitats, particularly during the Pueblo I occupation (reproduced from Anderson 2008a:46).

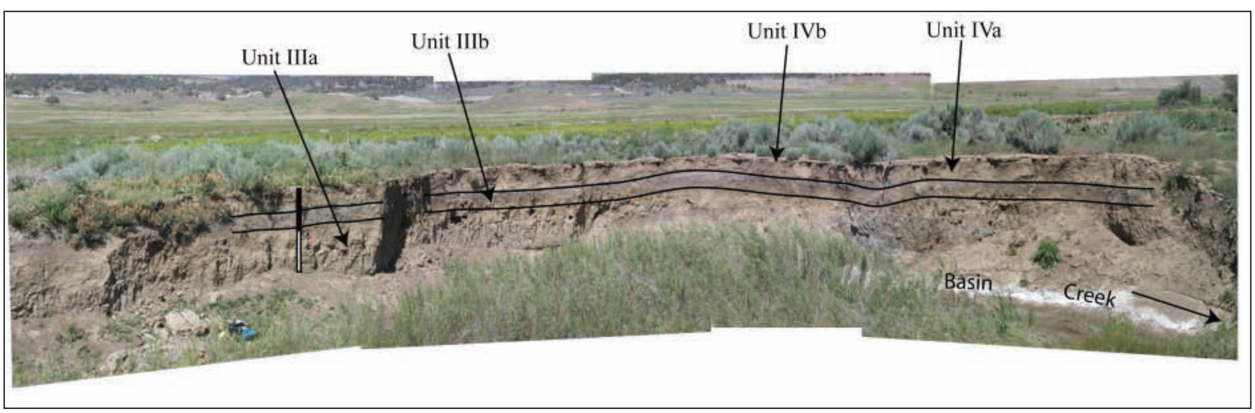

Figure 9.6. Photographic panel of stratigraphy exposed along the Basin Creek arroyo bank. Unit IIIb, which contained dark, ponded sediments and cattail pollen, corresponds with the Pueblo I occupation of the basin. The stadia rod (left) is 2 m high. (Reproduced from Anderson 2008a:43.)

Maize pollen was found in the buried Unit IIIb paleosol. Additionally, as indicated above, an abundance of cattail pollen was found in samples associated with Unit IIIb, "indicating that these clay-rich and organic matter–rich sediments, which in themselves suggest marshy conditions, indeed contained pollen representative of marshy habitats" (Anderson 2008a:45). In summary,

> recent geomorphic studies in Ridges Basin show [that] a marshy environment characterized the lower reaches of the Basin Creek floodplain during the early Pueblo I occupation, and aggraded the entire Basin Creek floodplain during this time. Pollen, radiocarbon assay, stratigraphic, and sedimentologic evidence suggest that alluvial fan activity intermittently constricted the outflow, creating what was probably a lush setting with ponded water and abundant food resources. Cattail in the pollen record and a variety of waterfowl and beaver in the archaeological record of Ridges Basin point toward the presence of a valuable wetland resource during the A.D. 700–1000 time. (Anderson 2008a:45)

PALEOCLIMATE DATA

Precipitation

Overall, the Durango area record reflects conditions that were moister than those reflected by the regional record, particularly prior to the migration of Pueblo I peoples into the basin in the early and mid A.D. 700s. In general, the Durango area was wetter than surrounding areas due to its higher elevation. For instance, the years A.D. 761–769 were significantly wetter compared to the "near normal" regional conditions (Anderson 2008c:27) (Figure 9.7). During this time, Ridges Basin would have been a relatively good place to live, with abundant rainfall and marsh resources. In the early A.D. 770s, drought years occurred both locally and regionally. Anderson (2008c:27) suggests, though, that

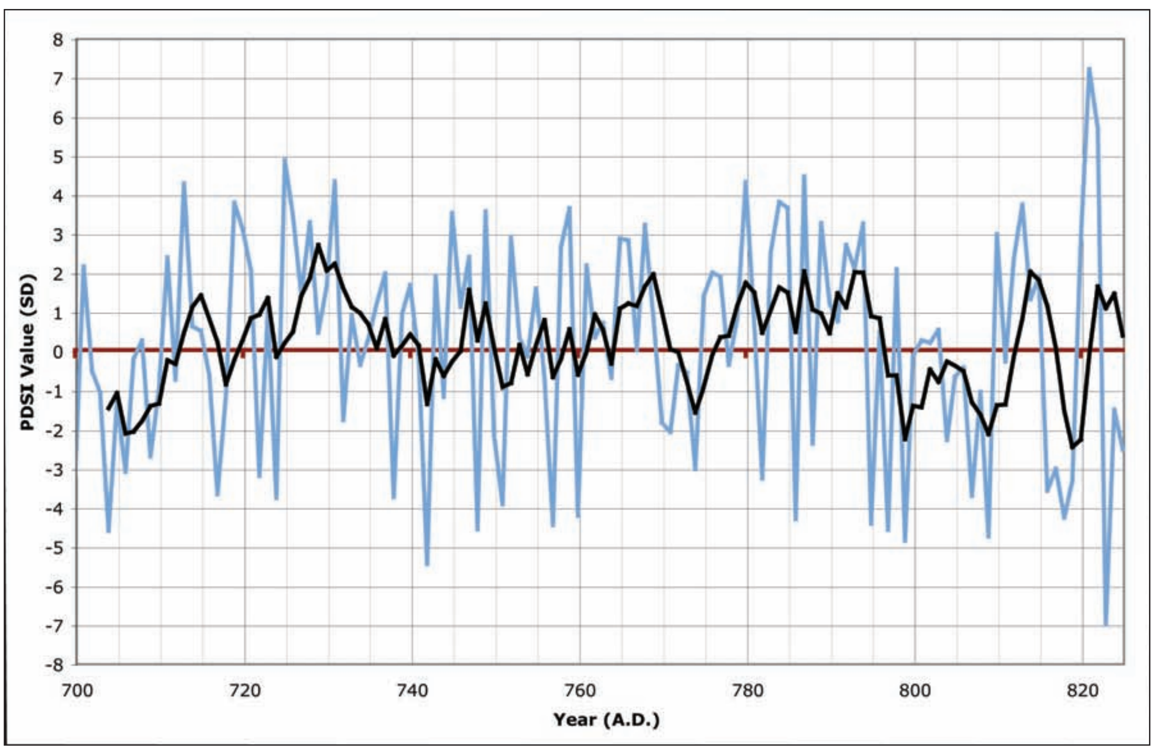

Figure 9.7. PDSI values for the Durango area for A.D. 700–825, from the University of Arizona Laboratory of Tree-ring Research. Five-year running average in black. SD = standard deviation. (Reproduced from Anderson 2008c:25.)

the regional drought was offset in Ridges Basin from A.D. 775 to 781 by above-normal rainfall (Figure 9.7). The years from 780 to 794 were wet years. After 794, however, the climate became increasingly dry in the Durango area until 810 (Figure 9.7).

> In the Durango area, the period from A.D. 794 to A.D. 809 was marked by extreme drought years, as was the case for the rest of the region. However, Ridges Basin came out of the drought before the rest of the region, and the years A.D. 810–815 were wet. This period was followed by consecutive severe to extreme drought years in A.D. 816, A.D. 817, A.D. 818, and A.D. 819. These extreme drought years were some of the last years experienced by anyone who remained in Ridges Basin. (Anderson 2008c:27)

The paleoclimate record supports the ideas of earlier researchers (e.g., Berry 1982) that the regional droughts from the A.D. 730s until 760 encouraged people to move to higher elevations to find moister soils in which to grow crops.

> The Durango area in general and Ridges Basin in particular were indeed wetter during this period, as evidenced by the tree-ring records and PDSI reconstruction supplied to the ALP project by Jeffrey Dean of the University of Arizona's Laboratory of Tree-ring Research. Following this, the period from A.D. 761 to A.D. 769 was very wet and would have provided high crop yields for the new immigrants. Relatively good conditions existed until about A.D. 795, when severe and extreme drought years occurred until A.D. 809, causing crop loss and presaging the true depopulation of Ridges Basin by about A.D. 815. (Anderson 2008c:28)

Temperature

Temperature variations may have also played an important role in the occupation and depopulation of Ridges Basin and Blue Mesa during the Pueblo I period. Whereas the high elevation of the area appears to have ameliorated the effects of drought, particularly compared to lower elevation parts of the Southwest, it made the area more susceptible to cold temperatures. According to the work of Salzer and Kipfmueller (2005) in the San Francisco Peaks area of northern Arizona, the period from A.D. 710 to 790 was a relatively warm period in the Southwest (with the exception of a brief cold spell from A.D. 729 to 736) (Table 9.1) (Anderson 2008c:13; Bellorado 2007:32). This would have made the Durango area a particularly attractive area for dry farmers during this period, because rainfall averages were relatively high for this time period, as well (see above). At about 790, however, the climate began a cooling trend that culminated with cold temperatures from 804 to 824 (Table 9.1). The combination of an increasingly dry and cold climate in the early 800s in the Durango area would have made conditions marginal for dry farming, and more than likely contributed to the Pueblo I farmers' decisions to leave the area at this time.

Table 9.1. Summary Data from the San Francisco Peaks Dendroclimate Record (from Anderson 2008c:13)

Cool Period (A.D.)	Anomaly	Rank	Warm Period (A.D.)	Anomaly	Rank	Wet Period (A.D.)	Anomaly	Rank	Dry Period (A.D.)	Anomaly	Rank
683–700	-1.96	1	840–845	+1.05	14	798–805	+1.03	12	660–664	-1.04	5
897–902	-1.25	10	673–682	+1.01	15	727–737	+1.00	13	823–832	-0.74	17
846–859	-1.15	12	591–609	+0.98	18	636–642	+0.84	17	877–884	-0.74	18
804–824	-0.96	19	878–893	+0.86	19	688–695	+0.70	26	611–620	-0.72	21
663–669	-0.93	21	706–717	+0.82	22				847–851	-0.68	26
729–736	-0.85	26							699–724	-0.65	28

Source: Salzer and Kipfmueller 2005

SUMMARY

The environment in Ridges Basin was generally favorable from about A.D. 760 to 794, which was a warm and wet period. This would have made the Durango area a particularly attractive area for dry farmers at the time, and, indeed, this period corresponds with the peak of population influx into the area at about A.D. 760 (see Chapter 8, Chronology and Population). In addition to a favorable climate during the late eighth century, Ridges Basin, in particular, offered an abundant and diverse array of game and plant resources, and it is clear that the Pueblo I inhabitants of Ridges Basin exploited them widely. Finally, geomorphic, faunal, and archaebotanical data indicate that a substantial marsh was present in the basin during this same time, and it would have been a major draw for early Pueblo people. It seems likely that some Pueblo I communities, such as Sagehen Flats and McPhee Village in the Dolores River Valley and Ridges Basin, were intentionally established in or near marshy environments (Anderson 2008a). Because marshes collect water they attract game and produce wetland ruderal foods such as cattail (Wilshusen et al. 1997:675). Establishing early villages near marshes may have been a strategy to lay claim to their faunal and floral resources (Potter 2009). Moreover, marshes hold a special place in Pueblo ideas of the landscape for their religious and spiritual significance. Marshes and marsh reeds are prominent in creation stories of the Hopi and the Zuni people, for example, and marshes and lakes are important as places of origin, creation, and power. All of these factors likely attracted migrants in the eighth century A.D. After about 804, however, cooler temperatures may have made the area marginal for dry farming and encouraged Pueblo I farmers to leave.

Chapter 10: The House and the Household

James M. Potter

A household is defined as a group of individuals who share a single residence and who cooperate on a regular basis in a number of basic economic and social activities. "The household is a social group defined on the basis of the activities it performs rather than on the basis of kin relations of its members" (Lightfoot 1994:146). Wilshusen (1988a:636) describes the distinction between the household and the dwelling unit, or house, that it occupies: "A household is the social unit that occupies a dwelling unit (house); and a dwelling unit is a sheltered and enclosed space in which domestic activities, such as food storage, processing, and consumption and child-rearing, are performed. This definition…assumes the norm of 1 household equaling 1 dwelling unit."

So, in general, the house consists of the central architectural facilities used by a household. In the ALP project area, the house consisted of a single pit structure and small, often contiguous, aboveground storage or isolated pit rooms. In association with these common architectural features, houses may also contain extramural pits, hearths, activity areas, a midden, burials, and an enclosure, and the ALP project sites contained all of these associated features. Within this basic framework, however, the ALP project sites showed notable architectural, organizational, and activity variation among houses and households. In this chapter, this variation is documented and described.

HOUSEHOLD COMPOSITION AND SIZE

One of the most comprehensive studies of Pueblo I households is Lightfoot's (1994) analysis of the Duckfoot site, a completely excavated Pueblo I hamlet just south of the Dolores River Valley. For this site, Lightfoot argued that the Pueblo I household was centered on the pit structure and comprised an extended family or extended-family-type group. This is in contrast to earlier interpretations made during the Dolores Archaeological Program (DAP) that saw multiple nuclear family households occupying surface room suites and sharing a pit structure (Kane 1984; Schlanger 1987; Varien and Lightfoot 1989). The lack of surface living rooms in the ALP project assemblage—due both to a lack of preservation and to the fact that many of the surface rooms appear to have been storage rooms rather than living rooms in this earlier period (see below)—suggests that Lightfoot's model is more appropriate than the DAP model for describing the composition of households in the Durango area. As Lightfoot (1994:158) describes,

> households at Duckfoot may have been extended-family-type households that incorporated a number of nuclear-family groups or dyads (Adams 1960)…. Through time, the size and composition of households could have changed because of the developmental cycle of domestic groups, which includes such events as marriage, birth, death, group fission, and so forth. As the size and composition of the social groups changed, the architectural configurations and the use of structures would have changed as well.

Schlanger (1987:589) notes that the average use-life of an earthen-walled pit structure (10–15 years) is approximately one-half to two-thirds of a generation (about 18–20 years) as defined by Hassan (1978). Thus, house size will be affected by the time within a household's domestic cycle (and accordingly the number of members of the household) when an old house is worn out and a new house is needed. These two factors—the variable and fluid extended-family-type composition of the early Pueblo I household and the building of new houses at various points within the domestic cycle—are expected to generate a certain range in the size of households and their houses. Functional variation of these structures may introduce yet a third cause of variable house size. Unlike the other factors, however, functional variation is expected to generate specific modes of house size.

SWCA excavated 60 Pueblo I pit structures in the project area sufficiently to record floor area and other attributes. Figure 10.1 plots the distribution of pit structure sizes in the ALP project area based on floor area, and indicates a range from about 7.5 m^2 to 42.5 m^2. Three modes are recognized as the central tendencies for structure size: small (16 m^2), medium (26 m^2), and large (40 m^2) (Figure 10.1). Small pit structures are here defined as those having a floor area between 7.5 m^2 and 21.5 m^2 (n = 23); medium pit structures range from 21.5 m^2 to 28.5 m^2 (n = 21); and large structures are greater than 28.5 m^2 (n = 16). The presence of definable modes in the distribution prompts the question: Were there functional differences among variously sized pit structures? Because the definition of the household hinges on the performance of shared activities in a dwelling, the focus of this chapter is on

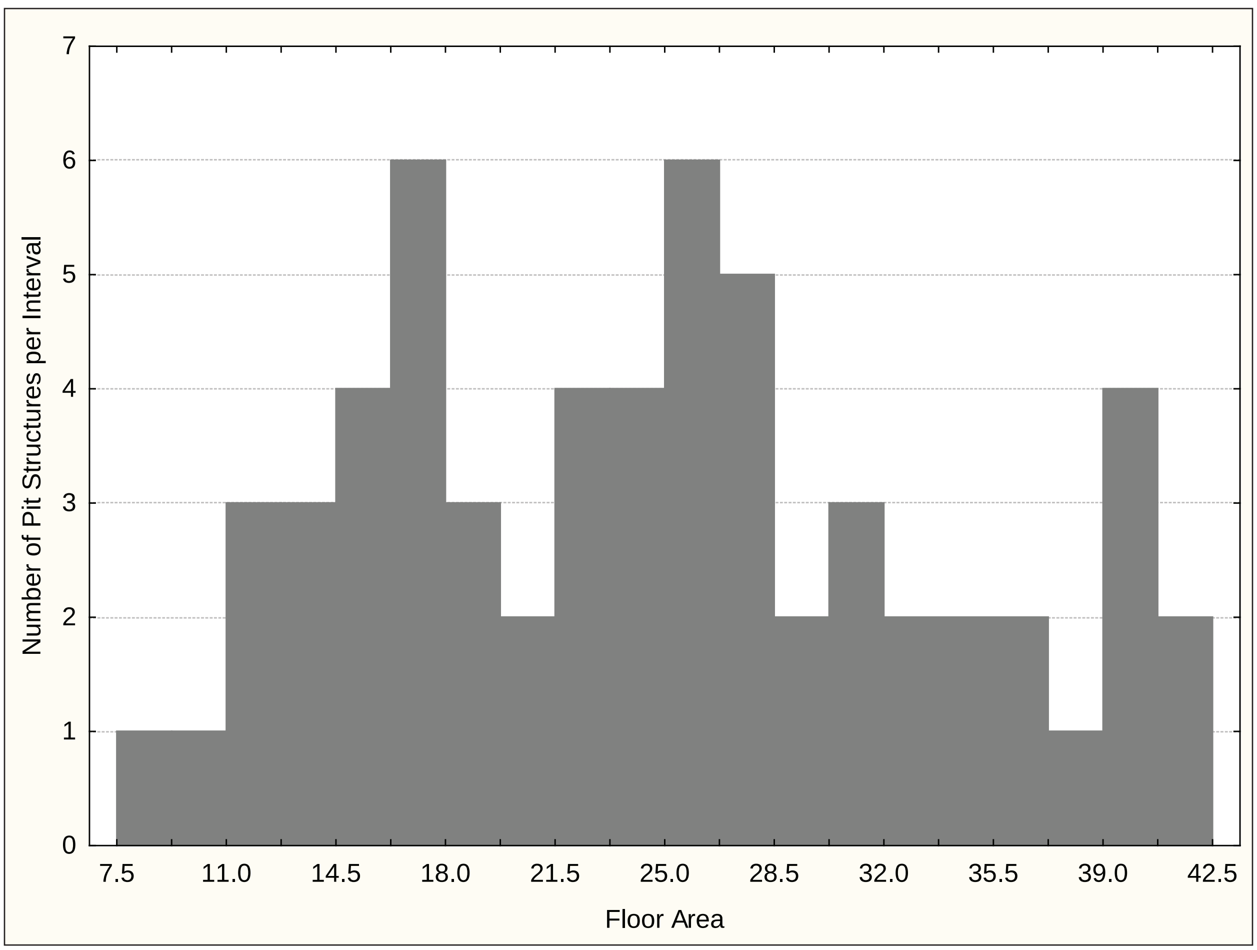

Figure 10.1. Histogram of floor area size for pit structures (n = 60) excavated by SWCA in the ALP project area.

activity variation in, and in association with, the pit structure. Architectural features of the pit structure, closing attributes, associated artifact assemblages, and associated extramural features are explored for possible variation among houses and households.

ARCHITECTURAL FEATURES OF THE HOUSE

Architectural features are those features incorporated into a pit structure at some point in its use as a dwelling. The more common features include benches, bins, conical pits, deflectors, hearths, main support post holes, mealing bins, sipapus, storage pits, stringer post holes, ventilator systems, and wing walls. A brief description of each of these feature types as defined in the excavation methods section of the ALP project research design (Potter 2006) is included below.

Bench

A bench is a raised area around the interior perimeter of a pit structure into which stringer posts are set. The bench was also used to store objects.

Bin

Bins are often found in the back corners of Pueblo I structures, although they also have been found in the front corners adjacent to wing walls. They are usually built of some combination of adobe, posts, and slabs. Bins often stand the same height as the bench, and it is not uncommon for them to be as large as 1 m in diameter. They are associated with food storage.

Conical Pit

These features are pits of a uniform inverted-cone shape. They are lined with a thin layer of clay plaster. In the ALP project area all conical floor pits were observed only at the Sacred Ridge site (5LP245) and were positioned to one side of the hearth. A ritual function for these features is inferred. This feature is not described in the excavation methods section of the ALP project research design (Potter 2006) because it was an unanticipated feature type.

Deflector

Deflectors are found in pit structures and rarely in surface structures. They are built of adobe, posts and adobe, or simply as an upright stone slab anchored into the floor. Deflectors are found between the hearth and the ventilator opening.

Hearth

A hearth is a formally constructed pit that usually shows signs of thermal use, such as oxidation. Stone or adobe plaster is usually incorporated into its construction. A hearth may incorporate clay coping around its perimeter, giving the feature a raised appearance. In the ALP project area, all pit structures contained hearths; some were coped.

Mealing Bin

Although usually found in structures, mealing bins also occur in extramural contexts. They are usually rectangular with upright slab or adobe walls and are often found with the metate in place. Pueblo I sites generally do not have formal mealing bins; they are usually found in post–Pueblo I contexts. The empty shallow pits found in many pit structures may have served a similar function.

Post Hole

A post hole is a hole that once held a post or that still contains a post remnant. Post holes are usually cylindrical and vary in depth and diameter. Main support post holes range in number from four to eight and can be set in the floor or against (or incorporated into) the bench. Rarely, main support post holes are located on the exterior of the house. Stringer post holes are part of the secondary support system and are set in the top of the bench (see Stringer Post below).

Sipapu

A sipapu is a small, usually cylindrical pit defined by its location along the primary axis of a pit structure. In general, a sipapu will be in line with the hearth, ash pit, deflector, and ventilator shaft. It may be immediately adjacent to the hearth or set farther back, closer to the back wall of the structure. Very often sipapus have been filled in with clean sand and capped. It is not uncommon for Pueblo I sipapus to be paired or to occur in multiples as a sipapu complex. Paho (prayer stick) marks may also be found in association with sipapus. Sipapus will often contain culturally modified levels of pollen.

Storage Pit

A storage pit is non-thermal feature that may or may not have a formal lining but that exhibits some evidence of having been used primarily for storage. The storage function is implied by the absence of thermal alteration, the presence of the remains of stored goods, or the pit's location in a structure or site.

Stringer Post

Stringer posts are inward-leaning timbers that supported earthen coverings of mud and brush that formed the walls of structures. They are set in the top of a bench and are usually much more numerous than main supports.

Ventilator

A ventilator is a component of a pit structure and comprises two parts: 1) a vertical shaft 0.5–1.5 m in diameter and approximately 1.5 m outside the structure and 2) a horizontal tunnel leading from the structure chamber to the base of the vertical shaft. Some pit structures in the Durango area have a bifurcated ventilator—that is, the horizontal tunnel has two openings into the structure. Most ventilators in the ALP project area had single openings, and often these openings were coped with adobe.

Wing Wall

A wing wall is feature that divides space in a pit structure. Wing walls may be constructed of posts and adobe, upright slabs, or a combination of posts, adobe, and rock. The area between the front structure wall and the wing wall was often used for storage of tools and milling equipment. It is common for wing walls to be connected to the deflector, forming a low partition across the front of the structure. Apertures are often seen in wing walls, allowing air or objects to pass through.

Frequency and Distribution of House Features

The most common pit structure feature types in the ALP project area were benches, four-post roof support systems, main support post holes set in the floor rather than set in the bench or exterior, one-hole ventilators, wing walls, and deflectors (Figure 10.2). Almost half of the structures contained sipapus and coped hearths; the remainder contained uncoped hearths. Present but rare feature types were posts set in the bench, stringer post holes, exterior posts, two-hole ventilators, and bins and pits.

Small structures generally contained fewer of each of the recorded feature types (Figures 10.3 and 10.4). The exception is the presence of the one-hole ventilator. It may have been more efficient to ventilate smaller structures with this type of system, which would have been easier to engineer and build. Though relatively rare, more two-hole ventilators were associated with medium and large structures than with smaller structures (Figure 10.3). Large structures had fewer deflectors as well, and this may relate to two-hole ventilators making deflectors redundant and unnecessary.

Not surprisingly, structures with larger floor areas contained more floor features, including bins, storage pits, mealing bins, sipapus, and conical pits. The extra space in larger structures may have allowed for more storage and space-demanding activities, such as maize grinding, than would have been possible in smaller

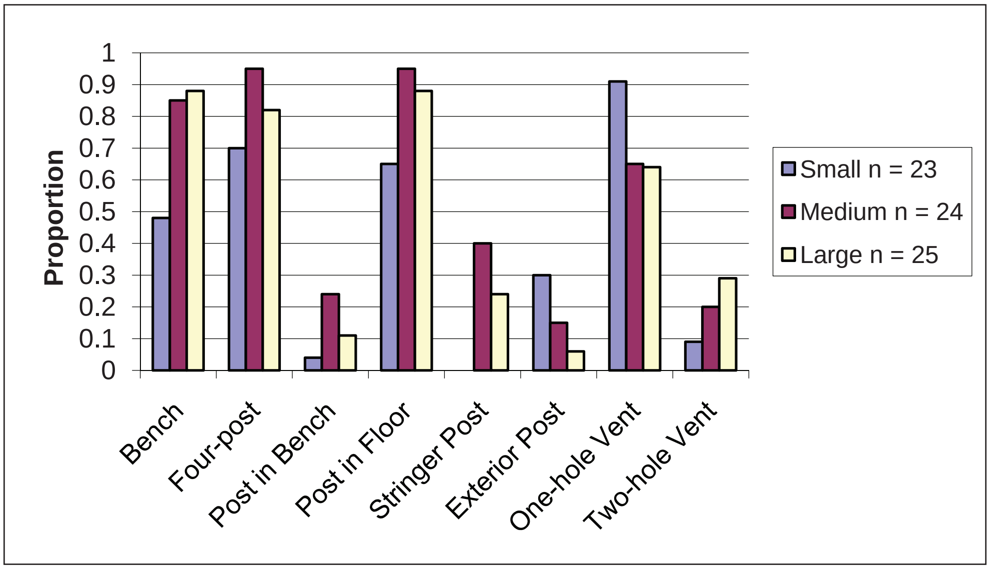

Figure 10.2. Count of pit structures containing each feature type. The presence or absence of all attributes in every pit structure could not be confirmed.

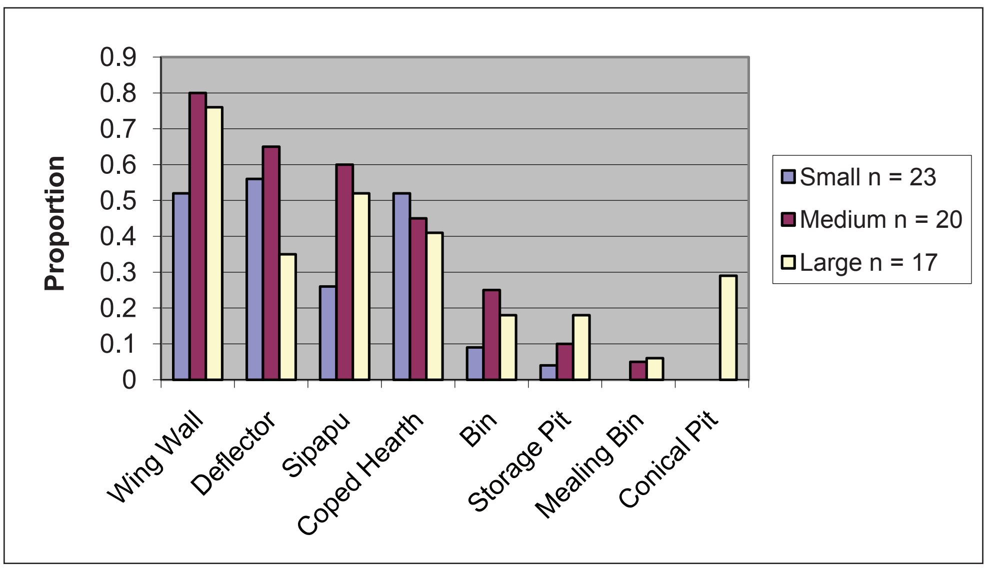

Figure 10.3. Proportions of pit structures of various sizes containing particular bench, post, and vent features.

structures. Sipapus and conical pits were most likely features related to ritual, and the association of these features with larger structures suggests that larger structures, particularly the largest structures, had ritual as well as domestic functions.

The larger floor areas also may have allowed for more space delineation inside the structure. Wing walls were present in most medium and large structures and relatively rare in small structures (Figure 10.4). Benches were more common in medium and large structures than in small structures, which would have made the roofed area of these larger structures that much greater in size. Benches also may have provided additional storage areas in these larger structures. The best preserved section of bench uncovered in the project area—that at 5LP236—contained numerous artifacts, which apparently had been stored on the bench (Chuipka et al. 2008:163–199).

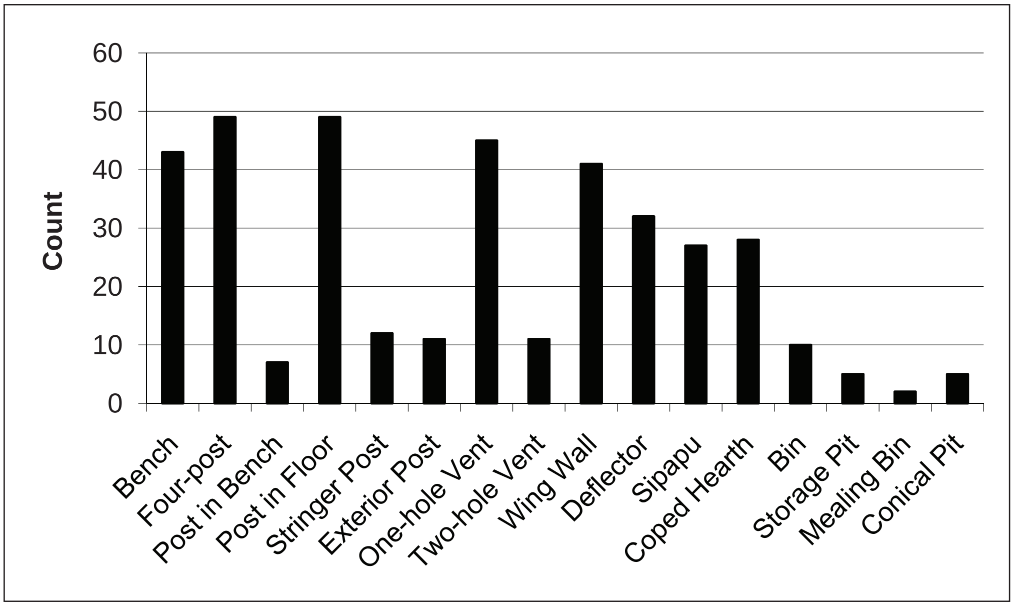

Figure 10.4. Proportions of pit structures of various sizes containing particular floor features.

Finally, large and medium structures had a four-post roof support system with posts set in the floor more often than did small structures (see Figure 10.3). Small structures, on the other hand, more often had exterior posts, and often this configuration involved more than four posts. Likewise systems involving bench-set posts, though rare, often entailed the use of more than four posts, and these were most often associated with medium and large structures (see Figure 10.3). The pattern of exterior posts associated with small structures may have been simply a matter of the floor area limitations of small structures, the result being the placement of posts outside the structure rather than inside. It also may have been a function of less energy investment in small structures and of the fact that they were not built to last as long as larger structures.

To explore connections among these feature types, a correlation analysis was conducted. Forty-nine pit structures yielded presence/absence data on every feature type included in this analysis. (If the presence or absence of any of the feature types was unknown, the structure was excluded from the analysis. This happened in 11 cases.) Table 10.1 presents correlations for the presence/absence of features in pit structures. When features were always present, as in the case of roof-support post holes, hearths, and ventilators, the different versions of these features were tallied and included in the analysis (e.g., two-hole ventilators vs. one-hole ventilators). Figure 10.5 presents the principal components analysis (PCA) scores on the first two components derived from the correlation matrix for pit structure features (Table 10.1) [1].

The values presented in Table 10.1 and the factor scores plotted in Figure 10.5 corroborate many of the observations presented above. Small structures correlated positively with one-hole ventilators and exterior posts, and negatively with most other variables. Medium structures correlated positively with benches, stringer posts, posts in the floor, and a four-post roof support system. Large structures contained mealing bins and conical pits more frequently than did medium and small structures. As expected, benches and stringer

[1] Principal components analysis (PCA) is an exploratory tool for obtaining a two-dimensional picture of complex multivariate data (Baxter 1994:48–50). PCA involves a mathematical procedure that transforms a number of possibly correlated variables into a smaller number of uncorrelated variables called principal components. The first principal component accounts for as much of the variability in the data as possible, and each succeeding component accounts for as much of the remaining variability as possible. The results of a PCA depend largely on how the data are scaled or standardized. The most common method of standardizing data is through the use of a correlation matrix. Thus, the plots of a PCA can be interpreted as two-dimensional approximations to the correlation matrix.

posts were highly correlated, as were four-post roof support systems and posts in the floor, and wing walls and deflectors. In addition, one of the strongest sets of correlations was among two-hole ventilators, coped hearths, and deflectors (see Figure 10.5; see Table 10.1). The possible meanings of these associations are unclear, but these features may have been functionally related somehow. Alternatively, they may have been culturally linked; that is, the people who built and occupied these structures had a culturally specific way of building their houses (see Chapter 12, Settlement Cluster Variation, for additional discussions of possible cultural variation in building techniques in the project area). Finally, conical pits, storage pits, and mealing bins were strongly correlated, all of which were correlated positively with large structures.

House Features Summary

In summary, small structures tended to have few features incorporated into them and much less capacity for storage (both in number of storage pits and bench area). Their smaller size, roofing technique using exterior posts, and lack of additional features such as wing walls and bins suggest a lack of energy investment in their construction compared to that spent on larger structures. Large structures had the most associated features, including mealing bins, storage pits, and conical pits. These structures not only appear to have received more energy investment, but some also probably played a ritual function as well as a domestic function. Finally, some highly correlated variables, such as two-hole ventilators and coped hearths, may be culturally related rather than functionally related, and may signal the presence of more than one culture group in the community. This topic is further explored in Chapter 12 and Chapter 15, Ritual, Social Power, and Identity.

CLOSURE OF THE HOUSE

Also referred to as mode of abandonment (see, for example, Varien and Lightfoot 1989:82), the closure of a house informs on the last uses of the house before it was vacated. These closure treatments include whether the house was cleaned of artifacts and how features were treated at the time of vacancy, whether the house was burned when placed into disuse as a dwelling or the timbers were salvaged for use in other structures, and whether cultural or natural deposits filled the remaining depression. How a house was treated at closure may relate to the anticipated distance and permanence of the move (Schlanger and Wilshusen 1993), the need for timbers for the construction of new houses locally, and any ritual concerns the household may have had for the structure (Wilshusen 1986). In rare cases, catastrophic closures may have occurred due to accidental burning of a house or deliberate acts of violence (LeBlanc 1999).

The following closure variables were recorded as present or absent on all 60 Pueblo I pit structures: post-abandonment (PA) burning, after-salvage (AS) burning (main support posts absent), de facto artifact assemblage on the floor, animal or human burial on the floor or in the fill, refuse in the fill, and capped floor features.

Twenty-five of the 60 pit structures (42%) were burned at closure (i.e., had post-abandonment burning) (Figure 10.6). Of these, 13 had their main support posts removed prior to the burning (or, alternatively, they were not preserved because they were not burned thoroughly enough in the closure fire). Fourteen had de facto artifact assemblages on their floors[2], which means that 46 of the pit structures (77%) were completely or mostly cleaned of artifacts when they were closed as dwellings. Burials, both human and animal, on the floor and in the fill were rare occurrences, but human burials outnumbered animal burials. Additionally, very few structures were filled with trash. Interestingly, 19 pit structures had capped floor features, indicating that care was taken in the closure of these structures.

[2] This count does not include Feature 104 at the Sacred Ridge site. This structure contained a substantial floor assemblage, but this assemblage was associated with a post-occupancy use of the structure (see Chapter 16, Paleodemography, Health, and Violence in Ridges Basin).

Table 10.1. Pit Structure Feature Correlations Based on Presence/Absence

Pit Structure Size and Feature Type	Small	Medium	Large	Bench	Four-post	Post in Bench	Post in Floor	Stringer Post	Exterior Post	One-hole Vent	Two-hole Vent	Wing Wall	Deflector	Sipapu	Coped Hearth	Bin	Storage Pit	Mealing Bin	Conical Pit
Small	1.00	**−0.61**	**−0.45**	**−0.47**	−0.15	−0.17	−0.27	**−0.43**	0.22	0.16	−0.20	−0.28	0.10	**−0.38**	0.06	−0.27	−0.13	−0.16	−0.24
Medium	**−0.61**	1.00	**−0.43**	0.27	0.19	0.10	**0.31**	**0.30**	−0.11	−0.06	0.03	0.17	0.15	0.18	0.02	0.19	0.02	0.06	−0.23
Large	**−0.45**	**−0.43**	1.00	0.23	−0.04	0.08	−0.04	0.15	−0.12	−0.12	0.18	0.13	−0.27	0.23	−0.08	0.10	0.12	0.12	**0.52**
Bench	**−0.47**	0.27	0.23	1.00	0.15	0.22	**0.28**	**0.32**	−0.23	−0.13	**0.30**	0.27	−0.05	**0.39**	0.13	−0.07	0.20	0.12	0.18
Four-post	−0.15	0.19	−0.04	0.15	1.00	**−0.38**	**0.67**	0.08	**−0.29**	0.04	−0.08	0.15	−0.00	0.10	0.17	0.04	0.14	0.08	0.12
Posts in bench	−0.17	0.10	0.08	0.22	**−0.38**	1.00	−0.20	0.10	−0.17	−0.08	0.12	−0.06	−0.18	0.09	−0.12	−0.02	0.08	0.24	−0.11
Posts in floor	−0.27	**0.31**	−0.04	**0.28**	**0.67**	−0.20	1.00	0.08	**−0.61**	0.04	−0.08	0.28	0.12	0.22	−0.07	0.04	0.14	0.08	0.12
Stringer post	**−0.43**	**0.30**	0.15	**0.32**	0.08	0.10	0.08	1.00	0.16	−0.15	0.21	0.21	−0.03	**0.29**	0.06	−0.00	−0.18	0.14	0.20
Exterior post	0.22	−0.11	−0.12	−0.23	**−0.29**	−0.17	**−0.61**	0.16	1.00	0.25	−0.22	0.02	0.05	**−0.38**	0.01	−0.07	−0.15	−0.09	−0.13
One-hole vent	0.16	−0.06	−0.12	−0.13	0.04	−0.08	0.04	−0.15	0.25	1.00	**−0.89**	0.20	−0.21	**−0.42**	**−0.30**	−0.10	0.04	0.12	0.17
Two-hole vent	−0.20	0.03	0.18	**0.30**	−0.08	0.12	−0.08	0.21	−0.22	**−0.89**	1.00	−0.04	0.13	**0.46**	**0.42**	0.15	−0.00	−0.10	−0.15
Wing wall	−0.28	0.17	0.13	0.27	0.15	−0.06	**0.28**	0.21	0.02	0.20	−0.04	1.00	**0.41**	0.11	0.13	**0.29**	0.20	0.12	0.18
Deflector	0.10	0.15	−0.27	−0.05	−0.00	−0.18	0.12	−0.03	0.05	−0.21	0.13	**0.41**	1.00	0.05	0.19	−0.02	−0.12	−0.24	−0.04
Sipapu	**−0.38**	0.18	0.23	**0.39**	0.10	0.09	0.22	**0.29**	**−0.38**	**−0.42**	**0.46**	0.11	0.05	1.00	−0.02	0.00	−0.10	0.19	0.12
Coped hearth	0.06	0.02	−0.08	0.13	0.17	−0.12	−0.07	0.06	0.01	**−0.30**	**0.42**	0.13	0.19	−0.02	1.00	0.06	−0.06	0.00	−0.14
Bin	−0.27	0.19	0.10	−0.07	0.04	−0.02	0.04	−0.00	−0.07	−0.10	0.15	**0.29**	−0.02	0.00	0.06	1.00	0.19	−0.10	−0.14
Storage pit	−0.13	0.02	0.12	0.20	0.14	0.08	0.14	−0.18	−0.15	0.04	−0.00	0.20	−0.12	−0.10	−0.06	0.19	1.00	0.27	**0.39**
Mealing bin	−0.16	0.06	0.12	0.12	0.08	0.24	0.08	0.14	−0.09	0.12	−0.10	0.12	−0.24	0.19	0.00	−0.10	0.27	1.00	**0.32**
Conical pit	−0.24	−0.23	**0.52**	0.18	0.12	−0.11	0.12	0.20	−0.13	0.17	−0.15	0.18	−0.04	0.12	−0.14	−0.14	**0.39**	**0.32**	1.00

Note: Bolded correlations are significant at $p < 0.05$; $n = 49$.

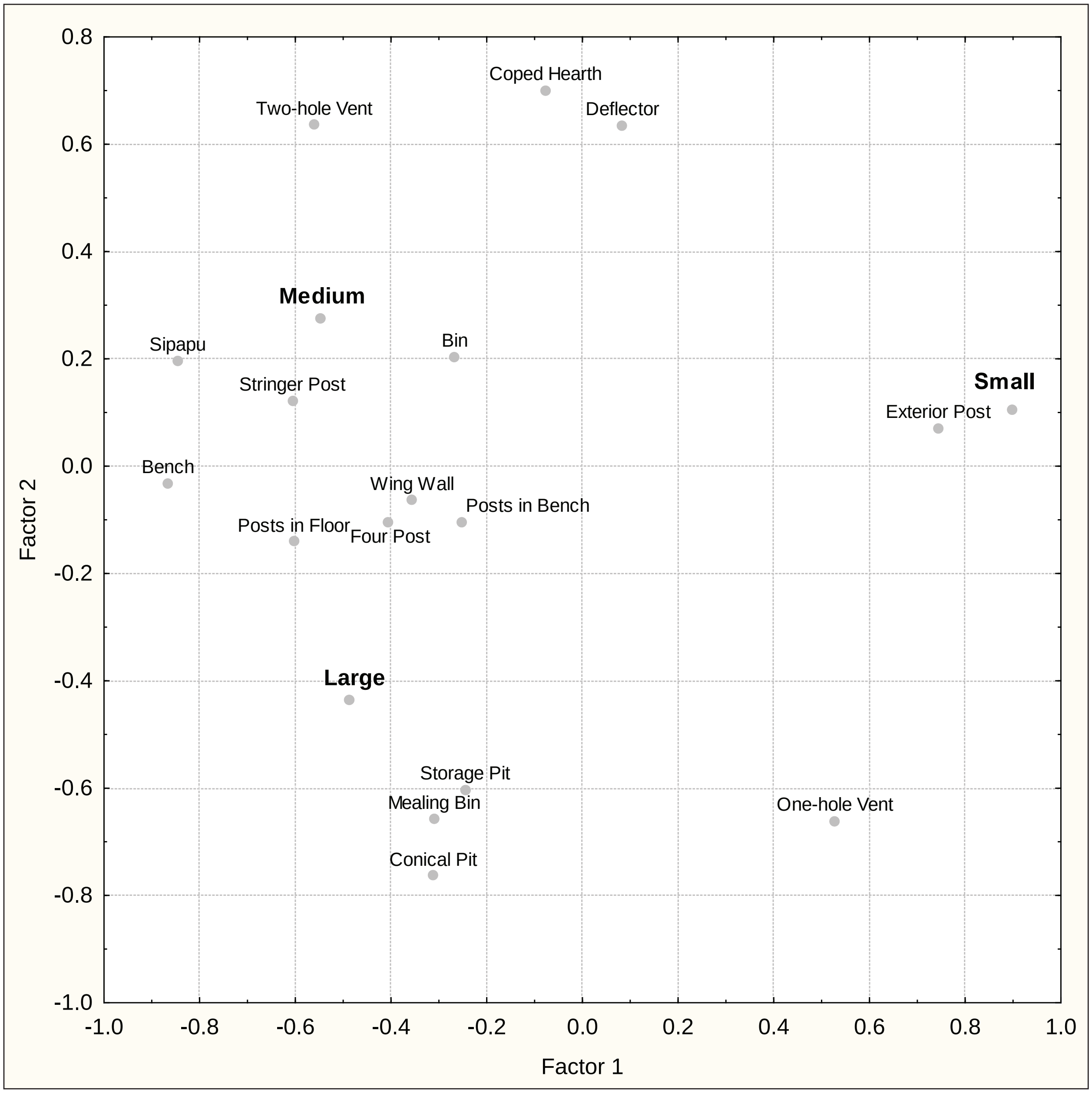

Figure 10.5. Scatterplot of scores on the first two principal components (or factors) derived from the correlation matrix for pit structure features.

Small structures exhibited fewer closure attributes than medium and large structures (Figure 10.7). They were burned less frequently, contained fewer floor assemblages and burials, and were filled with trash and had capped floor features less frequently than larger structures. Slightly more than half of the large structures were burned at abandonment. Large structures also exhibited the highest frequency of fill burials, floor assemblages, trash, and capped floor features (Figure 10.7).

A correlation analysis of the variables shows that the only significant correlation with respect to structure size is that between medium structures and human floor burials. In general, small structures exhibit negative correlations with most variables, whereas medium and large structures are positively correlated with most variables (Table 10.2). Among the variables, pit structures with post-abandonment burning and after-salvage burning are highly correlated, which is not unexpected given that those pit structures burned after salvage compose a subset of the pit structures that received post-abandonment burning. Animal burials in the fill and floor are highly correlated, suggesting that the process of including animals in the closing of the structure continued well after the house was no longer used as a domicile. And interestingly, human floor burials and floor artifact assemblages co-occur significantly, suggesting either that the floor assemblages comprised burial items or that both the body and the items were haphazardly left in place when the structure was closed, perhaps as a part of a violent act (Figure 10.8; Table 10.3).

Capped floor features are positively correlated with post-abandonment burning (Figure 10.8), suggesting that most post-abandonment burning was part of the same careful closing process that motivated people to cap the floor features. In other words, most post-abandonment burning does not appear to have been accidental or part of a violent act. If it were, we would expect floor features, including main support post holes, in burned structures to remain uncapped and a more significant positive correlation between the occurrence of floor assemblages and burning (Figure 10.8; Table 10.3).

In summary, the closure variables recorded for pit structures suggest that most structures were carefully cleaned of artifacts before they were vacated. Although just under half of the structures were burned at abandonment, those that were burned exhibited capped floor features more often than not, indicating a planned and careful closure of the structure. Small structures were less often associated with burning, capped features, and artifact floor assemblages, and they appear to have been the most haphazardly treated at the time of closure.

Medium structures had the most occurrences of human skeletons on the floor and more floor assemblages. Large structures were most often purposefully burned at abandonment, even when their main support posts had been salvaged and their floor features had been capped. In other words, of all pit structure size classes, large structures underwent the most planned and labor-intensive closure process.

ARTIFACTS ASSOCIATED WITH HOUSES

Floor Artifact Assemblages

Less than a quarter of the structures contained de facto floor artifact assemblages, that is, floor assemblages that were probably not altered substantially as part of the vacancy process (see Figure 10.7). The ones that did contain de facto assemblages, however, allow for some assessment of the variation in activities conducted in the structures. This section compares the relative frequencies of artifact categories that can be associated with specific activities in these structures (Table 10.3). For this portion of the analysis, an attempt was made to count pottery vessels as whole or partially whole vessels rather than simply as sherds. Thus, a reconstructible vessel was counted as a single item regardless of the number of sherds that went into its reconstruction. Also, sherds of a single vessel type (e.g., Rosa Black-on-white bowl) point-located together on a house floor were counted as a single vessel, even if they did not ultimately refit. Furthermore, in addition to heavy- and light-duty scrapers, used flakes were counted as flaked stone scrapers for this analysis. Finally, awls made from artiodactyl bones were counted both as awls and as artiodactyl bones.

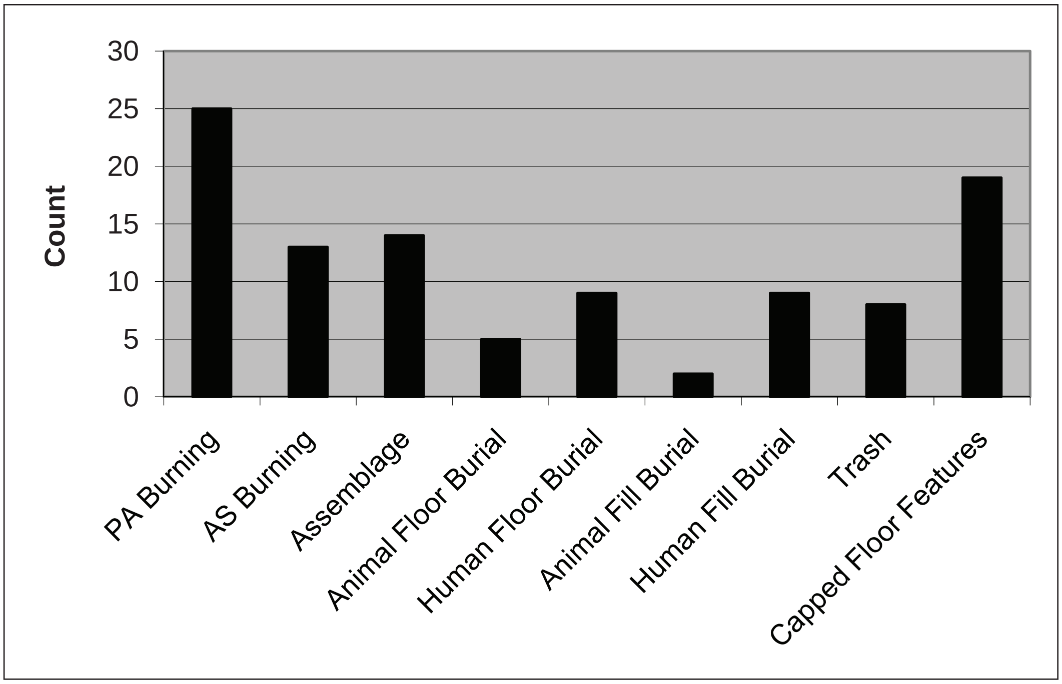

Figure 10.6. Count of pit structures exhibiting the presence each closure attribute. The presence or absence of each attribute was noted in all 60 fully excavated pit structures. PA burning = post-abandonment burning; AS burning = after-salvage burning (main support beams absent).

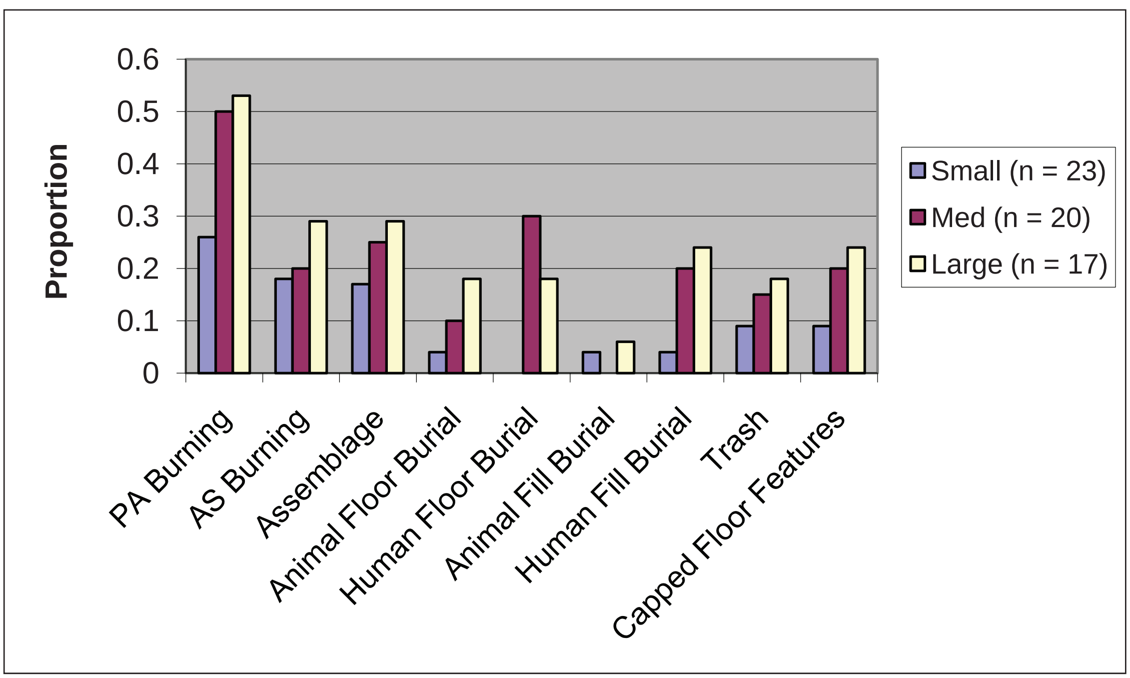

Figure 10.7. Proportion of pit structures of various sizes exhibiting particular closure attributes. PA burning = post-abandonment burning; AS burning = after-salvage burning (main support beams absent).

Table 10.2. Pit Structure Closing Attribute Correlations Based on Presence/Absence

	Pit Structure Size			Closing Attribute								
	Small	**Medium**	**Large**	**PA Burning**	**AS Burning**	**Artifact Assemblage**	**Animal Floor Burial**	**Human Floor Burial**	**Animal Fill Burial**	**Human Fill Burial**	**Trash-filled**	**Capped Floor Features**
Small	1.00	**−0.56**	**−0.50**	−0.25	−0.08	−0.17	−0.11	**−0.33**	0.04	−0.24	−0.11	−0.17
Medium	**−0.56**	1.00	**−0.44**	0.12	−0.03	0.14	0.04	**0.30**	−0.13	0.10	0.03	0.06
Large	**−0.50**	**−0.44**	1.00	0.14	0.12	0.03	0.08	0.05	0.09	0.15	0.08	0.12
PA Burning	−0.25	0.12	0.14	1.00	**0.29**	0.13	−0.01	0.21	−0.16	−0.07	0.07	**0.26**
AS Burning	−0.08	−0.03	0.12	**0.29**	1.00	−0.18	−0.16	−0.11	−0.10	0.01	0.15	0.20
Artifact assemblage	−0.17	0.14	0.03	0.13	−0.18	1.00	−0.01	**0.35**	−0.10	−0.11	−0.09	−0.13
Animal floor burial	−0.11	0.04	0.08	−0.01	−0.16	−0.01	1.00	−0.13	**0.28**	0.04	0.24	0.03
Human floor burial	**−0.33**	**0.30**	0.05	0.21	−0.11	**0.35**	−0.13	1.00	−0.08	0.22	−0.03	−0.06
Animal fill burial	0.04	−0.13	0.09	−0.16	−0.10	−0.10	**0.28**	−0.08	1.00	**0.44**	−0.07	−0.08
Human fill burial	−0.24	0.10	0.15	−0.07	0.01	−0.11	0.04	0.22	**0.44**	1.00	0.25	−0.06
Trash-filled	−0.11	0.03	0.08	0.07	0.15	−0.09	0.24	−0.03	−0.07	0.25	1.00	0.09
Capped floor features	−0.17	0.06	0.12	0.26	0.20	−0.13	0.03	−0.06	−0.08	−0.06	0.09	1.00

Notes:

Bolded correlations are significant at $p < 0.05$; $n = 60$.

PA burning = post-abandonment burning.

AS burning = after-salvage burning (main support beams absent).

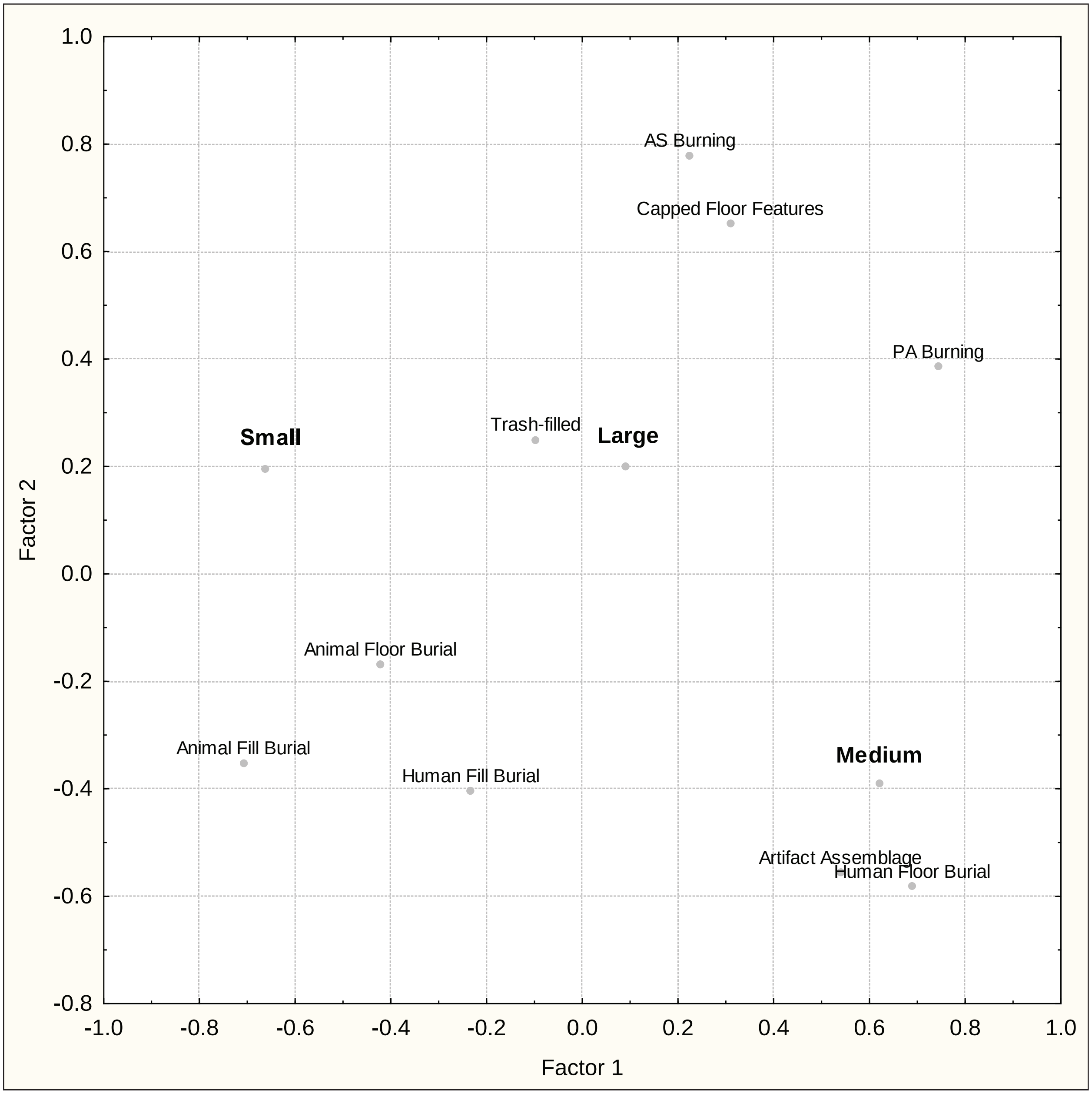

Figure 10.8. Scatterplot of scores on the first two principal components (or factors) derived from the correlation matrix for pit structure closing attributes.

Table 10.3. Artifact Categories Used in Household Activity Comparison and Primary and Secondary Uses of Each Artifact Category

Artifact Category	Primary Use	Secondary Use
Axe	Chopping wood	Weapon
Maul	Quarrying and shaping building stone	Possible weapon
Projectile point	Hunting	Weapon
Core/hammerstone	Producing flaked stone tools	
Flaked stone scraper	Cutting and scraping, especially processing of hunted game	Plant cutting, bone or wood working
Ground stone tool	Grinding plants, especially maize	
Pecking stone	Sharpening grinding tools	Shaping building stone
Bone awl	Sewing clothing and baskets	
Grayware jar	Cooking vessel	Storage vessel
Bowl	Serving prepared foods	
Seed jar	Storing liquids and seeds	
Lagomorph	Food	Clothing and tools
Artiodactyl	Food	Clothing and tools
Turkey	Food	Clothing and tools
Polishing stone	Polishing clay and plaster	
Pipe	Ceremony	

Source: Adapted from Potter and Ortman (2004:176–177).

Artifact types associated with Pueblo I pit structure floor assemblages can be categorized as rare, common, and abundant. Most of the artifact types are rare, and these include axes, mauls, projectile points, pecking stones, seed jars, lagomorph and artiodactyl remains, polishing stones, and pipes (Figure 10.9). This suggests that, in general, the activities associated with these items were performed on a less frequent basis—in these contexts—than those associated with more common artifact types. Thus, wood chopping, the quarrying and shaping of stone, hunting, the sharpening of grinding tools, the storage of liquids and seeds, the consumption of rabbits and deer, the polishing of floors and pottery, and ceremonial smoking appear to have been rare activities inside most houses. This is probably an over-simplification, of course. Projectile points, for instance, are not expected to be commonly associated with house floors because they were used almost exclusively outdoors. Thus, households may have participated in hunting activities but their floor assemblages may not reflect this activity. Likewise, animal remains were most likely cleaned out of most houses on a fairly regular basis, substantially reducing their presence on the floor of the house.

More common artifacts on house floors were cores/hammerstones, flaked stone scrapers, bone awls, and bowls, suggesting that flaked stone tool production and maintenance, the processing of animal carcasses, sewing and weaving, and food serving commonly occurred in most houses (Table 10.4). The most abundant artifacts were ground stone tools, grayware jars, and turkey remains (see Figure 10.9). (It should be noted that the abundant turkey remains were associated with two houses at 5LP237 [Table 10.4]). These data suggest that food cooking and storage and the grinding of maize were the most frequent activities conducted in Pueblo I houses.

A correlation analysis of the variables suggests some interesting associations (Figure 10.10; Table 10.5). Small structures are positively correlated with projectile points, flaked stone scrapers, pecking stones, lagomorph and turkey remains, and all of the pottery categories. Medium structures had bone awls and artiodactyl bones on their floors. And large structures contained axes, mauls, and pipes.

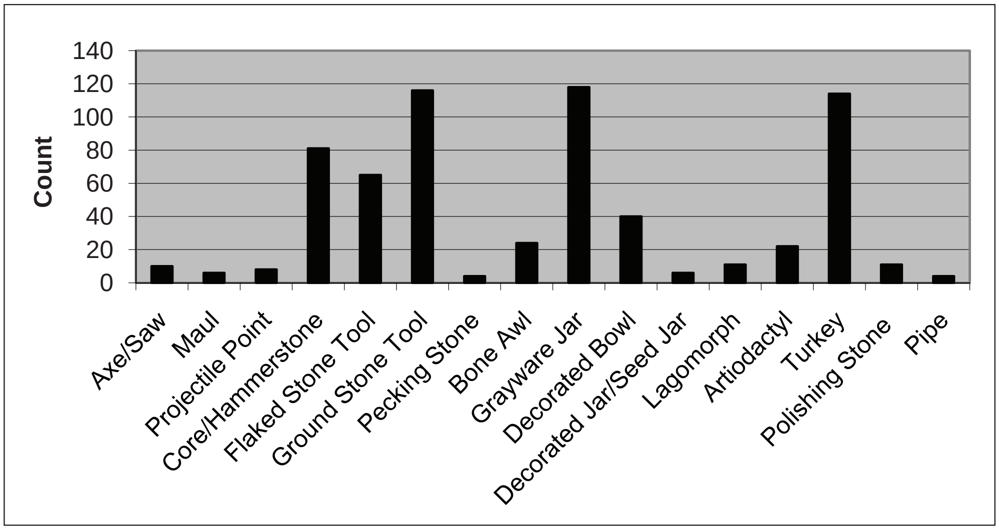

Figure 10.9. Pueblo I pit structure floor assemblage composition, all floor assemblages combined.

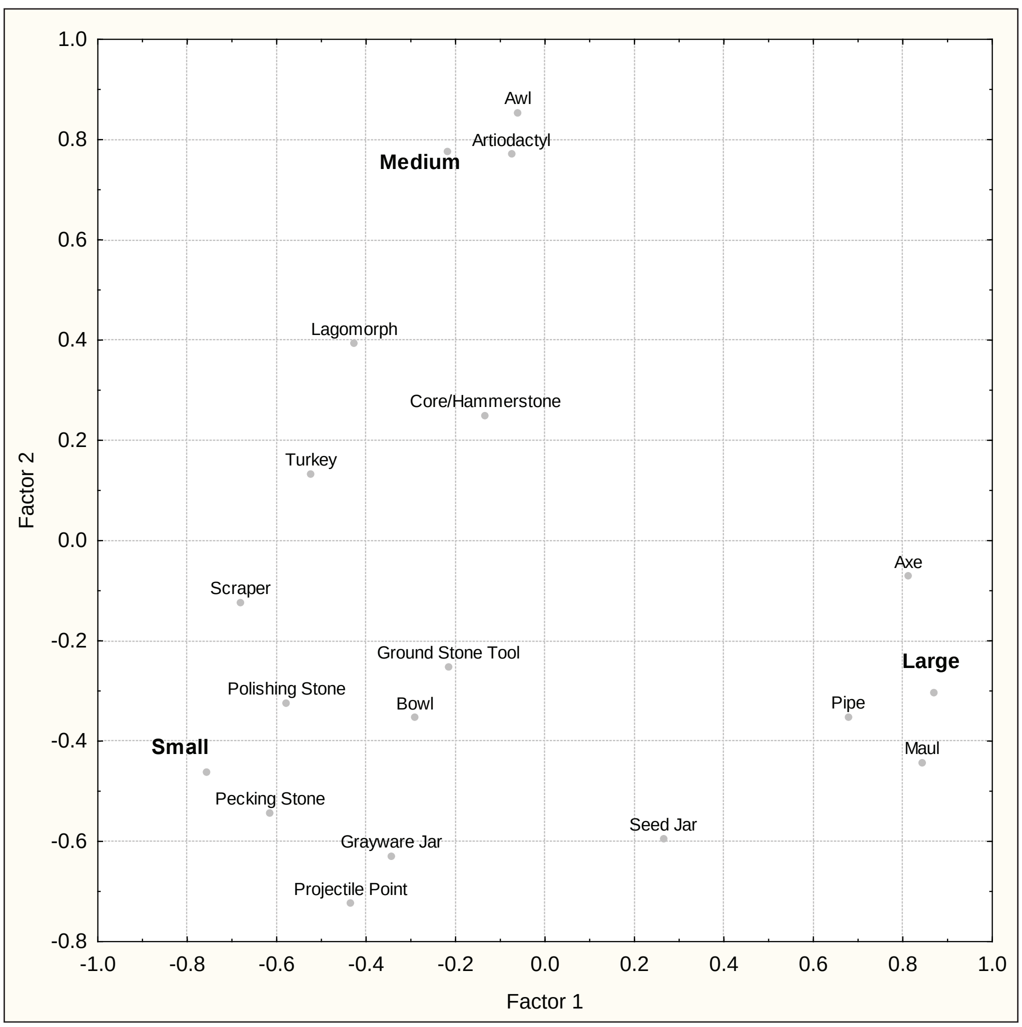

Figure 10.10. Scatterplot of scores on the first two principal components (or factors) derived from the correlation matrix for pit structure floor assemblages.

Table 10.4. Counts of Artifacts Associated with Floor Assemblages from Pueblo I Pit Structures

Site Number–Feature Number	Artifact Type															
	Axe	Maul	Projectile Point	Core/ Hammerstone	Flaked Stone Scraper	Ground Stone Tool	Pecking Stone	Bone Awl	Grayware Jar	Bowl	Seed Jar	Lagomorph	Artiodactyl	Turkey	Polishing Stone	Pipe
5LP237–3	2	0	0	19	7	9	0	7	8	0	0	2	4	1	0	0
5LP237–2	1	0	1	3	3	6	0	0	3	3	0	0	1	32	3	0
5LP237–4	0	0	0	2	13	9	0	1	1	4	0	4	1	78	0	0
5LP187–5	0	0	0	1	1	15	1	1	6	1	0	0	1	0	1	0
5LP187–1	1	1	5	6	8	13	1	0	19	3	3	2	2	1	1	1
5LP241–6	0	0	2	16	10	7	2	2	24	2	0	0	1	0	2	0
5LP2026–3	0	0	0	2	0	4	0	1	16	5	0	0	2	2	0	0
5LP536–1	0	0	0	3	1	1	0	2	7	6	0	0	2	0	1	0
5LP244–15	0	0	0	4	4	7	0	5	2	2	1	2	3	0	1	0
5LP246–2	1	0	0	6	6	21	0	1	12	8	0	0	1	0	1	0
5LP236–3	0	0	0	1	2	4	0	0	2	0	0	0	0	0	0	0
5LP245–134	2	2	0	5	4	8	0	1	7	3	0	0	1	0	1	0
5LP245–83	0	1	0	6	4	8	0	2	0	1	0	1	2	0	0	2
5LP245–58	3	2	0	7	2	4	0	1	11	2	2	0	1	0	0	1
Total	**10**	**6**	**8**	**81**	**65**	**116**	**4**	**24**	**118**	**40**	**6**	**11**	**22**	**114**	**11**	**4**

Table 10.5. Pit Structure Floor Assemblage Variable Correlations Based on Artifact Counts

Pit Structure Size and Artifact Type	**Small**	**Medium**	**Large**	**Axe**	**Maul**	**Projectile Point**	**Core/ Hammerstone**	**Flaked Stone Scraper**	**Ground Stone Tool**	**Pecking Stone**	**Bone Awl**	**Grayware Jar**	**Bowl**	**Seed Jar**	**Lagomorph**	**Artiodactyl**	**Turkey**	**Polishing Stone**	**Pipe**
Small	1.00	−0.47	−0.47	−0.31	−0.16	0.55	0.12	**0.59**	−0.10	0.50	−0.15	0.39	0.26	0.23	0.37	−0.05	0.35	0.16	−0.04
Medium	−0.47	1.00	−0.56	−0.09	−0.44	−0.21	0.00	−0.34	−0.01	−0.11	0.42	−0.15	−0.22	−0.19	0.01	0.48	−0.04	0.19	−0.36
Large	−0.47	**−0.56**	1.00	0.38	**0.58**	−0.32	−0.11	−0.21	0.11	−0.36	−0.28	−0.22	−0.02	−0.02	−0.36	−0.43	−0.29	−0.33	0.40
Axe	−0.31	−0.09	0.38	1.00	**0.69**	0.02	0.38	−0.03	0.05	−0.24	0.11	0.14	−0.09	0.39	−0.11	0.10	−0.16	−0.07	0.14
Maul	−0.16	−0.44	**0.58**	**0.69**	1.00	0.11	0.02	−0.10	−0.09	−0.12	−0.22	0.06	−0.14	0.48	−0.14	−0.14	−0.22	−0.20	**0.55**
Projectile point	**0.55**	−0.21	−0.32	0.02	0.11	1.00	0.19	0.38	0.20	**0.60**	−0.27	**0.60**	−0.02	**0.68**	0.16	0.02	−0.07	0.35	0.24
Core/hammerstone	0.12	0.00	−0.11	0.38	0.02	0.19	1.00	0.44	0.07	0.37	**0.63**	0.46	−0.28	0.02	0.10	0.49	−0.25	0.04	0.04
Flaked stone scraper	**0.59**	−0.34	−0.21	−0.03	−0.10	0.38	0.44	1.00	0.33	0.35	0.14	0.20	0.02	0.09	**0.70**	0.06	**0.56**	0.04	−0.02
Ground stone tool	−0.10	−0.01	0.11	0.05	−0.09	0.20	0.07	0.33	1.00	0.22	−0.06	0.15	0.25	0.07	0.13	−0.05	−0.01	0.10	−0.00
Pecking stone	0.50	−0.11	−0.36	−0.24	−0.12	**0.60**	0.37	0.35	0.22	1.00	−0.12	**0.68**	−0.19	0.17	−0.11	−0.16	−0.18	0.40	−0.03
Bone awl	−0.15	0.42	−0.28	0.11	−0.22	−0.27	**0.63**	0.14	−0.06	−0.12	1.00	−0.11	−0.30	−0.14	0.35	**0.85**	−0.19	−0.21	−0.12
Grayware jar	0.39	−0.15	−0.22	0.14	0.06	0.60	0.46	0.20	0.15	**0.68**	−0.11	1.00	0.24	0.35	−0.26	0.01	−0.36	0.21	−0.06
Bowl	0.26	−0.22	−0.02	−0.09	−0.14	−0.02	−0.28	0.02	0.25	−0.19	−0.30	0.24	1.00	−0.08	−0.12	−0.13	0.15	0.17	−0.24
Seed jar	0.23	−0.19	−0.02	0.39	0.48	**0.68**	0.02	0.09	0.07	0.17	−0.14	0.35	−0.08	1.00	0.22	0.13	−0.17	−0.07	0.44
Lagomorph	0.37	0.01	−0.36	−0.11	−0.14	0.16	0.10	**0.70**	0.13	−0.11	0.35	−0.26	−0.12	0.22	1.00	0.41	**0.64**	−0.32	0.09
Artiodactyl	−0.05	0.48	−0.43	0.10	−0.14	0.02	0.49	0.06	−0.05	−0.16	**0.85**	0.01	−0.13	0.13	0.41	1.00	−0.21	−0.19	0.09
Turkey	0.35	−0.04	−0.29	−0.16	−0.22	−0.07	−0.25	**0.56**	−0.01	−0.18	−0.19	−0.36	0.15	−0.17	**0.64**	−0.21	1.00	0.03	−0.18
Polishing stone	0.16	0.19	−0.33	−0.07	−0.20	0.35	0.04	0.04	0.10	0.40	−0.21	0.21	0.17	−0.07	−0.32	−0.19	0.03	1.00	−0.30
Pipe	−0.04	−0.36	0.40	0.14	0.55	0.24	0.04	−0.02	−0.00	−0.03	−0.12	−0.06	−0.24	0.44	0.09	0.09	−0.18	−0.30	1.00

Note: Bolded correlations are significant at $p < 0.05$; $n = 14$.

This suggests, at least, that more animal-carcass processing occurred in small structures, and that more ceremonial smoking of tobacco occurred in large structures. Correlated variables include axes and mauls, suggesting either an overlap in classification or a common use for these morphologically similar items; cores/hammerstones and bone awls, suggesting that flaked stone tool production and sewing often occurred in the same structures; flaked stone scrapers and lagomorph and turkey remains, indicating that most flaked stone scrapers were used to process animal carcasses; and artiodactyl remains and bone awls, which is not surprising given that all of the awls in this analysis were made from artiodactyl bones. A less easily interpretable correlation occurred between pecking stones, projectile points, and grayware jars.

In sum, significant differences were apparent in the floor assemblages of small, medium, and large structures. Small structures exhibited the most diverse array of activities associated with them, including animal hunting and processing, sharpening grinding tools, and food serving, storing, and cooking. Medium structures were associated with sewing clothes and baskets and with artiodactyls. And large structures frequently were the locus of maize grinding and tobacco smoking. The following section broadens the analysis of household artifacts to include all artifacts found in association with each household, including those recovered from fill, midden, and extramural features.

Other Artifact Assemblages

Forty-one Pueblo I sites or loci in the ALP project area yielded substantial artifact assemblages. Many of these sites contained more than one house, and the artifact assemblages of these frequently were not easily separable (e.g., when houses shared a midden) and were therefore combined. Sacred Ridge was divided into nine habitation loci, many of which contained more than one house. For this analysis these loci are treated the same as sites. Moreover, pit structure size is not considered in this section because many of the sites and loci with multiple pit structures contained structures of more than one size class.

Table 10.6 presents the counts of major artifact classes by site. To simplify the analysis, jars of all types were combined, as were bowls. Unlike the floor assemblage analysis above, in this analysis ceramic counts are sherd counts rather than numbers of reconstructible vessels. Finally, mauls were excluded from this section due to their absence in most site assemblages.

To explore patterning among the artifact variables and cases presented in Table 10.6, a correspondence analysis[3] was conducted on the data. Figure 10.11 is a scatterplot of the first two dimensions of the analysis. In this plot, each dot represents a single case (site or locus). Two well-defined clusters of cases are indicated on either side of the 0.0 point along Dimension 1. This suggests that two distinct sets of activities (as represented by the various associated artifact categories) were emphasized at Pueblo I habitation sites.

[3] Correspondence analysis (CA) is a multivariate technique that employs a chi-square statistic on contingency-table cell values (usually counts) to produce components or "dimensions" (Baxter 1994). Dimensions may be thought of as summary variables, and each analysis produces as many of these summary variables as are needed to account for the total variation in the assemblage. The first two, however, account for the largest proportion of that variation, and, by plotting these on a two-dimensional scatterplot, that variation can be explored visually. In general, the closer variables and cases are to each other on the plot, the more highly correlated they are in the assemblage(s); the farther apart, the less correlated they are. This method has several advantages over other exploratory methods of data examination. First, the use of counts (rather than percentages) and row and column marginals to generate the coefficients circumvents problems of calculating percentages with very small sample sizes (cells are weighted appropriately based on sample size) as well as the closed-sum problem that arises when using percentages. Second, CA generates coefficients for both cases and variables, allowing the researcher to display each on the same scatterplot and thereby observe visually which variables are causing the correlations among cases. And finally, CA is a multivariate technique that allows for the comparison of many cases and variables at once in order to tease out patterns among them. It is important to note that CA is purely an exploratory method and does not provide a test of significance in any of its calculations.

Table 10.6. Counts of Artifacts Associated with Pueblo I Sites, and with Loci (L) at Sacred Ridge (5LP245)

Site	Number of Houses	Axe	Projectile Point	Core/ Hammerstone	Flaked Stone Scraper	Ground Stone Tool	Pecking Stone	Bone Awl	Grayware Jar	Bowl	Seed Jar	Lagomorph	Artiodactyl	Turkey	Polishing Stone	Pipe
5LP185	3	20	24	182	280	117	15	14	1,387	900	36	317	58	12	18	3
5LP187	4	36	17	107	102	102	6	5	602	338	21	29	17	63	13	4
5LP236	2	0	2	41	44	16	0	1	201	114	7	0	2	0	3	1
5LP237	4	2	16	109	218	47	3	17	255	210	2	196	2	164	4	3
5LP238	1	5	4	30	243	10	0	0	67	82	2	2	0	3	2	3
5LP482	1	5	1	22	6	2	4	2	64	44	1	3	0	0	5	1
5LP503	2	0	1	22	34	4	1	3	64	32	0	173	4	0	3	1
5LP174	2	1	1	5	17	5	1	0	41	25	0	0	0	0	1	0
5LP176	1	6	3	39	90	11	3	3	130	140	10	23	10	0	1	0
5LP177	2	10	13	63	22	61	9	24	413	501	9	128	30	326	3	1
5LP178	1	0	0	10	12	15	1	7	26	17	2	19	2	0	0	0
5LP179	1	3	4	33	34	25	4	4	370	289	4	43	3	3	2	0
5LP239	1	1	3	33	11	43	6	5	216	350	11	69	9	10	6	0
5LP240	1	27	12	20	101	11	5	6	329	249	22	22	10	5	5	0
5LP241	1	0	6	68	67	29	4	10	482	261	8	43	7	0	6	1
5LP242	1	8	12	67	67	67	4	9	297	387	9	22	16	0	10	0
5LP630	1	0	0	2	7	8	0	0	5	9	0	0	1	0	0	0
5LP243	1	5	1	74	43	33	3	2	212	88	3	3	2	0	9	0
5LP634	2	5	1	38	16	18	8	2	284	109	0	5	1	75	5	1
5LP184	3	14	17	75	204	66	2	8	283	172	9	57	2	10	3	1
5LP244	2	1	9	39	164	25	1	12	271	212	2	44	17	2	2	1
5LP246	3	1	5	29	141	46	1	0	186	102	2	5	4	0	4	7
5LP248	3	0	0	8	43	8	0	0	53	20	4	1	1	0	0	1
5LP510	1	3	1	15	55	18	0	0	13	7	0	1	0	0	1	0
5LP511	3	5	2	60	142	20	0	0	133	67	1	4	1	1	5	2
5LP536	1	5	4	20	23	2	1	2	107	197	2	13	2	1	3	0
5LP549	1	1	1	14	15	3	0	1	15	3	0	3	1	0	0	0
5LP614	1	0	0	1	19	1	0	0	5	7	0	23	2	1	1	0
5LP2026	3	9	13	55	72	110	11	17	1,211	794	57	192	27	23	11	3
5LP2091	1	0	6	19	12	33	3	1	92	79	0	20	2	5	2	1

Table 10.6. Counts of Artifacts Associated with Pueblo I Sites, and with Loci (L) at Sacred Ridge (5LP245) (continued)

Site	Number of Houses	Axe	Projectile Point	Core/ Hammerstone	Flaked Stone Scraper	Ground Stone Tool	Pecking Stone	Bone Awl	Grayware Jar	Bowl	Seed Jar	Lagomorph	Artiodactyl	Turkey	Polishing Stone	Pipe
5LP2088	1	3	5	19	6	8	0	0	11	19	0	5	0	0	0	0
5LP2089	1	2	1	3	5	6	0	0	3	9	0	1	1	0	1	0
5LP245 L1	2	1	1	24	59	37	1	3	93	65	0	24	5	0	1	0
5LP245 L2	2	9	4	22	40	17	0	2	97	71	3	35	20	4	1	0
5LP245 L3	2	6	35	84	369	29	3	8	212	293	10	120	152	4	5	2
5LP245 L4	2	8	21	78	261	67	1	11	264	362	20	60	26	32	0	0
5LP245 L5	2	6	9	43	274	29	0	19	132	225	21	175	12	6	0	3
5LP245 L6	1	2	4	23	42	9	2	3	73	85	3	36	7	2	0	1
5LP245 L7	2	9	14	98	571	100	6	26	483	519	20	96	34	162	1	12
5LP245 L8	2	2	10	52	214	20	3	8	225	218	10	43	12	29	0	3
5LP245 L9	2	12	24	79	454	36	6	12	352	361	24	134	29	15	5	4

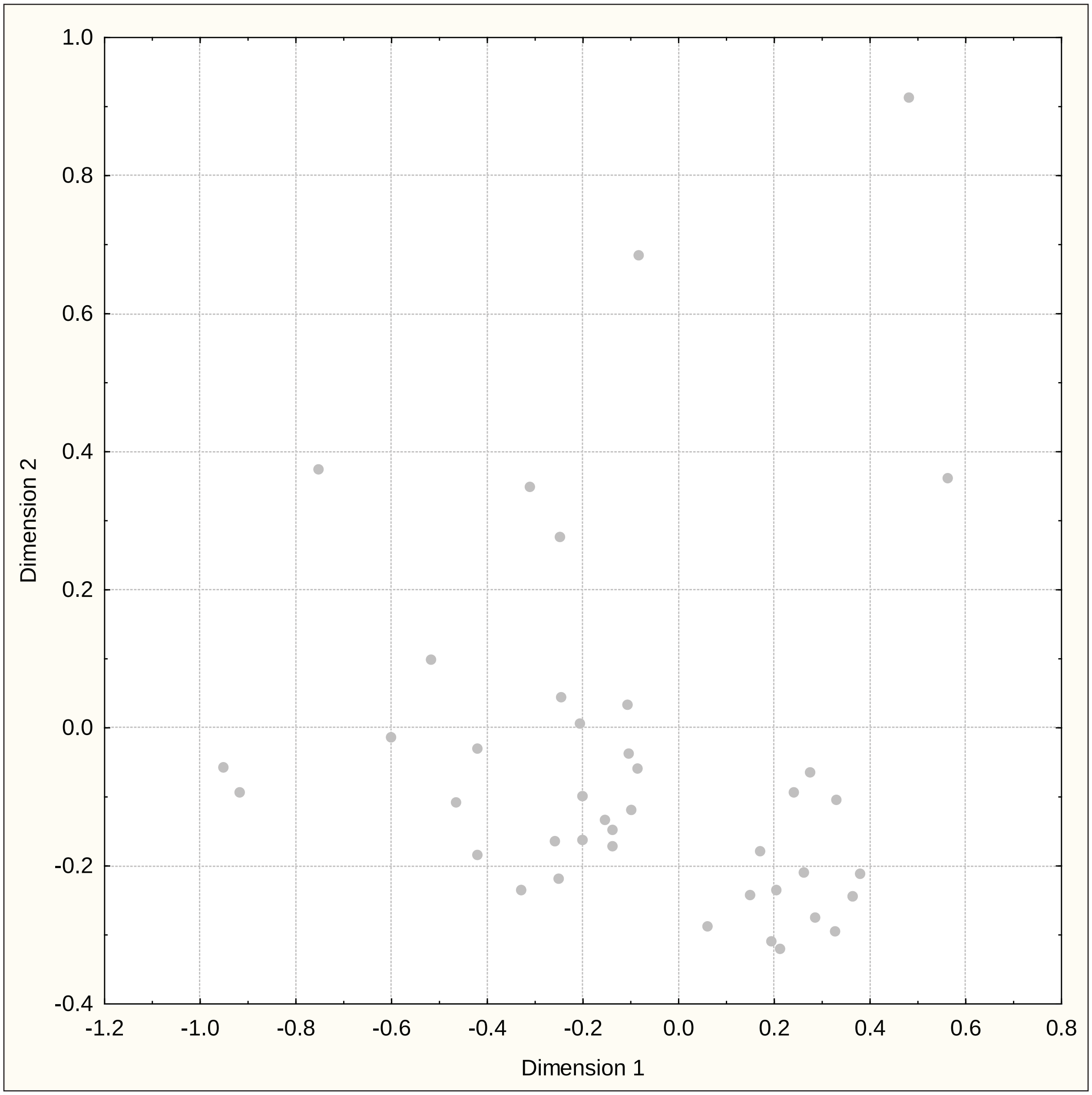

Figure 10.11. Scatterplot of the first two dimensions of a correspondence analysis performed on the count data in Table 10.6. Each dot represents a single case (site or locus). Note two clusters of cases on either side of the 0.0 point along Dimension 1.

Figure 10.12 plots the variables in this analysis and shows which artifacts are causing the clustering of cases seen in Figure 10.11. The cluster to the right of the 0.0 point along the x axis is most closely correlated with jars and bowls, pecking and polishing stones, ground stone tools, axes, and seed jars—many of the items used in everyday domestic activities, especially cooking, processing, and storing maize, and producing and using pottery. The items to the left of the 0.0 point, on the other hand, are all related to hunting, processing hunted game, manufacturing stone tools (many of which were ostensibly for the processing of hunted game), and ritual. These items are flaked stone scrapers, projectile points, cores/hammerstones, the remains of hunted game, and pipes (see Figure 10.12). This is not to say that maize grinding and cooking did not occur at these sites as well, but rather, the activities represented by the various artifact categories were differentially emphasized among the households in the project area. The fact that the cases are clustered so tightly and that the variables causing the clustering are behaviorally related to such a degree argues for the strength and behavioral significance of the pattern.

Dimension 2 of the case plot (the y xis) (see Figure 10.11) appears to separate out a few of the cases based on the high frequency of turkey bones in their assemblages (see Figure 10.12). The frequency of turkey bones is actually a problematic variable because some of the high counts associated with various sites are due to one or a few turkey burials that severely elevate the bone counts of this species, even though only one or a few individuals may be represented. This is not the case with lagomorphs or artiodactyls, which were not interred as turkeys sometimes were. When turkey-count as a variable is eliminated from the analysis, the clustering and separation of cases on either side of the 0.0 point along the x axis is even stronger (Figure 10.13).

In summary, patterning exhibited by total artifact assemblages suggests two distinct sets of activities associated with Pueblo I households—one that emphasized the cooking, serving, and processing of maize, and the production and use of pottery, and one that emphasized the production and use of stone tools, the hunting and processing of fauna, and ritual. These patterns are examined in greater detail in Chapter 12 through an assessment of the spatial distribution of these activities throughout the project area.

EXTRAMURAL FEATURES

Many of the activities conducted by the Pueblo I household occurred outside yet still in the vicinity of the main domicile. These activities involved the construction and use of extramural features. Nine extramural feature types were common on habitation sites in the ALP project area: enclosures, thermal pits, non-thermal pits, surface rooms without hearths, surface rooms with hearths, pit rooms without hearths, pit rooms with hearths, middens, and inhumations (Table 10.7). The following section defines and discusses each of these feature types.

Enclosures

Referred to as stockades in the excavation methods section of the ALP project research design but hereafter referred to as enclosures, this type of feature is defined as

> [an alignment] that surrounds a habitation. Stockades were constructed of upright posts and vary in robustness. Some appear to have been built of posts up to 30 cm in diameter, while others appear to have been built of brush. The presence of burned adobe suggests that some may have also been mudded. They are generally visible as post hole alignments or linear smears of charcoal and adobe. (Potter 2006:89)

Although much less common, cobble aprons or rings are also considered enclosures. These features were between 0.5 m and 2.0 m wide and were made of unshaped gravels, cobbles, and light refuse, and had little or no depth. They often surrounded the pit structure and associated surface rooms.

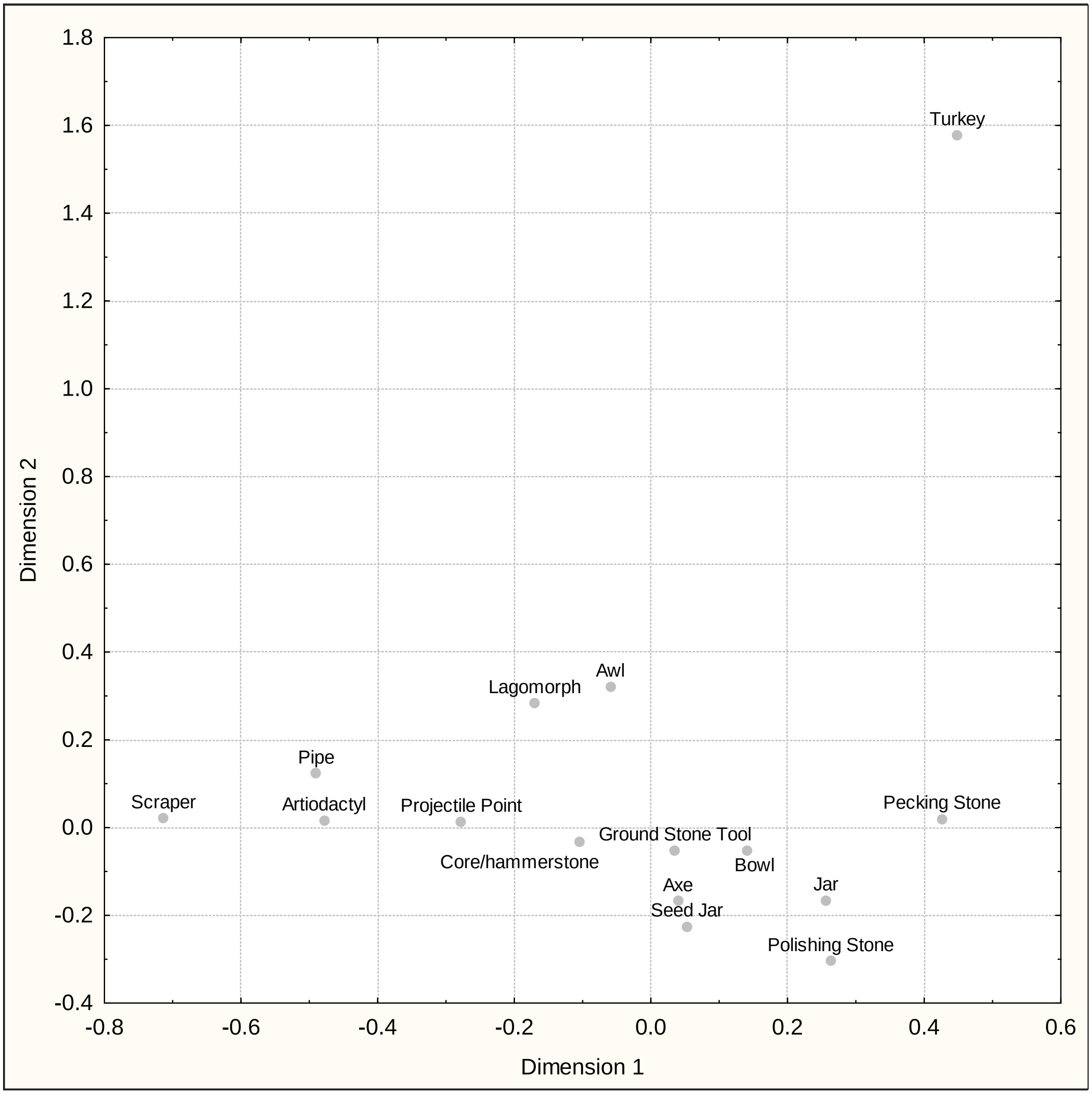

Figure 10.12. Scatterplot of the first two dimensions of a correspondence analysis performed on the count data in Table 10.6. Each dot represents a single variable (artifact category). Note the various artifact types on either side of the 0.0 point along Dimension 1, causing the clustering of cases seen in Figure 10.11.

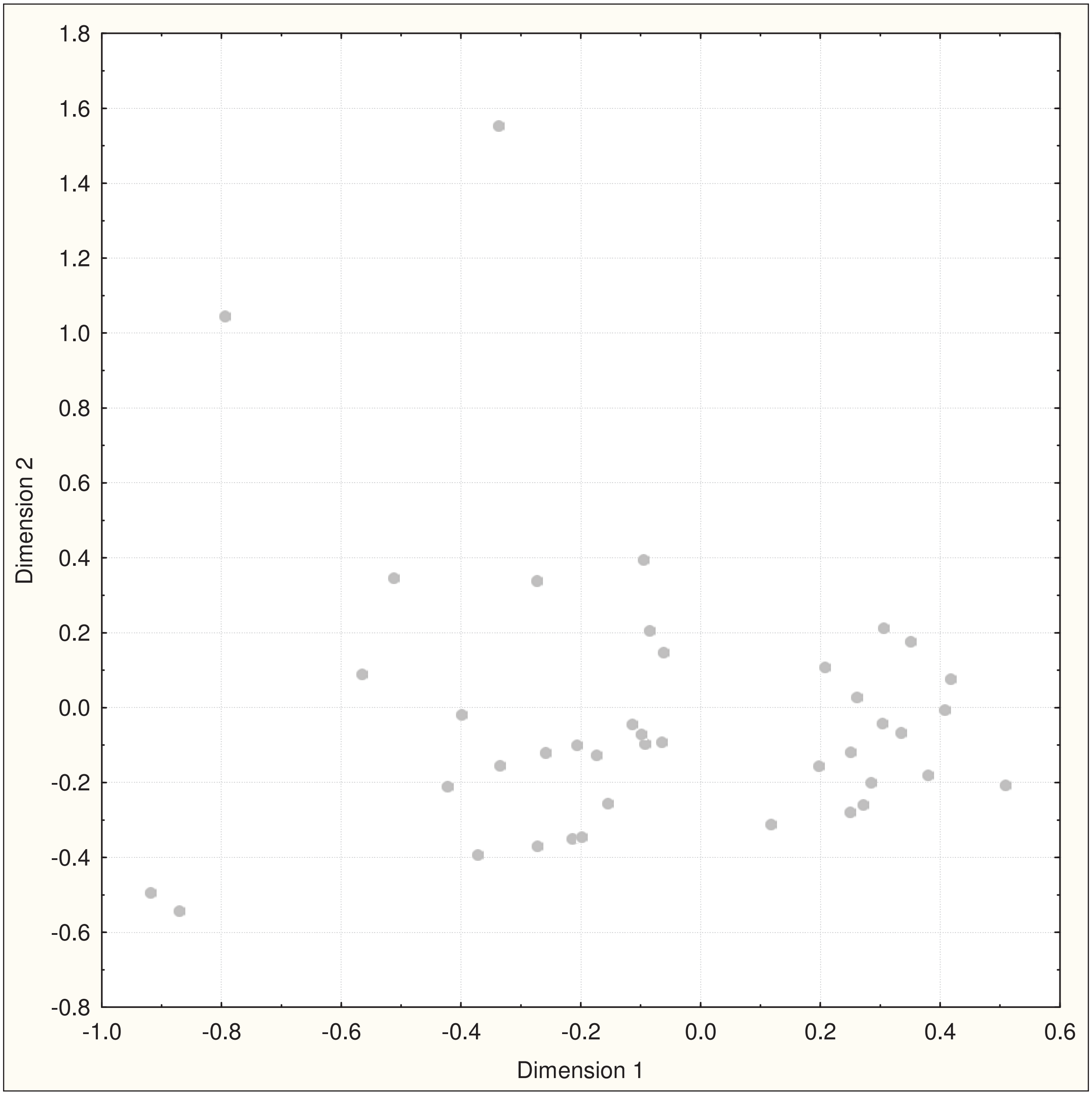

Figure 10.13. Scatterplot of the first two dimensions of a correspondence analysis performed on the count data in Table 10.6, excluding the variable turkey. Each dot represents a single case (site or locus). Note the two clusters of cases on either side of the 0.0 point along Dimension 1.

Table 10.7. Counts of Extramural Features Associated with Pueblo I Sites, and with Loci (L) at Sacred Ridge (5LP245)

	Feature Type								
Site	Enclosure	Thermal Pit/ Hearth	Non-thermal Pit	Surface Room without Hearth	Surface Room with Hearth	Pit Room without Hearth	Pit Room with Hearth	Midden	Inhumation
5LP174	0	0	0	0	0	0	0	0	0
5LP176	1	1	0	0	0	0	0	1	3
5LP177	2	6	0	4	0	0	2	1	18
5LP178	0	3	0	4	0	0	0	0	0
5LP179	1	4	0	1	0	1	0	2	1
5LP239	1	4	0	0	1	0	0	2	5
5LP240	1	0	2	1	0	0	0	1	1
5LP241	1	0	2	1	0	0	0	1	1
5LP242	2	3	1	1	0	2	0	0	3
5LP243	0	5	0	4	0	1	0	2	1
5LP630	0	7	0	1	0	0	0	1	0
5LP634	1	3	0	4	1	0	0	1	0
5LP185	0	8	18	0	0	4	0	0	20
5LP187	2	20	5	5	2	0	0	2	3
5LP236	0	2	1	0	0	0	0	2	0
5LP237	1	11	1	0	0	0	0	0	8
5LP238	0	3	2	0	0	0	0	1	1
5LP482	0	1	0	0	0	0	0	1	0
5LP503	0	0	0	0	0	0	0	1	1
5LP184	1	11	11	4	2	1	1	2	5
5LP244	0	8	5	3	2	0	1	4	2
5LP246	0	1	4	0	0	3	0	1	4
5LP248	0	0	1	0	0	0	0	1	6
5LP510	0	1	1	0	0	0	0	0	0
5LP511	0	1	0	10	0	2	0	0	3
5LP536	1	1	0	9	1	0	0	1	0
5LP549	0	0	1	3	0	0	0	0	0
5LP614	0	0	10	8	0	0	0	0	0
5LP245 L1	1	1	1	6	1	0	0	0	1
5LP245 L2	0	2	3	1	1	0	0	0	0
5LP245 L3	2	1	0	1	0	0	0	1	14
5LP245 L4	0	0	1	2	0	0	0	1	2
5LP245 L5	0	3	1	0	0	1	0	1	2
5LP245 L6	0	1	0	1	0	0	0	0	3
5LP245 L7	1	0	4	0	0	1	0	2	1
5LP245 L8	1	3	2	0	0	0	0	1	1
5LP245 L9	1	3	1	4	1	1	0	1	9
5LP2026	1	3	1	3	1	0	0	1	0
5LP2088	0	0	0	1	0	0	0	1	0
5LP2089	0	0	0	2	1	0	0	0	0
5LP2091	1	1	0	0	0	0	0	1	0
Total	**23**	**122**	**79**	**84**	**14**	**17**	**4**	**38**	**119**

Thermal Pits

These are pits that show signs of thermal use, including formal hearths, slab-lined pits, roasting pits, pits with burning, and fire pits. With the exception of those interpreted as kilns (n = 3), their primary function is assumed to be for food cooking. Thermal pits located in pit structures, surface rooms, or pit rooms are not included in this category.

Non-thermal Pits

These are pits with no evidence of oxidation or use as a thermal pit. They include borrow pits, storage pits, and refuse pits. Post holes may also be considered non-thermal pits, but these were excluded from this analysis of extramural features. Non-thermal pits located in pit structures, surface rooms, or pit rooms are not included in this category.

Surface Rooms

These features generally originate at the prehistoric ground surface level, or slightly below the surface. Most had walls built of posts covered with adobe and were footed on unshaped cobbles or sandstone slabs. Floors were often unprepared, although some rooms were floored with slabs or had a floor of adobe and wood. Surface rooms may be isolated or contiguous. Surface rooms with hearths were considered more likely to have been habitation rooms. Surface rooms without hearths were most likely storage rooms or processing rooms, or both. If the presence or absence of a hearth was not determined for a surface room due to damage by previous excavations or looting, a lack of preservation, or a lack of excavation by SWCA, the feature was not included in this analysis of extramural features.

Pit Rooms

Pit rooms are semi-subterranean rooms that may be slab lined. They may be isolated or occur in noncontiguous arcs. In contrast to surface rooms, pit rooms have depths more than 30 cm below the prehistoric surface. Pit rooms with hearths are considered more likely to have been habitation rooms. Those without hearths were most likely storage rooms or processing rooms, or both. If the presence or absence of a hearth was not determined for a pit room due to damage by previous excavations or looting, a lack of preservation, or a lack of excavation by SWCA, the feature was not included in this analysis of extramural features.

Middens

Middens are the formal trash areas of a site and usually located south or east of a pit structure. Most Pueblo I sites in the Durango area have thin sheet middens with little or no depth. Trash-filled habitation features were not included in this category.

Inhumations

Inhumations are defined as the deliberate deposit of a human body, whether buried in a pit or laid on the floor of a structure. Many Pueblo I inhumations involved burial in a pit with grave goods. This feature type does not include isolated or processed human remains (remains that have been intentionally crushed, cut, burned, and broken by a human being into small fragments at or soon after the time of death), and it should be noted that the feature type refers to the context of inhumation rather than the interred individual. Thus, inhumations may contain the remains of more than one individual. For the purposes of this analysis, individuals intentionally placed in structure fill or on structure floors are considered inhumations.

Frequency of Extramural Features

Figure 10.14 presents the frequency distribution of extramural features by type across the project area. The most common feature types were thermal pits and inhumations. Non-thermal pits and surface rooms without hearths were also fairly numerous. Middens were less numerous overall, but they were present at the majority (68%) of sites (Figure 10.15). Enclosures also were not numerous overall, but were present at about 45 percent of sites (Figure 10.15).

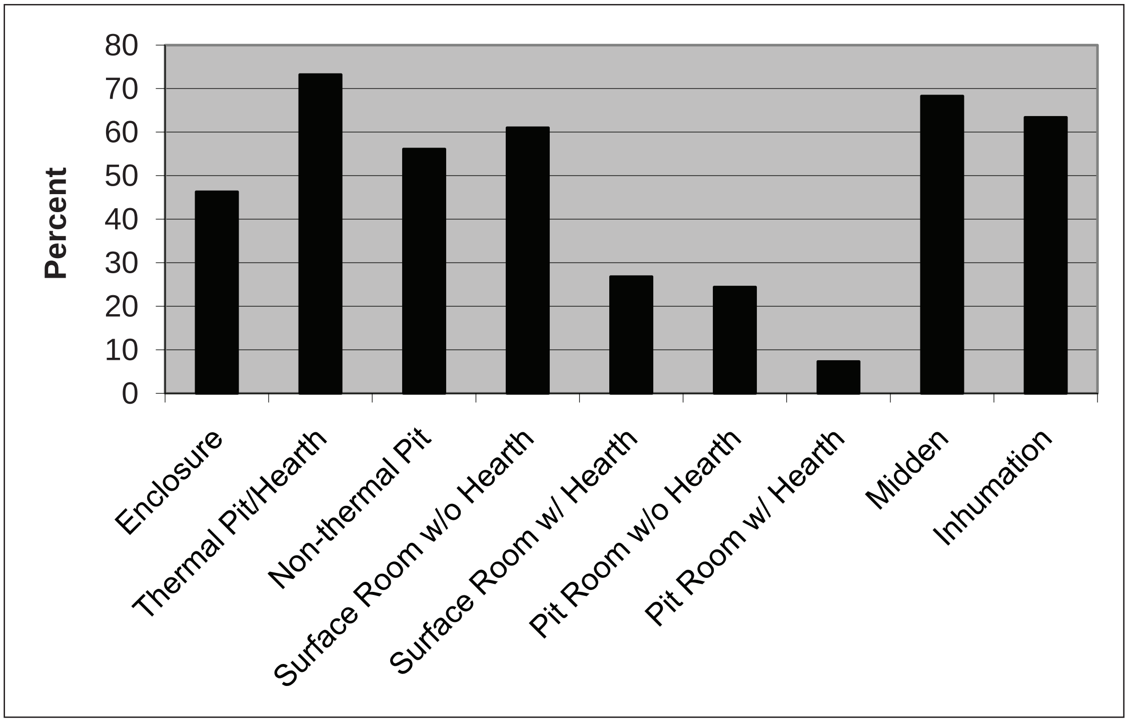

Figure 10.14. Total counts of extramural features by type in the project area.

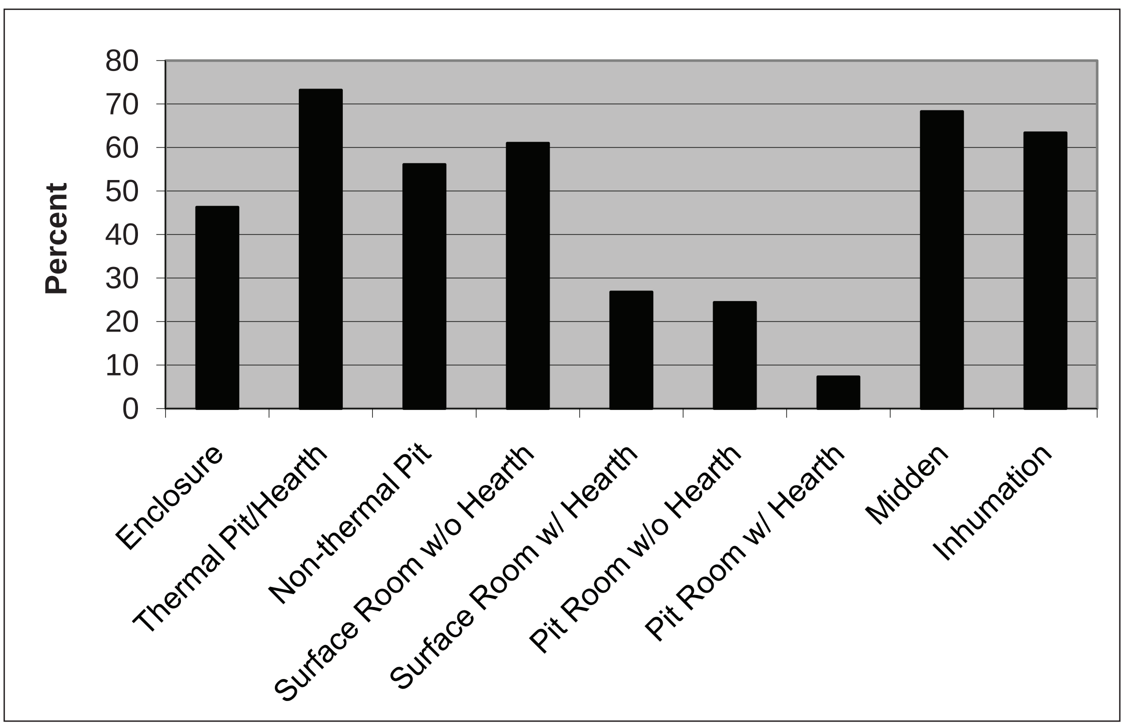

Figure 10.15. Percentages of Pueblo I habitation sites with each extramural feature type present.

Most cooking activities not associated with the pit structure occurred in extramural contexts, rather than in surface rooms or pit rooms. The vast majority of surface rooms and pit rooms did not contain hearths, and thus they are interpreted as primarily storage facilities. Over half of the sites contained surface rooms without a hearth, whereas only a quarter of the sites had surface rooms with hearths (Figure 10.15). Surface rooms were also much more numerous than pit rooms (Figures 10.14 and 10.15). Finally, the large number of sites with non-thermal extramural pits suggests that storage occurred not only in pit structures and surface rooms but also in extramural contexts.

Activity Variation among Surface Rooms and Pit Rooms

As indicated above, it is generally assumed that surface rooms and pit rooms containing hearths were likely the locus of habitation and common domestic activities such as cooking. Rooms without hearths, on the other hand, were more likely storage rooms. It is also possible, however, that rooms without hearths were places for daily domestic activities, such as maize grinding, that did not require a hearth but that may have been better achieved in an enclosed and protected space. To assess this possibility, this section explores the artifact assemblages associated with surface rooms and pit rooms with and without hearths. The analysis here uses only a few of the major artifact categories to explore possible activity variation among these feature types; these are grayware jars, bowls, seed jars, ground stone tools, flaked stone scrapers (including used flakes), and cores/hammerstones. Ceramic vessel counts are sherd counts rather than reconstructible vessel counts. (Note that the behavioral correlates for these various artifact types are presented in Table 10.3.)

Table 10.8 presents the counts of artifacts by site and room feature type, and includes only those cases that yielded artifact assemblages. Table 10.9 is matrix of correlations among the feature and artifact types as listed in Table 10.8. Interestingly, surface rooms without hearths, by far the most numerous room feature type (see Figure 10.14), correlated positively with cores/hammerstones and ground stone tools, indicating that flaked stone tool production and maize grinding occurred in at least some of these features. Seed jars also correlated positively with surface rooms without hearths, confirming a storage function for some of these rooms. Much less common, surface rooms with hearths exhibited no positive correlations with any of the artifact types, due ostensibly to their having been cleaned of artifacts during their use—and just prior to their closure—as habitation structures (Table 10.9).

Like surface rooms without hearths, pit rooms without hearths appear to have functioned both as storage facilities and as enclosed spaces for activities not requiring a hearth. This feature type correlated most positively with bowls, jars, and seed jars, all suggestive of storage. (The high bowl frequency may be from the storage of these items; it does not seem likely that food serving would have been conducted extensively in non-habitation or non-ritual contexts.) In addition, however, these features exhibited positive correlations with cores/hammerstones and flaked stone scrapers, all suggestive of common domestic activities. Pit rooms with hearths, on the other hand, were positively correlated with cooking jars and ground stone items, items associated with common domestic activities (see Table 10.9).

Table 10.8. Counts of Artifacts Associated with Surface Rooms and Pit Rooms (with and without hearths) at Pueblo I Sites and Loci (L) at Sacred Ridge (5LP245)

Site	Feature Type				Artifact Type					
	Surface Room without Hearth	**Surface Room with Hearth**	**Pit Room without Hearth**	**Pit Room with Hearth**	**Bowl**	**Grayware Jar**	**Core/ Hammerstone**	**Flaked Stone Scraper**	**Ground Stone Tool**	**Seed Jar**
5LP177	4	0	0	0	59	71	22	5	22	2
5LP177	0	0	0	2	34	120	3	3	7	1
5LP179	0	0	1	0	2	8	0	0	3	0
5LP179	1	0	0	0	20	61	6	2	2	1
5LP239	0	1	0	0	11	17	1	0	1	0
5LP240	1	0	0	0	17	50	2	5	1	2
5LP242	0	0	2	0	18	28	0	0	3	0
5LP243	4	0	0	0	2	6	2	0	1	0
5LP243	0	0	1	0	52	120	28	5	6	3
5LP634	4	0	0	0	15	36	3	4	1	0
5LP634	0	1	0	0	0	4	0	0	0	0
5LP185	0	0	4	0	45	55	6	13	0	4
5LP187	5	0	0	0	24	14	22	9	9	2
5LP187	0	2	0	0	14	12	7	3	10	0
5LP184	4	0	0	0	24	49	17	28	7	1
5LP184	0	0	1	0	13	39	2	10	0	1
5LP244	0	2	0	0	7	19	4	18	1	0
5LP244	1	0	0	0	0	1	0	4	0	0
5LP244	0	0	0	1	6	3	0	0	0	0
5LP511	3	0	0	0	3	5	1	10	1	1
5LP511	0	0	1	0	4	8	3	6	2	1
5LP536	0	1	0	0	2	2	2	3	0	0
5LP549	2	0	0	0	2	0	1	1	1	0
5LP614	1	0	0	0	1	1	0	5	0	0
5LP245 L1	1	0	0	0	5	6	1	7	2	0
5LP245 L2	0	1	0	0	3	1	2	1	1	0
5LP245 L2	1	0	0	0	0	10	0	1	1	0
5LP245 L5	0	0	1	0	13	3	4	9	0	1
5LP245 L7	0	0	1	0	63	57	19	94	5	0
5LP245 L9	4	0	0	0	65	72	10	79	0	6
5LP245 L9	0	0	1	0	146	116	21	139	2	6
5LP2026	0	1	0	0	0	0	0	1	0	0
5LP2026	3	0	0	0	50	98	4	2	2	1
5LP2089	1	0	0	0	0	0	0	1	0	0

Table 10.9. Surface Room and Pit Room Assemblage Variable Correlations Based on Counts in Table 10.8

	Feature Type			
Artifact Type	Surface Room without Hearth	Surface Room with Hearth	Pit Room without Hearth	Pit Room with Hearth
Bowl	0.09	−0.24	0.29	0.03
Grayware jar	0.08	−0.29	0.21	0.31
Core/hammerstone	0.29	−0.16	0.13	−0.11
Flaked stone scraper	0.01	−0.14	0.17	−0.09
Ground stone tool	0.34	−0.00	−0.09	0.11
Seed jar	0.19	−0.29	**0.36**	−0.05

Note: Bolded correlations are significant at $p < 0.05$; $n = 34$.

SUMMARY: ADDRESSING THE RESEARCH DESIGN

The main goal of this chapter has been to characterize the Pueblo I house and household in the ALP project area and to address some of the more basic questions about households posed in the research design (see Chapter 7, Pueblo I Research Questions). This final section repeats those questions and offers some brief responses, summarizing much of the patterning noted above.

What is the architectural expression of the early Pueblo I household in the Durango area?

Following Lightfoot (1994), the early Pueblo I household appears to have consisted of a single, extended-family-type group that occupied a single pit structure as its main domicile. The composition and size of these household groups varied considerably in the Ridges Basin community. Associated with this main domicile were often a number of surface rooms or pit rooms, or both, the vast majority of which did not contain hearths and operated both as storage rooms and as enclosed spaces for tasks not requiring a hearth. In addition, numerous extramural hearths and roasting pits were associated with these architectural structures, indicating that much of the domestic activity of the household occurred just outside the pit structure.

The substantial differences in the frequency and distribution of features, closure attributes, and floor artifact assemblages among small, medium, and large pit structures suggest some functional variation among the various house size categories. Large structures, for example, in some cases appear to have had a ritual as well as a domestic function. This argues against a strict correlation between house size and household size—large houses may not always represent large households.

Did each household perform the same range of activities, or was there some level of socioeconomic interdependence among households in a settlement cluster or community?

The data presented in this chapter suggest some variation and clustering of activities among households. In particular, some households exhibited high frequencies of artifacts related to everyday domestic activities, especially the cooking, processing, and storage of maize, and the production and use of ceramic vessels. Others exhibited inordinately high frequencies of items related to hunting, the processing of hunted game, the manufacture of stone tools (many likely used for the processing of hunted game), and ritual. These items include flaked stone scrapers, projectile points, cores/hammerstones, the remains of hunted game, and pipes. It is possible that this dichotomy represents some level of activity specialization among households. This dichotomy will be further explored in Chapter 12 to determine if there is a spatial pattern, or clustering, of these or other activities. In addition, possible economic interdependence and specialization of household production, including possible ceramic production variation among households, is examined in greater detail in that chapter.

What do surface rooms represent functionally?

A small percentage (15%) of surface rooms and pit rooms contained hearths and functioned as habitation rooms. Rooms without hearths functioned either as storage rooms or as enclosed spaces in which to conduct tasks not requiring hearths, such as grinding maize, producing stone tools, and processing animal carcasses. Pit rooms without hearths may have been used more consistently than surface rooms without hearths as storage facilities; this may be, however, simply a function of the small number of pit rooms relative to surface rooms.

Were all pit structures domestic, or were ritual functions associated with some?

Large structures appear to have functioned as ritual structures significantly more often than did medium and small structures. Large structures (those with a floor area greater than 28.5 m^2) stood out in many respects: They contained more floor features than did small and medium structures; were the only size class to contain conical floor pits (a possible ritual feature); were closed more carefully and systematically than were small and medium structures; contained the most animal burials on the floor and in the fill; were burned post-abandonment most often; and had tobacco pipes in the floor assemblage more consistently than did small and medium structures. The distributions of these structures and their attributes throughout the project area are further discussed in Chapter 11, Settlement Clusters, and in Chapter 12.

What do artifact assemblages associated with room and pit structure floors tell us about the function and use of those features?

De facto floor assemblages were rare in the project area. Most pit structures were cleaned prior to or as part of their closing, including those that were burned when closed. The few intact floor assemblages that were recovered indicate differences among small, medium, and large structures. Small and medium structures contained the most diverse floor assemblages. Large structures frequently were associated with floor assemblages containing maize-grinding implements and tobacco pipes.

Assemblages associated with surface room floors suggest that these features had at least three functions: as storage; as enclosed work areas for domestic tasks not requiring a hearth, such as maize grinding and flaked stone tool production; and, least common of all, as habitations.

Chapter 11: Settlement Clusters

James M. Potter, Jason P. Chuipka, and Thomas D. Yoder

"Early Pueblo social organization may be understood best as a series of groups within larger groups, which were themselves contained within even larger groups, and so on" (Lightfoot 1994:128). For the early Pueblo I period, this nested hierarchy may be thought of as consisting of the household, the hamlet or village group, and the community (Lightfoot 1994:128–130; Wilshusen 1988a). Lightfoot's model of the early Pueblo settlement hierarchy (Figure 11.1) was adjusted for the ALP project systematics, with the addition of the settlement cluster as intermediate between the hamlet group and the community. In the case of the Sacred Ridge site (5LP245), the settlement cluster could be identified as a village with clear boundaries; in other cases, the clusters of hamlets were not sufficiently compact and integrated to be considered villages. Yet, as will be shown in this chapter, these clusters of households and their houses did form spatial units that were distinct from one another.

Late Basketmaker settlements were clearly centered on individual houses with most sites having only one pit structure. Even in those cases where two or possibly three pit structures composed a site, it seems that the site was shared by a single group of people who shared a general residential area, blood ties, and the use of a common set of economic resources.

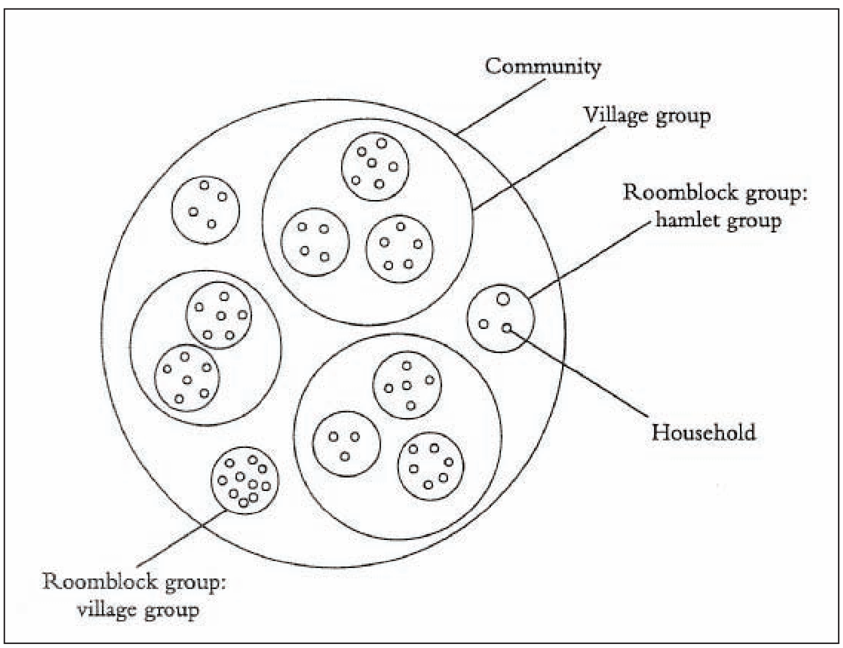

Figure 11.1. Schematic illustration of Lightfoot's nested hierarchy model of social organization (reproduced from Lightfoot 1994:Figure 6.1).

These late Basketmaker sites often were surrounded by enclosures (Chenault and Motsinger 2000), which reinforces the impression that the two or three households within this bounded space actually represented a distinct social group, possibly similar to lineage-based "house societies" (Carsten and Hugh-Jones 1995) documented worldwide. Many of the early Pueblo I habitation sites documented in the ALP project research are reminiscent of late Basketmaker settlements, yet the discrete clusters of these habitations documented in Ridges Basin clearly represent a new way of organizing people on the landscape. Whether the linkages that connected people in each settlement cluster were ones of descent or alliance, or a combination of the two, is the subject of research presented in later chapters. This chapter is primarily devoted to identifying and describing the different settlement clusters.

IDENTIFYING SETTLEMENT CLUSTERS

Using nearest-neighbor analysis, Fuller (1988a:365–380) defined eight Pueblo I settlement clusters in Ridges Basin (Figure 11.2). According to Fuller, these clusters ranged from five to 20 houses, but his estimates were based primarily on survey information. For the ALP project, SWCA continued with the idea of settlement clusters and, in the process of investigating and analyzing the Pueblo I habitation sites in Ridges Basin, consolidated some of Fuller's clusters and expanded others. As a result, five Pueblo I settlement clusters—four in Ridges Basin and one on Blue Mesa—were designated by SWCA researchers (Figure 11.3; Table 11.1). These cluster designations were based on three criteria. The first was the spatial proximity of pit structures. Figure 11.3 plots each pit structure based on UTM coordinates and shows both the SWCA settlement cluster designations and the results of a k-means cluster analysis[1] on the UTM coordinates, which is based purely on distance. The results of the six-cluster k-means solution show considerable correlation with SWCA's cluster designation, but there are important differences, as well. One difference is the containment of two of the k-means clusters into a single North-central Cluster. This highlights the second criterion for cluster designation—the size of the cluster. For management and reporting purposes, SWCA attempted to establish settlement clusters of roughly equal numbers of pit structures. So, although spatially it might have made sense to have a north cluster and a central cluster, it made more sense from a management and comparative analytical perspective to combine these into a single cluster. The same is true for the Western Cluster, which contains two k-means clusters (Figure 11.3).

Finally, SWCA cluster designations included groupings that were likely prehistorically meaningful. The Sacred Ridge site (5LP245), for example, was designated its own cluster not only because it was the largest settlement and it thus made management sense to treat it as a separate cluster, but also because it was such a large and tight grouping of houses compared to other clusters, and it contained such unusual architecture, that it seemed likely the prehistoric occupants of Ridges Basin considered it distinctive and separate from other settlements. This approach varies from Fuller's, who included Sacred Ridge as one of several sites in his Cluster VI (see Figure 11.2), a pattern that was reproduced as k-means Cluster 4 (see Figure 11.3). It should be noted, too, that the SWCA settlement clusters are based only on excavated pit structures and are thus partially a product of sampling. This caveat also contributes to the distinction between Fuller's clustering solutions, which are based on survey data, and SWCA's.

Ultimately, the social significance of these archaeologically defined clusters is an empirical problem. How similar in their material culture are habitation sites in the same cluster? How different are they from sites in other clusters? Are some clusters more homogeneous than others? How organizationally variable are the clusters? And how real are any of the cluster designations? The remainder of this chapter and the next are devoted to addressing these fundamental questions.

[1] The method of k-means cluster analysis divides *n* observations into *k* clusters; each observation belongs to the cluster with the nearest mean. The technique attempts to find the centers of natural clusters in the data through the use of an iterative refinement approach.

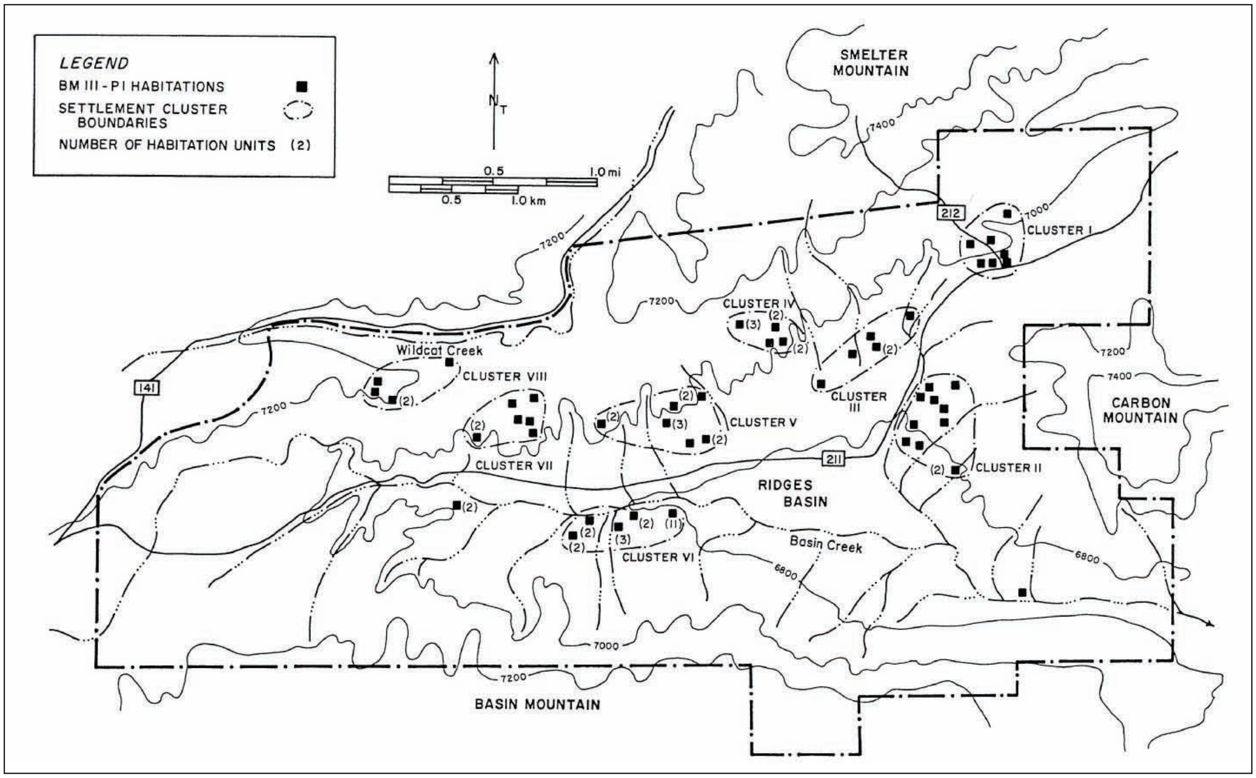

Figure 11.2. Pueblo I settlement clusters identified by Fuller (reproduced from Fuller 1988a:Figure 185).

DESCRIPTIONS OF THE CLUSTERS

ALP project systematics divided the early Pueblo I habitations into five settlement clusters (Figure 11.4). As described above, one settlement cluster consisted of only the Sacred Ridge site. Three other settlement clusters were in Ridges Basin: the Eastern Cluster with 10 sites, the North-central Cluster with seven habitations, and the Western Cluster with nine. Four excavated sites on Blue Mesa form the fifth cluster; they are part of a much larger group of habitations, mostly unexcavated, on Blue Mesa. The following sections provide a description of the features in each of these settlement clusters.

The Eastern Cluster

Ten sites formed a concentration that Potter and Yoder (2007) refer to as the Eastern Cluster: 5LP176, 5LP177, 5LP179, 5LP239, 5LP240, 5LP241, 5LP242, 5LP243, 5LP630, and 5LP634. All were located on a large, discrete alluvial fan on the western flank of Carbon Mountain (Figure 11.5). For the purposes of this study, three additional sites—5LP174, 5LP178, and 5LP515—are included in the Eastern Cluster; these were located south of Potter and Yoder's original Eastern Cluster, and also had been referred to by Wilshusen (2007) as the Southeastern Cluster (see Figure 11.4). All sites were excavated by SWCA, with the exception of 5LP515, which was excavated in 1999 by Woods Canyon Archaeological Consultants (Silverman 2003). These 13 habitation sites contained 16 pit structures (Figure 11.6).

In general, the Eastern Cluster was composed of single-dwelling habitations. Three sites—5LP174, 5LP177, and 5LP634—contained two pit structures. The structures at these sites may have been occupied sequentially, but chronometric data from the two structures at 5LP177 suggest that they were occupied at the same time, or at least within a few years of each other (Desruisseaux et al. 2007:120–121). On the other hand, although 5LP177 contained two pit structures, they were spaced far enough apart (80 m) that they could be considered separate sites. Good chronometric data were not recovered from the other two double-structure sites.

Table 11.1. Cluster Assignments for Pueblo I Pit Structures

Site–Feature	SWCA Cluster	k-means Cluster (six-cluster solution)
5LP185–3	North-central	1
5LP185–10	North-central	1
5LP185–45	North-central	1
5LP187–1	North-central	1
5LP187–5	North-central	1
5LP187–6	North-central	1
5LP187–9	North-central	1
5LP187–14	North-central	1
5LP503–1	North-central	1
5LP503–2	North-central	1
5LP503–4	North-central	1
5LP236–3	North-central	2
5LP236–6	North-central	2
5LP237–1	North-central	2
5LP237–2	North-central	2
5LP237–3	North-central	2
5LP237–4	North-central	2
5LP238–1	North-central	2
5LP482–1	North-central	2
5LP174–1	Eastern	3
5LP174–2	Eastern	3
5LP176–1	Eastern	3
5LP177–1	Eastern	3
5LP177–2	Eastern	3
5LP178–2	Eastern	3
5LP179–2	Eastern	3
5LP239–1	Eastern	3
5LP240–1	Eastern	3
5LP241–6	Eastern	3
5LP242–1	Eastern	3
5LP243–3	Eastern	3
5LP630–3	Eastern	3
5LP634–2	Eastern	3
5LP634–6	Eastern	3
5LP184–1	Western	4
5LP184–12	Western	4
5LP184–15	Western	4
5LP244–1	Western	4
5LP244–15	Western	4
5LP248–1	Western	4
5LP248–3	Western	4
5LP248–4	Western	4
5LP614–1	Western	4
5LP246–2	Western	5
5LP246–6	Western	5
5LP246–26	Western	5
5LP510–6	Western	5
5LP511–1	Western	5
5LP511–2	Western	5
5LP511–3	Western	5
5LP549–2	Western	5
5LP536–1	Western	5
5LP245–1	Sacred Ridge	4
5LP245–18	Sacred Ridge	4
5LP245–19	Sacred Ridge	4
5LP245–23	Sacred Ridge	4
5LP245–41	Sacred Ridge	4
5LP245–48	Sacred Ridge	4
5LP245–49	Sacred Ridge	4
5LP245–58	Sacred Ridge	4
5LP245–62	Sacred Ridge	4
5LP245–79	Sacred Ridge	4
5LP245–83	Sacred Ridge	4
5LP245–90	Sacred Ridge	4
5LP2026–2	Blue Mesa	6
5LP2026–3	Blue Mesa	6
5LP2026–4	Blue Mesa	6
5LP2088–1	Blue Mesa	6
5LP2089–1	Blue Mesa	6
5LP2091–2	Blue Mesa	6

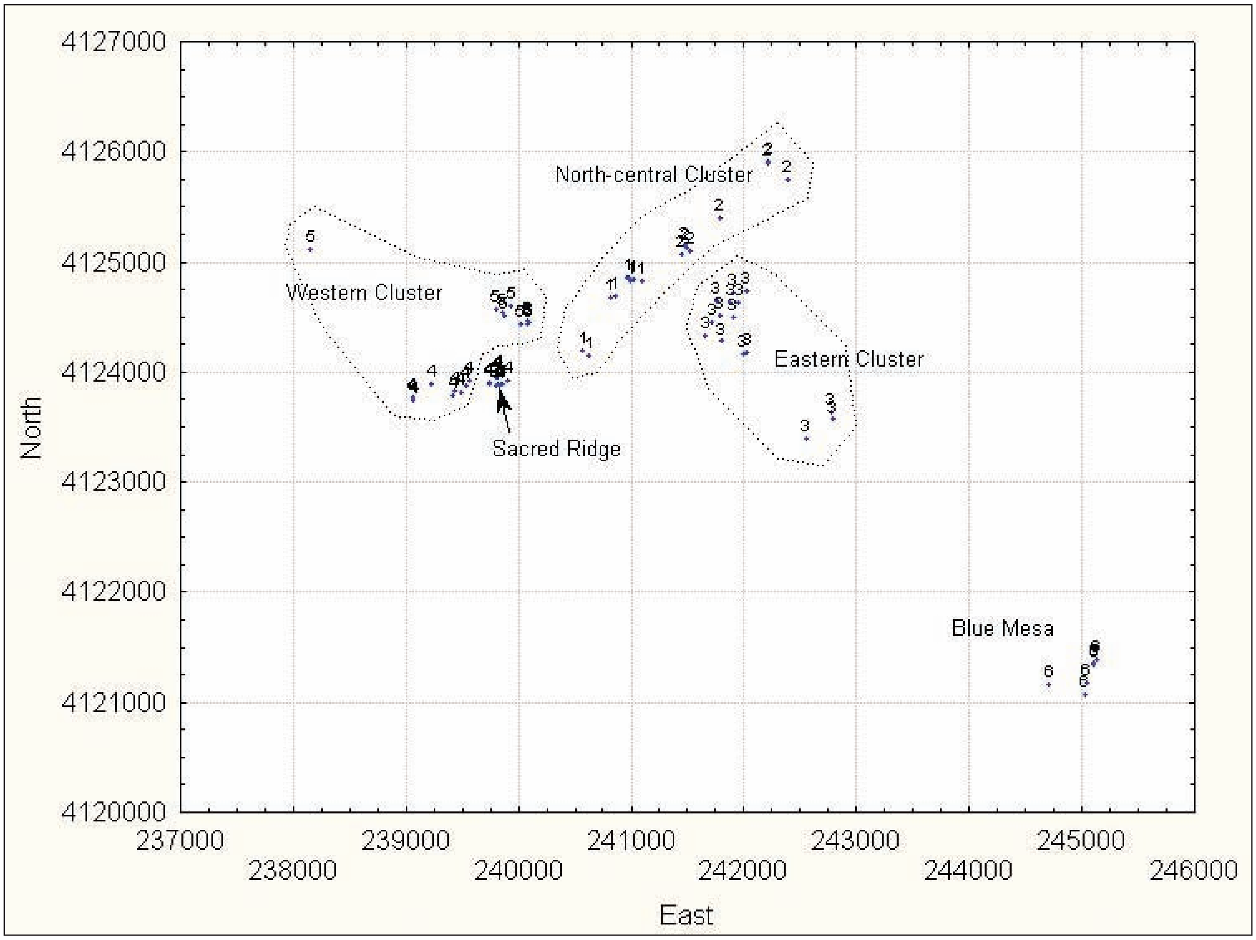

Figure 11.3. Plot of sites by UTMs with cluster designations. Each dot is a pit structure. Numbers are k-means cluster assignments based on UTMs (six-cluster solution). Dashed lines and labels indicate SWCA's cluster assignments. (Note that Sacred Ridge is itself a cluster, as is Blue Mesa.)

The presence of clean fill in all but one (Structure 1 at 5LP515) of the 16 pit structures indicated that the occupation of the Eastern Cluster was relatively brief. Two main abandonment modes were represented in the 16 pit structures in this sample (Wilshusen 2007:Table 14.3). The four pit structures at 5LP174, 5LP178, and 5LP515—in the southeastern portion of the main cluster (Wilshusen's Southeastern Cluster)—were intensely burned at abandonment, contained no cultural refuse in their fill, and had most of the domestic assemblage removed. The main cluster of houses composing the Eastern Cluster, on the other hand, may have been closed slightly earlier than the southeastern structures. None were intensely burned; most (n = 8) appeared to have been salvaged; and seven of the 12 structures had water-laid sediments covering their floors, indicating flooding as a possible reason to vacate the structures (Wilshusen 2007:383–384). Wilshusen suggests that, following a catastrophic flooding episode, some of the salvaged beams may have been used to construct structures in the Southeastern Cluster at 5LP174, 5LP178, and 5LP515.

Although cultural refuse was virtually absent in the fill of Eastern Cluster structures, the ritual deposition of animal carcasses is well represented in this sample. Three structures had dog burials on or above their floors. On the alluvium covering the floor of the Feature 1 pit structure at 5LP239 were two dog burials (Features 3 and 4). The dogs had been laid out on slabs placed on alluvial sediments that had been deposited shortly after

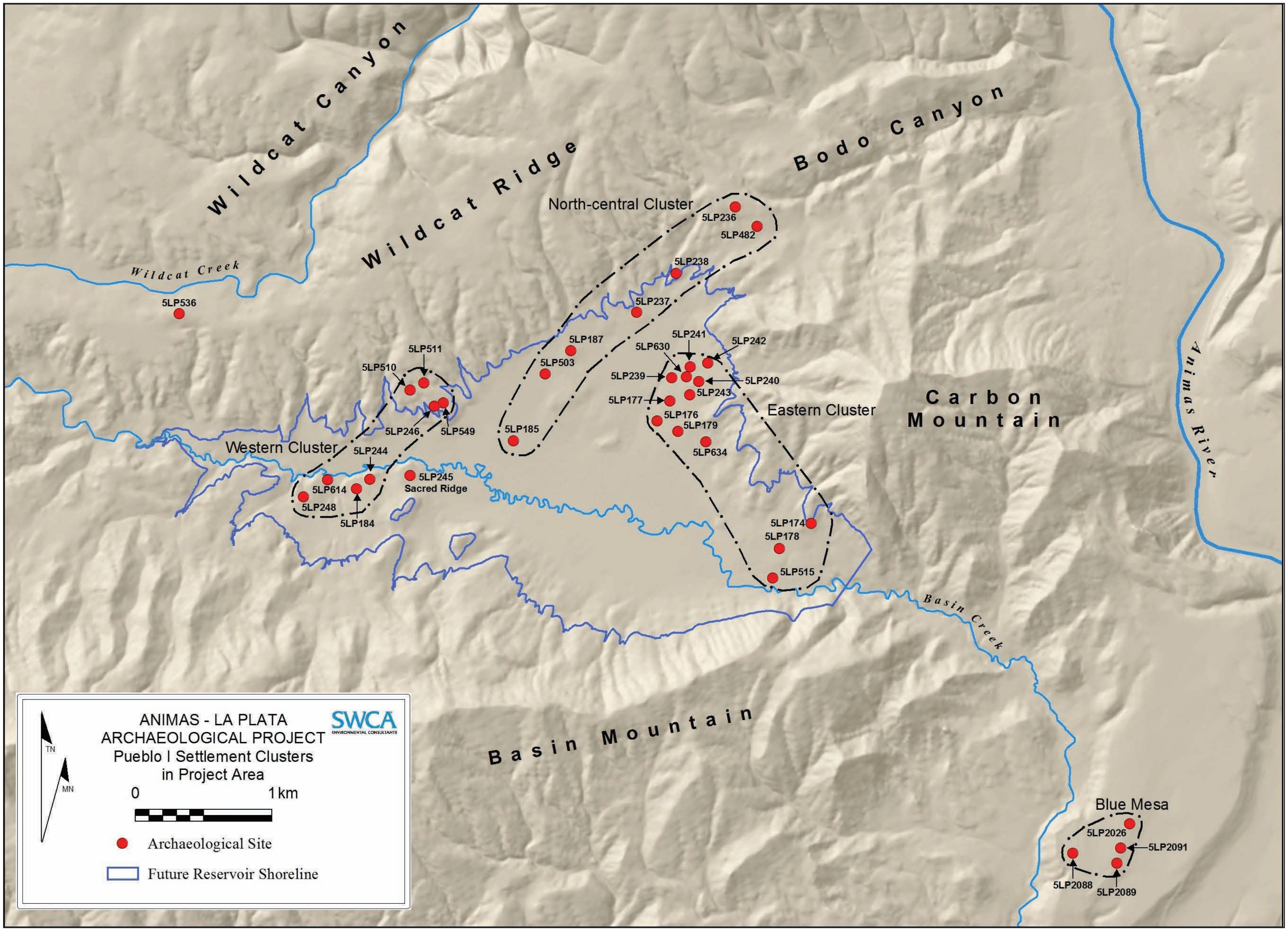

Figure 11.4. Map of Pueblo I settlement clusters defined by SWCA. Site 5LP536 is part of the Western Cluster. Sacred Ridge is its own cluster. Includes only those sites excavated by SWCA.

the desertion of the structure. These burials were unusual in that the dogs had been severed in half at the mid torso and placed with the upper and lower body portions in opposite orientations. The dogs were recorded adjacent to each other at the same stratigraphic level, so it is likely they had been sacrificed in a planned event related to the closure of Feature 1 and interred simultaneously shortly after the flooding and before the subsequent dismantling of the structure. The floor fill of this structure also yielded much of a gray fox hindlimb, including part of the pelvis, and a left ulna. In addition, the left mandible of a bobcat and multiple portions of a common snipe were recovered from this feature. Although these remains are not complete enough to be considered animal burials, they do appear to have been part of the closure ritual for the structure. In Feature 2 at 5LP177, a dog, a crane or swan, and the articulated bones of a turkey wing were found in association with the floor.

Most of the pit structures in the Eastern Cluster (13 of 16) were subrectangular in plan. Three structures were oval or circular. The largest structures, those at 5LP176 and 5LP177, had floor areas of 35 m^2, and the smallest, those at 5LP174 and 5LP178, had areas of 9 m^2—almost a quarter the size of the largest structures. Analysis of the floor areas reveals an almost perfectly normal distribution with the two largest structures and two smallest structures being clear outliers to the rest of the bell curve. The remaining 75 percent of the sample had an average floor area of 22 m^2, which is the midpoint between the largest (35 m^2) and smallest (9 m^2) areas (Wilshusen 2007:390).

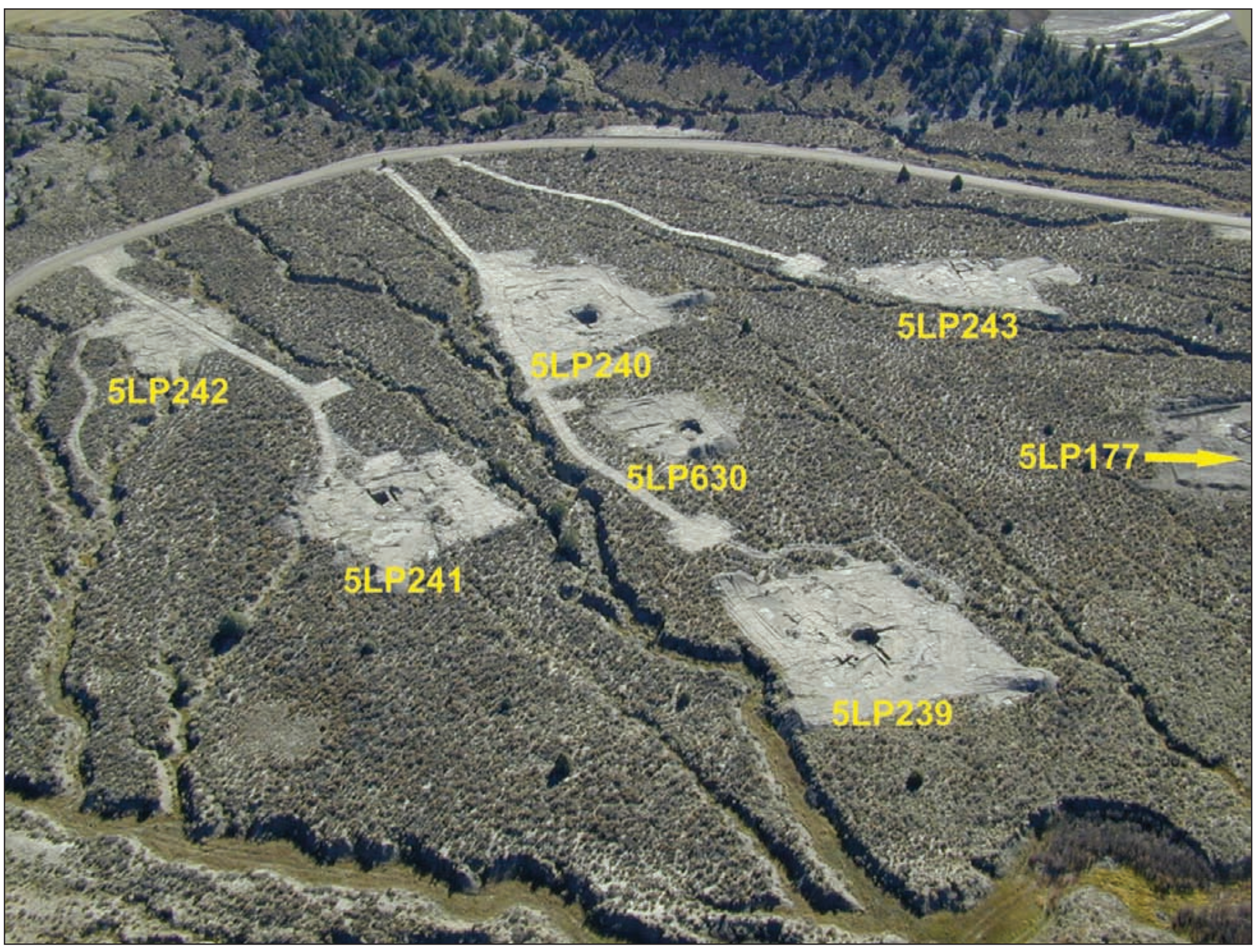

Figure 11.5. Aerial photograph of a portion of the Eastern Cluster of Pueblo I habitation sites in Ridges Basin.

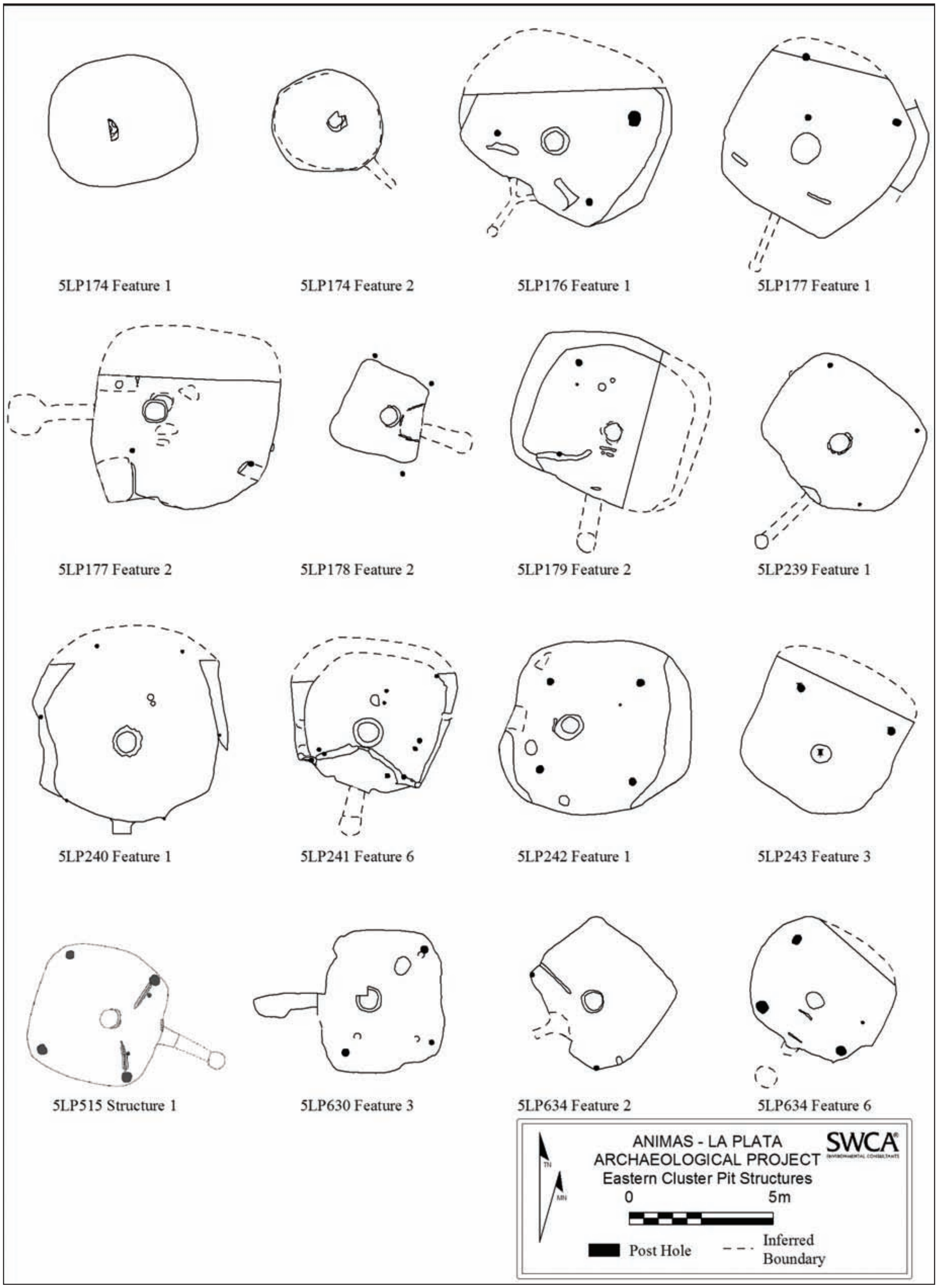

Figure 11.6. Plan maps of excavated pit structures in the Eastern Cluster.

According to Wilshusen (2007), the most notable aspect of the subfeatures on pit structure floors in all sites of the Eastern Cluster was their relative absence compared to other early pit structures in the area. Architectural features such as post supports, benches, wing walls, and deflectors were the most frequently identified subfeatures in these structures. Only coped central hearths were as common; they were observed in 12 of the 16 structures. Features such as corner storage bins (n = 2) and possible sipapus (n = 5) were the next-most-numerous feature types. Capped or remodeled features were relatively rare, and in only one case was a pit structure clearly rebuilt and remodeled. Feature 1 at 5LP241 had a burned interior wall with a subsequently replastered wall over it, a later wing wall, and, possibly, a totally rebuilt roof. Otherwise, the capped and remodeled features represented relatively minor remodeling within the use life of a structure.

Eastern Cluster pit structures exhibited two types of ventilator openings—a single opening into the pit structure and a double, or bifurcated, opening. Most were single-hole ventilators. Only one clear example of a bifurcated ventilator and two possible bifurcated ventilators were observed. Seven structures had benches, and five lacked them. All four of the pit structures in Wilshusen's Southeastern Cluster sites lacked benches. With a single exception (5LP240), all of the structures with sufficient evidence had a four-post roof support system (see Figure 11.6). Feature 1 at 5LP240 had a six-post system, and the superstructure of this roof appeared to have been morphologically distinct in the Ridges Basin area. The only other comparable roof designs were the six-post roof support system documented in Feature 3 at 5LP236, the seven-post system in Feature 1 at 5LP237, and the roofs of three sites in Hidden Valley northwest of Durango that were excavated by Morris and Burgh in 1939 (Carlson 1963). All these structures appeared to date between A.D. 760 and 800. The roofs on these structures probably would have been of a cribbed construction similar to that of some of the roofs at the nearby Basketmaker II site of Talus Village (Morris and Burgh 1954:51) as well as later Pueblo II and Pueblo III kiva roofs.

Extramural features were also common in the Eastern Cluster. All but one of the sites had surface structures, and all but two of the sites (5LP174 and 5LP178) had middens. Wilshusen (2007) notes that the occupations of the Southeastern Cluster sites occurred somewhat later than the occupations of Potter and Yoder's (2007) original Eastern Cluster sites. He suggests that the lack of middens at 5LP174 and 5LP178 and the lack of surface structures at 5LP174 support the interpretation that these sites had been inhabited for a very limited time before being abandoned and destroyed by fire.

Wilshusen (2007) also notes that extramural features often were located north of the pit structure close to the surface structures, sometimes in areas that might have been shaded by ramadas (e.g., Feature 33 at 5LP177 or Features 15, 16, and 18 at 5LP634). Other extramural features were situated away from the structural areas, as with roasting pits (Feature 22 at 5LP177 and Feature 3 at 5LP178), pottery kilns (Feature 10 at 5LP239 and Features 3 and 13 at 5LP240), and construction borrow pits (Feature 12 at 5LP241).

Site enclosures were common at Eastern Cluster sites—nine enclosures were documented at eight sites. These enclosures ranged in size and preservation from short segments of poorly preserved curvilinear walls or fences at 5LP176, 5LP179, and 5LP240 to well-defined but still fragmentary sections at 5LP177 (where two enclosures were found in association with two loci) and at 5LP241. Almost-full enclosures were recorded at 5LP239, 5LP242, and 5LP634. In every case, at least a portion of the remains of the enclosure was observed upslope, and often north, of the pit structure. Yoder et al. (2007) suggest that, at least for 5LP242, enclosures were built to divert runoff from the main site area. Wilshusen notes that when the presence or absence of an enclosure is compared to the mode of pit structure abandonment, there is some support for this suggestion.

> It is striking that every one of the seven pit structures that has water-laid sediment covering its floor also has an enclosure. In at least three cases, nearly complete tool assemblages were left lying on the floor and were covered by a layer of alluvium. Certainly other reasons for delimiting and protecting habitation areas must have existed, such as blowing snow and wandering dogs. However, protecting domestic areas from downslope erosion must have ranked high among the most critical threats to the safety of these particular habitations. (Wilshusen 2007:389)

The mortuary assemblage associated with the Eastern Cluster was unique. Eight of the Eastern Cluster sites had burial features. All these features except one—an adult male cranium found in the northern pit structure (Feature 2) at 5LP177—were in extramural or midden contexts. Of the 36 mortuary features in the Eastern Cluster, seven were double interments (i.e., they consisted of two individuals buried in the same pit feature). This is the highest proportion of double interments in the project area. In addition, Eastern Cluster burials contained high proportions of ceramic vessels—bird effigy vessels, pipes, redware vessels, and seed jars—as well as shell and faunal bone artifacts. Nine fox mandible pendants were recovered from two burials at 5LP239. Finally, this mortuary assemblage contained seven rich burial assemblages (i.e., containing more than five items), five of which were adult females (Potter 2010b:Table 2.18).

The North-central Cluster

The North-central Cluster was a highly dispersed group of Pueblo I habitations comprising seven sites and 19 pit structures, 15 of which were excavated (see Figure 11.4). One of these sites, 5LP185, was in the central portion of Ridges Basin adjacent to Basin Creek. The remaining six sites—5LP187, 5LP236, 5LP237, 5LP238, 5LP482, and 5LP503—were located north of 5LP185 along the northeastern margin of Ridges Basin either at the terminus of smaller ridges emanating from Wildcat Ridge to the north or on alluvial settings just inside the basin. Though not as tightly aggregated as other habitation clusters (e.g., the Eastern Cluster), the North-central Cluster contained pockets of aggregation in the form of multiple–pit structure habitations comparable to Lightfoot's (1994) hamlet group (see Figure 11.1). In particular, 5LP185 contained three pit structures (only two of which were excavated), 5LP237 contained four, and 5LP187 contained five (only three of which were excavated).

Most of the structures in the North-central Cluster appeared to be contemporaneous with many of the Eastern Cluster structures and dated from about A.D. 760 to 810 (see Chapter 8, Pueblo I Chronology and Population). The exception is 5LP185, which appears to have had an earlier habitation component dating to the early A.D. 700s and a later cemetery component dating to the late 700s (Potter 2008). Data from three sites (5LP503, 5LP187, and 5LP237) suggest sequential occupation for at least some of the structures. Two pit structures at 5LP503 (Features 1 and 4) overlapped stratigraphically (Feature 1 was built inside of Feature 4), indicating sequential occupation of these features. At 5LP187, Features 5 and 6 each contained post-abandonment cultural refuse, signifying that these structures had been vacated while other areas of the site were still occupied (Figure 11.7; note that Feature 6 is not pictured in Figure 11.7 because it was only sample-excavated with a backhoe trench). Additionally, the enclosures of Features 5 and 9 overlapped, suggesting that Feature 9 was occupied after Feature 5. At 5LP237, two unburned structures (Features 3 and 4) had been vacated and salvaged by (presumably) occupants of two later structures on the site (Feature 1 and 2), which were later deliberately burned. This pattern of sequential occupation contrasts with the pattern of occupation in the Eastern Cluster, where most of the sites appeared to have been shorter-lived and quickly abandoned due to flooding (Wilshusen 2007).

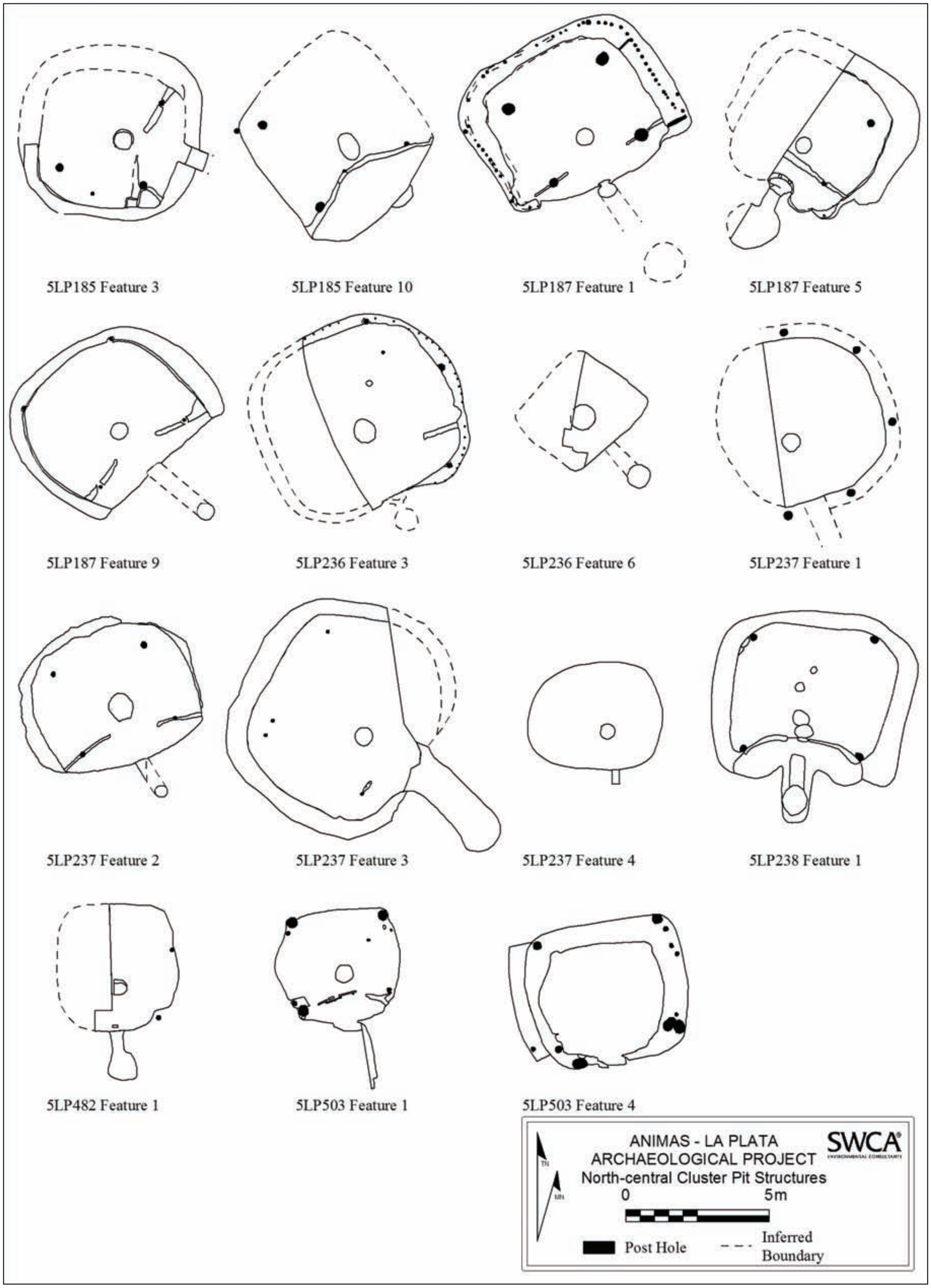

Figure 11.7. Plan maps of excavated pit structures in the North-central Cluster.

Six of the 15 excavated pit structures in the North-central Cluster contained well-preserved floor assemblages, the highest proportion in the project area. These floor assemblages were not only numerous but also the largest and best preserved in the project area—one yielded by far the largest number of perishable artifacts. Feature 1, a burned pit structure at 5LP187, contained the most complete, abundant, and diverse pit structure floor assemblage in the project area, including the largest collection of preserved textiles and other perishable artifacts. The floor of Feature 1 contained 18 whole or reconstructible ceramic vessels, coiled basket fragments, at least one sandal fragment, yucca fiber cordage, seed beads, trough metates, stone tools, and a collection of ceremonial items, which consisted of a gypsum pipe, a jet bead, fossil concretions, a polished hematite pebble, and a chert projectile point. Additional floor assemblages were recovered from pit structures at 5LP237. One of the four pit structures at 5LP237, Feature 4, had a floor assemblage that contained an especially high relative frequency of animal bones, particularly turkey and rabbit. Given the large amount of faunal debris associated with the floor of this structure, it is likely that at some point Feature 4 had been discontinued as a residence and used for processing fauna.

The structures in the North-central Cluster were more variable in shape and generally larger than the structures in the Eastern Cluster. Just over half of the structures (8 of 15) were subrectangular in plan. But the North-central Cluster also contained four oval or circular structures, two rectangular structures, and one D-shaped structure (see Figure 11.7). The largest structures were Feature 3 at 5LP237, with an estimated floor area of 39 m², and Feature 3 at 5LP236, with an estimated floor area of 40 m². The smallest pit structure was Feature 4 at 5LP237, with a floor area of about 15 m². The mean floor area, if this outlier is included, is just under 28 m²; if it is excluded (as was done for the Eastern Cluster above), the average floor area is 27 m², considerably larger than the average Eastern Cluster structure.[2]

[2] Feature 2 at 5LP503 is actually the smallest structure, with a floor area of 7m², but this was a featureless pit room and not considered a full habitation.

Subfeatures associated with pit structures were more numerous than in the Eastern Cluster, with the exception of coped hearths and two-hole ventilators—only four structures had a coped hearth and only one had a two-hole ventilator. However, 10 structures had benches, nine had wing walls, five had possible sipapus, and seven had floor storage features. As in the Eastern Cluster, capped or remodeled features were relatively rare, and in only one case was a pit structure clearly rebuilt and remodeled. Feature 4 at 5LP503 had a multitude of support posts added to the roof system in an apparent attempt to extend the life of the structure. When that failed, an entirely new, smaller structure was built inside the old structure. Most structures had a four-post roof support system. The two exceptions were Feature 3 at 5LP236, which had six posts, and Feature 1 at 5LP237, which had six or seven. These posts were set in the bench like pilasters (see Figure 11.7), presumably to support a cribbed roof. In addition, two structures in the North-central Cluster (Feature 1 at 5LP187 and Feature 3 at 5LP236) had a multitude of secondary roof supports (i.e., stringer posts) set in the bench. This trait was absent in the Eastern Cluster entirely.

The distribution of extramural features was extremely uneven in the North-central Cluster. For example, 5LP503 had three pit structures, yet only one extramural feature (a midden), whereas 5LP185 had hundreds of extramural hearths, slab-lined pits, storage pits, and inhumations but no enclosures or surface rooms, and 5LP187 had four surface rooms and two enclosures in addition to 14 thermal pits. The surface rooms at 5LP187 were constructed of upright wooden posts and adobe with no stone incorporated. These rooms differed from Eastern Cluster surface rooms in that at least two contained a hearth, indicating that they were not used exclusively for storage, as appears to have been the case in the Eastern Cluster (although poor preservation of rooms in the Eastern Cluster may account for this pattern). In general though, surface rooms, middens, and enclosures were less common in the North-central Cluster than they were in the Eastern Cluster.

Three of seven sites contained evidence of surface rooms, four contained middens, and only two had enclosures. The most common extramural feature types were hearths and thermal pits; these were present at all but one site (5LP503).

Human burials were also distributed unevenly among sites in the North-central Cluster. Site 5LP185 contained the largest number with at least 23 individuals, followed by 5LP237 with eight individuals, 5LP187 with three, and 5LP503 with one (Potter 2010b)[3]. Context of burial varied considerably among sites, as well. At 5LP185, most of the burials were in two large extramural areas. The large number of burials and isolated and disturbed remains far exceeded the likely number of occupants of the site, given that there were only three pit structures. Based on radiocarbon dates, stratigraphy, and the association of Bluff Black-on-red with many of the interments, many of these burials appeared to have postdated the houses, suggesting that at some point the site's use was changed from primarily habitation to a cemetery. With the possible exception of 5LP177 in the Eastern Cluster, this is the only example of this type of site in Ridges Basin.

In addition to extramural contexts, burials in the North-central Cluster occurred in association with pit structures. At 5LP185, the fill of Feature 3 contained the remains of two individuals: a subadult and an adult female buried with seven pots and 52 olivella shells. Another adult female in an extramural context was associated with 26 items, including faunal items, olivella shell beads, and numerous pots and flaked stone items. In terms of burial item frequency, diversity, and exoticness, these are two of the richest burials in the project area (along with a burial at Sacred Ridge that was comparably rich).

5LP237, by contrast, contained the only examples of both interment on a pit structure floor and haphazard burial in an extramural pit. On the floor of Feature 2 (a pit structure), the remains of a single male were observed lying atop a yucca and feather blanket. The skeletal elements exhibited varying degrees of burning, the patterning of which suggested this individual had been lying on his left side when the structure burned. Possible associated funerary objects were a coiled basket near the head, two projectile points, and one piece of obsidian, although these also could have been in situ floor artifacts. The projectile points could have caused the individual's death, and it is possible these remains represented a violent act, rather than a burial, after which the house burned down around the dispatched individual. This type of treatment of human remains has been documented on Blue Mesa at 5LP379 (Fritz and Honeycutt 2003) and, interestingly, at two other sites (5LP236 and 5LP481) in the northeastern part of Ridges Basin (Chuipka et al. 2008; Fuller 1988a). Root (1969:107) notes the burned remains of an individual on the floor of what SWCA later termed Feature 3 at 5LP236, and Fuller (1988a:138) describes the remains of a child on the floor of a pit structure at 5LP481. Although accidental death is possible in these cases, the concentration of these remains in a particular portion of Ridges Basin suggests the possibility that the pit structures were intentionally burned down over individuals who had suffered a violent death.

The Western Cluster

The Western Cluster was a group of nine Pueblo I habitations on each side of Basin Creek in the west end of Ridges Basin (see Figure 11.4). The main concentrations of houses were in two areas: one on a wide ridge terminus north of Basin Creek and one on a series of low hills west of the Sacred Ridge site just south of Basin Creek. Several of the sites in the Western Cluster contained multiple-habitation units, including 5LP184, 5LP244, 5LP246, 5LP248, and 5LP511. The other sites in the cluster (5LP510, 5LP536, 5LP549, and 5LP614) consisted of single-structure habitations. Tree-ring dates from 5LP244 are the latest recovered from Ridges Basin and date to A.D. 809 (see Chapter 8).

[3] These are conservative figures that do not include isolated human remains or remains out of primary context, which were very numerous at 5LP185.

Thirteen pit structures were investigated in the Western Cluster sufficiently to examine architectural variation among them (i.e., at least half of each structure was excavated). Plan shapes were highly variable in this group of sites (Figure 11.8). Four were subrectangular; three were roughly D-shaped; three were circular or oval; and three were square. Floor areas ranged between 10 m² (Feature 3 at 5LP511) and 41 m² (Feature 1 at 5LP184), with an average floor size of 22 m².

Several abandonment modes were evident in these structures. Most structures (n = 11) were dismantled and salvaged to some degree. Nine of these were unburned, and most were left to fill naturally; only two contained post-occupational refuse. Two structures were dismantled, partially salvaged, and then burned. Neither of these structures had post-occupational cultural fill, but one contained a dog burial on the floor, which appeared to be part of the closing ritual for the structure. Finally, three structures were thoroughly burned and not salvaged at all. Two of these structures were at 5LP246 (Features 2 and 26) and one was at 5LP244 (Feature 15). All three contained intact floor assemblages, suggesting the possibility of catastrophic or accidental burning. However, these structures represented the likeliest ritual structures in the cluster. Two of them were some of the largest structures in the cluster, one of which contained a sipapu, and the third was one of the smallest. This small structure, Feature 26 at 5LP246, was interpreted as a specialized ritual structure based on its unusual size and unusual artifact assemblage, including numerous pipes, textile fragments, and an effigy vessel (Yoder and Lowe 2008:130). It seems possible that the burning of these structures was related to their ritual function.

Pit structure subfeatures were fairly uniform in this group of structures. Of the 13 pit structures excavated and documented, 11 had benches, wing walls, and a four-post roof support system. No structure had more than four roof support posts; the six-or-more-post roof support system appears to have been present only in the North-central and Eastern clusters (see Figure 11.4). (It is absent from the Sacred Ridge site, as well [see below].) In addition, Western Cluster structures commonly contained coped hearths (n = 9). Rare in these structures, however, were capped features (n = 3), sipapus (n = 2), stringer posts (n = 2), and bifurcated ventilators (n = 2). As Yoder (2008:297) notes,

> four main support posts set into the floor and the absence of stringer posts were very common. Only one pit structure in the group, Feature 1 at 5LP511, contained a full row of stringer posts set against the back of the bench. This secondary roof support system is more familiar in the North-Central Cluster and at the Sacred Ridge Site. Vent systems were almost all one-hole vents, with two-hole vents observed at 5LP246 and 5LP511 in pit structures with larger than median floor areas. Bins incorporated into the corners of square-shaped pit structures were also common, as were coped hearths.

Extramural features were present at all Western Cluster sites, and all sites contained surface or pit rooms in addition to at least one pit structure. The next-most-common extramural features were thermal, borrow, and storage pits—all but one site had these features. Middens were present at five of nine sites. And enclosures were observed at only two sites. Surface structures were of two types: pit rooms (n = 14) and surface rooms (n = 54) (see Chapter 10, The House and Household, for descriptions of these features). Many of these were exposed by backhoe stripping and were not excavated. All but one site had surface rooms; 5LP246 had only pit rooms (n = 5). In general, all these features were ephemeral, poorly preserved, and not contiguous in their arrangement. The exception was 5LP536, which had 10 well-preserved, contiguous rooms, of which four were at least half excavated; all contained post holes and were constructed of wood and adobe. One contained a hearth. The rooms appeared to have been built in stages. An abundance of oxidized adobe on the surface and subsequently uncovered during excavation indicated that all the rooms had been burned.

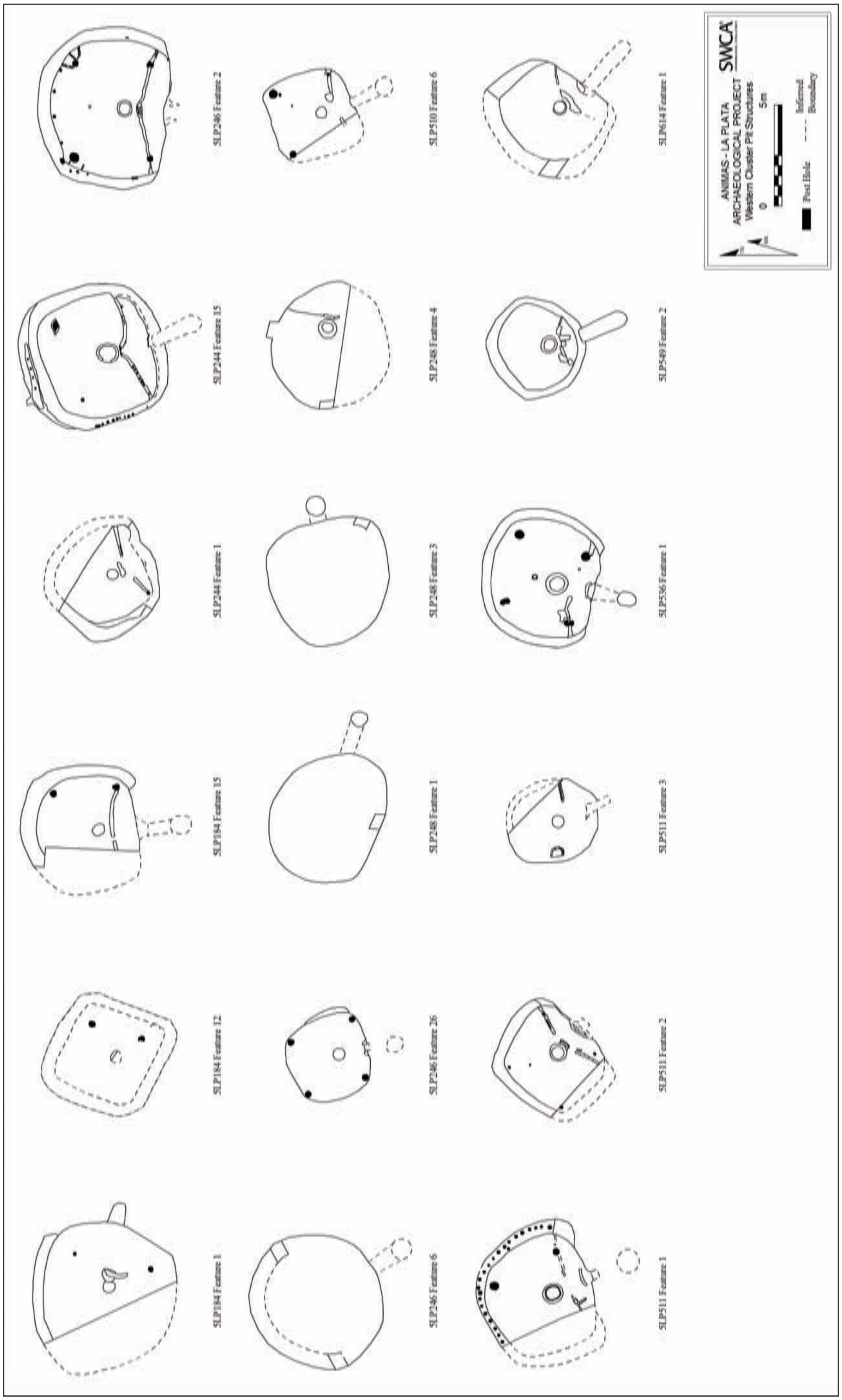

Figure 11.8. Plan maps of excavated pit structures in the Western Cluster.

Unlike the Eastern and North-central clusters, where most burials were in extramural areas, Western Cluster burials occurred most frequently in association with architecture. Of 18 interments, five were in pit structure fill and five were found in pit rooms. The pit room burials were at 5LP184; the pit structure fill burials were at 5LP511 and 5LP246. One of the pit room burials, that of a male, was considered a rich burial (Potter 2010b) because it contained 13 items, including a variety of minerals and a trough metate. The extramural burials were at 5LP246 (n = 2) and 5LP248 (n = 6).

The Sacred Ridge Site

SWCA defined 10 loci at the Sacred Ridge site (Figure 11.9) (Chuipka 2009). With the exception of Locus 10, each locus contained at least one pit structure, remnants of surface architecture, human remains, and midden deposits. Twenty-two pit structures were identified and excavated. Eight of the nine habitation loci at Sacred Ridge contained more than one pit structure, and in each case, evidence suggested that these pit structures were sequentially occupied and that pit structures in close proximity were not contemporaneous. However, enclosures in Loci 3, 7, and 8 surrounded both the earlier (trash-filled) pit structures and the latest pit structures, suggesting that the pit structures had been contemporaneous for a time (Figure 11.10). Locus 6 contained only one pit structure, Feature 49, which was the largest structure in the project area and may have functioned as a community-level ritual structure in the mid to late A.D. 700s.

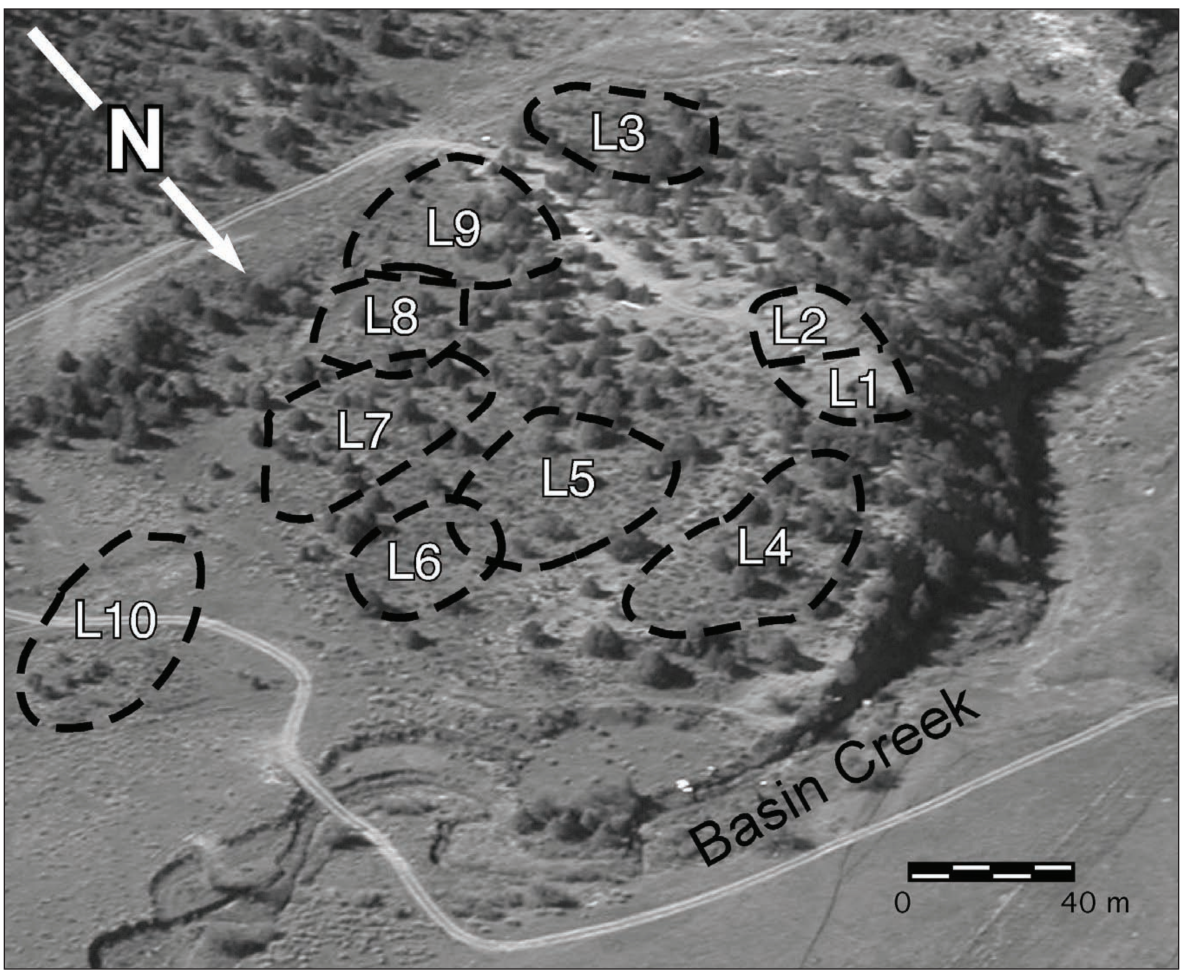

Figure 11.9. Aerial photograph of the Sacred Ridge site with Loci 1–10 delineated.

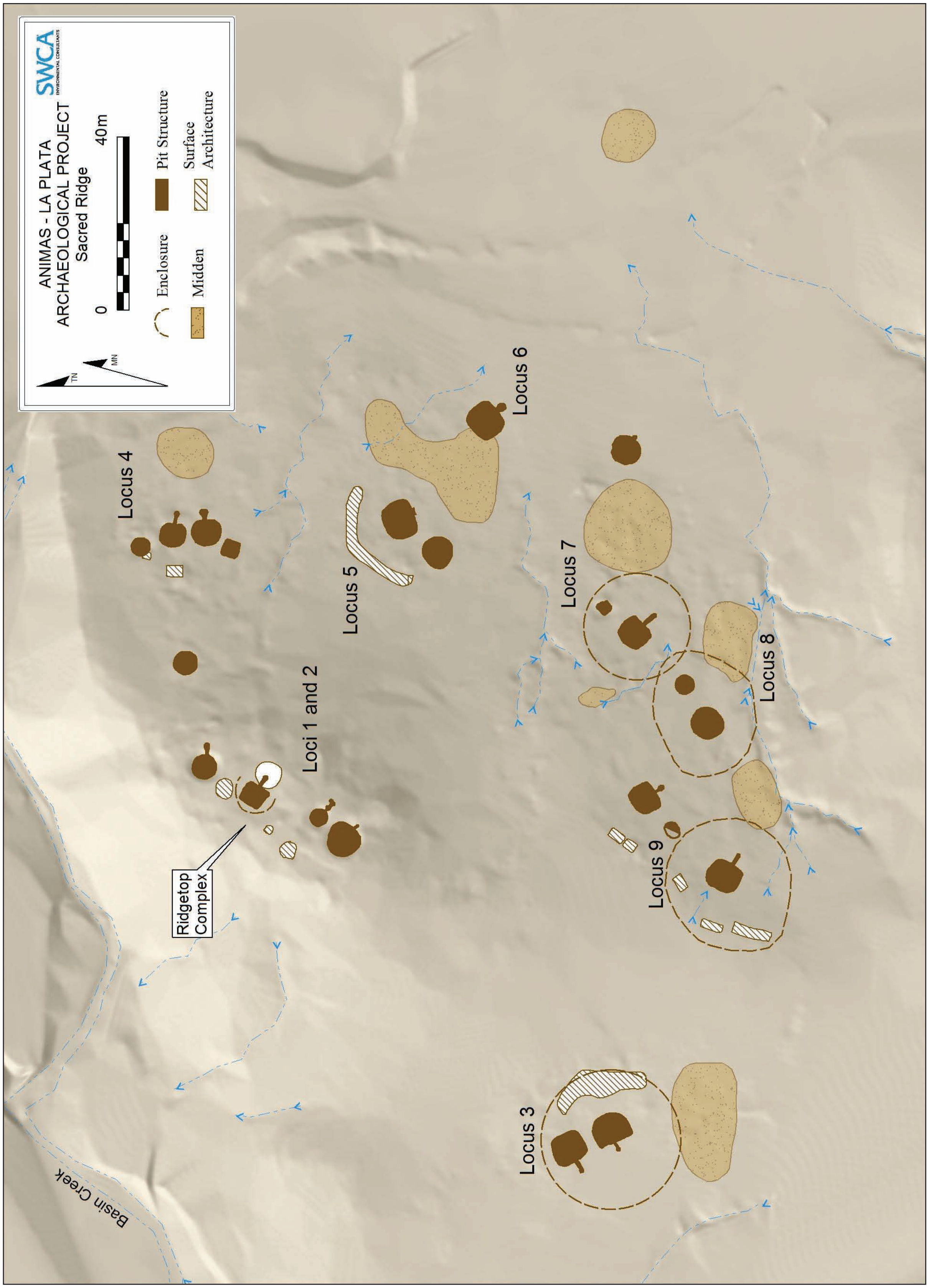

Figure 11.10. Map of the Sacred Ridge site.

Sacred Ridge had perhaps the longest occupation span in the basin, beginning sometime around A.D. 700 and ending sometime shortly after A.D. 803. (5LP185 may have had a similarly lengthy period of use, but it apparently went out of use a habitation site in the early to mid A.D. 700s, at which point it was transformed into a cemetery.) Three building sequences were evident at the Sacred Ridge site (Figure 11.11); each involved the construction of new structures and, with the exception of the earliest phase, the abandonment or reconfiguring of earlier structures. Based on radiocarbon dates, the earliest phase of occupation (Building Sequence 1) involved Features 1, 18, and 23 on the ridgetop (Table 11.2). These dates were recovered from annuals and have intercepts in the late A.D. 600s. In addition, Feature 179, immediately below the crest of the ridge, was filled with refuse and is thought to be comparable in age with these early features. Although other structures at the site may have been in use during this initial phase, there is little evidence to suggest it. This early occupation appears to have begun in the late A.D. 600s or early 700s and lasted until about 750, when the site became more intensively occupied.

The middle phase of occupation (Building Sequence 2, A.D. 750–780) involved the construction of multiple pit structures across the eastern and southern slopes of the site. The largest pit structure, Feature 49, was also built during this period and may have functioned as a community-level ritual structure. Many of these structures contained post-occupational cultural refuse, indicating the existence of later habitation structures at the site.

At some point between A.D. 780 and 800, the last phase of occupation, Building Sequence 3 began. Building Sequence 2 pit structures were vacated and salvaged, and were then either used as trash receptacles or were left to fill naturally. Relatively large pit structures (Features 41, 58, 89, 117, and 134) were built during this phase, most often immediately adjacent to the structures that had been dismantled. At roughly the same time, new structures were added to the top of the knoll, and others were remodeled. The Feature 23 pit structure was de-roofed and altered to serve as an entryway for newly constructed Feature 2 (a domed, circular structure). Feature 16 (a tower), Feature 17 (an enclosure), and Feature 19 (a fourth pit structure) were constructed on the ridgetop. By approximately A.D. 810, all structures in use, including those on the ridgetop, were burned, and Sacred Ridge was entirely depopulated.

Like the structures in the Western and North-central clusters, plan shapes of Sacred Ridge structures are highly variable (Figure 11.12). Of the structures excavated enough to permit documentation of shape, five were circular or oval, five were subrectangular, three were D-shaped, and two were square. The size of structures varied widely—Sacred Ridge had both the smallest and the largest structures in the project area. Floor areas ranged from 10 m^2 (for Features 60 and 89) to 42 m^2 (for Feature 49) with an average of 27 m^2, the same as the North-central Cluster average and larger than the average (22 m^2) for both the Western and Eastern clusters.

Table 11.2. Radiocarbon Dates from Features 1, 18, and 23 at the Sacred Ridge Site

Analyst's Sample Number	Locus, Feature Number	Conventional Radiocarbon Age (years B.P.)	2-sigma Calibration	1-sigma Calibration
Beta-197185	Locus 1, Feature 1 (pit structure floor)	1440 ±40	A.D. 550–660	A.D. 600–650
Beta-197187	Locus 2, Feature 18.05 (hearth)	1310 ±40	A.D. 650–780	A.D. 670–720
Beta-197188	Locus 2, Feature 18.06 (bell-shaped pit)	1320 ±40	A.D. 650–780	A.D. 660–710
Beta-197189	Locus 2, Feature 23.06 (pit)	1330 ±40	A.D. 650–770	A.D. 660–700

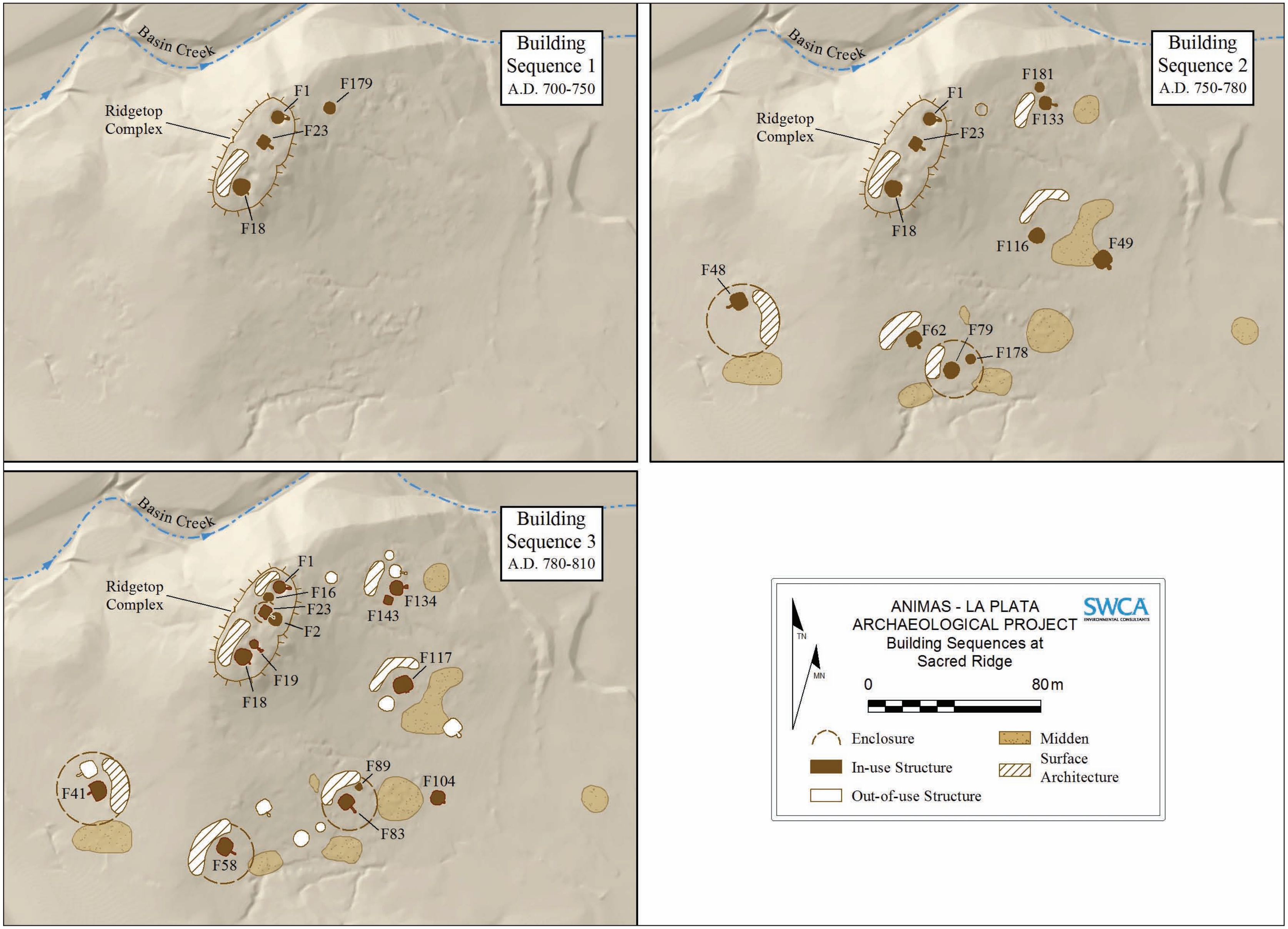

Figure 11.11. Maps showing the pit structures associated with Building Sequences 1–3 at the Sacred Ridge site.

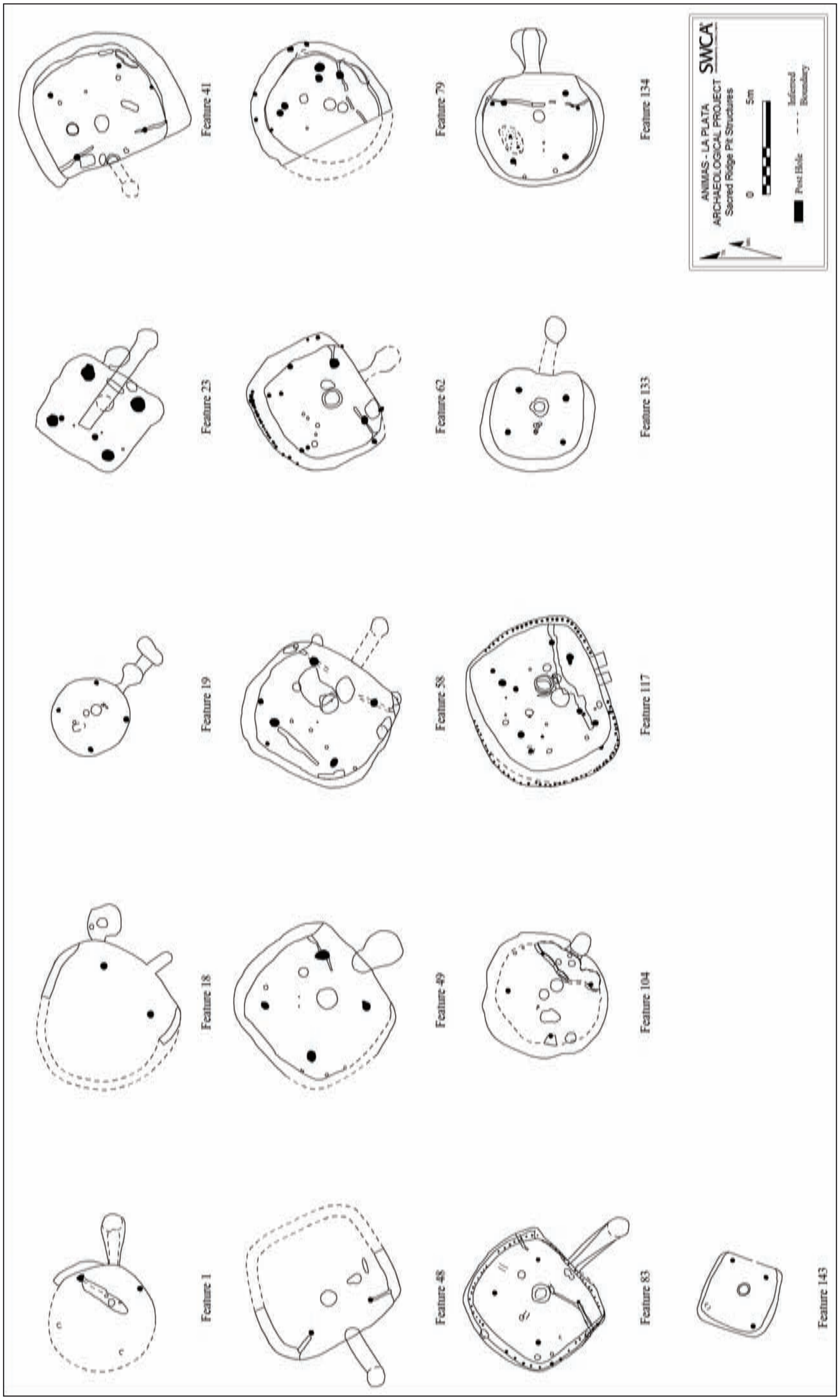

Figure 11.12. Plan maps of excavated pit structures at the Sacred Ridge site.

Four types of pit structures were defined at Sacred Ridge based primarily on size (Chuipka 2009:355–358; Potter and Chuipka 2007a) (Figure 11.13). These types also correlate with abandonment mode (see below). Type I structures were the smallest; similar structures have been referred to as "pocket pit structures" (Potter and Chuipka 2007a; Wilshusen 1988b). Sacred Ridge had two Type I pit structures (Features 60 and 89); each was less than 4 m in diameter and approximately 1 m deep. Feature 60 contained a small floor vault, and Feature 89 contained a hearth. Neither structure had wing walls, interior support posts, a ventilator tunnel, or other features characteristic of larger structures at the site. Each of these Type I pit structures had roofed areas of less than 13 m^2, and both had been filled with trash, indicating that they were vacated early in the site occupation. It is thought these structures were short-term habitations used as temporary residences during the construction of larger, more permanent structures.

Six medium-sized pit structures (Features 19, 23, 133, 143, 169, and 181) were designated Type II pit structures. These pit structures measured between 4 and 6 m in diameter and up to 2 m deep. All of these pit structures had roofed areas no greater than 30 m^2. These pit structures compared favorably in size with the pit structures of the late A.D. 700s in the Dolores area (Wilshusen 1988b:600) and with Pueblo I pit structures in the Navajo Reservoir area (Eddy 1966; Sesler and Hovesak 2002; Silverman et al. 2003), which measured on average less than 25 m^2 in floor area. Typical attributes of Type II structures at Sacred Ridge were wing walls, single-hole ventilators, benches, substantial hearths (often collared), and a four-post roofing system. These structures are interpreted as year-round domestic residences.

Type III pit structures measured between 6.0 and 7.5 m in diameter, had roofed areas greater than 30 m^2, and had floor areas greater than 25 m^2. In addition, several of these structures had a single, conical, plastered floor pit offset from the hearth. These conical pits have been recorded only at Sacred Ridge, and their function is unclear (see Chapter 10). Ten Type III structures (Features 1, 18, 58, 62, 79, 83, 104, 116, 134, and 179) were identified at Sacred Ridge.

Type IV pit structures were the largest, and similar types of structures have been described as "oversized" (Kane and Robinson 1988; Wilshusen 1988b). Four pit structures of this type (Features 41, 48, 49, and 117) were present at Sacred Ridge, and each measured at least 7.5 m across and 2.0 m deep, with a floor area of at least 34 m^2. The total roofed area, including the bench, exceeded 50 m^2 in all four Type IV structures. As did the Type II and Type III pit structures, Type IV pit structures typically had wing walls, benches, one-hole ventilators, four roof support posts, and hearths. And, as did the Type III pit structures, each Type IV pit structure had a plastered conical pit of unknown function offset from the hearth. One of the largest of these pit structures (Feature 49, see Figure 11.13) was unique in that it had a ventilator entryway and no associated midden, and it was isolated from other contemporaneous pit structures. The isolated nature of the Feature 49 pit structure, the lack of domestic trash associated with its use, its large size, and its unique ventilator entryway suggest a communal, ritual use for the structure. Unlike the oversized pit structures at McPhee Village near Dolores (Kane and Robinson 1988; Wilshusen 1988b), the oversized structures at Sacred Ridge had few floor features, maximizing the usable floor space in each.

The ways in which pit structures were abandoned closely correlates with pit structure size (Chuipka 2009:359). Discontinuation of the Type I and Type II pit structures as habitations involved the removal of the domestic assemblage and the subsequent disassembly of the roof. Most of these unburned structures were then used as refuse areas, suggesting that they had been vacated for some time before the site as a whole was depopulated. For Type III structures and all Type IV structures except Feature 49 (the isolated pit structure), the occupants deliberately burned the structures and did not salvage the roof timbers.

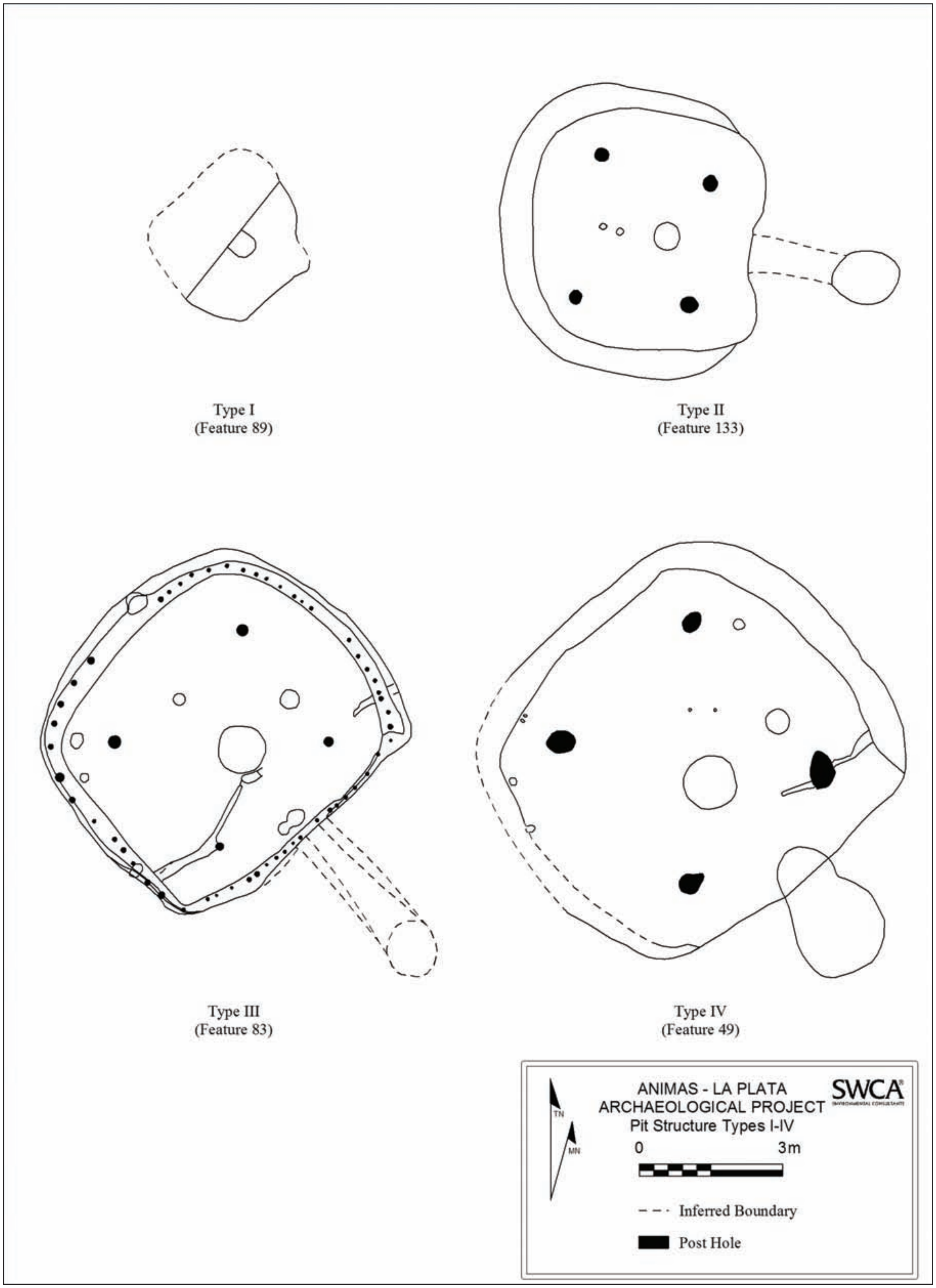

Figure 11.13. Pit structure plan maps representing pit structure Types I–IV.

Several of the Type III and IV structures had fragmentary human remains on the floor surfaces (Features 58, 83, and 104) or in the floor fill (Features 49, 79, and 134). These remains differed from those found in association with pit structure floors in the North-central Cluster in that they had undergone a certain level of perimortem processing (Chuipka 2009:216, 354). The most extensive deposit of fragmented bone was observed in the fill of Feature 104. These fragments were evidently processed elsewhere before being deposited into the de-roofed pit structure (see Chapter 15, Ritual, Social Power, and Identity).

One Type IV structure, Feature 41 in Locus 3, had the remains of a domestic dog on its floor. The skeletal elements were articulated, suggesting that the dog had been deposited soon after its death and most likely in conjunction with the intentional burning of the structure. The entire carcass was covered with sandstone slabs.

Sixteen pit structures were excavated sufficiently to record the presence or absence of subfeatures. All but two had a four-post roof support system; three of these had a secondary roof system of stringer posts set in the bench (see Figure 11.12). The two exceptions were the two Type I structures (Feature 60 and 89), which had posts (presumably four) on the surrounding ground surface. Thirteen structures had benches, 10 had wing walls, and eight had deflectors. In seven pit structures, wing walls were integrated with the deflector to form a continuous partition across the southeastern third of the structure floor. Ten of the pit structures lacked deflectors, and several of those had modified ventilator tunnel openings that likely served this function. Only one structure at Sacred Ridge, Feature 104, had a two-hole ventilator, but three other structures had unique ventilator entryways: Feature 49 in Locus 6 and Features 133 and 134 in Locus 4. A corner storage bin was found in Feature 104, but this type of feature was absent from all other pit structures.

Hearths were the most common non-architectural feature in Sacred Ridge pit structures—only Feature 60, a Type I pocket pit structure, lacked a central hearth. Only three of the hearths at Sacred Ridge were coped, a stark contrast with Eastern and Western cluster structures where most of the structures (approximately 75% in both cases) had coped hearths. Coped hearths were less common in the North-central Cluster. Twelve pit structures at Sacred Ridge had possible sipapus; this number equals the total number of sipapus found in all the other pit structures in Ridges Basin combined. In addition, filled or capped features were recorded in most structures (n = 14), suggesting that the occupants' move out of these structures was planned. Almost all structures exhibited remodeling in some form; most commonly the central hearth appeared to have been reworked. The level of remodeling at Sacred Ridge is unparalleled elsewhere in Ridges Basin. Indeed, four structures were completely dismantled and rebuilt; three were re-roofed; and one (Feature 23 in Locus 1) was de-roofed and converted into an entryway to a surface structure. This pattern is indicative of the longer occupation span of Sacred Ridge compared to that of other clusters in the basin, particularly the Eastern Cluster. Finally, Sacred Ridge structures were distinguished by the presence of conical pits in five structures. These features were exclusive to Type III and Type IV structures, and all were offset from the hearth (see Figure 11.13 for examples), were plastered, and contained clean fill. Their function is presumed to have been ritual in nature.

Although extramural features were present in every locus except Locus 10, they were found in relatively small numbers. No more than three extramural pits or hearths were found in any one locus, and these features were often in close proximity to the surface rooms and pit structures, suggesting that most activities took place inside the pit structures.

Surface rooms were present in all loci except Locus 10. Most of them did not have interior features. Surface structures that contained hearths, and which are therefore inferred to have functioned as living spaces, were identified only in Loci 2 and 9. These living rooms were accompanied by rooms without hearths that were likely storage rooms.

Five enclosures were uncovered on Sacred Ridge, one each in Loci 1, 3, 7, 8, and 9 (see Figure 11.10). All five enclosures originated at the surface rooms and surrounded the pit structure, separating it from the midden. The enclosures at Loci 3, 7, and 8 each surrounded two sequentially occupied pit structures. Evidence for each of these enclosures consisted of a linear stain measuring 15–18 cm wide, likely the remnant of a small trench or series of sockets for posts and brush. No individual posts were visible in these enclosures. These four partially defined enclosures are inferred to have enclosed areas measuring between 486 and 812 m^2. A fifth enclosure (Feature 17 in Locus 1) differed from the other enclosures in that it consisted of 25 individual post holes, three possible post holes, and surface staining in a C-shaped arc around the unroofed Feature 23 pit structure. This feature also enclosed a much smaller area (70 m^2).

In addition to the common suite of features seen in other habitation clusters in Ridges Basin, Sacred Ridge had several unique features. Activity Area 3, also referred to as the ridgetop complex, occupied the central portion of the ridge and consisted of four distinct architectural elements: a circular surface structure (Feature 2), a remodeled pit structure (Feature 23) and plaza enclosure (Feature 17), and a feature that is inferred to have been a tower (Feature 16) (Figure 11.14).

Feature 16, the tower structure, is interpreted as having been more than a single story high based on three lines of evidence: 1) the volume of burned adobe associated with the feature, 2) the number and arrangement of post holes, and 3) the size of the timbers that the post holes would have held.

The first line of evidence—the volume of burned adobe—was determined in several ways. This portion of the ridgetop had been entirely shovel-scraped by Homer Root and the Fort Lewis College field school in 1966. Root removed up to 60 cm of fill from Locus 1, and SWCA's later examination of his backdirt off the ridgetop adjacent to Feature 16 found that it contained a large volume of burned adobe fragments. SWCA shovel-scraped and mechanically stripped this area in 2003, removing an additional 20 cm of adobe and overburden and exposing a circular concentration of adobe 15 cm thick. Excavation revealed that the concentration was contained in a shallow basin with an unprepared floor. The mound of burned adobe associated with Feature 16 is estimated to have been at least 80 cm thick prior to disturbance, suggesting a substantial superstructure.

Second, four primary post holes spaced less than 2 m apart in the floor basin and 15 secondary post holes surrounded the perimeter of the basin. The large interior posts were the roof supports, which appeared to have been buttressed by the smaller secondary posts that also constituted the structure's walls. Typical surface rooms in the region have similar floor areas but have only four roof supports at most. Thus, Feature 16 contained nearly five times as many post holes as the typical surface room.

Third, the post holes were large relative to the floor area. The interior post holes were more than double the diameter and depth of those recorded in any other surface structure in the project area, and were even larger than those recorded in pit structures, such as Feature 19 in Locus 2. The four primary post holes in Feature 19 averaged 24 cm in diameter and 21 cm in depth, less than 60 percent of the size of the interior supports of Feature 16, the tower structure. The Feature 19 pit structure chamber was at least 1.6 m deep, and the primary roof supports would have been at least that tall and probably taller. Because the Feature 16 post holes were significantly larger than those in Feature 19, it is assumed that they held posts of greater size. In other words, the Feature 16 primary posts could have extended 1.6 m or more above the floor surface. The secondary post holes that surrounded the floor basin were similar in size to those found in some surface rooms, but were far more numerous and more closely spaced. It is thus possible that these posts supported not an expansive roof but a tall structure. Potter and Chuipka (2007a) suggest that Feature 16 was at least 4 m high (Figure 11.15).

Feature 2 was a circular surface structure that appeared to have had a domed pole-and-mud roof. The structure lacked domestic features and artifacts, including hearths and metates, but had a well-prepared plastered floor, suggesting that it was a storage facility. Post holes between inward-leaning double rows of sandstone slabs defined the base of the structure and indicated that it was walled and roofed (Figure 11.16). Ten post holes up to 12 cm in diameter were excavated in the structure's most intact quarter, suggesting that at least 40 such post holes were present. Further evidence for a roof comes from Root, who noted that "burned material" was present in this area of the ridgetop; he concluded that enough fill existed to suggest that what he termed "dance plazas" were enclosed by walls and a roof (Root 1967:24–25). Consistent with Root's observations, undisturbed fill removed by SWCA in 2003 from the feature's southern portion contained burned adobe and charred beam fragments. These materials, combined with the presence of the post holes between the double rows of slabs and the plastered floor surface, strongly suggest that this was an enclosed structure. Projecting the angle of the slabs toward the center of the structure suggests that the roof, presumably constructed of poles and mud, stood between 1.5 m and 2.0 m above the floor surface. At 7.0 m in diameter, Feature 2 would have enclosed an immense space by early Pueblo standards.

Feature 23 initially had been a square pit structure with a four-post roof support system, ventilator tunnel, hearth, and deflector (Figure 11.17). It likely functioned as a domicile until it was extensively altered as part of the Activity Area 3 construction. At that time the superstructure was disassembled, the four primary support post holes were floored over, and the ventilator tunnel was extended into the structure, obliterating all but a small piece of the hearth basin and the edges of the deflector slot. The remodeling of Feature 23 appears to have coincided with the construction of Feature 2, the circular domed structure, which was constructed over what had originally been the exterior end of the ventilator tunnel. Feature 17, a C-shaped post-and-brush enclosure, was built as part of this remodeling event, partially encircling the now-open Feature 23 floor area (Figure 11.18). The final configuration of Activity Area 3 thus consisted of an open plaza with a subfloor entry into the circular domed structure (which we interpret as an oversized storage structure) and the tower structure, Feature 16, immediately adjacent (Figure 11.19).

Forty-five formal burials were recovered from Sacred Ridge. This does not include the large number of processed human remains found in pit structures across the site, nor those remains found out of primary context. Not only did Sacred Ridge have more burials than any other cluster, the Sacred Ridge burials were located in a wider range of contexts, including middens and other extramural contexts (n = 36), pit structure fill (n = 6), ventilator shafts (n = 2), and a pit structure bench (n = 1). Only one burial was inordinately rich. Burial 303, found in the midden of Locus 9, was a male interment that contained 55 items: 34 clear quartz crystals, 20 turquoise inlay tiles, and one piece of hematite (Potter 2010b).

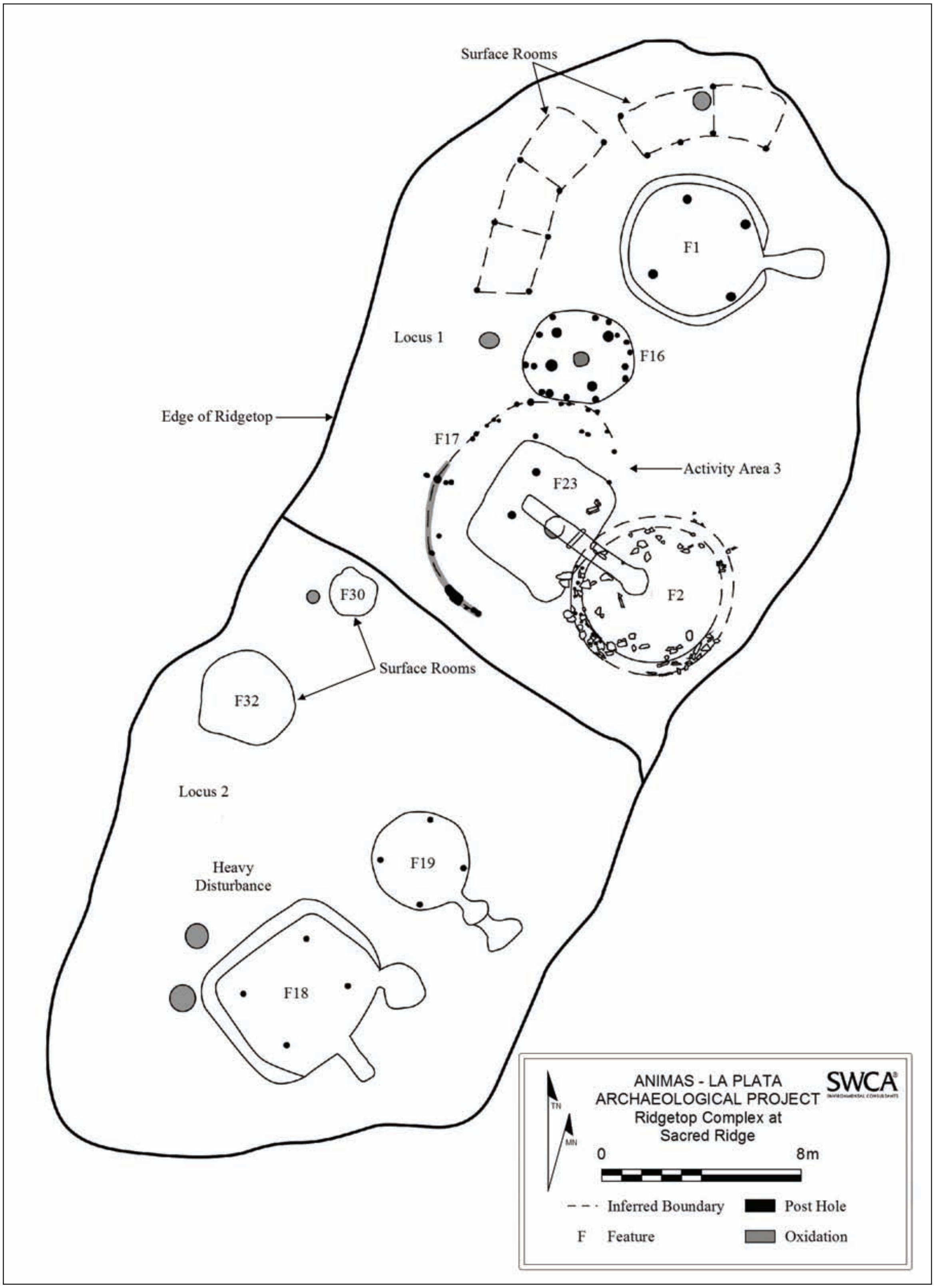

Figure 11.14. Plan map of the ridgetop complex at Sacred Ridge.

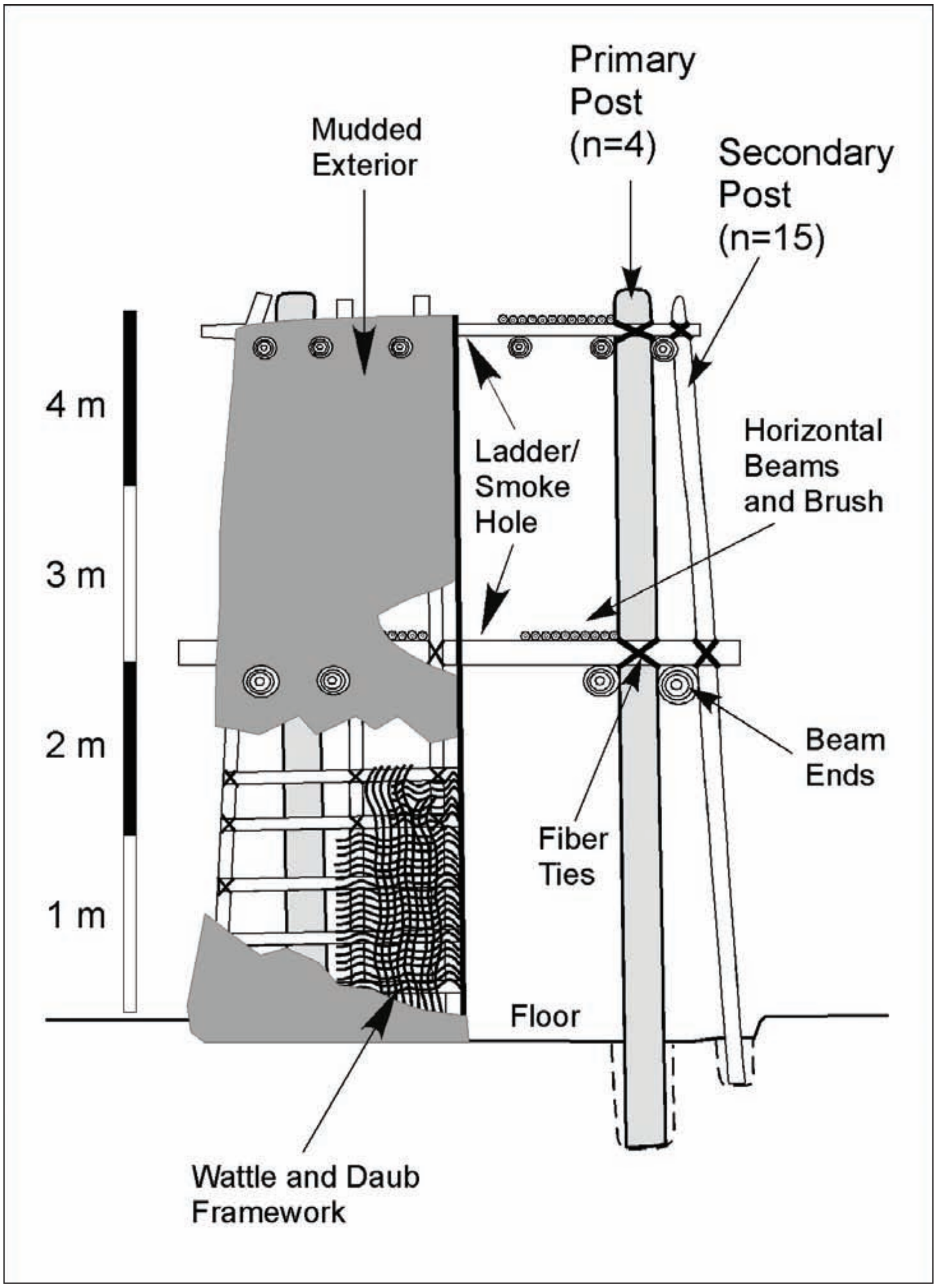

Figure 11.15. Cutaway view showing the proposed construction of Feature 16 at the Sacred Ridge site.

Blue Mesa

SWCA excavated four early Pueblo I habitations at the southern end of Blue Mesa (see Figure 11.4). These sites—5LP2026, 5LP2088, 5LP2089, and 5LP2091—were part of a larger community of habitations, most of which remain unexcavated (Figure 11.20). Prior to SWCA's work, six other sites had been investigated, but only sites 5LP378 and 5LP379 were systematically excavated, documented, and reported (Adams 1982; Fritz and Honeycutt 2003; Gerwitz 1982). Little information exists for the other four sites (5LP1380, BM-4/WA-5, BM-5/WA-6, and B:13:4) (Dean 1975; Duke and Matlock 1999:101; Hibbets 1975). All the investigated sites were on the southern portion of the mesa (Figure 11.20), with the exception of B:13:4 (not shown).

Most of the Blue Mesa sites were habitation sites consisting of a single pit structure, but three (5LP378, 5LP379, and 5LP2026) contained more than one pit structure. In all three of these instances, evidence indicated that the structures had been sequentially occupied (Chuipka and Potter 2007b).

The abandonment mode for the Blue Mesa pit structures varied, as well. In the most common scenario, the structures were cleaned out prior to desertion, with most of the domestic assemblage removed from nine of the 11 documented pit structures. Although all of these structures had artifacts on the floor and bench surfaces, they appeared to have been incidental or low-value items that were purposely not salvaged. Only two pit structures (Pit House 1 at 5LP378 and Feature 4 at 5LP2026) appeared to have been deserted without the roof timbers being salvaged. Both these pit structures had post remnants in the primary post holes and unburned wood fragments in the fill, suggesting that the roof had collapsed over time. Most of the domestic assemblage had been removed from these structures in what appeared to be planned events. Five pit structures had been disassembled with the primary roof support posts removed, most likely for use in the building of other structures elsewhere on the mesa. One of these structures (Feature 2 at 5LP2026) had been systematically dismantled and ritually closed. The four primary post holes had been filled with reddish-brown silty clay once the posts

Figure 11.16. Photograph of a portion of Feature 2 showing inward-leaning upright slabs and post holes indicating pole-and-mud roofing technique.

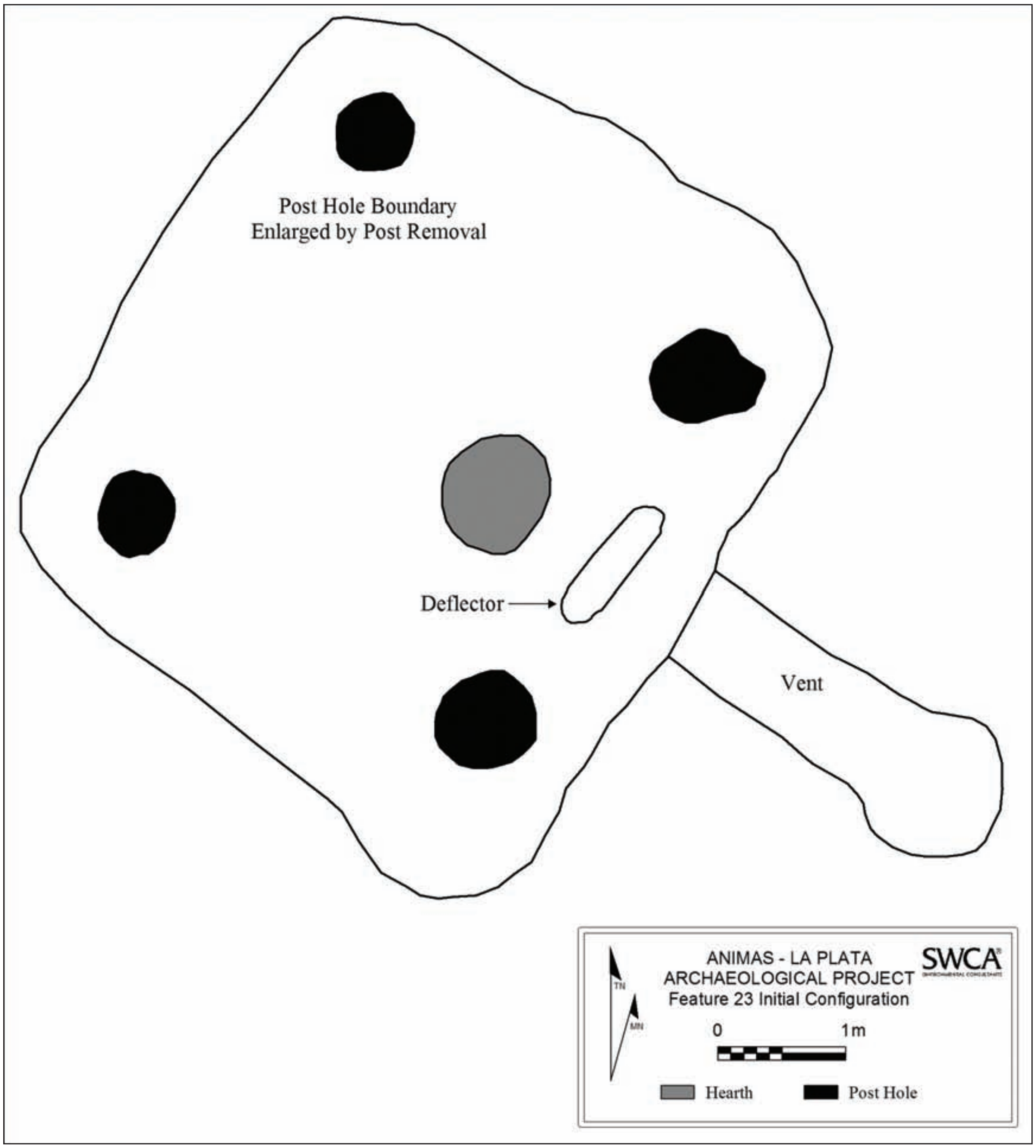

Figure 11.17. Initial configuration of Feature 23 as a shallow pit structure.

were removed. Over the northern primary post hole was a plaited basket containing a mass of charred plant materials. Charred macrobotanical remains and the impression of a basket were on top of the southern primary post hole. The baskets contained a variety of botanical remains, including sagebrush, juniper, piñon, ponderosa pine needle fragments, oak, maize, groundcherry, and purslane. The eastern primary post hole was topped with the base of a plain grayware jar containing a variety of botanical materials, including juniper charcoal, piñon bark, maize cupule fragments, dicotyledon-type stem fragments, and goosefoot/pigweed seeds. The western primary post hole had been filled with approximately 12 cm of gray-green sand. Immediately northeast of this post hole was an unworked nodule of a mineral that was similar in color and texture to the fill material.

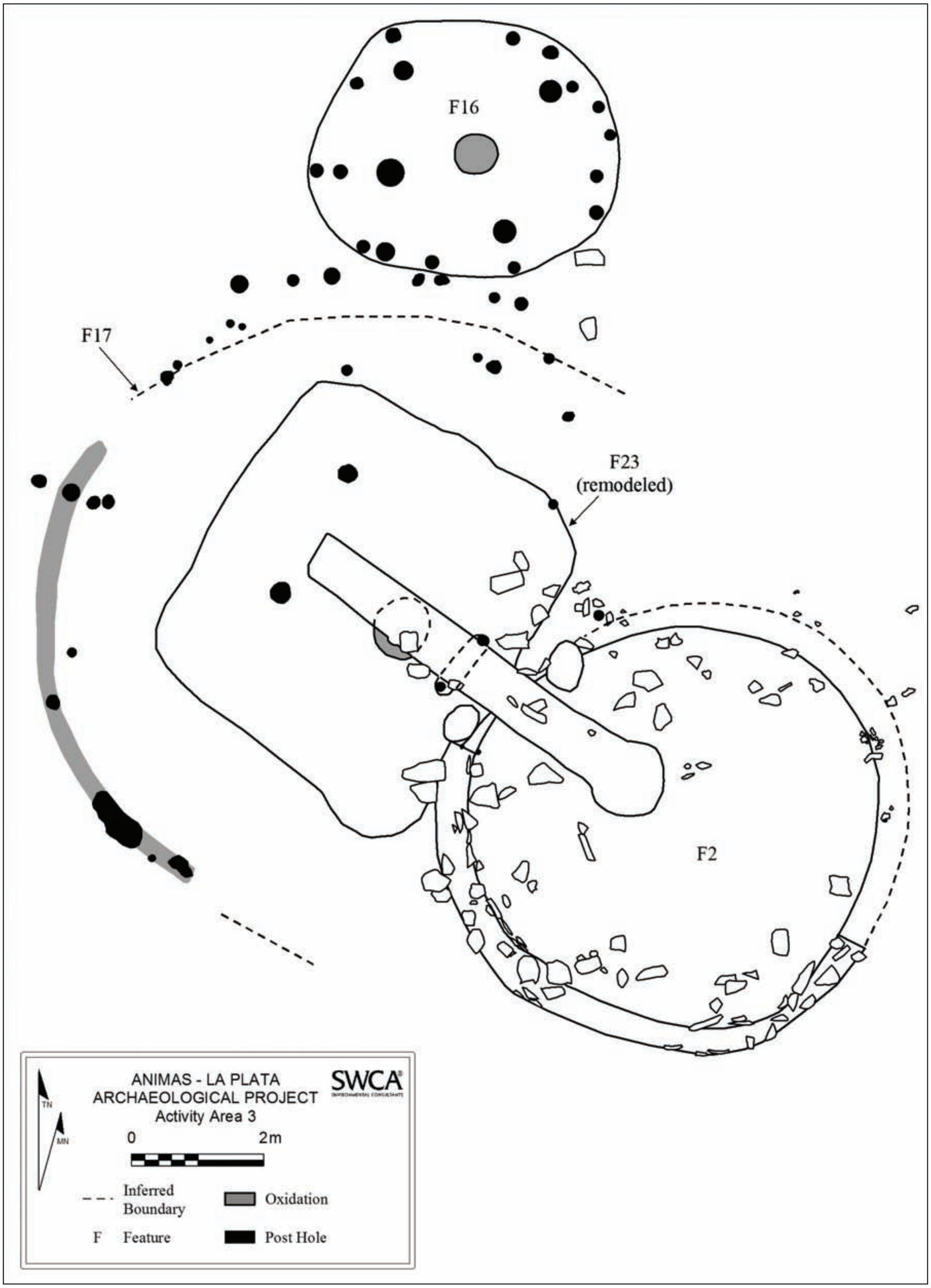

Figure 11.18. Plan map of the final configuration of Activity Area 3.

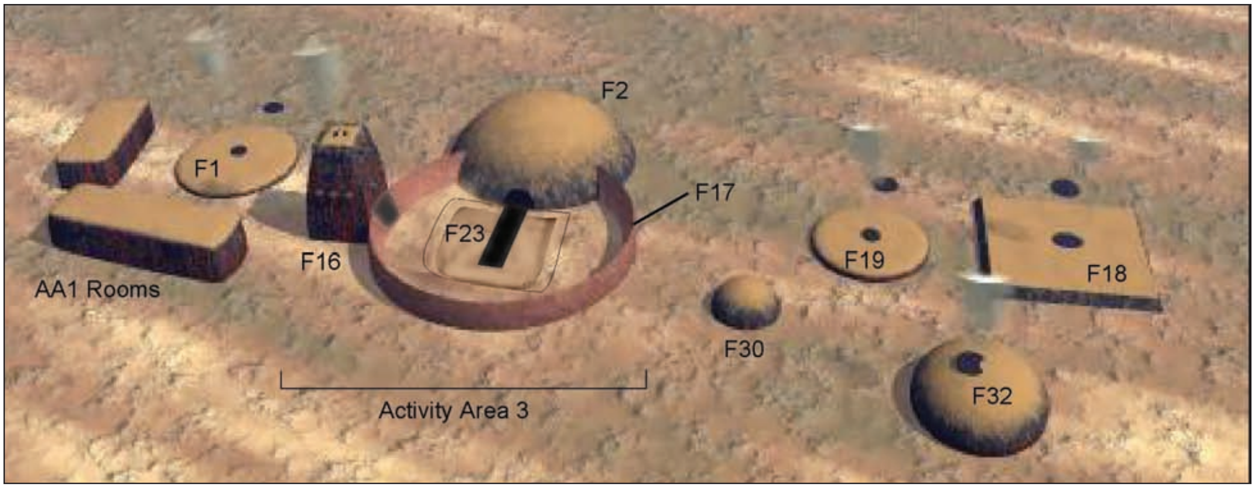

Figure 11.19. Computer-generated reconstruction of the ridgetop complex at Sacred Ridge at approximately A.D. 800, view facing east.

The architecture of 10 pit structures on Blue Mesa has been recorded sufficiently to allow for comparisons (Figure 11.21). Nine of the structures were similar in that they had a roof supported by four primary posts set into the floor surface. Although the pit structure at BM-5/WA-6 initially had a roof supported by four posts, it had been remodeled and the new roof was supported by six posts recessed into the face of the lower wall. The remaining morphological attributes of these structures show no apparent pattern. The structures were subrectangular, D-shaped, oval, or circular in plan, and floor areas ranged from 13.5 m to 32.4 m², with an average of 23.0 m². Three structures did not contain a bench, and ventilator opening styles were nearly evenly divided between bifurcated openings (n = 6) and single-hole openings (n = 5). Seven structures contained a possible sipapu, and seven contained coped hearths. Of all the clusters, the sample from Blue Mesa contained the highest frequency (55%) of double-hole ventilators. Remodeled or capped features were observed in six structures, perhaps indicating that they were occupied longer than structures without such changes. One of the most striking aspects of pit structure morphology was the large variation in the number of non-architectural features (features such as hearths, sipapus, and storage bins not directly associated with roof support or structure ventilation). Seven of the pit structures contained no more than 10 non-architectural features; two contained between 11 and 20; and two had more than 20. Most of the structures with 10 or fewer non-architectural features did not contain remodeled or capped features, suggesting that they were occupied for relatively short periods of time.

All 10 excavated habitation sites on Blue Mesa contained a definable midden, at least one pit structure, and remnants of storage-related surface architecture. In at least four instances, these storage rooms were accompanied by living rooms that contained hearths or artifact assemblages, or both, indicating both food-processing and tool-processing activities. The descriptions of the surface rooms at sites BM-4/WA-5 and BM-5/WA-6 suggest that some were likely used for activities other than storage. An enclosure was observed at Locus 2 at 5LP2026 but nowhere else on the mesa. This enclosure originated at the surface rooms and surrounded the Feature 4 pit structure, separating it from the midden. The cobble apron observed at 5LP2091 may have functioned as an enclosure, defining domestic space around the pit structure (Carlson 1963; Eddy 1966; Silverman et al. 2003). Extramural features were observed at 5LP1380, 5LP2026, and 5LP2091. The small number of extramural features identified at the 10 investigated Blue Mesa sites suggests that most activities were conducted in the pit structures or surface rooms rather than in the open.

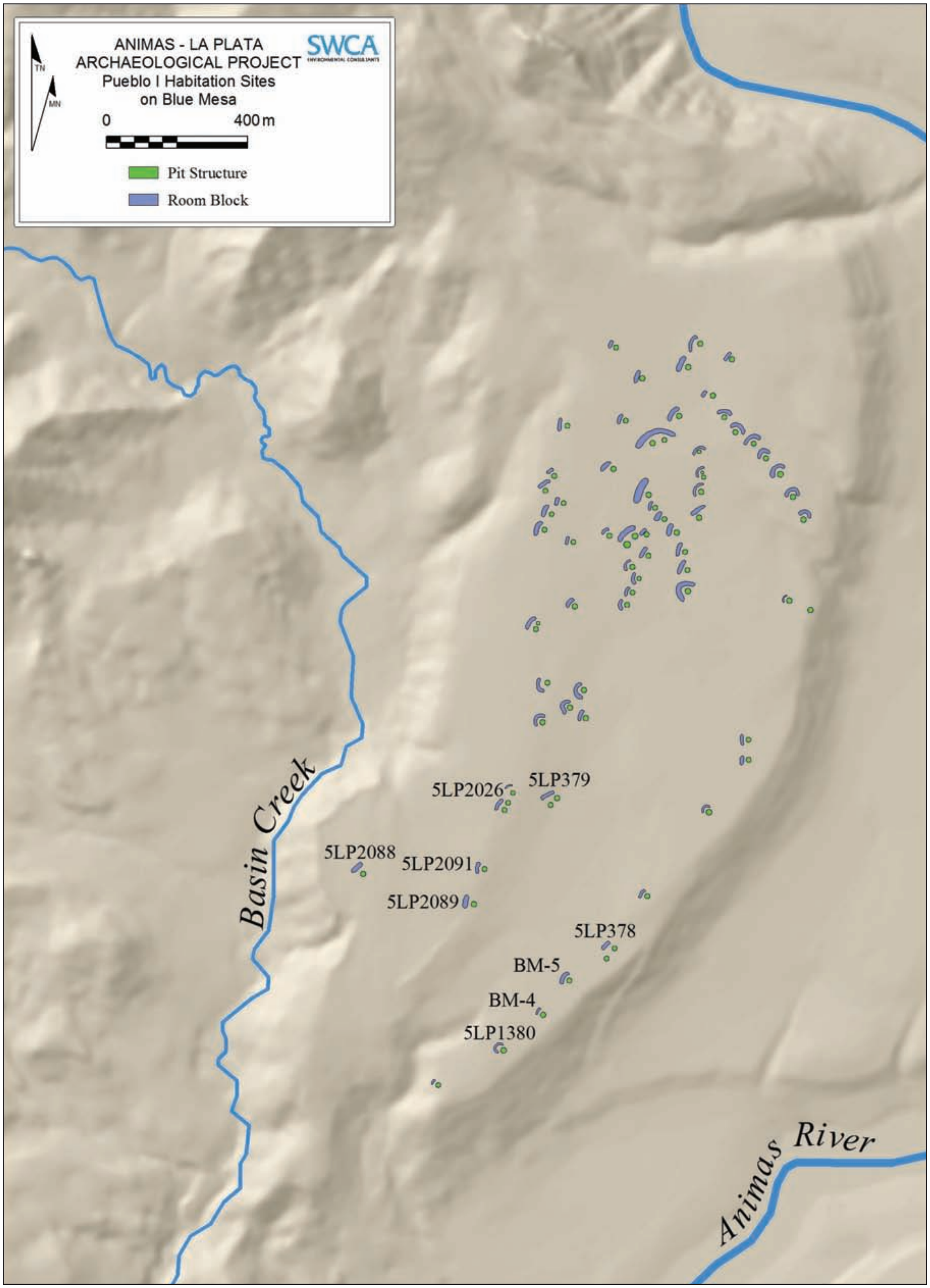

Figure 11.20. Map showing early Pueblo I habitations on Blue Mesa, based on survey and excavation data.

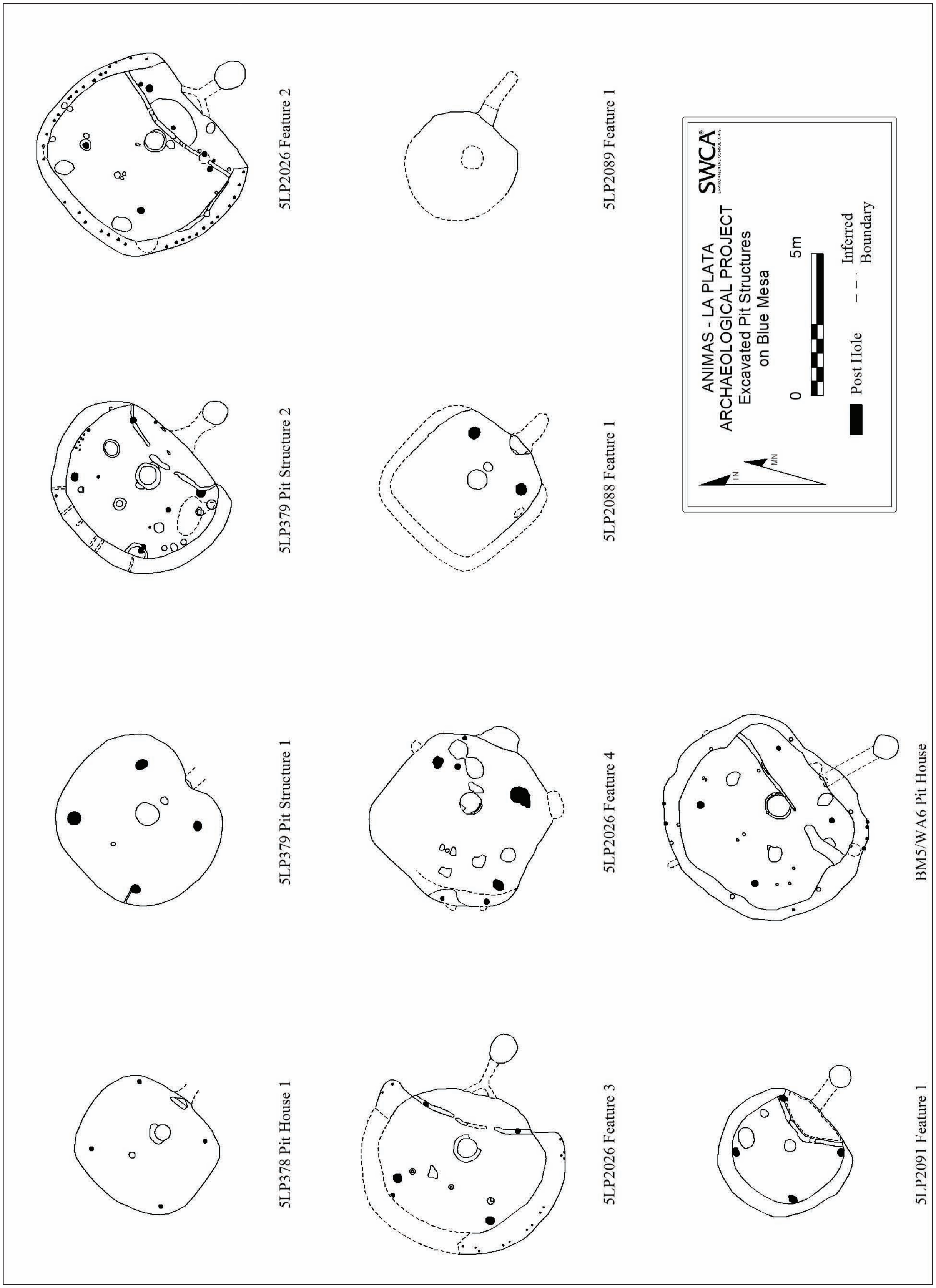

Figure 11.21. Plan maps of excavated pit structures on Blue Mesa.

Two pit structures containing human remains (Pit Structure 2 at 5LP379 and Feature 3 at 5LP2026) were burned when vacated. Both assemblages of human remains exhibited trauma. Pit Structure 2 at 5LP379 was burned down over the remains of a middle-aged woman whose position suggested that she had died where she fell (Fritz and Honeycutt 2003:3-20). A possible cause of death was indicated by a projectile point recovered from the left side of the ribcage and a partial projectile point found on the floor surface adjacent to the body. Feature 3 at 5LP2026 was burned down over the processed remains of a single adult individual of indeterminate gender. Although 5LP379 was evidently occupied after the desertion of Pit Structure 2, the use of 5LP2026 ended with the burning of Feature 3 over the human remains found there. Evidence in the partially filled depressions of Pit House 1 at 5LP378 and Feature 1 at 5LP2091 suggested that these structures had been reoccupied and that the occupation of Blue Mesa continued after they had initially fallen into disuse. The reuse of the depression at 5LP378 was much more extensive than that at 5LP2091 (McAndrews et al. 2000). Feature 2 at 5LP2026 was filled with a large volume of refuse after it was deserted. Pit Structure 2 at 5LP379 appeared to have been deserted for some time before a layer of darkly stained fill containing refuse accumulated in the depression. New pit structures were constructed at both sites after the earlier structures had burned and collapsed. The other nine pit structures had relatively clean upper fill, with most artifacts and debris attributable to post-occupational slump and erosion of surface architecture into the depressions. No evidence was found to suggest that later habitations were built to replace these pit structures, and their desertion appears to have coincided with the terminal desertion of these sites.

SUMMARY

It is clear from this mostly descriptive analysis that while considerable variation was exhibited within each of the designated clusters, particular attributes set the clusters apart from each other. Site occupation sequence and span, ways of constructing buildings and domestic features, and even burials and abandonments served to distinguish the clusters. Some were more than simply spatial clusters and appeared to be the residential areas of culturally distinct social groups.

Table 11.3 summarizes the attributes of the clusters. In general, the Eastern Cluster was distinguished by the consistency of pit structure plan shape and mode of abandonment for these structures; the lack of floor features and high frequency of extramural features, including enclosures and extramural burials; and the common presence of coped hearths. The North-central Cluster had larger structures, on average, and many had been burned at desertion. Also present in this cluster was a number of in situ floor assemblages and burials found in various contexts, including the floor of a burned structure. Most burials were found in one of two extramural burial areas at 5LP185, an early habitation that had been transformed into a cemetery in the late A.D. 700s. The Western Cluster was distinguished by the presence of surface and pit rooms, and by the association of burials with these structures. Sacred Ridge, the largest site, contained unusual architecture in the form of oversized pit structures with sipapus and conical floor pits, and unique architecture on the ridgetop. And finally, Blue Mesa sites had the highest frequency of two-hole ventilators. The following chapter explores these spatial patterns further by quantitatively analyzing the distribution of traits, including artifact categories, in the project area.

Table 11.3. Feature Attributes by Settlement Cluster

Settlement Cluster	Number of Excavated Structures	Occupation Sequence/Span	Mode of Abandonment	Plan Shape	Average Structure Size	Common Architectural Traits	Common Non-architectural Traits	Common Extramural Features	Burials
Eastern	16	Sequential/ short	• All structures salvaged • Animals incorporated into structure at the time of desertion • Few structures burned	Subrectangular	Medium $22m^2$	• Four-post • One-hole ventilator • Wing wall	• Coped hearth	• Enclosure • Midden • Surface structure	• Common • Double interments • Extramural • Rich females
North-central	15	Sequential/ long	• Complex floor assemblages • Earlier structures salvaged • Later structures burned	Subrectangular Variable	Large $27m^2$	• Bench • One-hole ventilator • Six-post • Wing wall	• Storage pit	• Thermal pits	• Evidence of violence • Highly variable frequencies and contexts • Most found in cemetery at 5LP185
Western	13	Sequential/ short?	• Most dismantled and salvaged	Variable	Medium $22m^2$	• Bench • Four-post • One-hole ventilator • Wing wall	• Coped hearth	• Surface and pit rooms	• Associated with architecture • Rich male
Sacred Ridge	22	Sequential/ long	• Capped features • Earlier structures salvaged • Later structures burned • Processed human remains	Variable	Large $27m^2$	• Bench • Four-post • One-hole ventilator • Stringers • Wing wall	• Conical pit • Sipapu	• Enclosure • Midden • Ridgetop complex	• Variable contexts • Processing of human remains • Evidence of violence • Rich male
Blue Mesa	10	Sequential/ medium	• Earlier structures salvaged • Later structures burned • Remodeled, capped features	Variable	Medium $23m^2$	• Bench • Four-post • Two-hole ventilator • Wing wall	• Coped hearth • Sipapu	• Midden • Surface rooms	

Chapter 12: Settlement Cluster Variation

James M. Potter

This chapter further addresses variation among Pueblo I settlement clusters in Ridges Basin by exploring spatial patterning in architectural and extramural features, pit structure closure attributes, artifact frequencies, and faunal and botanical remains. The goal is to add a spatial dimension to the patterns identified in Chapter 10, The House and Household; to add statistical heft to the patterns identified and described in Chapter 11, Settlement Clusters; and to address the questions posed in the research design regarding settlement clusters (see Chapter 7, Pueblo I Research Questions). The settlement cluster designations identified in Chapter 11 are used here with one exception: When appropriate for a particular analysis in this chapter, 5LP185 is treated separately, rather than as part of the North-central Cluster, due to its function as a special-use site (i.e., a cemetery) and its large and distinct artifact assemblage.

SPATIAL PATTERNING AMONG CLUSTERS, SITES, AND FEATURES

Pit Structure Features

Statistical analyses of pit structure features by settlement cluster (Table 12.1) corroborate the patterns identified in the last chapter (see Table 11.3). For the Eastern Cluster, the strongest positive correlation is the presence of coped hearths. This attribute is highly variable among all the clusters and has a significantly high or low correlation for three of five clusters. Coped hearths exhibit a significant negative correlation with the North-central Cluster and Sacred Ridge and a statistically significant positive correlation with Blue Mesa. Two-hole ventilators are significantly correlated with various clusters, as well. Blue Mesa has a high positive correlation with two-hole ventilators, whereas Sacred Ridge has a high negative correlation with this attribute. Sacred Ridge is positively associated with mealing bins and conical pits.

Figure 12.1 plots the factor scores derived from the correlation matrix and displays many of the observations presented above. (Note: This graph is the same as Figure 10.5 but with the addition of settlement clusters. See Chapter 10 for a discussion of principal components analysis [PCA] of the correlation matrix.) Most notable in this graph is the statistical separation of Blue Mesa, which is highly correlated with two-hole ventilators, coped hearths, and deflectors, and Sacred Ridge, which is correlated with conical pits and, to a lesser degree, mealing bins, one-hole ventilators, and large structures.

Pit Structure Closure Variables

The abandonments of pit structures at Sacred Ridge are positively correlated with four closure variables: post-abandonment (PA) burning, human floor burial, human fill burial, and capped floor features (Table 12.2). As suggested in Chapter 10, the association of post-abandonment burning with capped floor features and a lack of floor-associated artifact assemblages suggest the careful and planned vacancy of pit structures. This appears to have occurred most often at Sacred Ridge. Capped floor features were also common on Blue Mesa.

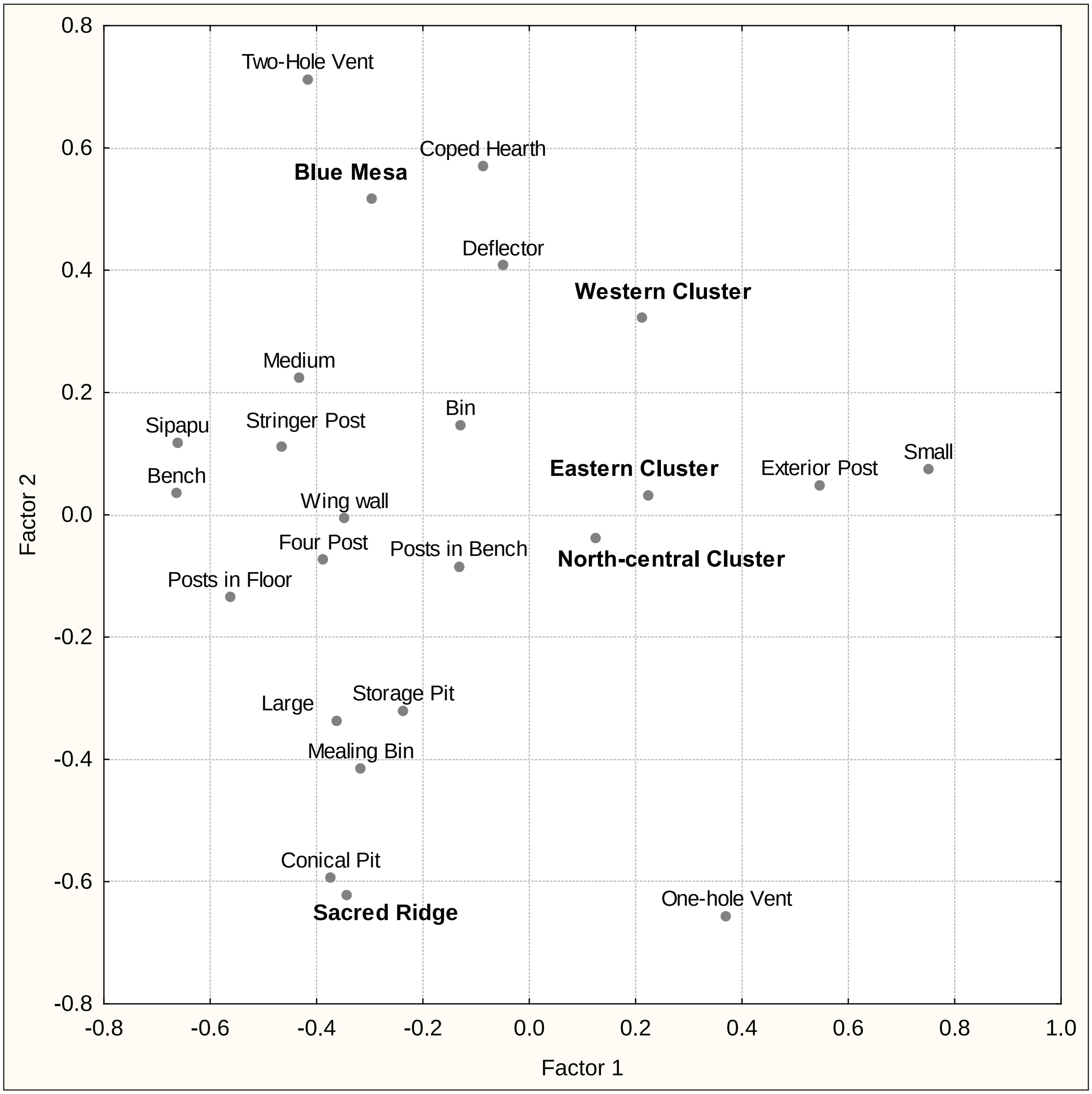

Figure 12.1. Scatterplot of scores on the first two principal components derived from the correlation matrix for pit structure features by settlement cluster.

Animal burials, both in the fill and on the floor, are positively correlated for the pit structures in the Eastern Cluster, though not in a statistically significant manner. Floor assemblages are highly associated with the North-central Cluster. And Western Cluster pit structures were burned after they were salvaged (Table 12.2).

Artifact Assemblages

Patterning in artifact assemblages (documented in Chapter 10) suggests two distinct sets of activities associated with Pueblo I households—one dominated by the cooking, serving, and processing of maize and the production and use of pottery, and one dominated by the production and use of stone tools, the hunting and

Table 12.1. Pit Structure Feature Correlations by Settlement Cluster Based on Presence/Absence

	Eastern Cluster	North-central Cluster	Sacred Ridge	Western Cluster	Blue Mesa
Small structure	0.07	0.01	-0.19	0.17	-0.08
Medium structure	-0.11	-0.07	0.02	-0.00	0.24
Large structure	0.03	0.06	0.20	-0.19	-0.17
Bench	-0.23	0.19	0.05	-0.12	0.18
Four-post	0.08	-0.23	0.11	-0.06	0.12
Posts in bench	-0.05	0.27	0.06	-0.20	-0.11
Posts in floor	-0.06	-0.23	0.25	-0.06	0.12
Stringer post	**-0.29**	0.21	0.01	-0.06	0.20
Exterior post	-0.11	**0.32**	-0.27	0.16	-0.13
One-hole ventilator	0.08	0.05	0.13	-0.03	**-0.35**
Two-hole ventilator	-0.03	-0.01	**-0.30**	0.09	**0.40**
Wing wall	-0.12	-0.04	-0.06	0.21	0.01
Deflector	-0.13	-0.18	-0.04	0.17	0.26
Sipapu	-0.10	-0.05	0.26	-0.20	0.12
Coped hearth	0.16	**-0.29**	**-0.31**	0.26	**0.30**
Bin	-0.00	0.15	-0.17	0.12	-0.14
Storage pit	-0.02	-0.00	0.10	-0.02	-0.10
Mealing bin	-0.11	-0.10	**0.34**	-0.11	-0.06
Conical pit	-0.16	-0.15	**0.50**	-0.16	-0.09

Bolded correlations significant at $p < 0.05$; n = 49.

Table 12.2. Pit Structure Closure Attributes by Settlement Cluster Based on Presence/Absence

	Eastern Cluster	North-central Cluster	Sacred Ridge	Western Cluster	Blue Mesa
PA burning	-0.20	0.05	**0.25**	-0.12	-0.01
AS burning	0.02	-0.18	-0.13	**0.31**	-0.01
Artifact assemblage	-0.18	0.21	-0.04	0.02	-0.01
Animal floor burial	0.13	-0.01	0.09	-0.16	-0.09
Human floor burial	-0.22	0.01	**0.27**	-0.11	0.04
Animal fill burial	0.13	0.13	-0.11	-0.10	-0.06
Human fill burial	-0.11	0.01	**0.27**	-0.11	-0.13
Trash-filled	-0.21	0.03	0.10	0.03	0.06
Capped floor features	-0.24	-0.24	**0.34**	-0.13	**0.35**

Notes:
Bolded correlations significant at $p < 0.05$; n = 60.
PA burning = post-abandonment burning.
AS burning = after-salvage burning (main support beams absent).

processing of large game, and ritual (see Figures 10.11–10.13). When case labels are added to Figure 10.11—forming Figure 12.2 in this chapter—a spatial component to this pattern becomes clear. Note that the Sacred Ridge loci and most Western Cluster sites (5LP511, 5LP549, 5LP244, 5LP510, 5LP614, and 5LP246) are part of the cluster of points to the left of the 0.0 point along Dimension 1 of this particular analysis. This statistical cluster is associated with high frequencies of scrapers, pipes, artiodactyl bones, and projectile points (see Figure 10.12). The grouping to the right of the 0.0 point contains mostly Eastern Cluster sites (5LP239, 5LP241, 5LP243, 5LP174, 5LP179, 5LP177, and 5LP634), Site 5LP185, and Blue Mesa Cluster sites (5LP2026 and 5LP2091). These sites are strongly correlated with ceramic vessels, ground stone tools, polishing stones, and pecking stones (see Figure 10.11).

When a correspondence analysis on these data incorporates settlement cluster designations, it is clear that Sacred Ridge, in contradistinction to the Eastern Cluster, Blue Mesa, and 5LP185, is the settlement cluster most highly correlated with the set of activities involving stone tools, hunting, and ritual (Figure 12.3). The frequencies of turkey separate cases along Dimension 2 of the analysis. (See Chapter 10 for a discussion of the utility of correspondence analysis as an exploratory multivariate technique.)

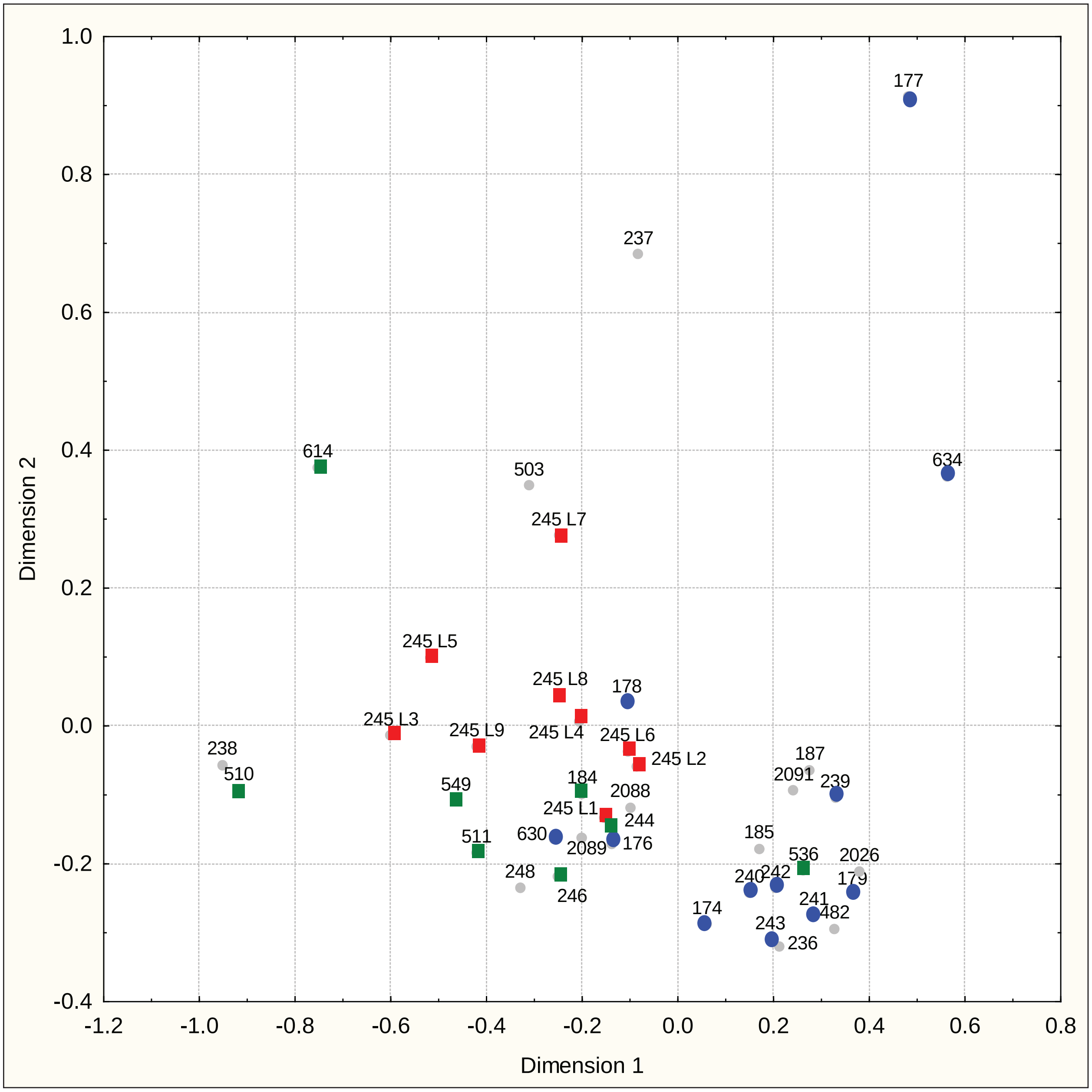

Figure 12.2. Scatterplot of the first two components of a correspondence analysis performed on artifact count data in Table 10.6. Case labels added. Each site number preceded by 5LP. Note: Blue= Eastern Cluster; Red = Sacred Ridge; Green = Western Cluster; Gray = North-central Cluster and Blue Mesa.

When turkey remains are excluded from the analysis, both because they represent a statistical outlier and because of inherent problems with them as a count variable (see Chapter 10), Sacred Ridge still correlates highly with artiodactyls, scrapers, awls, projectile points, and pipes along Dimension 1 of the analysis (Figure 12.4). The Western and North-central clusters group around cores/hammerstones and axes, and the Eastern Cluster, Blue Mesa, and 5LP185 key on the ceramic categories—jars, bowls, and seed jars. Especially intriguing in this graph is the U shape the cases make, the general east–west trend of this U shape, and the strong pattern of the easternmost settlement clusters and site grouping (Eastern Cluster, Blue Mesa, and 5LP185) in opposition to Sacred Ridge, located at the western end of Ridges Basin.

Extramural Features

Site 5LP185 exhibits the strongest positive correlations with the most types of extramural features (Table 12.3). This multifunction site contained high numbers of non-thermal pits and pit rooms without hearths (both presumably as part of its habitation function before it was a cemetery), as well as inhumations. This site was one of the earliest habitation sites in the basin (see Chapter 8, Pueblo I Chronology and Population), and pit rooms without hearths and extramural pits may have been early types of storage facilities in the area. Pit structures associated with the early component of this site also contained a high frequency of in-floor storage pits (see Chapter 11).

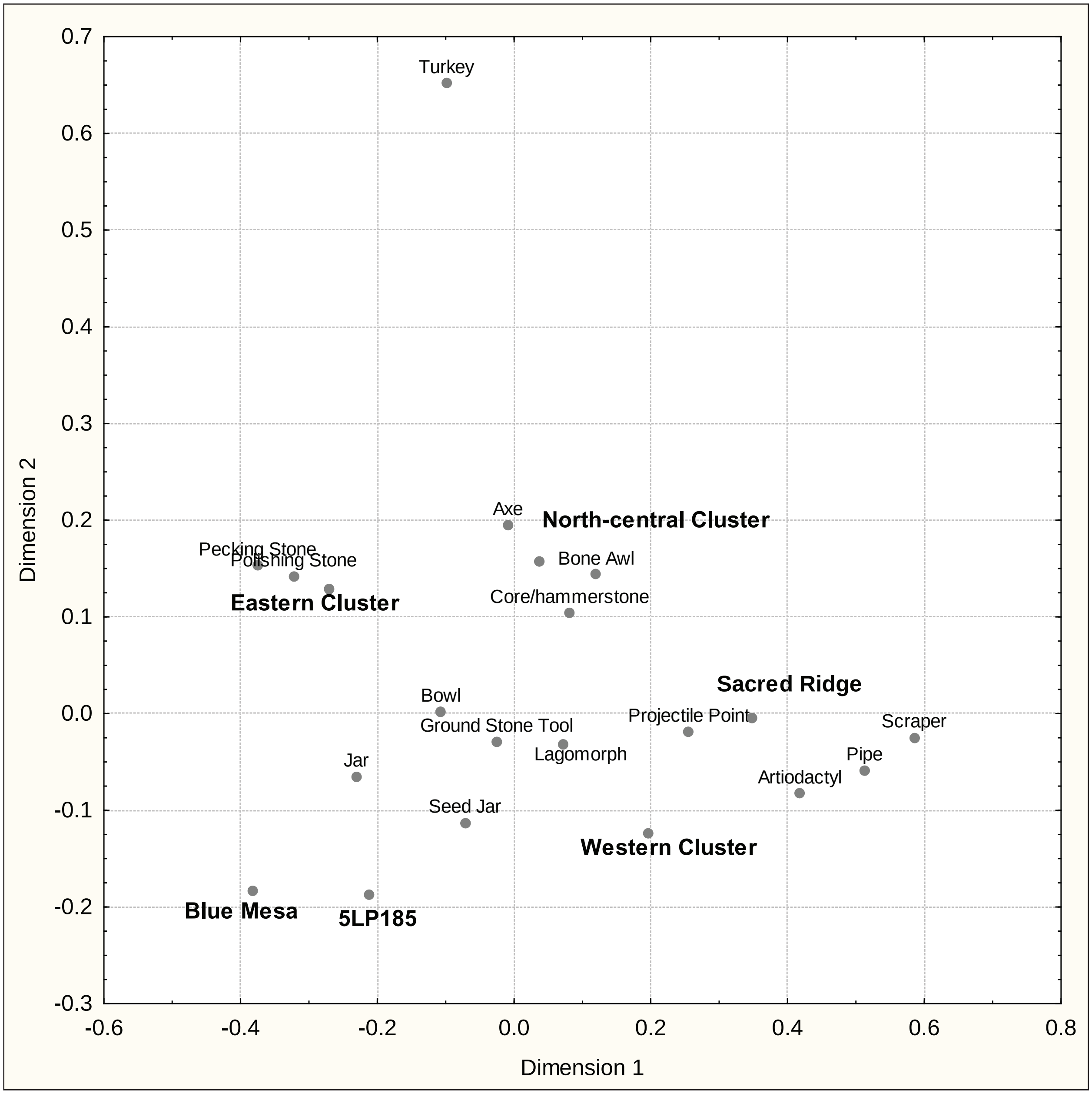

Figure 12.3. Scatterplot of the first two dimensions of a correspondence analysis performed on artifact count data in Table 10.6 grouped by settlement cluster.

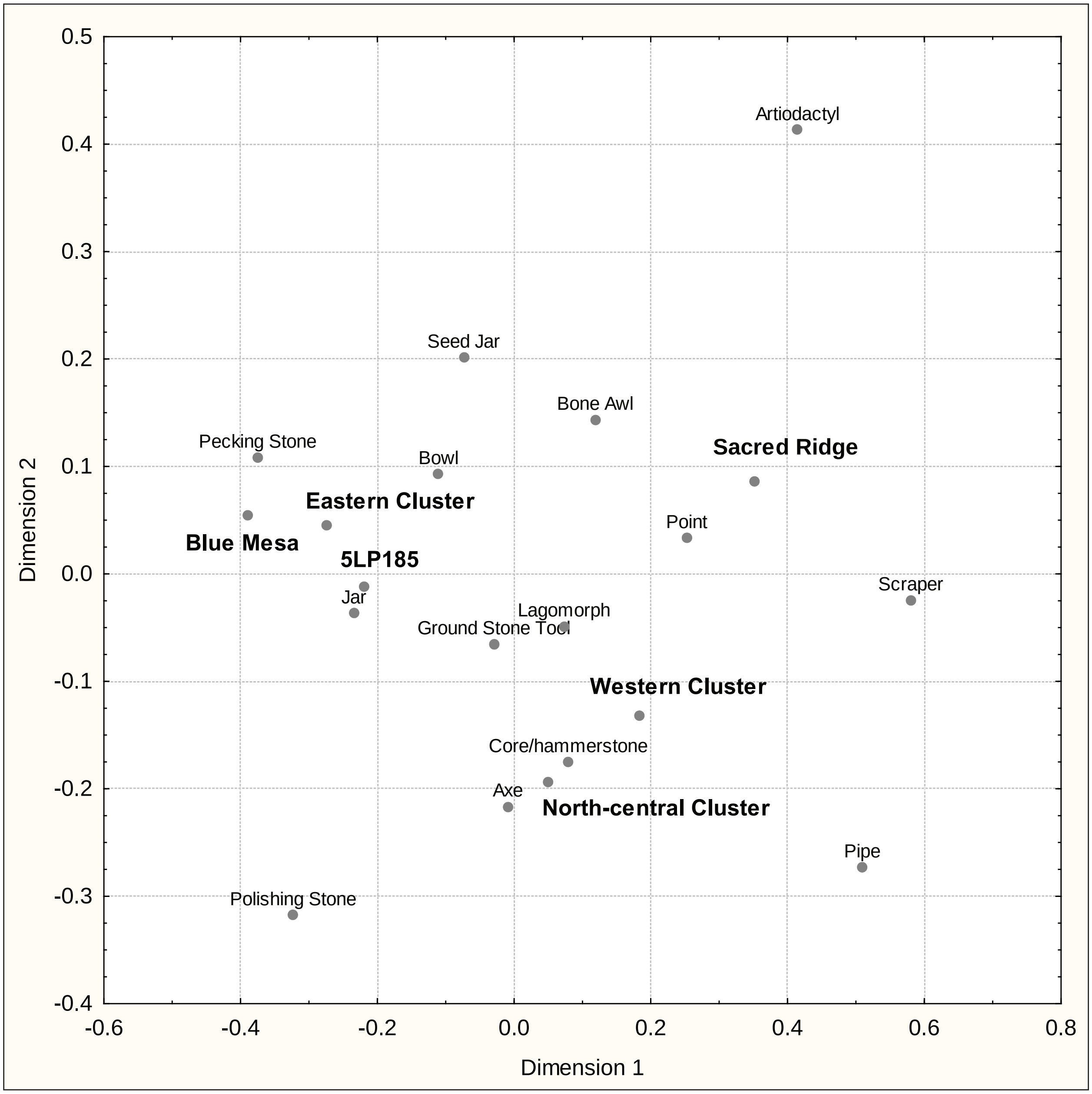

Figure 12.4. Scatterplot of the first two dimensions of a correspondence analysis performed on artifact count data in Table 10.6 grouped by settlement cluster. The variable *turkey* is excluded.

The North-central Cluster correlates with extramural hearths, and the Western Cluster correlates strongly with surface rooms without hearths. Blue Mesa, Sacred Ridge, and the Eastern Cluster exhibit no statistically significant associations with extramural feature types, but the Eastern Cluster does have a fairly strong positive correlation with enclosures, and Sacred Ridge has a strong negative correlation with extramural hearths. This negative correlation is consistent with the general lack of extramural features associated with Sacred Ridge and the interpretation that most activities at the site occurred within the context of pit structures.

Table 12.3. Extramural Features by Settlement Cluster Based on Counts

	Eastern Cluster	Northern Cluster	5LP185	Sacred Ridge	Western Cluster	Blue Mesa
Enclosure	0.26	-0.04	-0.13	0.08	-0.27	-0.03
Thermal pit/hearth	0.00	**0.33**	0.20	-0.19	-0.06	-0.16
Non-thermal pit	-0.28	-0.05	**0.72**	-0.07	0.26	-0.16
Surface room w/o hearth	-0.09	-0.19	-0.12	-0.07	**0.43**	-0.07
Surface room w/ hearth	-0.18	-0.01	-0.09	-0.01	0.19	0.09
Pit room w/o hearth	-0.04	-0.18	**0.65**	-0.10	0.17	-0.15
Pit room w/ hearth	0.12	-0.11	-0.04	-0.14	0.18	-0.09
Midden	0.06	0.12	-0.17	-0.09	0.05	-0.07
Inhumation	-0.02	-0.07	**0.58**	0.09	-0.08	-0.21

Notes: Bolded correlations significant at $p < 0.05$; n = 41.

Figure 12.5 shows these associations graphically, particularly the unique association of 5LP185 with inhumations, pit rooms without hearths, and non-thermal pits. It also show the strong association of several variables, including pit rooms without hearths and non-thermal pits (primarily because of their co-occurrence at 5LP185), and the three other surface-structure types, which are all positively correlated with the Western Cluster (Figure 12.5; Table 12.3).

In summary, settlement clusters demonstrate statistically significant variation in their associated features and artifact assemblages. Sacred Ridge was the most distinct among the various clusters and was strongly associated with mealing bins, conical pits, post-abandonment burning, human floor burials, capped floor features, and artifact categories related to hunting, large game processing, and ritual. Blue Mesa sites had a high occurrence of coped hearths, two-hole ventilators, and capped floor features. Finally, 5LP185 was distinct in its strong correlation with inhumations and extramural storage facilities, including pit rooms and non-thermal pits.

SPATIAL PATTERNING AMONG ARTIFACT TYPES AND ENVIRONMENTAL DATA

The following presents the results of more detailed analyses of artifacts (ceramics, lithics, and faunal and botanical remains) associated with the various settlement clusters and of environmental variation evidenced by catchment analyses and studies of the agricultural potential of soils associated with each of the clusters.

Ceramics

Because very few and very general categories of ceramics were used in the analyses above, this section reports the distribution of wares and types, clay sources, and design distinctions among the settlement clusters. A more detailed presentation of these data is presented the ALP project volume, *Ceramic Studies* (Allison 2010).

Ware and Type Distributions

Although redware items are relatively rare in the ALP project assemblage (making up less than 1%), some sites contained significantly more of these wares than did other sites in the project area (Potter 2010a). In particular, 5LP185, which contained not only several habitations but also a cemetery, exhibited comparatively high quantities of redware vessels. Most of the redware appears to have come from the relatively late use of the site as a cemetery after the habitation structures there were abandoned. This site also yielded a high proportion of whiteware vessels, and these also were primarily burial items associated with the cemetery (Figure 12.6). Most whiteware vessels were bowls (r^2 = 0.96), both decorated and undecorated.

Figure 12.5. Scatterplot of the first two dimensions of a correspondence analysis performed on extramural feature count data in Table 10.7 grouped by settlement cluster.

Whiteware bowls were also relatively abundant at Sacred Ridge, particularly at loci with oversized pit structures, such as Feature 49 in Locus 6 (Figure 12.6)[1]. Allison (2008:59) suggests that the high bowl frequencies at Sacred Ridge loci with oversized pit structures are due to communal "pot-luck" style feasting occurring in association with these structures.

By contrast, Locus 1 on top of the knoll at Sacred Ridge did not contain a high percentage of bowls nor whiteware. As Allison (2008:60) notes, access to Locus 1 appears to have been restricted, and there are no obvious public facilities there in which to conduct large communal feasts. The low whiteware bowl percentages were therefore not unexpected in Locus 1 if these vessels were consistently used during communal feasts.

[1] To show significant variations among site ceramic assemblages, 90-percent confidence intervals are plotted as dashed lines on percent plots (Potter 2010a:48). The confidence bands are based on binomial estimates on expected values derived from total assemblage proportions (Allison 2008a; Kintigh 1994). Accordingly, the smaller the sample size, the wider the interval. Cases plotted outside this interval are statistically significant at the 0.10 significance level.

Locus 1 did contain a relatively high proportion of redware, however, as did Locus 6. (Overall, Sacred Ridge did not contain a high proportion of redware). Locus 1 occupied the crest of Sacred Ridge and contained unique architectural elements, including a wood-and-adobe tower, an enclosed plaza, and a large communal storage feature (see Chapter 11). Yet it also contained several domestic structures and undoubtedly housed several households, some or all of which apparently were successful at acquiring non-local redware pottery. Locus 6 contained a large communal pit structure, the largest structure in the project area, in fact (Chuipka 2009). It is possible that the redware associated with this structure was related to communal feasting, as Blinman argues it was at McPhee Village (1989). Additionally, Potter (2010a) notes that Sacred Ridge exhibited a high frequency of narrow-neck jars for the storage and serving of liquids, perhaps also related to feasting.

Blue Mesa had more-than-expected bird-shaped vessels and a relatively high proportion of redware, but not as much 5LP185; whiteware vessels and bowls were rare at Blue Mesa compared to Ridges Basin sites, however. Finally, the Eastern Cluster contained large quantities of whiteware, and the Western Cluster contained higher-than-expected frequencies of both wide- and narrow-neck jars (Potter 2010a).

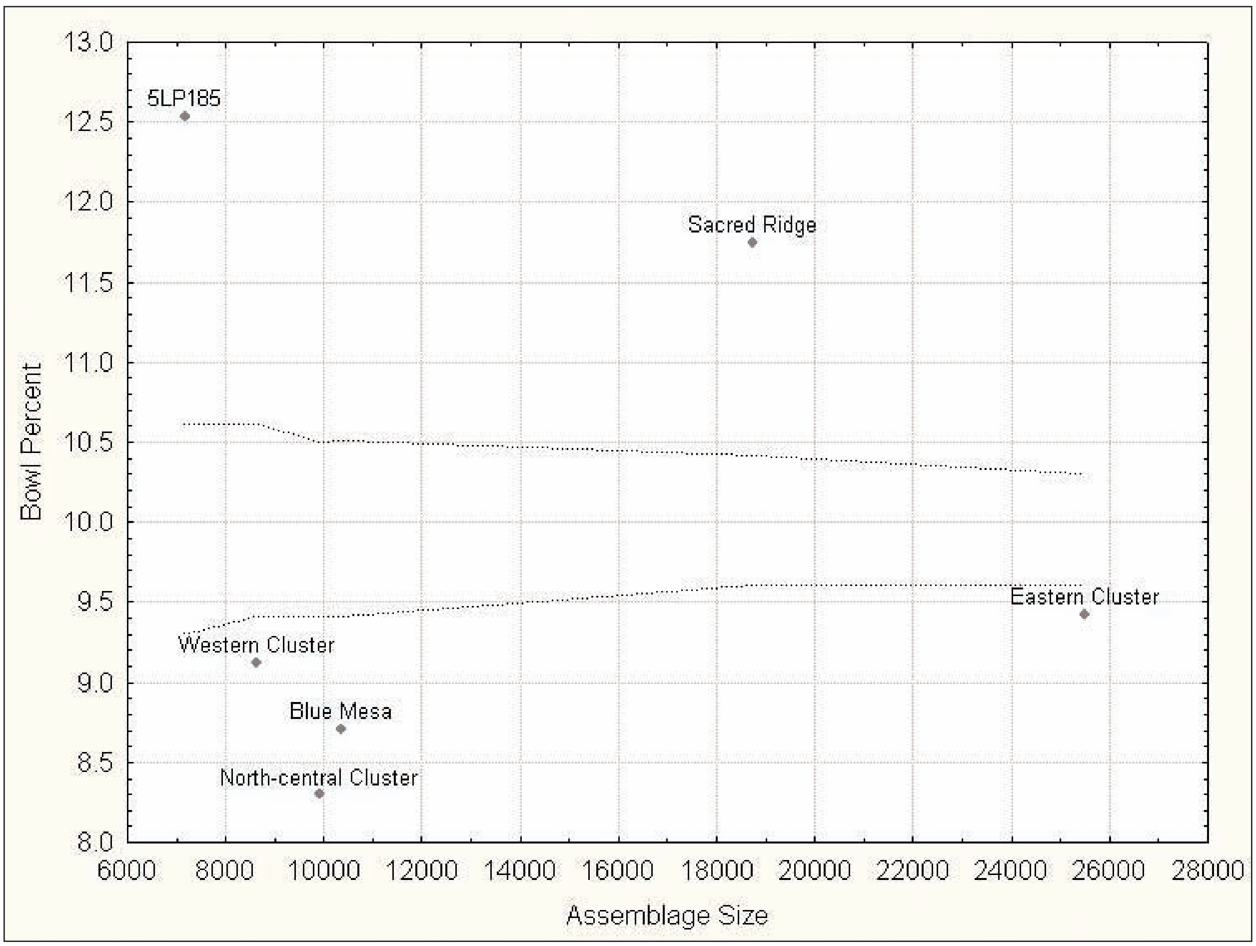

Figure 12.6. Plot of bowl percentages versus sample size for early Pueblo I habitation site clusters in the ALP project area. The dashed lines mark the upper and lower boundaries of a 90 percent confidence band for percentages based on the total ALP project Pueblo I assemblage. Labeled cases above the upper band are considered statistically significant. Site numbers preceded by 5LP. (Potter 2009b:Figure 3.18)

Clay Sources

Neutron activation analysis on a number of redware sherds recovered from the project area indicates differences among the settlement clusters. Thus, not only were there differences in the amounts of redware among the clusters (and by extension how much residents participated in redware exchange) but also in the sources of the redware (Allison 2010). "Most notably, residents of the Eastern Cluster and Blue Mesa obtained relatively large amounts of redware produced in the Montezuma Canyon area, while redware obtained by Sacred Ridge residents more often belonged to the compositional group that possibly indicates production near Cortez" (Allison 2010:212).

Additionally, re-fired color data for both grayware and whiteware suggest that although households within the same settlement clusters generally did not tend to use ceramics made with the same clays, Sacred Ridge was an exception.

> Of the seven loci from Sacred Ridge included in the analysis, six have similar proportions of white ware sherds belonging to different oxidized color groups. This indicates that they either maintained similar exchange relationships or obtained clay from similar sources if they made their own pottery, or both. Sacred Ridge Locus 2, with its unusual architecture on the ridgetop, looks different, however. Its residents apparently did not participate in whatever process led to the ceramic similarity among the other Sacred Ridge loci. Instead, its ceramic assemblage, as measured by the refired colors of white and gray ware sherds, is distinct from the other Sacred Ridge loci, as well as from other proveniences in the project area. (Allison 2010:213)

Design

Allison (2010) notes a similar pattern in the design element analyses for the project. Whiteware design element distributions were similar among most of the Sacred Ridge proveniences with the exception of the ridgetop loci. Similarly, the design structure analysis hints that Eastern Cluster residents made or acquired vessels with certain specific designs (bisected layouts and center-rim design units) more often than did residents of the other settlement clusters (Allison 2010:213).

Lithics

This section briefly describes distributions of flaked stone tools and ground stone tools among Pueblo I settlement clusters in the ALP project area. A more detailed presentation of the data is presented in ALP project volume *Lithic Studies* (Railey and Wesson 2009).

Flaked Stone Tools

As suggested by Figures 12.3 and 12.4, flaked stone tool assemblages exhibited substantial variation among settlement clusters. One of the strongest patterns was in the frequencies of general tool types (Figure 12.7[2]). Blue Mesa and the Eastern Cluster, for example, had high frequencies of angular debris/shatter, and relatively few tools, fewer projectile points, and—at Blue Mesa—fewer cores than expected, given the overall proportions of these items in the total assemblage (Railey 2009d). By contrast, Sacred Ridge and the Western Cluster exhibited high frequencies of projectile points, tools such as scrapers, and cores. Railey (2009d:95) notes that processing and production activities involving tools were much more common relative to other tasks at Sacred Ridge and the Western Cluster sites than at the other site groups. The high frequency of projectile points at Sacred Ridge further suggests that hunting was particularly important to Sacred Ridge occupants.

[2] Examination of the adjusted chi-square residuals is useful for understanding which specific variables are responsible for causing a chi-square to return a significant result. For each cell in a chi-square table, the adjusted chi-square residual provides a value ranging from $-\infty$ to $+\infty$. Values above + 2 or below – 2 indicate significant deviations from the expected value and can be read roughly as standard deviation units.

The flaked stone tool assemblage from Sacred Ridge also differed from those of other settlement clusters in that it has far fewer cores/hammerstones and unhafted choppers/axes and more scrapers, drills, perforators/engravers, and used flakes. The Sacred Ridge assemblage also looks very different from the Eastern Cluster and Blue Mesa assemblages in terms of flaked stone raw material frequencies (Railey 2009d). Although this pattern may to a certain degree reflect spatial proximity to particular raw material sources, this variable certainly did not factor into access to non-local materials such as obsidian, which occurred in higher-than-expected frequencies at Sacred Ridge and the sites of the Western and North-central clusters, suggesting some measure of differential access to this non-local material.

Analyses of flaked stone patterns among loci at Sacred Ridge showed high frequencies of cores/hammerstones and flakes on the ridgetop, suggesting that flintknapping was, in comparison with other tasks, a focal activity there. Heavy-duty tasks involving unhafted choppers/axes and more detailed work involving drills and perforators/engravers were also important production and processing activities at the Locus 2 household. More mundane tasks involving expediently used flakes were much less common at the ridgetop households than at those downslope.

Ground Stone Tools

Blue Mesa sites had the highest mean percentage of ground stone in their total lithic assemblages (flaked stone + ground stone items) at 10.8 percent. The Eastern Cluster had the second-highest mean percentage at 8.0 percent, and Sacred Ridge exhibited the lowest mean percentage at a mere 5.8 percent (Wesson 2009) (Figure 12.8). The high mean percentage at Blue Mesa suggests that floral resources were more important in the subsistence strategy employed by the people occupying this area than at the other two clusters.

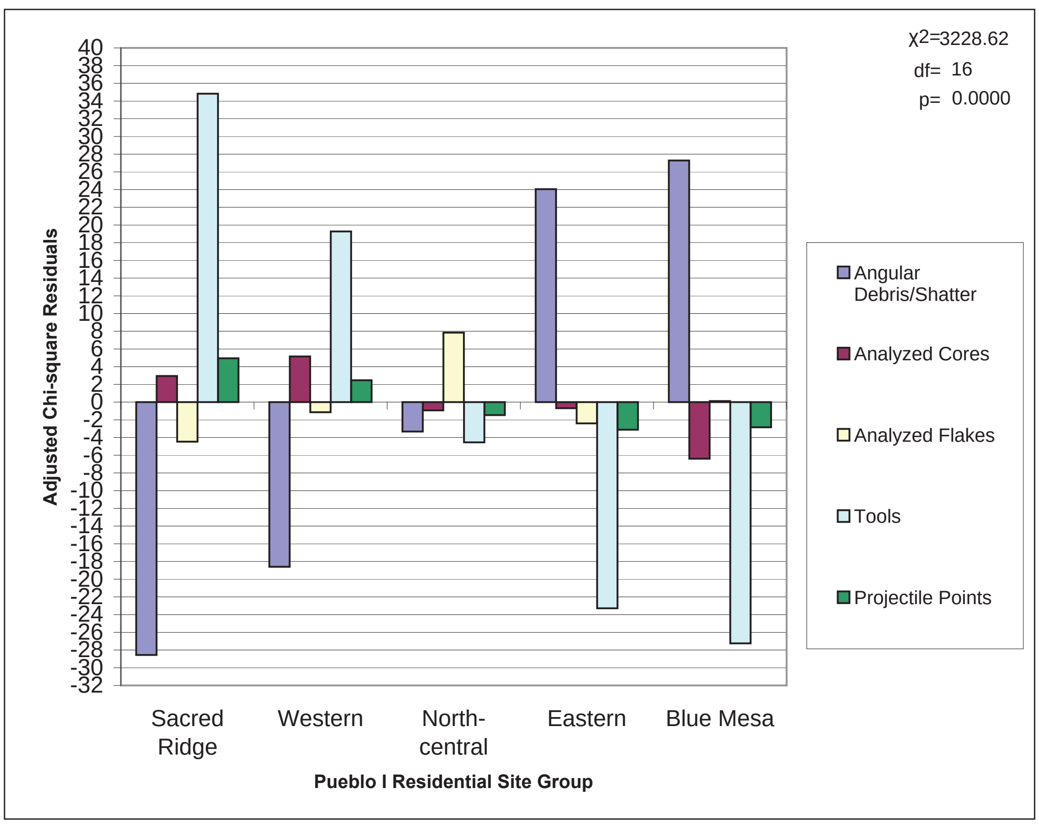

Figure 12.7. Adjusted chi-square residuals for general artifact categories, Pueblo I settlement clusters (Railey 2009d:Figure 5.21).

Although Sacred Ridge exhibited the lowest ratio of ground stone tools in its overall lithic assemblage, metates made up 30.5 percent of the Sacred Ridge ground stone tool assemblage. By contrast, the percentages at Blue Mesa and the Eastern Cluster were 13.6 percent and 18.3 percent, respectively. Wesson (2009:223) suggests that

> raw material availability may have been a factor, but it appears that the milling of corn in trough metates was more important at Sacred Ridge than at Blue Mesa or the Eastern Cluster. Another possibility is that Sacred Ridge may have served as a central milling location to which people from nearby sites would travel to process corn.

Wesson (2009:224) goes on the note that the higher percentages of ground stone tools at the Blue Mesa sites is largely due to a very high occurrence of both one-hand and two-hand manos, and he suggests that this may have been due to greater raw material availability at this location. Moreover, the milling of maize, as represented by two-hand manos and trough metates, was practiced at all clusters, but the high percentage of trough metates (and metates overall) at Sacred Ridge suggests that the relatively limited milling activity conducted there was focused on the processing of maize rather than gathered plants.

Faunal Remains

Faunal taxonomic frequencies varied significantly among the various settlement clusters (Potter and Edwards 2008) (Figure 12.9). The aggregate assemblage from the Eastern Cluster contained a high relative proportion of waterfowl, as might be expected given the cluster's proximity to the marsh (see Chapter 9, The Natural Environment). This group of sites also stands out in its high relative frequency of non-domestic carnivore, domestic dog, and turkey remains. In addition, the Eastern Cluster yielded the only occurrences of fish and reptiles in the ALP project assemblage. Osteichthyes and Reptilia bones compose 0.14 percent and 2.50 percent of the assemblage, respectively. (These species are not included in the analysis depicted in Figure 12.9.)

The assemblages from the Western Cluster, North-central Cluster, and Blue Mesa contain high relative frequencies of lagomorphs (Figure 12.9). The North-central Cluster of sites yielded a high proportion of lagomorphs, particularly jackrabbits; the lagomorph index value for the North-central Cluster is the lowest of all the cluster assemblages, indicating a high proportion of jackrabbits to cottontails (Figure

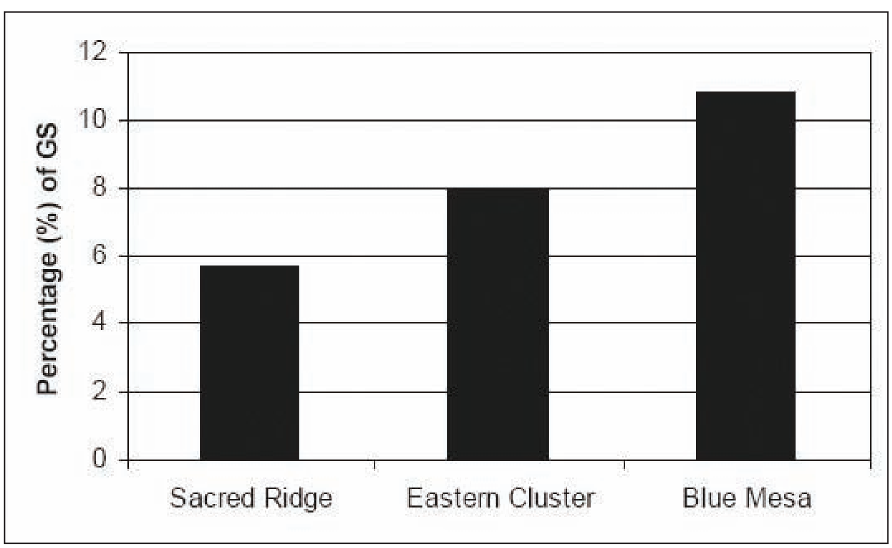

Figure 12.8. Mean percentages of ground stone tools in combined site cluster lithic assemblages (Wesson 2009:Figure 9.19).

12.10). Blue Mesa sites also yielded a high proportion of lagomorphs, but this cluster, in contrast to the North-central Cluster, yielded the highest lagomorph index value, indicating a high relative proportion of cottontails to jackrabbits.

The faunal assemblage from Sacred Ridge, the largest site in the project area, contains a high proportion of ungulates, dogs, birds of prey, and game birds, primarily grouse and/or prairie chicken. The artiodactyl index value for Sacred Ridge is significantly higher than that of any other cluster of Pueblo I habitations. These distributions are interesting because they may not be related strictly to environmental factors. Greater relative frequencies of ungulates (i.e., artiodactyls) at the large site, for example, may relate to differential access to highly valued resources within the community or to the occurrence of ritual or feasting events that involved the consumption of large game at the large site. Likewise, higher proportions of birds of prey, such as hawks, falcons, and eagles, may relate to more frequent uses of these animals or their feathers for rituals and ceremonies at Sacred Ridge than would have been the case at other sites in the project area.

In sum, taxonomic variation in faunal assemblages among most Pueblo I habitation clusters appears to complement environmental variation across the project area. Sites closest to the marshy bottom of Ridges Basin contained waterfowl and fish remains. Sites in open grassy areas of the basin contained numerous jackrabbit remains, as would be expected, and sites in prime agricultural areas contained numerous cottontail remains, also as expected. Possible exceptions to this general trend are the high relative frequencies of ungulates at Sacred Ridge, and high relative frequencies of wild carnivores, domestic dogs, and turkeys at Eastern Basin sites found primarily in contexts related to pit structure closure and human burials.

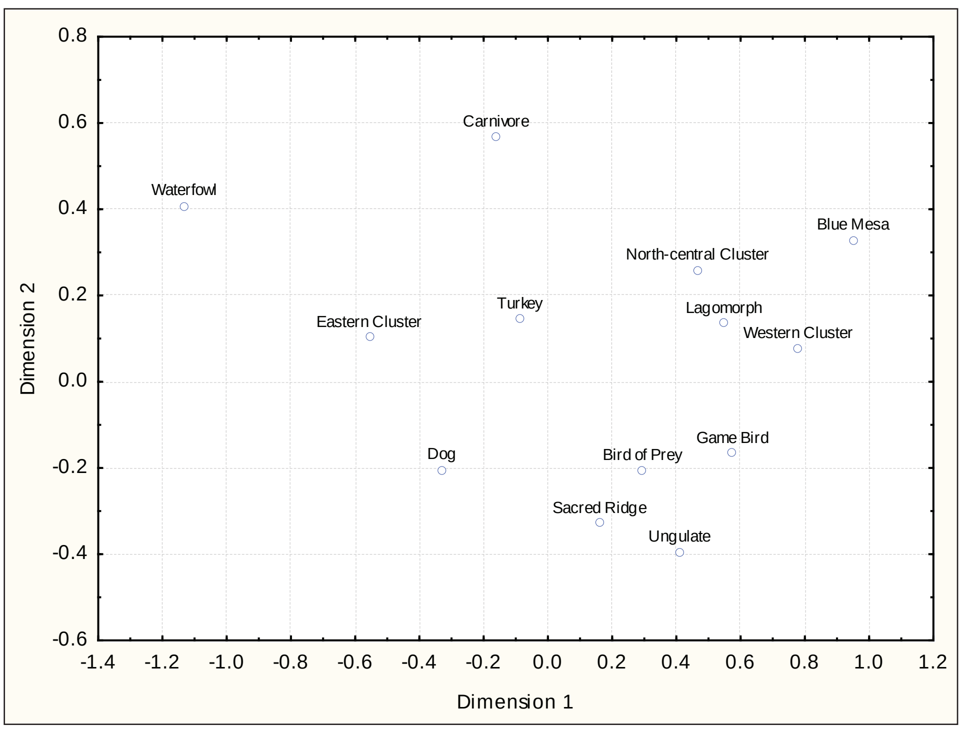

Figure 12.9. Scatterplot of the first two dimensions of a correspondence analysis performed on counts of animal group by cluster (Potter and Edwards 2008:Figure 12.3).

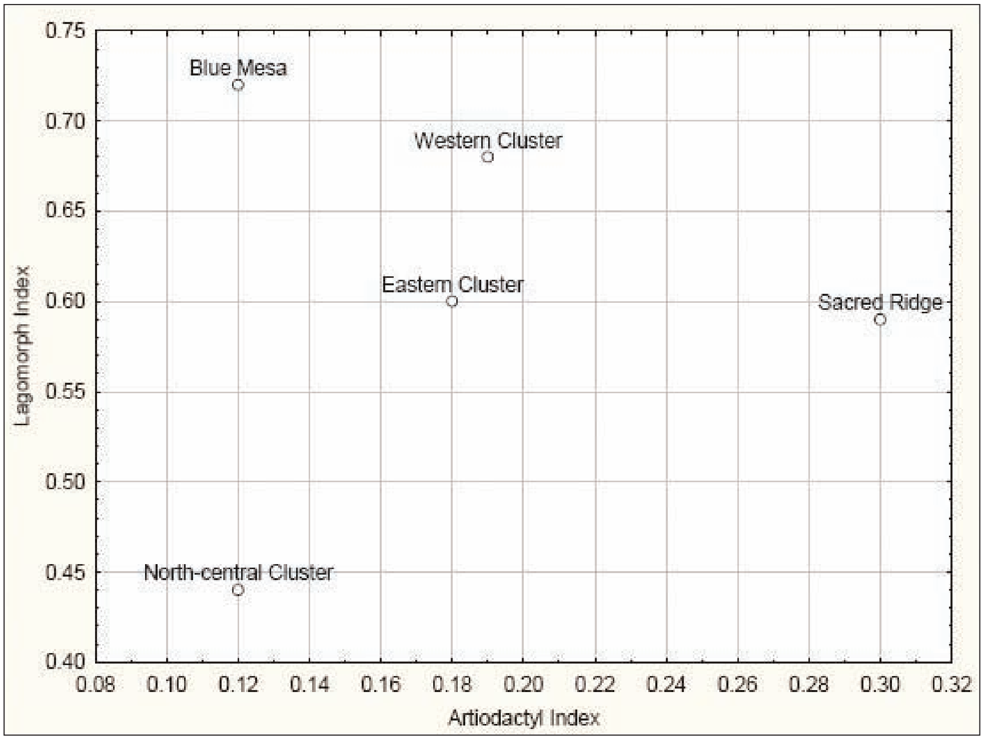

Figure 12.10. Scatterplot of lagomorph and artiodactyl indices for Pueblo I habitation clusters (Potter and Edwards 2008:Figure 12.4).

Botanical Remains

Botanical remains from flotation and pollen samples are very similar among settlement clusters. Each cluster exhibited evidence of a heavy reliance on both wild plants and maize. Reliance on maize seems to have varied slightly, however. Ubiquity values for maize kernels (i.e., the percentage of flotation samples from which maize kernel remains were recovered) ranged from 30 percent to 39 percent (see Figure 12.8). From lowest to highest were Sacred Ridge (30%), the North-central Cluster (31%), the Western Cluster (33%), the Eastern Cluster (36%) and Blue Mesa (39%). Blue Mesa stood out also in its high ubiquity for cupule and cob fragments (85%) and maize pollen (87%) (Figure 12.11).

In addition, some settlement clusters exhibited evidence of unusual plant remains. The Eastern Cluster had abundant cattail remains, presumably harvested from the nearby marsh (see Chapter 9). Cattails produce high quantities of harvestable yellow pollen that could have been used in blessings, as a paint source, or as a source of protein (Adams and Murray 2008:202). The Eastern Cluster, the Western Cluster, and Sacred Ridge each had evidence of tobacco in the form of charred seeds. This plant was probably used in ceremonial contexts. Pipes were also relatively abundant at Sacred Ridge and in the Western Cluster (see Figures 12.3 and 12.4). The North-central Cluster and Sacred Ridge had evidence of domesticated beans. Evidence of squash or gourds was found at Blue Mesa, the North-central Cluster, the Eastern Cluster, and Sacred Ridge (Adams and Murray 2008).

Catchment Analysis

A catchment analysis provided a quantitative evaluation of wild plant food potential surrounding three Pueblo I settlement clusters—Sacred Ridge, the Eastern Cluster, and Blue Mesa (Adams and Reeder 2009). The results suggest that the Sacred Ridge site was better situated for wild plant resource procurement in Ridges Basin than was the Eastern Cluster. Sacred Ridge was likely surrounded by relatively larger proportions of plant communities with high subsistence values for both the 1-km-radius and 2-km-radius catchments. For the 7-km-radius catchment, both of these Pueblo I settlement clusters shared 74 percent of overlapping plant communities, resulting in no wild plant food potential advantage for one cluster over the other. Interestingly, both Sacred Ridge and the Eastern Cluster were better situated than the Blue Mesa sites with respect to wild plant productivity.

Agricultural Potential

Soil fertility studies conducted in the ALP project area indicate variable soil quality for crop production throughout Ridges Basin (Anderson 2008b). Soils at the base of Basin Mountain, in the southern part of the basin, contained had relatively high values for nitrogen and phosphorous. This area had a slight northern exposure, however, and no habitation sites were located in this area.

The worst area in the basin to grow crops was the eastern part of the basin, particularly in the Eastern Cluster. Despite good nitrogen levels, soils in this area had high clay content and very low levels of phosphorous and were limited as well by high salinity (Anderson 2008b:80).

> During drought years, the effects of desiccation would have increased salinity in these soils, making the drought years worse for crop production. Pueblo I inhabitants growing crops on the Carbon Mountain fans (the Eastern Cluster) would have experienced particularly harsh conditions and crop failures during drought years, due to the high clay contents holding water and breaking plant roots, and due to the increasing salinities during drought episodes.

Anderson (2008b) notes that experimental farm plots established as part of the ALP project demonstrate that soils in the various settings of Ridges Basin were of sufficient quality to grow maize, beans, and squash for at least two years (see Chapter 9). However, with the relatively low values of phosphorous and nitrogen in some of the settings, these soils would have become rapidly depleted. Fallowing of certain fields probably would have been necessary.

SUMMARY: ADDRESSING THE RESEARCH DESIGN

One of the goals of this chapter is to further characterize the Pueblo I residential site clusters in the project area and address the questions posed in the research design regarding these settlements (see Chapter 7). This final section restates those questions and offers brief responses, summarizing the patterns described above.

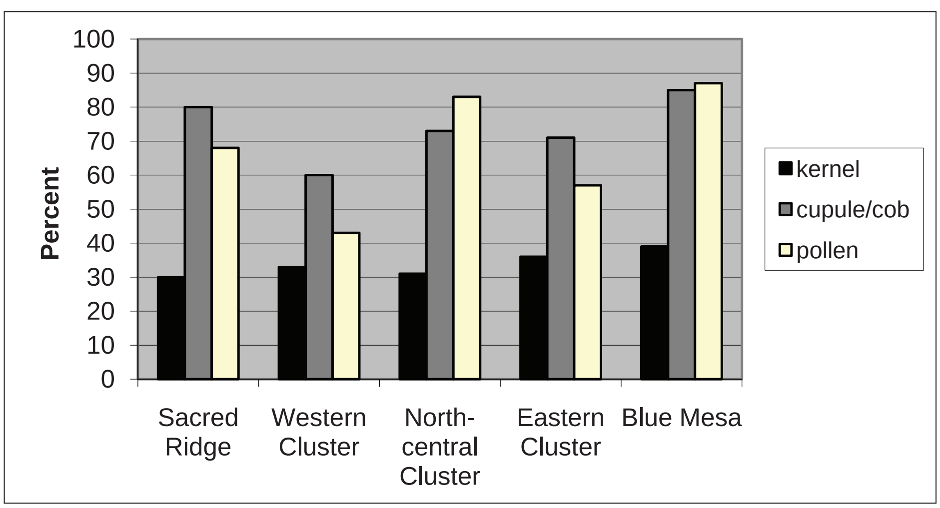

Figure 12.11. Bar chart of percentage of samples from which maize kernel remains, cupule and cob fragments, and maize pollen were recovered, by settlement cluster.

Do these clusters represent villages?

In much of the archaeological world, the term village refers to relatively permanent, multifamily residential clusters of variable size and density (Bandy and Fox 2010). In this sense, each of the settlement clusters in the ALP project area might represent one or more villages. However in the American Southwest, village formation has generally meant more specifically the appearance of settlements of a size greater than a specific threshold. Wilshusen (1991:204), for instance, has defined a village as having a minimum of 15 households, or 75 inhabitants. Smaller settlements are referred to as hamlets. Bandy and Fox (2010) note that this usage is broadly consistent with the terminology used among New World archaeologists (e.g., Sanders et al. 1979). By these definitions, each of the large clusters recorded by SWCA—Sacred Ridge, the Eastern Cluster, the North-central Cluster, the Western Cluster, and Blue Mesa—might qualify as a village.

Degree of aggregation in conjunction with size is another trait often applied to the definition of village (Kohler 1992; Lightfoot 1994:128–129; Wilshusen 1991; Wilshusen and Potter 2010). If tight aggregation, or nucleation, is considered a criterion, as well as population size, then the North-central Cluster, the Western Cluster, and Blue Mesa probably would not qualify as villages. Sacred Ridge and perhaps the Eastern Cluster may be aggregated enough to be considered villages, however.

Recently, Potter and Yoder have argued that villages are "dominant locales" (Gregory 1989); that is, they are not only concentrations of population "but also the loci of the communal storage of surpluses, communal rituals, and special architectural features not found among more dispersed settlements" (Potter and Yoder 2008:22). In other words, villages are set apart from the settlement cluster both quantitatively (in terms of sheer size and numbers of households) and qualitatively (in terms of the kinds of facilities present). Given these criteria, the Sacred Ridge site would be the only settlement cluster in the project area that qualifies as a village, albeit a small one by most standards. If further excavations on Blue Mesa were to uncover substantial communal architecture, this cluster might qualify as a village. As it stands, it remains a large community of dispersed houses.

Is the placement of clusters on the landscape structured by environmental or catchment variables (e.g., arable land and water) or by social variables (such as proximity to other clusters or defensibility concerns)?

Studies indicate that there were advantages in the location of some but not all settlement clusters with respect to environmental variables. All of the clusters in Ridges Basin, with the exception of 5LP185, were situated above the cold-air pool (Bellorado 2007; see Chapter 4, Basketmaker II Sites). In addition, none were located on the south side of Ridges Basin at the base of Basin Mountain; that is, no habitations were on north-facing slopes.

The North-central Cluster extended along the base of Wildcat Ridge, paralleling the distribution of Basketmaker II sites (see Figure 4.7). As did the Basketmaker II people, occupants of these Pueblo I sites undoubtedly reaped the benefits of their position along these south-facing slopes close to the most productive agricultural soils in the basin (see Figure 4.13). As Figure 12.11 suggests, maize agriculture appears to have played a relatively substantial role in the diet of these people.

By contrast, the Eastern Cluster was situated in some of the poorest soils for growing crops. This fact does not appear to have precluded this group from growing and consuming amounts of maize comparable to other settlement clusters and more than the Western Cluster occupants, however (see Figure 12.11). The Eastern Cluster was positioned relatively close to the prehistoric marsh, and its occupants appear to have taken advantage of that location by collecting cattail pollen, fish, and water fowl.

According to the catchment analysis conducted for three clusters, Sacred Ridge stood out as one of the best places in the project area from which to collect wild plants. Frequencies of ungulate remains and projectile points also indicate that the occupants of this locale were more intensively involved in large game hunting. The location of this settlement in the west end of the basin—with good access to upland areas such as Basin Mountain and Wildcat Ridge—may have been a factor. The primary variable influencing the location of this settlement, however, may have had nothing to do with environment and was more likely the site's visible position on top of a large knoll overlooking the valley.

Botanical evidence and ground stone tool data indicate the occupants of Blue Mesa were the most intensive agriculturalists in the project area. Better soils than in Ridges Basin (Anderson 2008b; Potter and Chuipka 2007b) and the absence of a cold air drainage undoubtedly made Blue Mesa an attractive place for dry farmers. The high cottontail frequency among Blue Mesa sites suggests that garden hunting was the most frequent form of hunting undertaken by Blue Mesa households.

The Western Cluster actually consisted of two clusters of houses, one on the north side of Basin Creek and one on the south side next to Sacred Ridge (see Figures 11.3 and 11.4). (Additionally, one site [5LP536] was on Wildcat Ridge, well outside both of these clusters.) It is unclear what attracted the occupants of these sites to this part of the basin. Western Cluster occupants appear to have relied on (or had access to) cultivated maize to a lesser extent than occupants of other settlement clusters (see Figure 12.11), and faunal data do not indicate an inordinate amount of large game hunting having occurred in this cluster. Furthermore, this cluster was not part of the catchment analysis, so it is unclear what value wild plants had in this cluster as compared to Sacred Ridge, the Eastern Cluster, and Blue Mesa (Adams and Reeder 2009). Households to the south of Basin Creek may have been attracted to that area because of its proximity to Sacred Ridge. Chronological data indicate that these sites, especially 5LP244, and Sacred Ridge were some of the latest in the basin to have been occupied (see Chapter 8).

As stated in Chapter 7, Winter et al. (1986) identify a pattern in Ridges Basin in which upland Pueblo I habitation sites generally appeared to be smaller and less clustered than lowland sites. Ware (1986a) proposed that these patterns are the result of seasonality—lowland sites were used in the winter and upland sites were occupied during the spring, summer, and fall. However, data from two habitations located well above Ridges Basin along Wildcat Ridge—5LP536 in the Western Cluster and 5LP236 (the Hoodoo Ruin) in the North-central Cluster—do not support the contention of seasonal habitation. Pit structures at these sites were as large and substantial as any in the basin (see Figures 11.7 and 11.8), and both sites contained substantial middens and surface rooms. Artifact assemblages were also comparable with those associated with habitation sites in the basin, and botanical remains suggest these sites were occupied at a minimum from the spring to the fall (Adams and Murray 2008:202–207). Upland sites do, however, appear less clustered than some lowland sites (e.g., there is nothing on Wildcat Ridge approximating the clustering evident at the Sacred Ridge site or in the Eastern Cluster). This topic is addressed in the following section.

Are all clusters similarly organized, or is there an organizational hierarchy?

Obviously Sacred Ridge was unique among the settlement clusters in its organization. If there was an organizational hierarchy among the settlement clusters, Sacred Ridge would have been at the apex of that hierarchy. The organizational structure of the community and the role of Sacred Ridge in this structure are addressed in Chapter 13, The Community.

Organizational differences among the non–Sacred Ridge clusters are apparent. Lithic and ceramic data suggest, for instance, that the Eastern Cluster and Blue Mesa were more closely related to each other than to the other site groups and were most unlike Sacred Ridge. These are also the most highly aggregated clusters of households. These patterns suggest that people living at the Sacred Ridge site and possibly the Eastern Cluster and Blue Mesa sites shared relatively homogeneous social identities and were closer socially to other households in their own settlement clusters than to households across the rest of the project area.

By contrast, the dispersed nature of the Western and North-central clusters suggests that "the occupants of these sites may have included a social mélange of settlers within Ridges Basin who were not clearly related to either Sacred Ridge or the Eastern/Blue Mesa sites" (Railey 2009d:95). The relationship among clusters is further explored in Chapter 13 and in Chapter 14, The Economy.

Is economic and/or social interaction evident among the clusters? Is there evidence of interdependence?

Although there are notable material culture distinctions among at least some of the settlement clusters in the project area, some data—the distribution of locally produced ceramic vessels, for instance—suggest that interaction occurred among households of different clusters. Social interaction among clusters is inferred from the distribution of locally produced ceramic vessels, for instance. Allison (2010) reports that the distributions of the re-fired colors of grayware and whiteware vessels suggest that households within the same settlement clusters generally did not use ceramics made with the same clays; they may have acted independently in obtaining whiteware and grayware pottery or the raw materials for pottery making. Exchange among households would also tend to produce a pattern of heterogeneity within clusters and a lack of distinction among clusters.

In addition, ceramic data suggest that a certain level of communal feasting occurred at Sacred Ridge, particularly in the loci containing oversized pit structures. As noted above, Allison (2008:59) suggests that the high bowl frequencies at Sacred Ridge loci with oversized pit structures is due to communal pot-luck-style feasting occurring in association with these structures. If that was the case, participants of these events may have come from different settlement clusters within the community. But, as also noted by Allison, loci at Sacred Ridge had similar proportions of whiteware sherds belonging to different oxidized color groups. He suggests "this indicates that they either maintained similar exchange relationships or obtained clay from similar sources if they made their own pottery, or both" (Allison 2010:213). Another possibility is that each locus hosted communal feasts and that similarities in the proportions of various whiteware groups reflect similarities and consistency in participation in these events across the site.

Households in various settlement clusters appear to have emphasized certain tasks and the production of certain items or commodities. At Sacred Ridge, large game hunting and animal processing were conducted more frequently than in other clusters (see Figure 12.3). In the Eastern Cluster the association of high frequencies of various pottery types, polishing stones (see Figure 12.3), and the only two possible kilns found in the project area suggests that pottery production was emphasized. Blue Mesa appears to have been the cluster that produced or relied upon maize agriculture to the greatest extent (see Figures 12.8 and 12.11). This, of course, does not mean that Sacred Ridge occupants did not make pottery or grow maize, or that Eastern Cluster occupants did not hunt and grow maize. They obviously did. But it appears that various economic endeavors were emphasized in the different clusters, and this may have influenced and helped define exchange relations among the households of various clusters and encouraged a certain level of economic interdependence. However, there is little evidence of economic specialization among various households or clusters, and the interdependence of groups appears to have been far less than documented for later groups (e.g., Spielmann 1991).

Is there another level of organization above the cluster?

The Pueblo I settlement clusters identified in Ridges Basin composed a community. The following chapter attempts to characterize the structure and organization of this community and compare it with other early Pueblo I communities in the northern Southwest.

Chapter 13: The Community

James M. Potter

More than a half century ago, Murdock (1949) defined a community as the location of regular face-to-face social interaction. Adhering to this notion, archaeologists often use settlement propinquity to define the community. Indeed, settlement clustering is a key element of what Lipe (1992) terms first-order, face-to-face communities, first-order referring to local residential communities that are small enough for regular interaction among people who are physically co-present (Varien 1999:19–23). Co-presence and regular interaction, however, do not in themselves produce community (Varien and Potter 2008:3). Indeed, communities may not even be the naturally bounded and well-integrated social entities they have been assumed to be (e.g., Isbell's [2000] so-called "natural communities"). Recently, scholars have challenged the notion that communities are homogeneous, bounded social units in which members share a collective consciousness. Instead, communities are seen as being inhabited by diverse social actors who regularly exercise their agency; they are potentially volatile places where social relations are contested; and they are inextricably connected to the larger outside world (Isbell 2000:246–248).

Nevertheless, for comparative purposes, it is useful to delineate a social unit approximating the natural community based on settlement propinquity, but this community is not assumed to be either well integrated or internally homogeneous. Therefore, for analytical purposes, a community is considered the largest definable group in which people are physically co-present and regularly interact. Communities, because they are based on frequent face-to-face interaction, also offer their members a sense of belonging and, therefore, a sense of shared identity (Varien and Potter 2008). In Ridges Basin, given its scale and the proximity of sites within it, members of various settlement clusters undoubtedly interacted on a daily basis, and therefore the community is assumed to have been larger than any single settlement cluster (see Chapter 11, Settlement Clusters). Instead, it appears the community was dispersed throughout the basin, and maybe even beyond the basin, and consisted of clusters of households surrounding one village, the Sacred Ridge site (5LP245).

Beyond that, though, the spatial configuration of the Ridge Basin community is nebulous. For example, was nearby Blue Mesa a separate contemporaneously occupied community, or was it part of the Ridges Basin community? There are a number of reasons to consider these two as separate communities. First, there is a recognizable space between them and natural borders around each based on the major land forms they occupied—Ridges Basin and Blue Mesa (see Figure 8.8). These spatial divisions would have affected the social interaction of community members on a daily basis and, as a result, potentially the sense of belonging and identity that comes with such interaction. Second, both communities were sizable enough to be economically and reproductively self-sufficient. By A.D. 800, each contained about 200–300 people (see Chapter 8, Pueblo I Chronology and Population).

Thus, there was no functional necessity for them to have operated as a single large community. And third, they were organized very differently. Within Ridges Basin, settlements were dispersed over a relatively wide area and included a village with ritual architecture. On Blue Mesa, settlement was far more aggregated overall, was more tightly bounded spatially, consisted of long rows of habitation sites (see Figure 11.20), and did not contain a dominant site with ritual facilities like the Sacred Ridge site. If the two locales were part of the same community, it would be expected that they would be more similar in their organization. Instead, members of each apparently had different ideas about how to organize their settlements.

On the other hand, similarities between the Eastern Cluster (in Ridges Basin) and Blue Mesa in lithic assemblage and redware clay composition have prompted analysts to suggest fairly intensive interaction between these two locales and a corresponding lack of interaction between these locales and Sacred Ridge (see Allison 2010; Railey 2009d; Chapter 12, Settlement Cluster Variation). These patterns suggest that the Eastern Cluster and Blue Mesa shared a social identity distinct from Sacred Ridge, and are consistent with Hegmon's (2002) contention that even when communities are present, "individuals may maintain multiple identities and memberships that become active in varying social and temporal contexts" (Schachner 2008:173). Furthermore, the relatively dispersed nature of the Ridges Basin community and the high frequency of enclosures around houses, even at the Sacred Ridge site, would have hindered daily social interaction among households and made accidental encounters with neighbors unlikely (Allison 2008:52). These factors undoubtedly played a role in how cohesive and integrated the community was made the boundaries within and around the community that much more ambiguous. This is especially the case when compared to early communities to the west of the La Plata River, such Alkali Ridge Site 13 (see below).

In summary, Pueblo I settlements in Ridges Basin and on Blue Mesa may be considered two distinct communities based on settlement propinquity, size, and organizational differences. But ceramic and lithic data from Blue Mesa and portions of Ridges Basin (i.e., the Eastern Cluster) suggest that community members maintained multiple identities and memberships and actively engaged the outside world, and that any boundaries around these groupings, if present, were quite permeable.

EARLY PUEBLO I COMMUNITIES IN THE NORTHERN SOUTHWEST

This section briefly describes and compares early Pueblo I communities in the Northern San Juan region. The focus is on those communities that were occupied between A.D. 750 and 825. Eight communities from the Northern San Juan region have produced cutting dates within this interval, including Ridges Basin and Blue Mesa (Figure 13.1). From west to east these communities are Alkali Ridge Site 13, Martin's Site 2, Sagehen Flats, Morris 23, Ridges Basin, Bodo Canyon, Hidden Valley, and Blue Mesa (Figure 13.2). Additional communities with non-cutting dates in the A.D. 700s include Grass Mesa Village (Lipe et al. 1988), Badger House (Hayes and Lancaster 1975), and the Frances Mesa community (Sesler and Hovezak 2002:193). Additionally, sites excavated as part of the Navajo Reservoir project are discussed where appropriate (Eddy 1966).

Bluff, Piedra, and Rosa Areas

Much of the variation evident among these communities is related to larger patterns of variation noted across the northern Southwest in the Pueblo I period. For example, archaeologists have noted three distinct pottery traditions across the Northern San Juan region in the eighth and ninth centuries. Wilshusen (1999b) and Wilshusen and Ortman (1999) documented three centers of pottery production at approximately A.D. 840 (Figure 13.3), which they labeled the Bluff, Piedra,

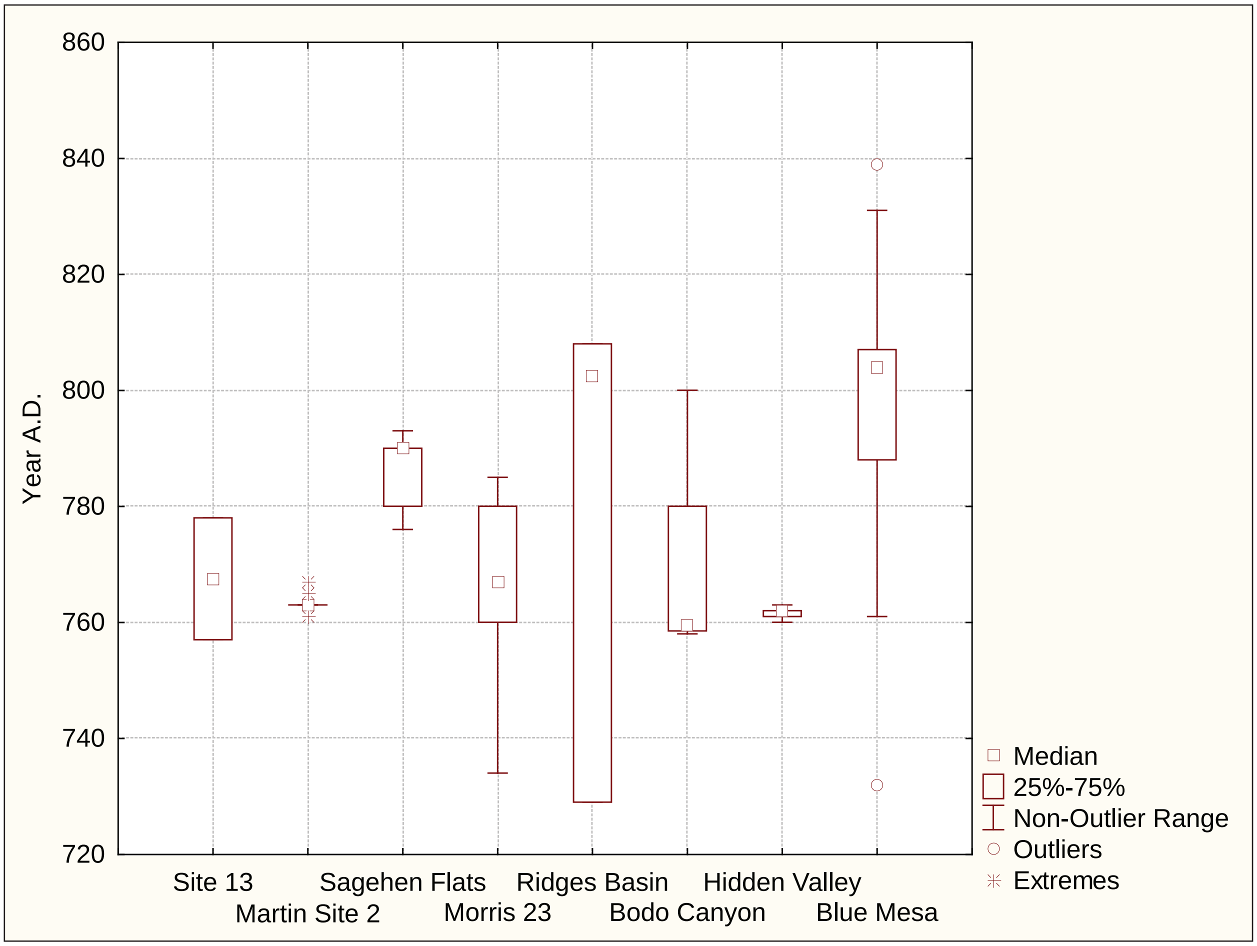

Figure 13.1. Box and whisker plots of cutting dates from early Pueblo I communities from across the northern Southwest.

and Rosa areas. Allison (2008) notes that comparable ceramic technological-style zones are recognizable at least as early as the late eighth century. He identifies them as redware, mineral-painted whiteware, and glaze-painted whiteware, and these closely correspond to Wilshusen's and Ortman's centers of production (see Figure 13.2).

In the western part of the region, most of the decorated pottery was redware. To the east, whiteware was more common, with mineral-painted whiteware predominating from the McElmo Creek drainage to about the La Plata River, and glaze-painted whiteware from the Animas River drainage east. These ceramic technological-style zones correspond with differences in pottery design styles, architecture, settlement patterns, and site layouts, suggesting that groups with distinct social identities occupied different areas in early Pueblo I times (Allison 2008:47). The following describes early Pueblo I communities in the Northern San Juan region from east to west, starting in the so-called Bluff area and ending in the Rosa area.

Alkali Ridge Site 13 and Martin's Site 2

Settlement layout in the west is exemplified by two sites, Alkali Ridge Site 13 and Martin's Site 2 (Figure 13.4). Both sites contain long rows of surface rooms delineating plaza areas that contain pit structures. Site 13 contains 16–20 pit structures and hundreds of contiguous, doubled-row surface rooms assembled around open plazas (Figure 13.4). Brew (1946:190) interpreted the larger front rooms as living quarters

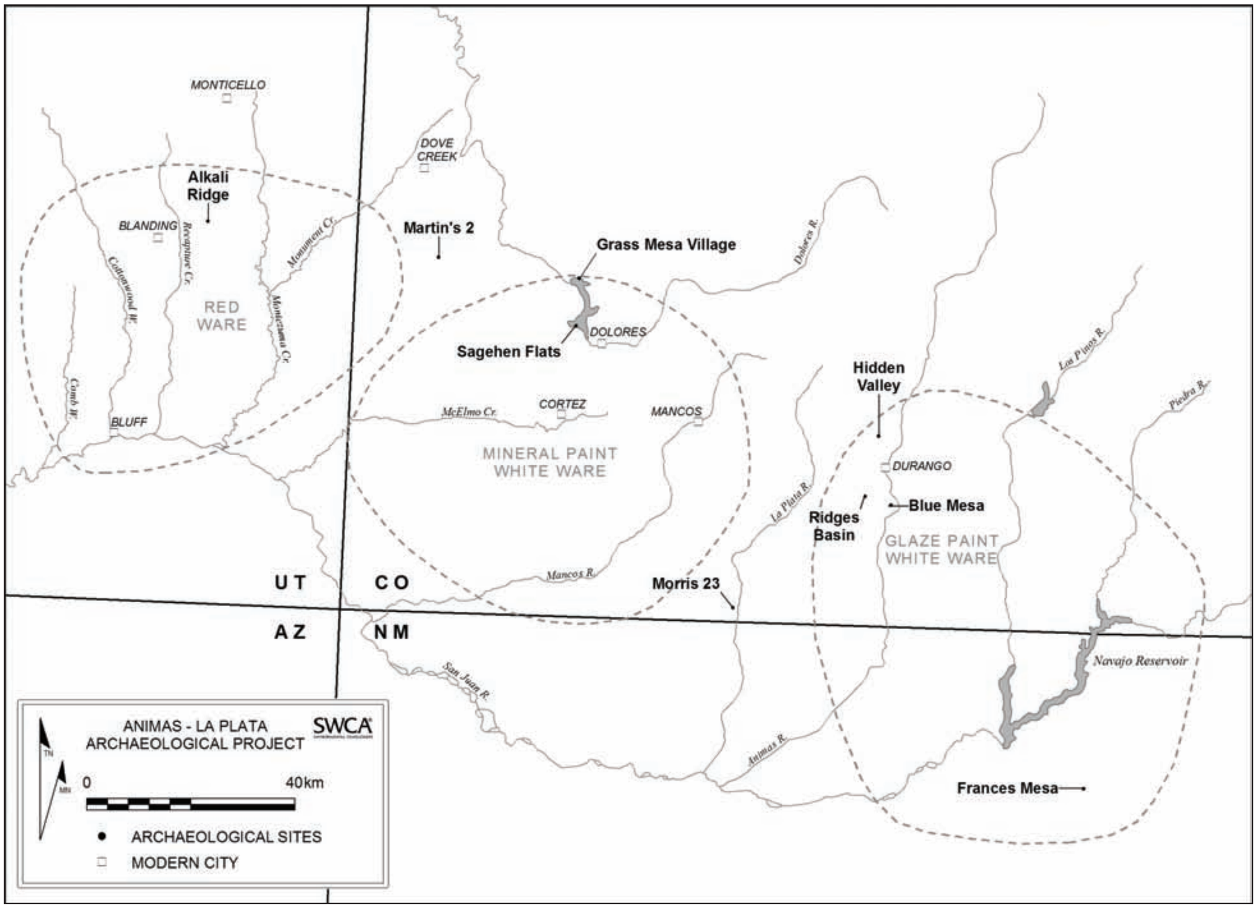

Figure 13.2. Map of early Pueblo I sites and locales in the Northern San Juan region. Approximate limits of early Pueblo I pottery traditions are demarcated by dashed lines (adapted from Allison 2008:Figure 3.1).

and the small back rooms as storage chambers. Additionally, at both sites there is a general north–south trend to the organization wherein surface rooms are located to the north of the pit structure.

Pit structure shapes are highly variable at Site 13. Square, circular, and D shapes are represented (Figure 13.5). Antechambers in the fronts of structures are present in several of the structures, but most ventilators are one-hole openings. The presence of benches, stringer posts, and coped hearths is also variable among structures at Site 13. Some of the variation exhibited by these structures may relate to functional differences. Brew (1946:157) interpreted the large circular structures, such as Pit House E in Figure 13.5, as ritual structures analogous to great kivas. Chuipka (2008b:131) notes, however, that the largest structure at this site is only 9 m in diameter "and is better classified as an oversized pit structure rather than a great kiva."

Allison (2008:49) reports, based on room block length, that Site 13 comprised 40–45 households, which he suggests translates roughly to a population of 200–250 people (assuming 5.5 people per household). If one uses a range of 5–8 people per household (see Chapter 8), a population range of 200–320 is generated. There are no known contemporaneous sites around Site 13, and this large, nucleated village therefore appears to compose the entire community. Martin's Site 2 comprised approximately 15–18 households and a population of 80–100 people (Allison 2008:49). The short occupation span of these settlements suggests that most of the structures at each of these sites were occupied contemporaneously (see Figure 13.1).

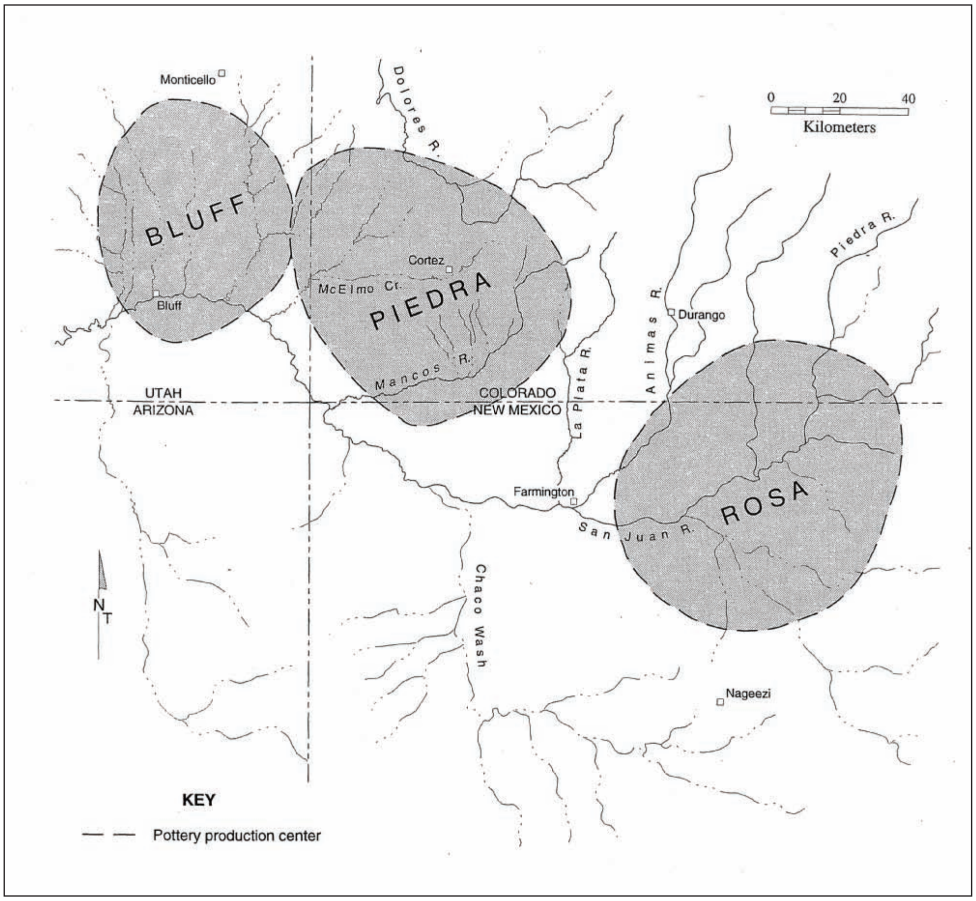

Figure 13.3. Ceramic production centers, circa A.D. 840 (reproduced from Wilshusen 1999b:Figure 7-4).

Allison also notes that at Site 13 people occupying aboveground domestic rooms shared walls with their neighbors and almost certainly had frequent unplanned interactions due to the closely spaced room entrances. He suggests that, unlike at Ridges Basin sites, it would have been difficult to avoid the inhabitants of nearby rooms, and accidental encounters with neighbors must have been relatively common at Site 13 (Allison 2008:52).

Sagehen Flats and Grass Mesa Village

Early Pueblo I communities in the Piedra area were less nucleated than those in the Bluff area and much more architecturally homogeneous. The Piedra area typically contains sites with square or rectangular pit structures with wing walls and single-hole ventilators. Surface room architecture tends to be more substantial than in the eastern region but not as contiguous as in the west; that is, room blocks are much shorter and do not define large plazas as they do at Alkali Ridge Site 13. As in the western settlements, though, blocks of surface rooms are typically two rooms deep and are both storage and living rooms. Organizationally, the major features in the Piedra area tend to be formally oriented north–south, with surface rooms to the north of the pit structure and a midden to the south.

The Sagehen Flats community exemplifies early Pueblo I communities in the Piedra area. Sagehen Flats was an open, flat, bottomlands area west of the Dolores River. From about A.D. 750 to 850, Sagehen Flats was occupied by a community of dispersed hamlets, several of which were excavated during the Dolores Archaeological Program, including five sites with

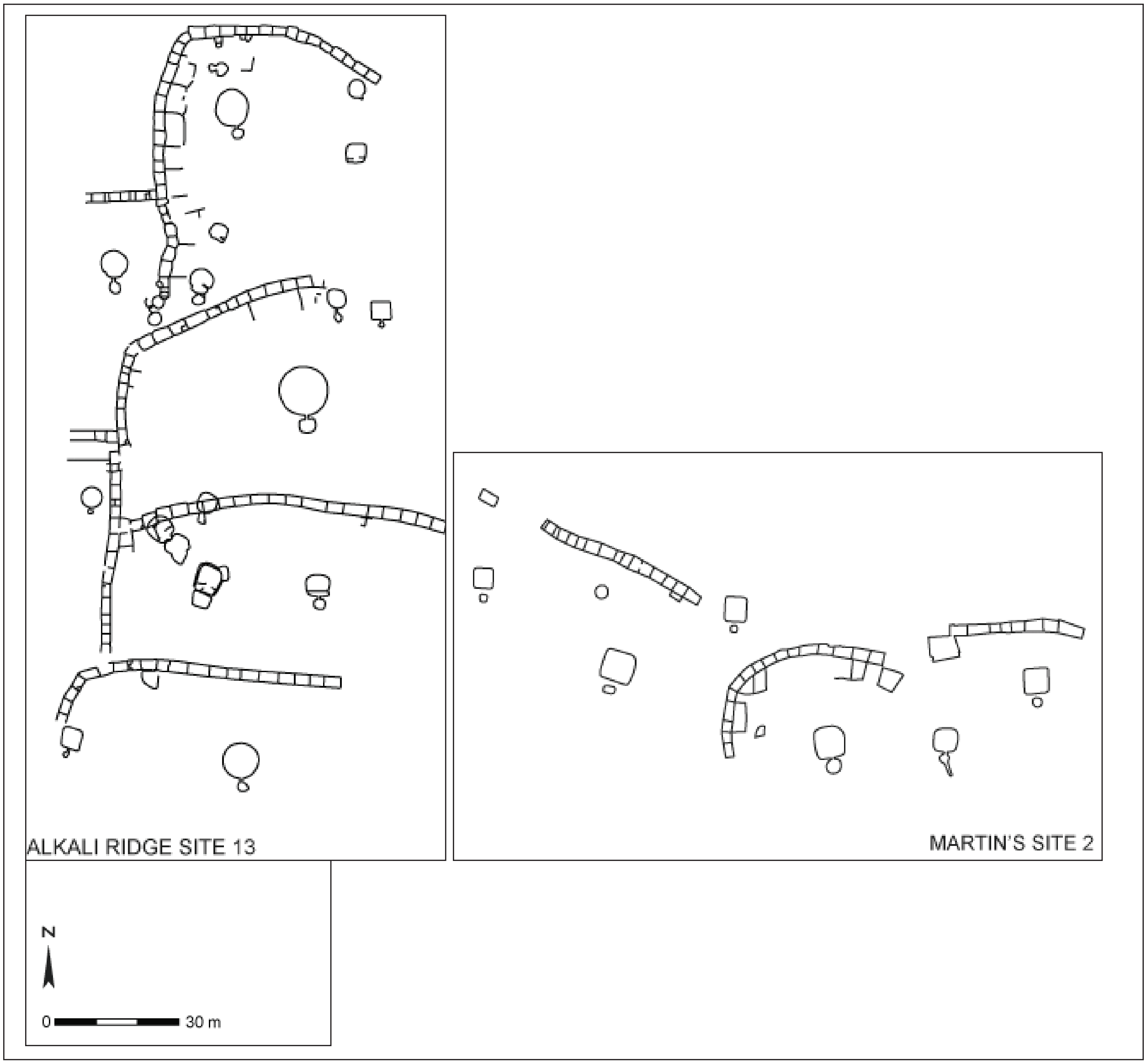

Figure 13.4. Plan maps of Alkali Ridge Site 13 and Martin's Site 2 (after Allison 2008:Figure 3.2).

tree-ring dates in the late eighth century: Dos Casas Hamlet, Windy Wheat Hamlet, Hamlet de la Olla, Rusty Ridge Hamlet, and Pit Structure 1 at Rio Vista Village (Brisbin 1986; Brisbin et al. 1986; Etzkorn 1986; Fields and Nelson 1986; Hewitt 1986) (see Figure 13.2). Dos Casas Hamlet is a typical Sagehen Flats site containing two sequentially occupied, square pit structures and several surface rooms (Figure 13.6).

The Sagehen Flats locality contained at least 10 hamlets that dated to the eighth century (Kane et al. 1986:Table 1.7). Most of these sites had one pit structure and represented a single household. Sites with two pit structures, such as Dos Casas Hamlet, most often also represented a single household because the structures were sequentially occupied (Figure 13.6). Windy Wheat Hamlet, with three structures, may have contained two households at one time. These figures generate an estimated 11 households composing the community, or a population estimate of approximately 60–100 people.

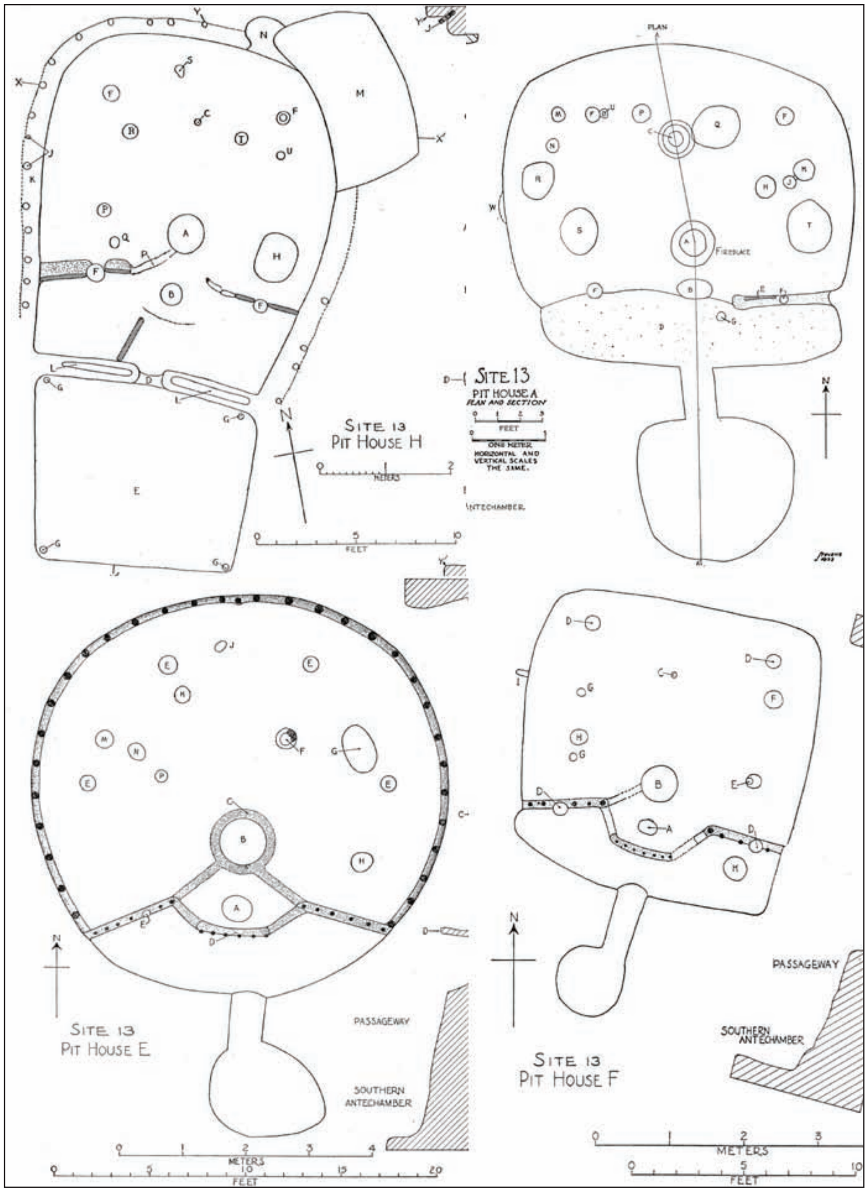

Figure 13.5. Plan views of select pit structures at Alkali Ridge Site 13 (not to scale).

There is no obvious communal ritual architecture associated with the Sagehen Flats community. However, the Grass Mesa Village community, also occupied in the early Pueblo I period (A.D. 700–850), had an oversized pit structure (PS 93) associated with the phase of occupation dating from 700 to 780 and a great kiva (PS 7) associated with the occupation dating from 780 to 850 (Lipe et al. 1988:617, 1221) (Figure 13.7). This early Pueblo I community comprised at least 28 pit structures, about half of which dated from A.D. 700 to 780 and half of which dated from 780 to 840. Surface architecture comprised only two or three rooms in a single row and was less formally arranged than the Sagehen Flats community. The Grass Mesa Village community, however, was more highly aggregated than the Sagehen Flats community and contained from 60 to 100 people at any one time.

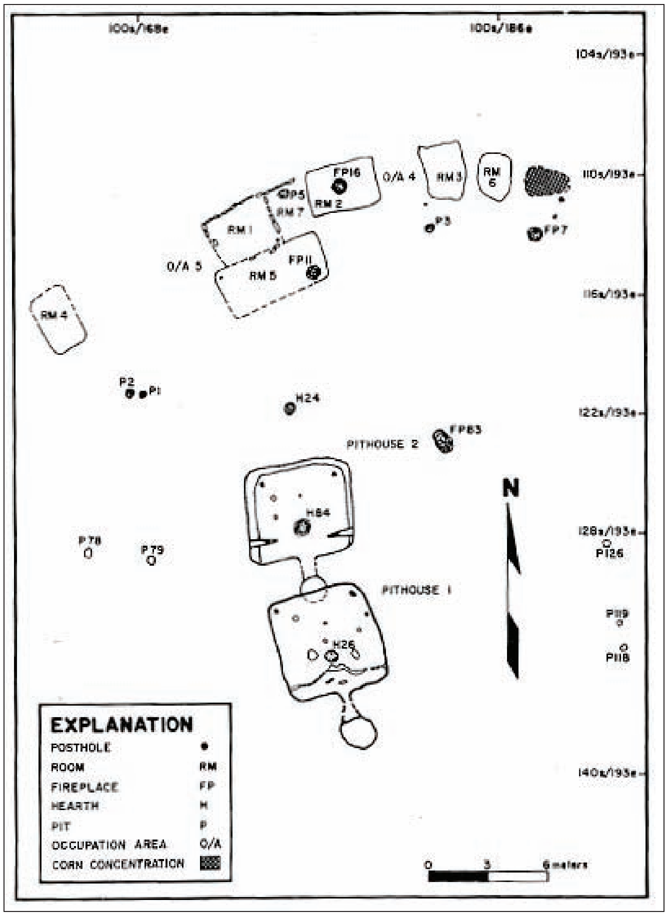

Figure 13.6. Plan map of Dos Casas Hamlet (reproduced from Brisbin et al. 1986:Figure 8.10).

Morris 23

Dating to the eighth century, Morris 23 is a large site in the La Plata River drainage between the Piedra and Rosa areas. The site comprises 51 pit structures and a great kiva (Figure 13.8) (Chuipka 2008b:114). These structures are organized into 28 discrete habitation units, each of which generally comprises at least one pit structure, associated surface architecture, and midden (Chuipka 2008b:114–115).

In 1927 Morris excavated five habitation units, which he referred to as Buildings I–IV and Protokiva 7. These are the only excavations of structures to have occurred at the site, although Chuipka mapped the site and conducted some limited auger testing across the site in 2007 (Chuipka 2008b). The pit structures excavated by Morris were square (Figures 13.9) and consistently had coped hearths, wing walls, and a four-post roof support system in the floor (see also Figure 6.3). A full bench was present in one of the structures (see Figure 6.3). Surface rooms were arranged in contiguous room blocks two rooms deep, and the orientation of the structures was north–south. These attributes are most similar to sites in the Piedra and Bluff areas to the west.

In contrast to the site's architectural attributes, the ceramic assemblage of Morris 23 is similar to assemblages seen on Rosa sites. According to Chuipka's in-field analysis (2008b:120–123), there is a near absence of redware, and decorated pots are most frequently of the Chapin/Lino and Rosa Black-on-white types. Piedra Black-on-white and neck-banded grayware sherds were also present but rare.

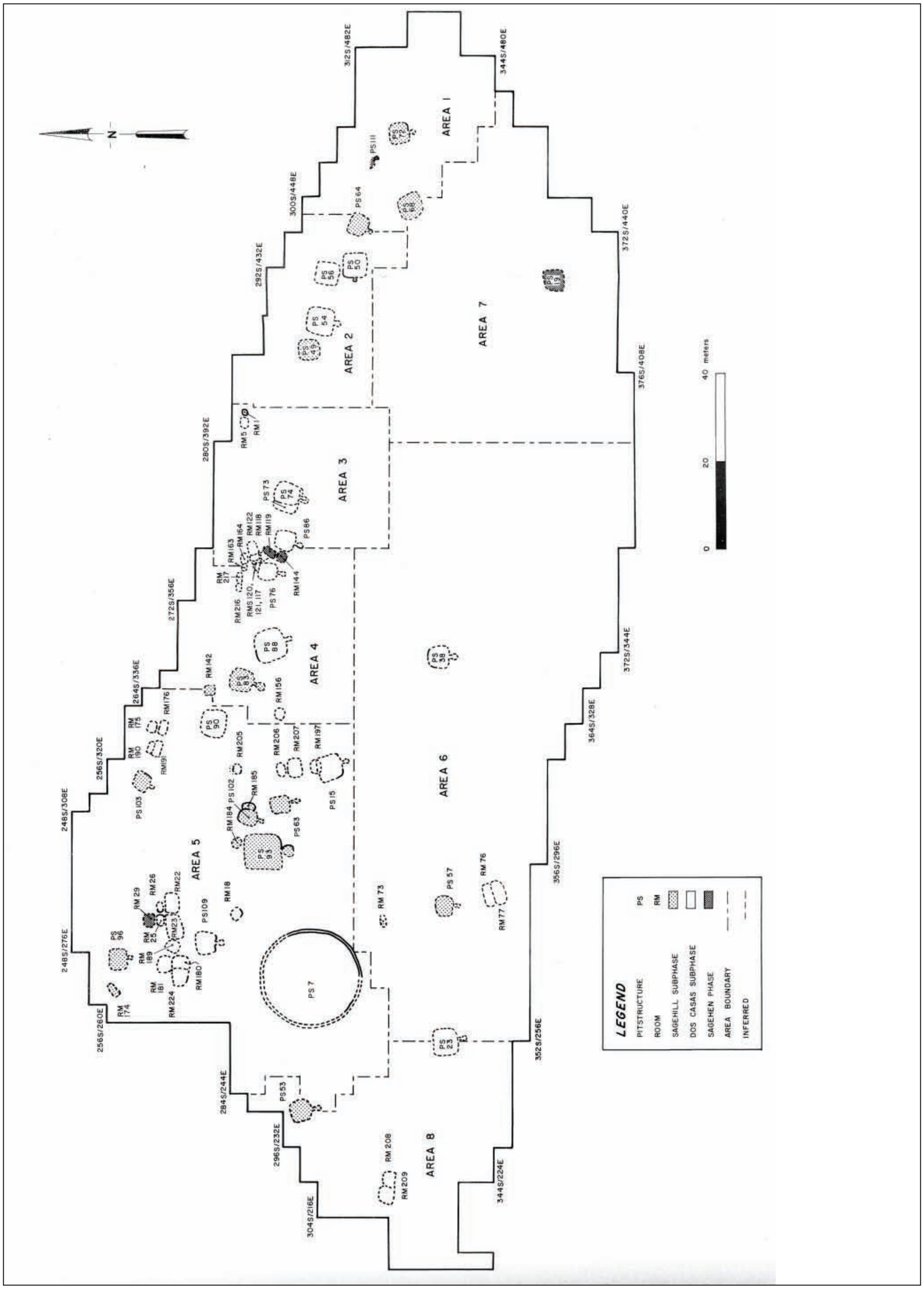

Figure 13.7. Plan map of Grass Mesa Village, A.D. 700–840 (reproduced from Lipe et al. 1988:Figure 18.1).

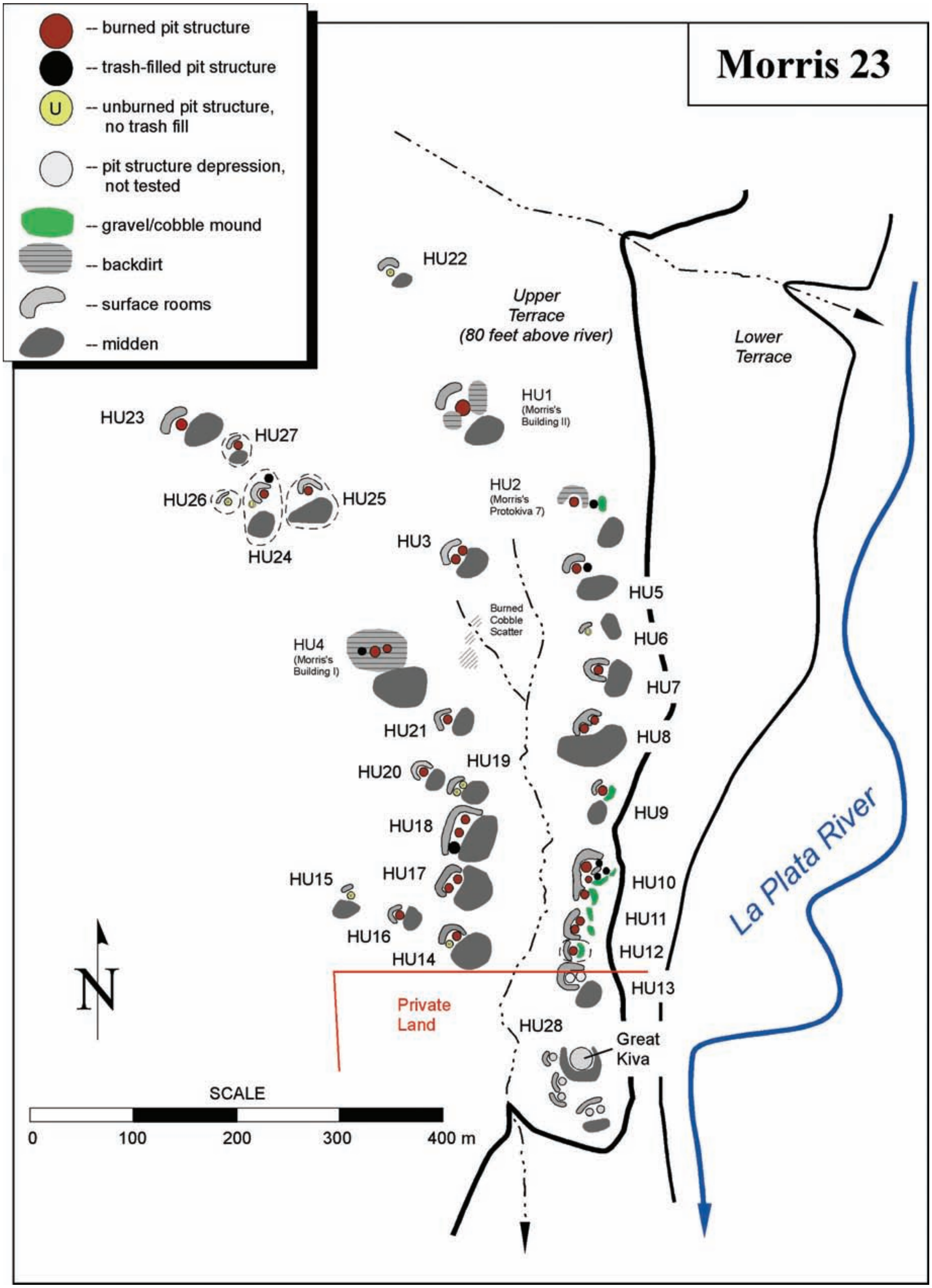

Figure 13.8. Plan map of Morris 23 (reproduced from Chuipka 2008b:Figure 5-8).

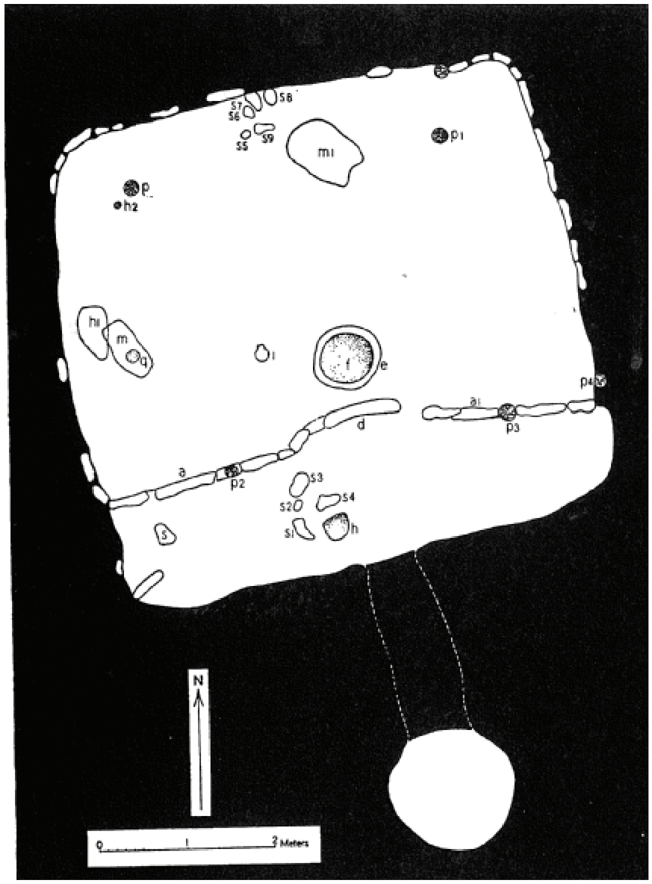

Figure 13.9. Plan map of Morris's Protokiva 7 (reproduced from Morris 1939:Figure 17).

Morris 23 was similar to Grass Mesa Village in its level of aggregation; it was not as highly aggregated as Alkali Ridge Site 13 but more aggregated than the Sagehen Flats community. And, like Grass Mesa, it has a great kiva. Chuipka (2008b:114–118) notes the sequential occupation of pit structures on the site and suggests that the latest occupation comprised 29 pit structures. This generates a momentary population estimate of 150–230 people.

Hidden Valley

Just north of the modern city of Durango is an early Pueblo I community called Hidden Valley (Figure 13.10). This community dates to the A.D. 760s and comprises approximately 20 single–pit structure habitations. Like Morris 23, it is considered to be between and outside of both the Piedra and Rosa areas (see Figure 13.3). Unlike Morris 23, houses in this community are widely dispersed, round in plan, and have a six-post cribbed roof, ventilator entryways, and cobble rings enclosing them (Figure 13.11). Additionally, surface rooms are few, small, and compose room blocks only one row deep, and the orientation of the architectural features is variable, making them similar in composition and layout to early Pueblo I sites in the Rosa area.

There is no evidence of sequential occupation in this short-lived community. None of the excavated structures were salvaged, and all had been burned at abandonment. Additionally, tree-ring dates cluster tightly at A.D. 760 and 761. If all 20 structures were occupied simultaneously, the estimated population of the community would be 100–160 people.

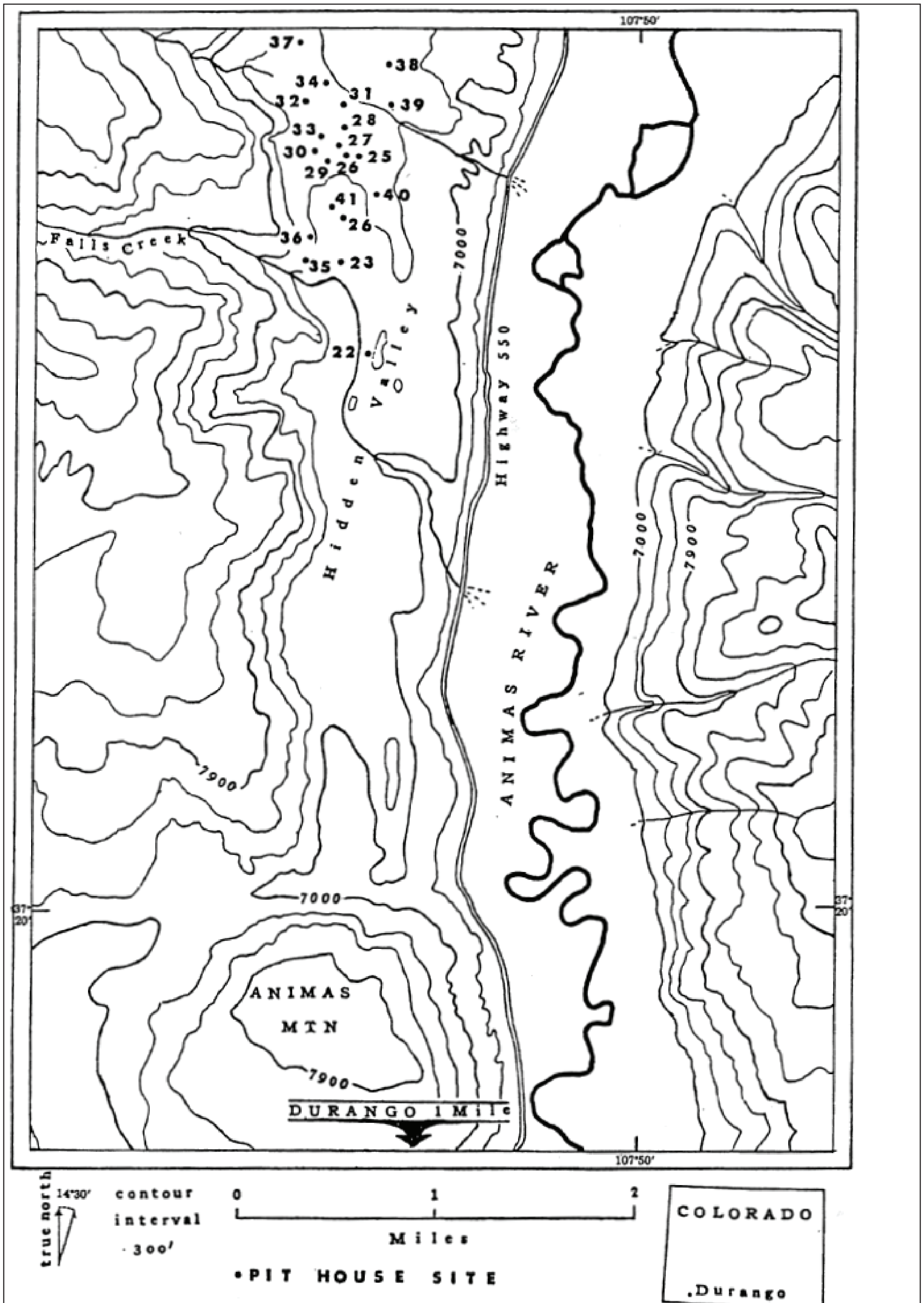

FIGURE 1. The Animas River Drainage near Durango, Colorado

Figure 13.10. Map of the Hidden Valley community (reproduced from Carlson 1963:Figure 1).

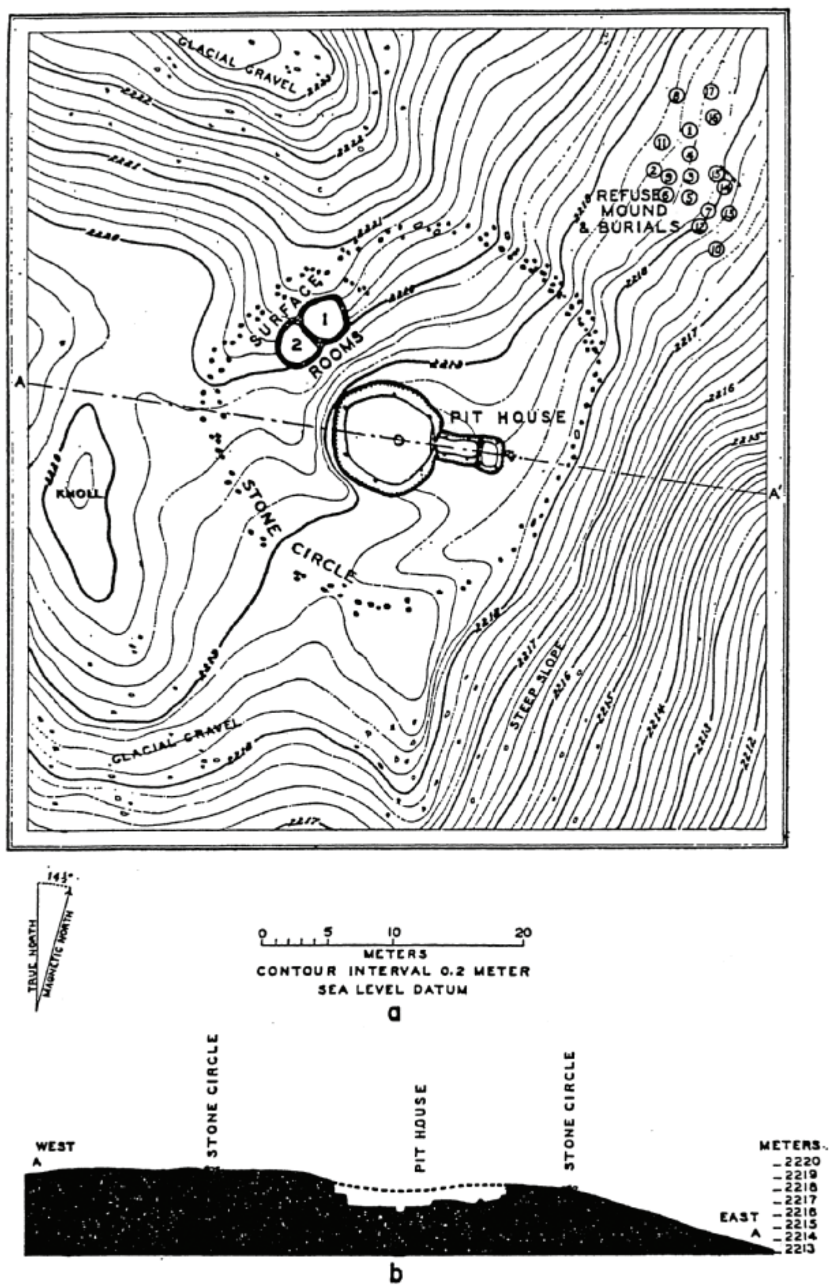

FIGURE 2. Plan and Section of Ign. 7:23

Figure 13.11. Plan map of Ign 7:23, part of the Hidden Valley community (reproduced from Carlson 1963:Figure 2).

Blue Mesa

Chapter 11 summarizes SWCA's work on Blue Mesa and briefly describes the findings there. This community dates from about A.D. 760 to as late as 840 (see Figure 13.1), although Chuipka and Potter (2007b) suggest that the late dates from 5LP239 are from a limited reoccupation of that site rather than continued occupation of the mesa. The community contained approximately 74 pit structures, some of which were sequentially occupied. Chuipka and Potter (2007b:243) estimate a momentary population level between 125 and 300 people.

The community was quite aggregated overall with the highest density of houses on the north half of the mesa (see Figure 11.20). Habitation sites contained at least one pit structure and usually at least one surface room. Some sites contained more than one pit structure, but evidence suggests that these were often occupied sequentially. Site layouts were consistent across the community, with a series of small storage rooms to the north or northeast and a southeast-facing pit structure. Pit structure shape was variable, as were midden locations relative to architectural features. No communal ritual architecture has been documented for the community, but investigations have been limited to the southern portion of the mesa and future investigations may uncover an oversized pit structure. In 1987 Complete Archaeological Services Associates identified a single pit structure at 5LP2057 on the northern half of the mesa with a deep, 10-m-wide depression that was subsequently interpreted as an oversized structure (Fuller 1988a). Chuipka and Potter (2007b:242) note, however, that surface depressions, particularly on Blue Mesa, are often much larger than the actual structures they represent.

Navajo Reservoir and Frances Mesa

Rosa area sites often contain circular pit structures with two-hole ventilators. Surface rooms are more ephemeral and built strictly of adobe. Room blocks tend to be only one room deep, and these rooms functioned primarily as storage rooms. These sites are less formal in both composition and alignment than in the west and often are enclosed by an enclosure or cobble ring.

During the eighth and early ninth centuries—what Eddy (1966) termed the “Rosa Phase”—communities in the Rosa area comprised dispersed hamlets. A few Rosa area sites are classified as villages, but, as Hovezak and Sesler (2002b:57) note, the largest site, Sambrito Village, contained only six pit structures and no surface rooms. “All of the surface rooms at Sambrito Village were associated with the Piedra and Arboles phase occupations of the site, dating after A.D. 850 (Eddy 1966:232)” (Hovezak and Sesler 2002b:57). Dating between A.D. 750 and 850, the Favorino site (LA3427), also excavated as part of the Navajo Reservoir project, is a more representative site for the Rosa phase (Eddy 1966:67–79) (Figure 13.12).

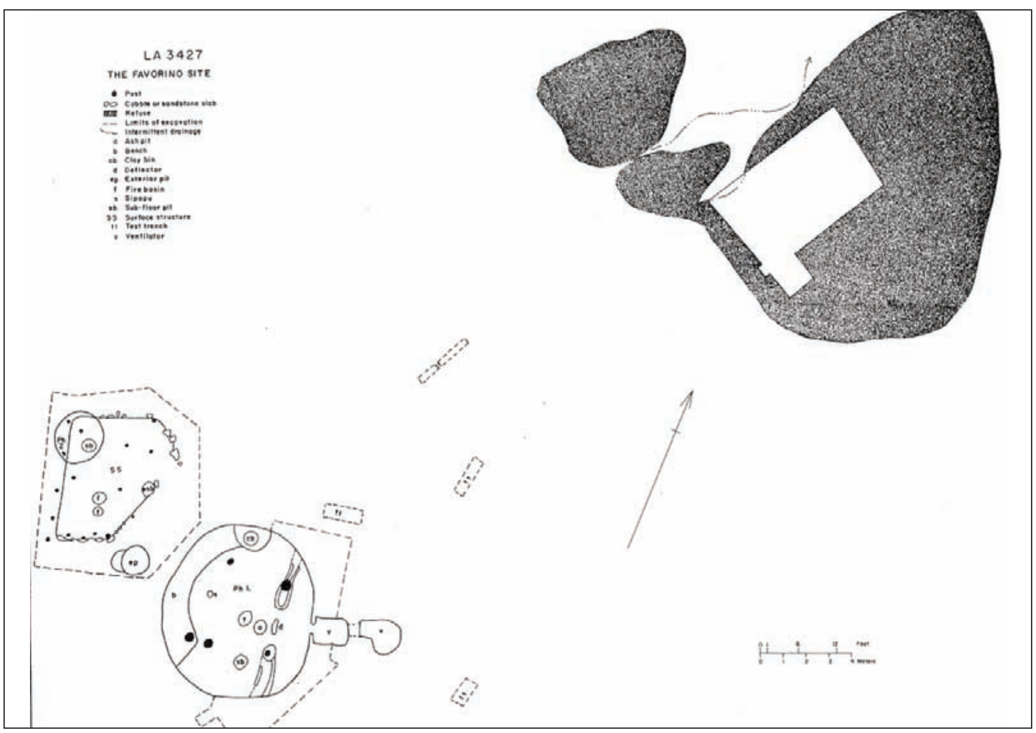

Figure 13.12. Plan map of the Favorino Site (LA3427) (reproduced from Eddy 1966:Figure 9).

One of the largest Rosa communities, the Frances Mesa community, contained 22 single-residence Rosa phase habitation sites and eight multiple residence sites containing a total of 44 pit structures (Sesler and Hovezak 2002:192–193). These sites were widely dispersed across Frances Mesa with no apparent communal ritual structures present. Sesler and Hovezak note that approximately half the structures are unburned and might represent salvaged structures. This suggests the sequential occupation of at least some of the structures, perhaps half, and a momentary population of about 100–175 people.

COMPARING RIDGES BASIN

Compared to other early Pueblo I communities, the Ridges Basin community is unique in four obvious ways: population size, spatial size, architectural heterogeneity, and layout and organization. In terms of population size, Ridges Basin and Blue Mesa—adjacent to each other—are two of the largest documented eighth-century communities in the Northern San Juan region (Figure 13.13)[1]. All other early Pueblo I communities, such as Alkali Ridge Site 13, were relatively isolated. Thus, the Ridges Basin–Blue Mesa area saw the highest local population densities in the northern Southwest in the eighth and ninth centuries. This undoubtedly affected both access to and competition for local resources and the social interactions that are involved in such competition.

Second, the Ridges Basin and Frances Mesa communities were, by several orders of magnitude, the most dispersed and spatially extensive early Pueblo I communities (Figure 13.14). Likewise, the overall density of pit structures within early Pueblo I communities is variable, with Ridges Basin being one of the least densely occupied (Figure 13.15). These factors have direct implications for the consistency and frequency of daily interaction of community members and, as Allison (2008) has pointed out, the frequency of accidental encounters with neighbors. Moreover, the relatively high frequency of enclosures in the Ridges Basin community would have maximized the seclusion of individual households, even in the face of aggregation (i.e., at Sacred Ridge). All of these factors would have affected the frequency of face-to-face interactions and ultimately the level of community integration.

Third, Ridges Basin is the only early Pueblo I community to consist of a small village and dispersed settlement clusters. Houses in other communities were distributed much more evenly across space. With the exception of Ridges Basin, in no instance were there both a highly aggregated settlement and numerous dispersed settlements present in a single community. Communities were either highly nucleated, such as Alkali Ridge; highly dispersed, such as Sagehen Flats, Hidden Valley, and Frances Mesa; or somewhere in between, as in the cases of Morris 23, Blue Mesa, and Grass Mesa Village. Extreme spatial unevenness is unique to the Ridges Basin community.

Finally, the Ridges Basin community is the most architecturally heterogeneous early Pueblo I community in the northern Southwest. Alkali Ridge Site 13 and Blue Mesa, indeed, contain a variety of pit structure shapes (see Figure 13.5 and Figure 11.21). However, at Alkali Ridge, above-ground living rooms are remarkably standardized and outnumber pit structures by about nine to one. Thus, overall, the community is architecturally quite homogeneous. Pit structures on Blue Mesa exhibit a variety of plan shapes, but overall they are not as varied as those in Ridges Basin, particularly in terms of pit structure size and in the types of internal features present in pit structures. Moreover, the Blue Mesa sample is much smaller than the Ridges Basin sample and may not be representative of the entire community. Surface structures are also not as varied on Blue Mesa as they were in the Ridges Basin community. Surface structures on Blue Mesa are consistently small, square, adobe rooms that compose small, one-room-deep room blocks (again,

[1] The populations presented in this graph are based on pit structures. This is probably appropriate for all communities except Alkali 13, which is the only village in this group that is not a pit house village. The majority of its population most likely was housed in room blocks. If surface room blocks are used to calculate population density at Alkali 13 then the measure would be off the chart. However, even using pit structures as a proxy for population, this site contains the largest population of any of the identified communities.

based on a very small sample). In addition to surface rooms like these, the Ridges Basin community contained a tower structure, pit rooms, and a pole-and-brush-roofed circular structure delineated with upright slabs.

Some, but not all, of the heterogeneity of architectural form in the Ridges Basin community may be due to its position close to the boundary between the Rosa and Piedra areas. Architectural forms—both surface rooms and pit structures—at other communities in the sample, such as Sagehen Flats and Frances Mesa, are all relatively consistent within each community and conform to the basic trends described for sites in the Bluff, Piedra, and Rosa areas.

The following is a more detailed comparison of particular traits among the Ridges Basin community and other early Pueblo I communities in the northern Southwest.

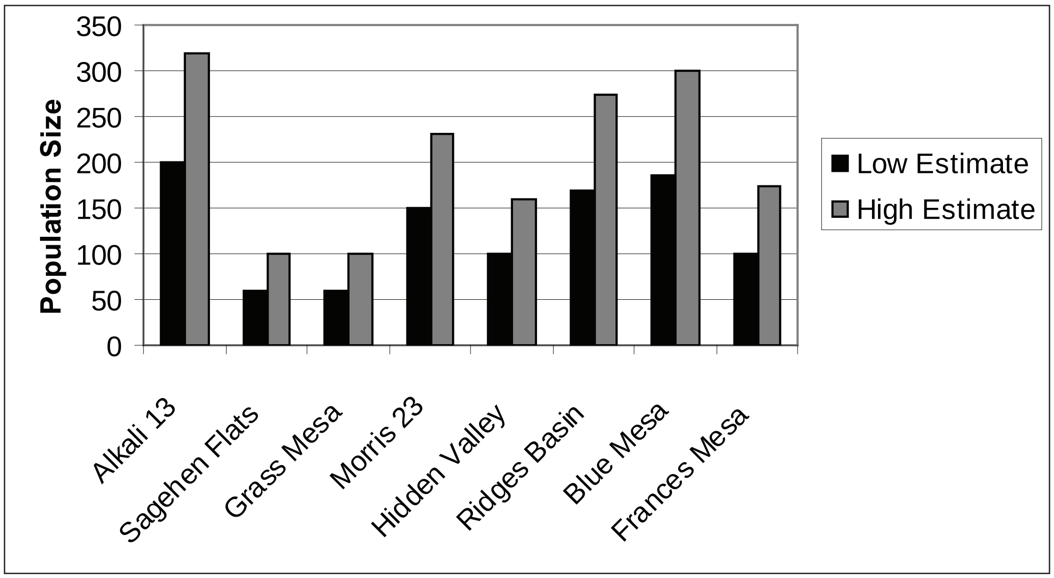

Figure 13.13. High and low momentary population estimates for early Pueblo I communities, A.D. 700–825.

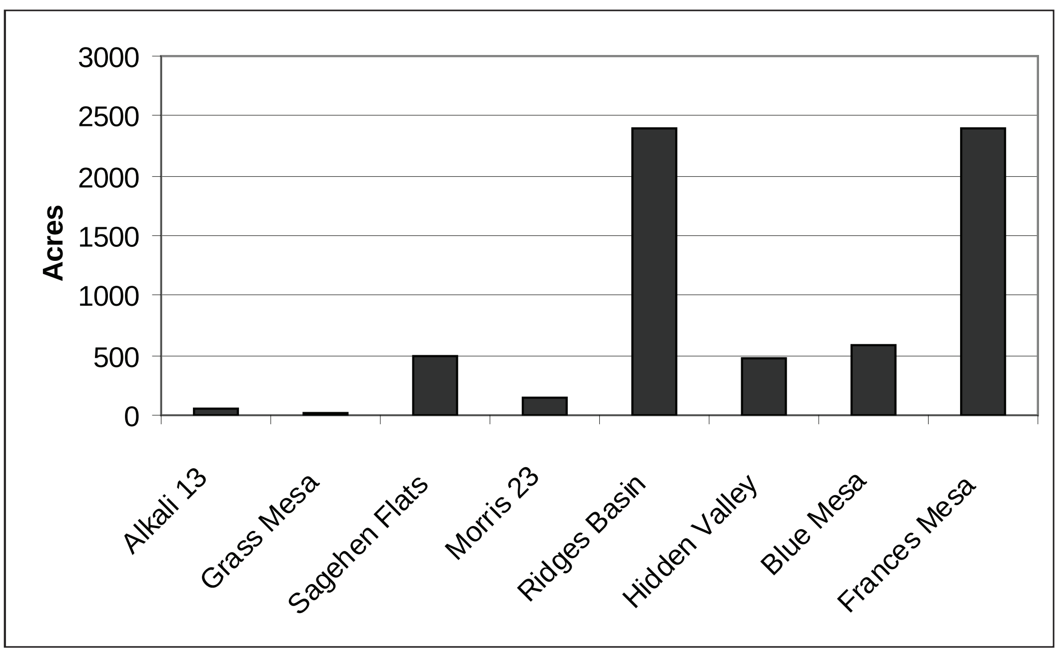

Figure 13.14. Approximate acreage for early Pueblo I communities, from west to east.

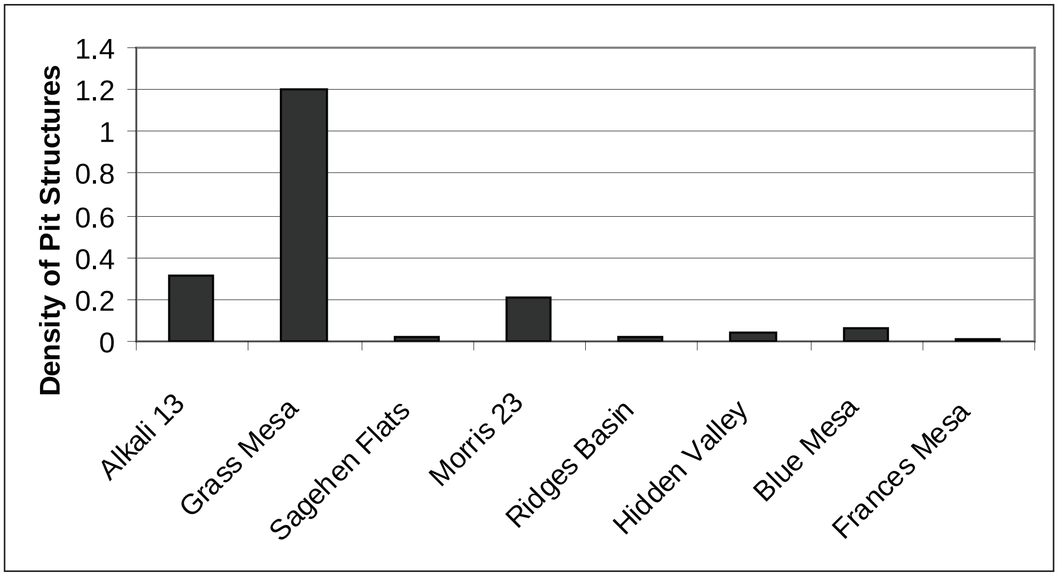

Figure 13.15. Number of contemporary pit structures per acre for early Pueblo I communities, from west to east.

Pit Structures

While it may be difficult to generalize about such a diverse assemblage of pit structures as was documented in the Ridges Basin community, it is possible to describe the frequency of certain architectural traits and how those frequencies compare to other early Pueblo I communities. Pit structure traits from seven communities—Alkali Ridge Site 13, Sagehen Flats, Morris 23, Ridges Basin, Hidden Valley, Blue Mesa, and Navajo Reservoir (see Figure 13.2)—were used in this comparative analysis. The presence or absence of each of the following traits was recorded from each fully excavated and documented early Pueblo I pit structure in each of the communities: bench, four main support posts, more than four main support posts, stringer or leaner posts, one-hole ventilator, two-hole ventilator, ventilator entryway (linking the main structure to an antechamber), wing wall, deflector, sipapu, coped hearth, bin, storage or floor pit, and mealing bin (see Chapter 10, The House and Household). Figure 13.16 displays the first two dimensions of this analysis (see Chapter 10 for a brief explanation of correspondence analysis) and shows several interesting trends. The first is the close association of Ridges Basin, Blue Mesa, and Navajo Reservoir. These communities are all positive along Dimension 2 and negative along Dimension 1 and appear to be clustering based on the high relative frequency of benches, mealing bins, and two-hole ventilators. (Mealing bins are actually rare in the total assemblage [n = 3], so their association may be spurious.) One-hole ventilators are also associated with this cluster but are more strongly associated with (closer to) Ridges Basin. Navajo Reservoir and Blue Mesa are most strongly associated with two-hole ventilators. Second, the distribution of communities on the plot generally parallels their geographic locations. Communities that are east of the La Plata River—Ridges Basin, Blue Mesa, and Navajo Reservoir—cluster together; Morris 23 is in the middle; and Sagehen Flats and Alkali Ridge Site 13 cluster in the lower right quadrant (Figure 13.16). This suggests a geographic gradient to trait frequencies. The exception is the Hidden Valley community, which is an outlier due to its high frequency of ventilator entryways and roof support systems with more than four posts. Hidden Valley sites also lack coped hearths, wing walls, deflectors, sipapus, and floor pits, which are common in many of the other locales. Much of the patterning seen in Figure 13.16 is caused by this outlier.

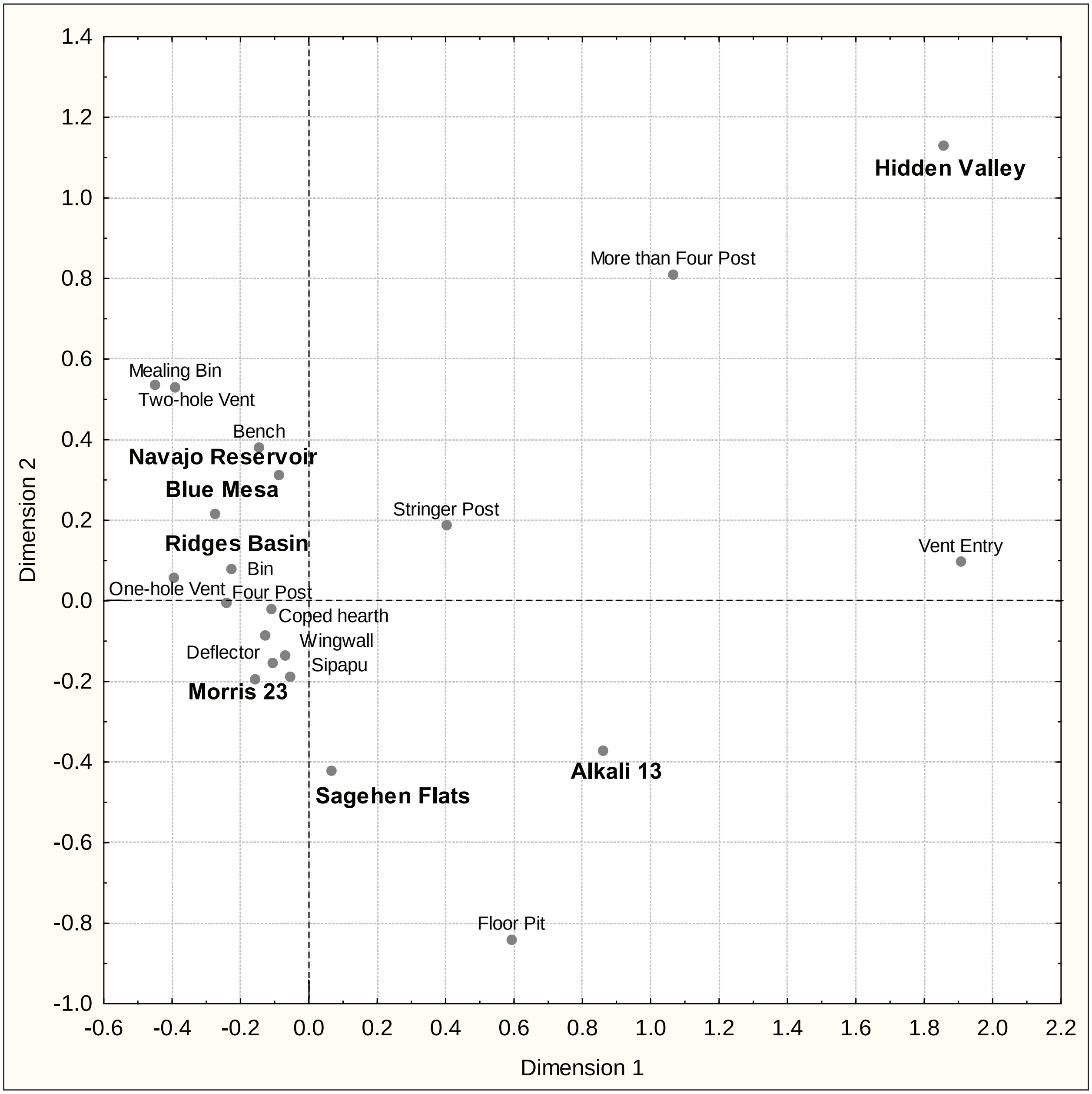

Figure 13.16. Plot of first two dimensions of a correspondence analysis performed on architectural trait data from early Pueblo I pit structures. Blue Mesa and Ridges Basin data from SWCA's excavations only. Navajo Reservoir data from LA3427, LA3434, and LA4086 (Eddy 1966). Hidden Valley data from Ign. 7:23, 7:30, 7:31, and 7:36 (Carlson 1963). Sagehen Flats data from 5MT2858, 5MT2854, 5MT2194, 5MT2193, and 5MT4644 (Kane and Gross 1986). Alkali Ridge Site 13 data from Pit Houses A–L (Brew 1946). Morris 23 data from Protokivas 4–7 (Morris 1939).

Figure 13.17 presents the same analysis as that shown in Figure 13.16 but excludes the Hidden Valley community because it is such an extreme outlier. Note again the general east–west trend in the distribution of the communities on the plot, starting in the lower left quadrant with Navajo Reservoir and ending in the lower right with Alkali Ridge Site 13[2]. Ridges Basin appears in the middle of the distribution, again associated strongly with one-hole ventilators, benches, and a four-post roof support system. Ridges Basin

[2] Distributions produced by correspondence analyses often form a U shape, especially seriations based on trait frequencies, which is essentially what this analysis is.

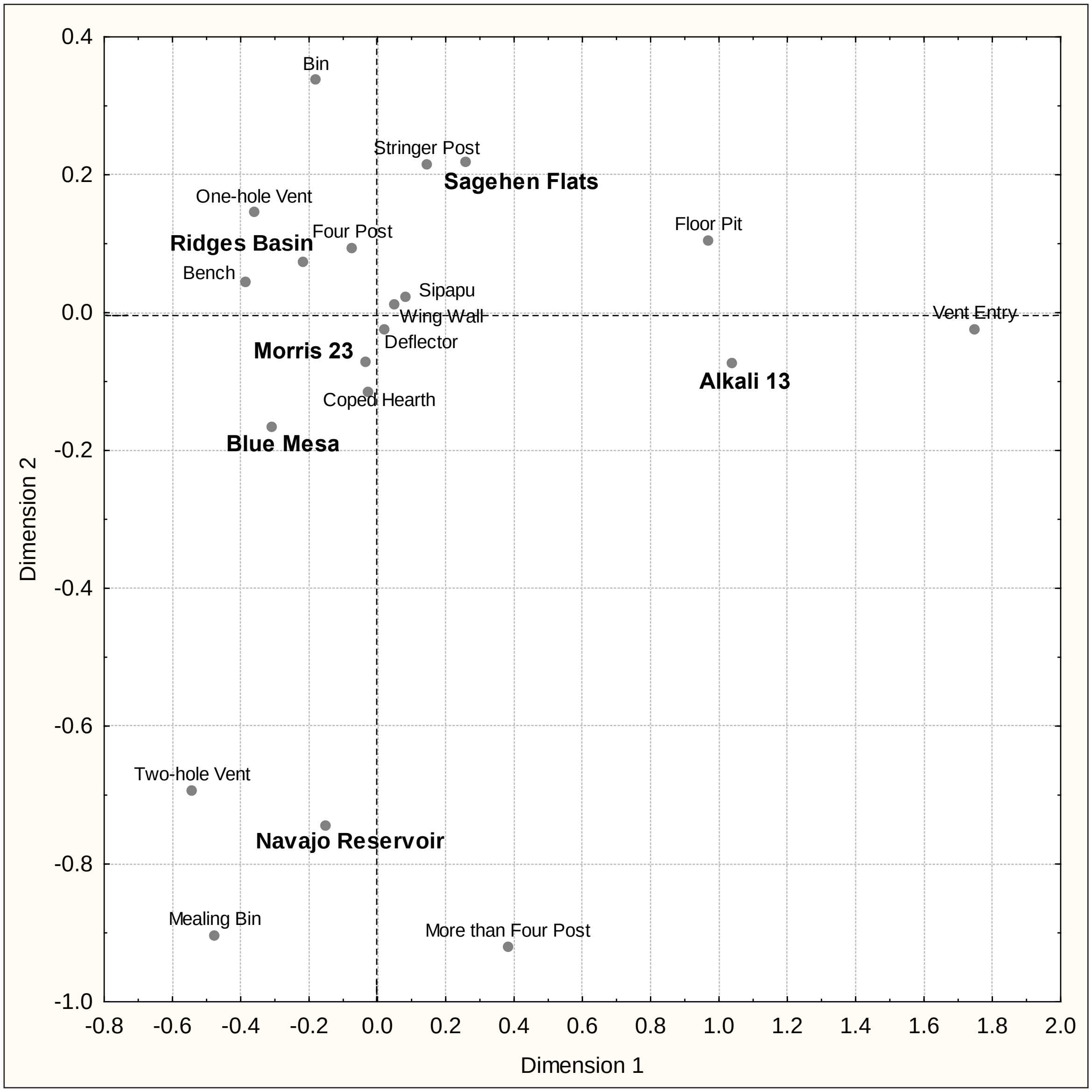

Figure 13.17. Plot of first two dimensions of a correspondence analysis performed on architectural trait data from early Pueblo I pit structures. Data used are the same as in Figure 13.16 but exclude the Hidden Valley community.

also has a high frequency of sipapus, wing walls, and deflectors, but other communities did also and these attributes are therefore neutral variables (i.e., they plot very close to the zero-zero point).

In both analyses, pit structure architectural-trait frequencies in Ridges Basin plot relatively close to those of Blue Mesa and Morris 23, and between those of Navajo Reservoir on the one hand and Sagehen Flats and Alkali Ridge Site 13 on the other. This suggests that, overall, Ridges Basin plots as expected given its geographic position. It also suggests that those few Ridges Basin structures exhibiting attributes strongly associated with distant communities—such as ventilator entryways, two-hole ventilators, floor storage pits, and more than four main roof support posts—and the distributions of these attributes within the community should be examined and considered thoroughly. Chapter 14, The Economy, addresses these features and their meaning in greater detail.

The average floor area of Ridges Basin pit structures is 25 m^2, which is in the middle of the overall distribution for early Pueblo I pit structure sizes; the variance of the Ridges Basin pit structure floor areas, however, is comparatively large (Figure 13.18).

The Morris 23 and Navajo Reservoir communities exhibited the largest structures on average although the sample size for each of these communities was small (four structures each). Alkali Ridge Site 13 had, on average, the smallest structures.

Communal Ritual Architecture

Communal ritual architecture is defined as architecturally defined space in which many people (more than one household) gathered for the purposes of conducting rituals. In the Pueblo I period, communal ritual architecture comprised oversized pit structures, great kivas, and possibly plazas. Plazas are present in the west and are most well defined at Alkali Ridge Site 13, which has at least three that are each bounded on three sides by surface room blocks (see Figure 13.4). There are also

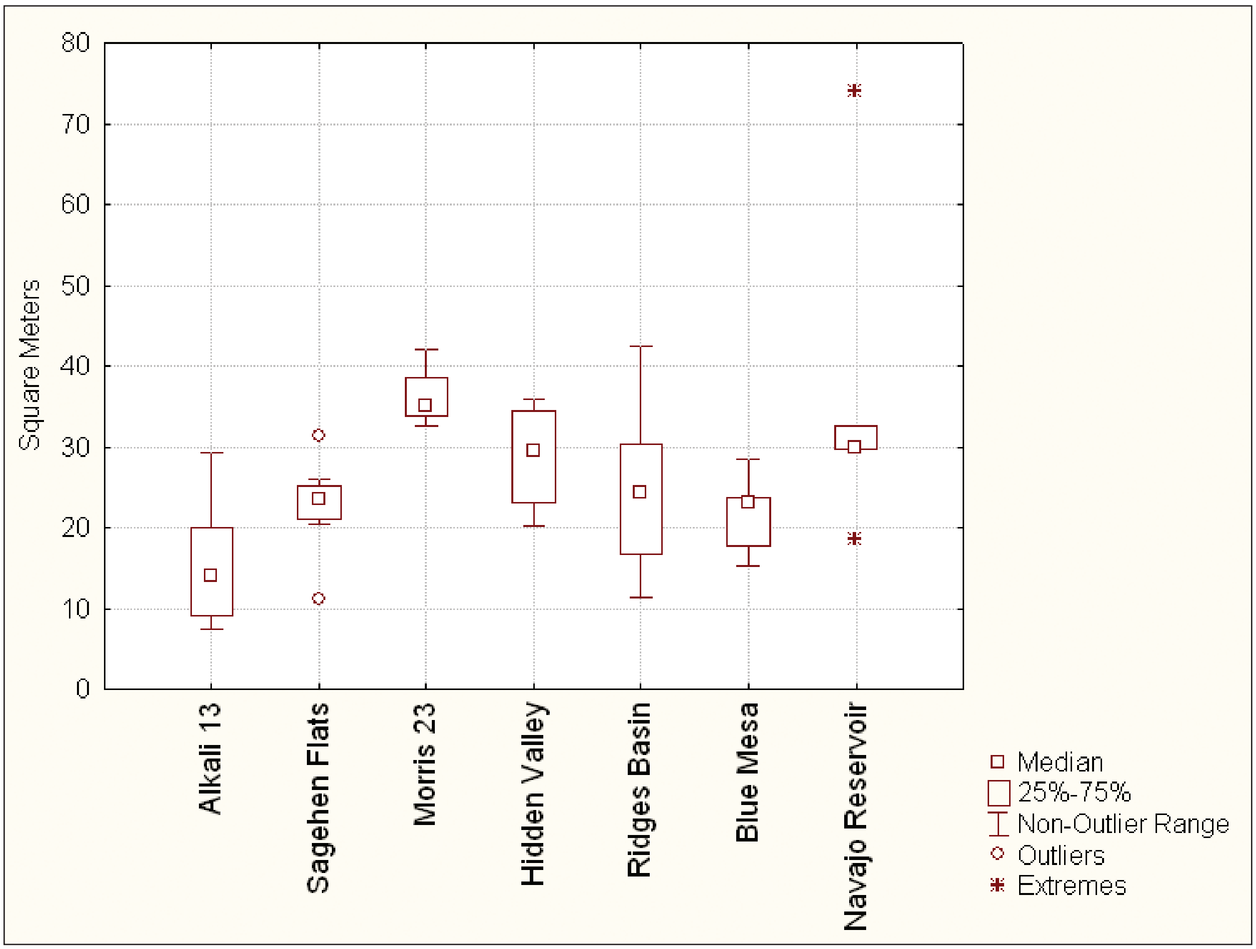

Figure 13.18. Floor areas for pit structures in early Pueblo I communities. Blue Mesa and Ridges Basin data from SWCA's excavations only. Navajo Reservoir data from LA3427, LA3434, and LA4086 (Eddy 1966). Hidden Valley data from Ign. 7:23, 7:30, 7:31, and 7:36 (Carlson 1963). Sagehen Flats data from 5MT2858, 5MT2854, 5MT2194, 5MT2193, and 5MT4644 (Kane and Gross 1986). Alkali Ridge Site 13 data from Pit Houses A–L (Brew 1946). Morris 23 data from Protokivas 4–7 (Morris 1939).

U-shaped room blocks at Martin's Site 2 and, slightly later (in the later ninth century), at McPhee Village, which may have enclosed small plaza areas where communal rituals occurred. Some U-shaped pueblos, such as McPhee Pueblo, had multicourse walls that connected the two ends of the U. These enclosed spaces are rare but present in the Pueblo I period. But very large, formal plazas enclosed on four sides in which communal ritual unambiguously occurred, as is evident in later pueblos, are not evident in the Pueblo I period. Therefore, it is not known whether communal rituals were held in the outdoor spaces at Alkali Ridge Site 13 and Martin's Site 2.

Within these open spaces, however, there is often an oversized pit structure. At Alkali Ridge Site 13, Brew's Pit Houses B, E, and M are "Type III" structures (Brew 1946:157): circular structures with six main support posts and a multitude of secondary support posts and larger-than-average floor areas (Figure 13.5 shows Pit Structure E). One of these structures is present in each plaza along with several smaller structures. As noted above, Brew interpreted these structures as ritual structures analogous to great kivas, but Chuipka (2008b:131) suggests that they are better classified as oversized pit structures due their relatively small size compared to other great kivas. A similar pattern was evident at McPhee Village, and researchers have noted the association at this late Pueblo I community among U-shaped room blocks, oversized pit structures, complex ritual floor features in these structures (Wilshusen 1989), the remains of communal feasting events (Blinman 1989), and ritual paraphernalia (Potter 1997a; Wilshusen 1989).

Two of the early Pueblo I communities included in this study—Grass Mesa Village and Morris 23—were associated with great kivas. (A great kiva is also present at Badger House on Mesa Verde, and even though the structure lacked tree ring dates, its stratigraphic relationship to dated structures suggests a date in the early A.D. 800s [Hayes and Lancaster 1975:60–63].) The great kiva at Grass Mesa (PS 7 in Figure 13.7) measured 22.6 m in diameter and had a floor area of approximately 400 m^2. It was constructed sometime between A.D. 760 and 810, and was discontinued from use by A.D. 850 (Lipe et al. 1988:617). Chuipka (2008b:146) notes that this structure is 16 times the size of the contemporaneous structures that surrounded it. The great kiva at Morris 23 has only been surface recorded and is represented by a 22-m-wide depression at the southern end of the community (Chuipka 2008b:114–115).

East of the La Plata River, communal ritual structures are rare and are not evident in most early Pueblo I communities, including in the communities of Hidden Valley, Blue Mesa, and Frances Mesa. The Sanchez Site in the Navajo Reservoir District (LA 4086) may be an exception. Pit House 1 at the Sanchez Site has a floor area of 74 m^2 and has a large bench, a sipapu, and subfloor pits (Eddy 1966:164–166). Eddy interprets this structure as a domicile for a large family, but, given its inordinate size compared to other pit structures on the site with average floor areas less than half that size, it could also have been a communal ritual structure.

Schachner (2001) argues that there was an important distinction between ritual associated with great kivas and ritual associated with oversized pit structures in the Pueblo I period. Great kiva ritual, he suggests, was not directly associated with particular social segments of a community, whereas communal ritual conducted in oversized pit structures was restricted to segments of the village or community. In other words, oversized pit structures were overtly controlled ritual spaces. He notes that oversized pit structures were two to five times the size of the smaller, household-level pit structures, and were therefore likely the loci of communal events. But, though oversized, they were considerably smaller than great kivas, physically limiting the number of participants in any ritual performance. Schachner (2001:180) also notes the clear association of oversized pit structures with U-shaped room blocks and suggests that access to these structures could have been easily controlled:

> The construction of U-shaped roomblocks created small, semienclosed courtyards that enveloped the oversized pit structures. In at least one case, McPhee Pueblo, a wall closed off the open end of the surrounding U-shaped roomblock, restricting access to the oversized pit structure to an even greater degree (Brisbin et al. 1988:234–235). This situation is quite different from that of great kivas, which although perhaps controlled by ritual sanction, were not physically restricted from community access.

In addition, Schachner (2001:181) observes that oversized pit structures are more formally laid out than great kivas and exhibit very little attribute variation, including size, shape, and internal layout:

> In some sense, oversized pit structures are regular domestic pit structures writ large, having the same shape and structural layout (posts, wingwalls, etc.) as smaller pit structures, but including very formalized features (foot drums, floor grooves, and perimeter benches) rarely found in other types of pit structures. Pueblo I great kivas, on the other hand, are often largely devoid of internal features.

By these standards, Ridges Basin contains no structures that would be considered great kivas. Five structures, however, may be considered oversized pit structures and may have been the loci of communal ritual. All of these structures were on the Sacred Ridge site. Their floor areas were all greater than 29.5 m^2, placing them in the category of large pit structure (see Chapter 10) (Table 13.1). In addition to being large, each had a bench, a conical pit offset from the hearth, and a sipapu directly behind the hearth—yet very few additional floor features—as well as a very standardized shape and layout (Figures 13.19–13.21; Table 13.1). Four of the five conical pits were offset to the left of the hearth (assuming one is facing the ventilator); the conical pit associated with Feature 41 was right of the hearth (Figures 13.19 and 13.21). All five structures had four main roof support posts set in the floor. And with the exception of Feature 49, they all had single-hole ventilators. Feature 49 had a large ventilator entryway (see foreground of Figure 13.21).

The best documented Pueblo I oversized pit structures are those at McPhee Village near Dolores (Kane and Robinson 1988; Wilshusen 1988b, 1989). Three structures associated with three different room blocks (5MT4475, 5MT4477, and 5MT5107) had roofed areas greater than 30 m^2 (67 m^2, 64 m^2, and 37 m^2, respectively) and contained a complex array of ritual floor features (Wilshusen 1989). Though the two largest of these structures were slightly larger than the largest structure documented at Sacred Ridge (Feature 49, which had a roofed area of approximately 59 m^2), the size range was quite comparable (see Table 13.1). The greatest difference between oversized structures at McPhee Village and Sacred Ridge was the tremendous number and complexity of ritual floor features in the McPhee Village structures (Figure 13.22)[3]. By contrast, the oversized structures at Sacred Ridge had few floor features, maximizing the usable floor space in each (see Figure 13.21).

In addition, unlike oversized pit structures in the west (e.g., at McPhee Village and Alkali Ridge Site 13), oversized pit structures in Ridges Basin were not enclosed by surface room blocks. They were, however, associated with specific households and, within Ridges Basin, were found only on Sacred Ridge. Thus, access to them may have been fairly controlled and restricted to segments of the village or community, as Schachner (2001) notes for oversized pit structures in the west. The role served by these structures in the community and the activities associated with them as evidenced by artifact assemblages is further discussed in Chapter 15, Ritual, Social Power, and Identity.

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[3] It should be noted that the Figure 13.22 photograph is of the basal floor of the structure and has features from both the upper and lower surfaces. A number of the features were filled in and capped.

Table 13.1. Oversized Pit Structures at the Sacred Ridge Site

Locus	Feature Number	Dimensions (m)	Roofed Area (m^2)	Floor Area (m^2)	Bench	Conical Pit	Sipapu	Shape
3	41	8.5 x 7.0	52	35	Present	Present	Present	D-shaped
5	117	8.8 x 7.6	57	40	Present	Present	Present	Sub-square
6	49	8.3 x 8.2	59	43	Present	Present	Present	Sub-square
7	83	7.0 x 6.3	38	30	Present	Present	Present	Sub-square
9	58	7.9 x 6.8	46	39	Present	Present	Present	Sub-square

Figure 13.19. Photographs of Feature 41 (upper left), Feature 117 (upper right), Feature 83 (lower left), and Feature 58 (lower right).

Surface Rooms

Early Pueblo I communities west of the La Plata River generally had double-row room blocks; the front rooms were generally living rooms and the back rooms storage rooms. Alkali Ridge Site 13, Sagehen Flats, and Morris 23 are examples of this type of arrangement (Brew 1946; Kane and Gross 1986; Morris 1939). Pit structures also shared room blocks; that is, room blocks were shared by more than one household. This is a pattern that persists into the late Pueblo I period (A.D. 850–900) in the west at sites such as Duckfoot (Lightfoot 1994) and McPhee Pueblo (Kane and Robinson 1988). Grass Mesa Village is the exception to this rule. In both the pre–A.D. 850 and the late Pueblo I incarnation of this settlement, room blocks were one-row deep and it is unknown whether multiple households shared room blocks (Lipe et al. 1988; Wilshusen and Ortman 1999). "Upright sandstone slabs, vertically coursed masonry, wattle and daub, and jacal construction styles are all found in Pueblo I rooms, sometimes with several styles evident in the same room" (Wilshusen 1988b:610). Often surface rooms combined lower masonry wall construction with an upper wall construction of mud and vegetal materials.

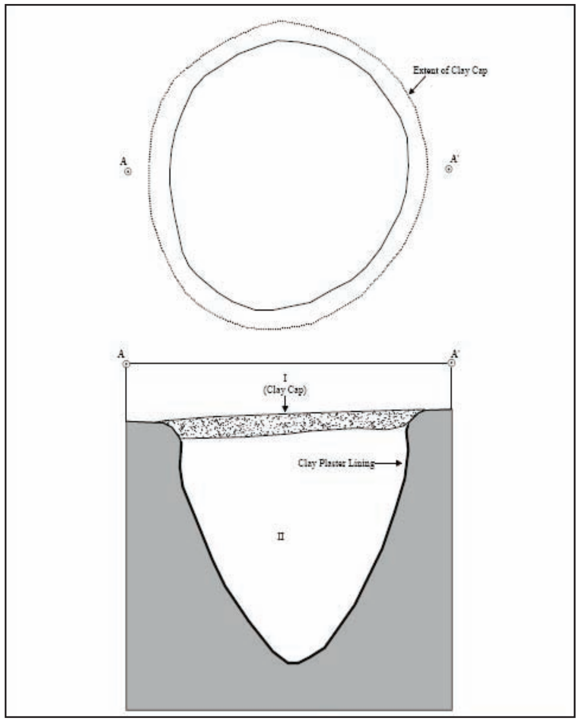

Figure 13.20. Plan and profile of Subfeature 41.03, a conical pit feature associated with Feature 41.

Figure 13.21. Photograph of Feature 49 at Locus 6 of the Sacred Ridge site, the largest structure in the project area.

Figure 13.22. Photograph of an oversized pit structure at McPhee Village showing complex ritual floor features (courtesy Richard Wilshusen).

Room blocks on Blue Mesa and in Ridges Basin, by contrast, were one-room deep and were not shared by more than one household. These rooms were most often storage rooms, but habitation activities are evident in some (see Chapter 10). They are also much more ephemeral in their construction and were mostly of wood and adobe construction, particularly in Ridges Basin. By contrast, upright slab construction was evident on Blue Mesa at 5LP2026 (Figure 13.23).

Surface rooms in Ridges Basin most often were made of jacal walls and a vegetal and adobe roof. Surface rooms were defined by the presence of post holes, rock alignments, and burned adobe wall fall and roof fall. Surface rooms at 5LP177 in the Eastern Cluster were some of the most substantial uncovered in Ridges Basin (Figure 13.24). The room block at 5LP177 consisted of two large rooms and two smaller rooms. All of the structures were approximately 2.7 m wide, with the two larger rooms being about 6.0 m long and the two smaller rooms being about 2.0 m long. Although much of the burned adobe and wood architectural debris of these rooms was jumbled, in situ sections were observed where timbers had collapsed inside the rooms. These sections revealed the impressions of parallel beams or posts embedded into a thick layer of smoothed adobe. These segments most likely represented portions of fallen walls constructed from series of wooden posts and smoothed adobe.

Some sites in Ridges Basin contained non-contiguous pit rooms rather than contiguous surface rooms. Pit rooms are not evident on Blue Mesa, but surface rooms in the Rosa area, including Navajo Reservoir and Frances Mesa, comprised non-contiguous pit rooms exclusively (see Figure 13.8).

Figure 13.23. Surface room block at 5LP2026 on Blue Mesa. Average room size is 4 m^2. Note the lack of floor features.

Figure 13.24. Surface room block at 5LP177 in Ridges Basin. Note the burned adobe evident on the floor and the lack of floor features.

Mortuary Features

Prior to the ALP project, 10 projects in the northern Southwest had recorded data on the context of mortuary features dating to the Pueblo I period (A.D. 750–900). Four of these projects were conducted west of the La Plata River drainage, and six were conducted within or east of the La Plata River drainage (Table 13.2). The data suggest that west of the La Plata, interment occurred more frequently in association with architecture. A full two-thirds (66.5%) of interments west of the La Plata River were found in intramural contexts, either in association with a pit structure (on the floor, in post-occupational fill, or in ventilator shaft fill) or in fill or floor contexts in surface structures. In contrast, east of the La Plata River, including in Ridges Basin, 88 percent of interments occurred in extramural nonarchitectural contexts such as middens, extramural non-midden areas, and extramural pits (Figure 13.25; Table 13.2).

These larger spatial patterns hold true even though several mortuary contexts pose interpretive challenges. Individuals found on the occupational surfaces of pit structures have been interpreted in a number of ways in the western subregion, for example. Several of the individuals found on the floors of McPhee Village pit structures are interpreted as having been intentionally killed (Wilshusen 1986), whereas individuals in association with pit structure floors at Duckfoot seem to have been entombed in the house (perhaps the house they had lived in) as part of a normal (nonviolent) mortuary sequence (Hoffman 1993:265–268; Lightfoot 1994:46–48). Regardless, even without these floor-contact interments, the high incidence in the western subregion of interments in association with surface structures and pit structure fill and ventilators indicates a strong association of formal interments with architectural contexts.

The few instances in the eastern subregion of bodies associated with the floor of a pit structure may not relate to standard mortuary practice. Two individuals found on a pit structure floor at 5LP481 in Bodo Canyon appear to represent individuals who were trapped in the structure when it burned (Fuller 1988a:138). To Fritz and Honeycutt (2003), the position of an adult woman on the floor of a pit structure at 5LP379 on Blue Mesa suggests that this was not a formal burial. The individual was lying supine with arms bent and the hands adjacent to the head. The legs were splayed apart with the knees slightly bent and pointing outward.

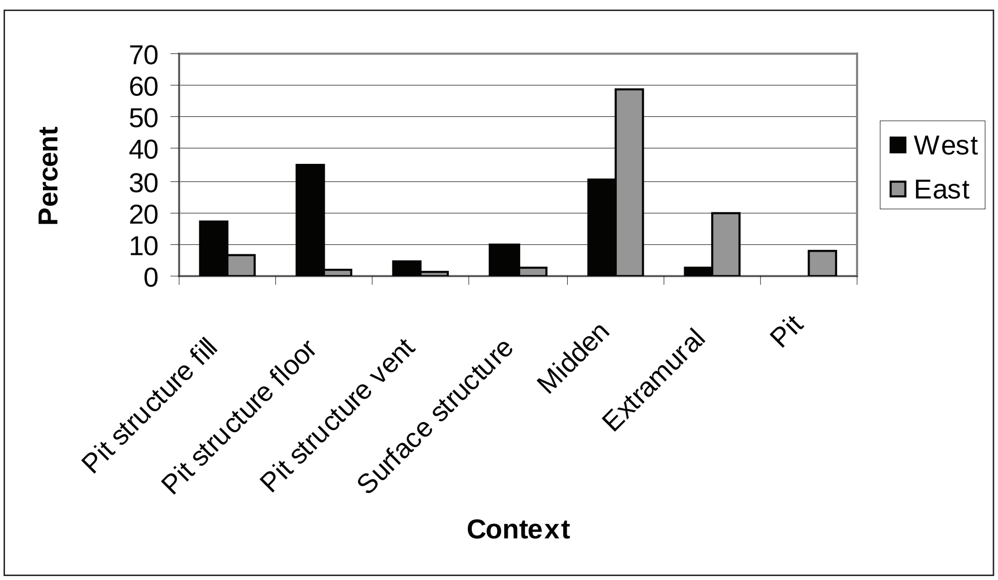

Figure 13.25. Relative frequencies of mortuary feature contexts in the western subregion and eastern subregion of the Northern San Juan region.

Table 13.2. Pueblo I Mortuary Feature Contexts in the Northern San Juan Region

Project or Area (sites containing Pueblo I mortuary features)	Number of Mortuary Features	Number of Individuals	Context of Interment: Extramural			Context of Interment: Intramural				Reference
			Midden/ Refuse Mound	Extramural Area (non-midden)	Extramural Pit	Pit Structure Fill/ Bench	Pit Structure Floor	Pit Structure Ventilator	Surface Structure Fill/ Floor/Subfloor	
Western Subregion										
Alkali Ridge (Site 13)	1	1		1 (100.0)						Brew 1946
Badger House (MV1676)	7	9	2 (22.2)				4 (44.4)		3 (33.3)	Hayes and Lancaster 1975
Dolores Archaeological Program (Grass Mesa, McPhee Village, Periman Hamlet)	37	45	12 (26.6)	1 (2.2)		12 (26.6)	13 (28.9)	3 (6.7)	4 (8.9)	Stodder 1987
Duckfoot (Duckfoot Site, 5MT3868)	11	14	7 (50.0)				7 (50.0)			Lightfoot and Etzkorn 1993
Totals for Western Subregion	***56***	***69***	***21 (30.4)***	***2 (2.9)***	***0 (0.0)***	***12 (17.3)***	***24 (34.8)***	***3 (4.3)***	***7 (10.1)***	
Eastern Subregion										
La Plata District (Morris 33)	8	8		8 (100.0)						Morris 1939
ALP Project (various)	125	142	79 (55.6)	33 (23.2)	8 (5.6)	14 (9.9)	1 (0.7)	2 (1.4)	5 (3.5)	
UMTRA–Bodo Canyon (5LP481, 5LP483)	12	12	9 (75.0)			1 (6.7)	2 (16.7)			Fuller 1988
MAPL (5LP379)	1	1					1 (100.0)			Fritz and Honeycutt 2003
Hidden Valley (Ign. 7:23)	17	17	17 (100.0)							Carlson 1963
Navajo Reservoir (Sambrito Village, LA 4195)	3	9			9 (100.0)					Eddy 1966
Piedra District (“A” Village)	16	16	16 (100.0)							Roberts 1930
Totals for Eastern Subregion	***182***	***205***	***121 (59.0)***	***41 (20.0)***	***17 (8.3)***	***15 (7.3)***	***4 (2.0)***	***2 (1.0)***	***5 (2.4)***	

The body position implies that the individual died where she fell (Fritz and Honeycutt 2003:3-20). Two projectile points found in association with this individual led the authors to conclude that "the woman was killed in an act of violence and the pit house was then pulled down and burned over her body" (Fritz and Honeycutt 2003:3-21).

The single individual found on a pit structure floor in Ridges Basin as part of the ALP project also may have been killed. At 5LP237 the skeletal remains of a young adult male (Burial 137) were discovered on the floor of a burned pit structure. The pattern of burning on the remains suggests that the individual was lying on his left side when the burned roof collapsed. Two projectile points and remnants of a feather and yucca blanket were found in association with this individual (Eisenhauer et al. 2008e:244). As with the Blue Mesa example, one interpretation is that this did not represent a formal burial but rather an incidence of violence. It is possible the victim was killed with arrows while sleeping on the blanket and the house was then burned down over him. The rarity of this type of mortuary feature in the eastern subregion and its similarity to other nearby human remains that have been interpreted as acts of violence rather than formal burials makes this a likely explanation.

It is also possible, however, that these individuals died elsewhere and were then placed on the floors of the pit structures, which were then burned down around them as part of a formal mortuary ritual. It is not known whether this has positive or negative connotations about the individual or the manner of death, but it might have been a rather expensive ritual if it required roof beams and an otherwise useable structure to be destroyed. As Wilshusen (1986:254) notes about floor-associated interments at McPhee Pueblo, "the fact that burials appear to have been deposited in ritual structures of secondary importance suggests that the individuals lacked social status at their death and yet that their demise had sufficient ritual importance to provoke the community into destroying a ritual structure in order to bury them (e.g., they were 'witches')."

Another Pueblo I context of interment with multiple possible interpretations is the exterior pit. These features were common at Sambrito Village in the Navajo Reservoir area (see Table 13.2) and consisted of burials "found almost entirely in pits which were originally dug for other purposes" (Eddy 1966:243). Often multiple individuals were placed in the pits.

> Most bodies were grouped in sets of from two to four…. Some of these group interments may have resulted from reuse of a pit, but lack of evidence of later disturbance indicates planned multiple burials in most cases. Since the combined burials were made in pits of undercut style, it was necessary either to place the bodies in layers or side by side near the outflaring base of the pit chamber. Sometimes combinations of these arrangements were made with two skeletons side by side near the bottom, both being overlain by a third near the top of the pit. (Eddy 1966:243)

Since most of these mortuary features contained graves goods—primarily ceramic pots—they were considered formal burials and not the haphazard burial of victims of violence. A similar feature in Ridges Basin, however, is not so clearly interpreted. A former roasting pit at 5LP237 contained four adults and one child. The individuals appeared to have been deposited in the pit haphazardly, with no accompanying goods (Eisenhauer et al. 2008e:245). The uniqueness of this mortuary feature compared to others in Ridges Basin suggests that it does not represent usual mortuary treatment, which may either indicate uniquely strong ties of a single household with Sambrito Village or a single instance of the quick and informal disposal of victims of violence or disease.

Ridges Basin excavations for the ALP project more than doubled the number of Pueblo I mortuary features for which the context of interment has been described. Contextual data from Ridges Basin indicate a strong association with the eastern subregion—with most interments associated with extramural areas—rather than with the western subregion, in which architectural interments predominate. Moreover, the few individuals in and around Ridges Basin that were found associated with architectural features were either victims of violence or an accidental house fire rather than recipients of formal mortuary treatment.

Ceramic Design

Glaze-painted black-on-white bowls from the Rosa area, including Ridges Basin, have distinctive layouts that almost always include a small circle in the bottom of the bowl and that make extensive use of concentric circles, including "walking circles" (Allison 2010) (Figure 13.26, lower right). These characteristics are less common on black-on-white mineral-painted bowls from the west of the La Plata river (the Piedra area [see Figure 13.3]), which more often incorporate rectilinear elements. "At least two local whiteware technological and stylistic traditions thus occurred in the region, with the division somewhere near the La Plata River" (Allison 2008:53). San Juan Red Ware, including both Abajo Red-on-orange and Bluff Black-on-red varieties, is another decorated vessel type found in Ridges Basin. These vessels were imported into Ridges Basin, however, and therefore do not represent a local design style. Redware exchange is discussed in more detail in Chapter 14.

Environment

Chapter 9, The Natural Environment, describes the local environment of Ridges Basin, using archaeological, geomorphic, paleoclimatic, and modern environmental data. Interestingly, when comparing the local natural environments of other early Pueblo I communities in the northern Southwest, the similarities are striking. Alkali Ridge Site 13, Sagehen Flats, Grass Mesa, Morris 23, Ridges Basin, and Blue Mesa are all situated at elevations between 6,250 and 6,850 feet above mean

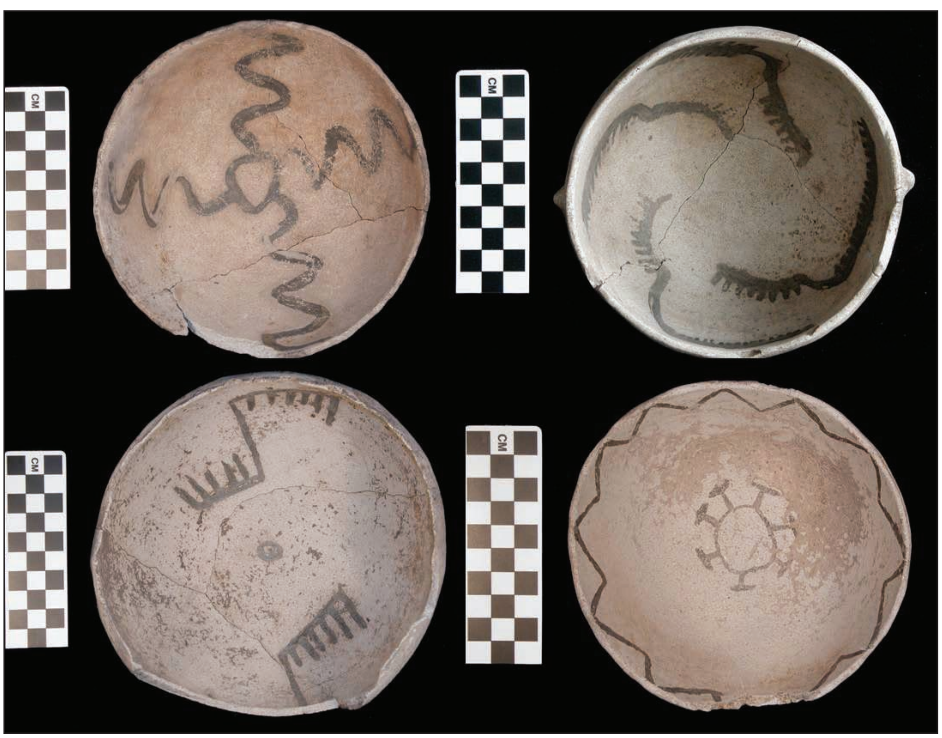

Figure 13.26. Rosa Black-on-white bowls from Ridges Basin.

sea level (Chuipka 2008b:48–50). Furthermore, Chuipka (2008b:48) notes that

> directly related to the occupation of this elevation range, each site occupies an ecologically diverse location where a variety of biotic communities interface. All of the sites in the study sample are located within 5 km (3.0 miles) of no fewer than five different biotic communities. Each of these biotic communities hosts a variety of economically useful wild plant and animal species that would have been important as both food and raw material resources.

A third similarity noted by Chuipka is that each of these communities, including Ridges Basin, is located on or immediately adjacent to deep soils suitable for dryland farming.

> These soils are characterized as well-drained, fine to very fine sandy loam and clay loam (Honeycutt 1985:17–20; Lipe et al. 1988:11–15). These soils are highly suitable for dry-farm techniques as they absorb high quantities of moisture during melting of winter precipitation and retain that moisture well during the growing season (Fuller 1988a:5). (Chuipka 2008b:49)

Finally, at least two other Pueblo I communities, besides Ridges Basin, are located near a marsh. Sagehen Flats was an open, flat, bottom-lands area west of the Dolores River. Prior to inundation by McPhee Reservoir, this area contained a substantial wetland known as the Sagehen Flats Marsh (Clay 1985; Petersen 1985) and two Pueblo I communities, the Sagehen Flats community and, later, McPhee Village. It seems possible that some Pueblo I communities were intentionally established in or near marshy environments[4]. Marshes not only collect water but also attract game for hunting, and they produce wetland ruderal foods such as cattail (Wilshusen et al. 1997:675). Moreover, marshes hold a special place in the Pueblo landscape for their religious and spiritual significance (Potter 2009:211).

[4] There was a wetland area just below Morris 23 in the form of an old abandoned bend in the river. But it is not clear whether it would have been there in Pueblo I times.

SUMMARY

The Ridges Basin community was similar to other Pueblo I communities and yet unique. Its population size, its spatial extensiveness, and the unevenness of the distribution of its population are unprecedented and unmatched in the Northern San Juan region at that time. It is the only known early Pueblo I community to consist of a core village and dispersed settlement clusters. Additionally, the Ridges Basin community is the most architecturally heterogeneous early Pueblo I community in the Northern San Juan. Indeed, one of the most distinctive traits exhibited by the Ridges Basin community is the presence of the oversized pit structures associated with—and only with—the Sacred Ridge site. These structures were not only large; they were extremely consistent in their internal architectural traits. Each contained a conical pit offset from the hearth, a wide bench, few floor features, and four main roof support posts in the floor. Four of the five structures had a single-hole ventilator, while one, the largest, had a ventilator entry. These structures were similar in size to oversized pit structures documented at McPhee Village and Alkali Ridge Site 13, but, unlike those structures, they were not enclosed by surface rooms and did not contain extensive ritual floor features. They may have functioned more as great kivas in that access to them was not blocked by surface rooms or walls, and they appear to have been constructed to accommodate large numbers of people, albeit still just a segment of the total community population.

In other ways, however, Ridges Basin fits the expectations derived from its geographic location. Locally decorated ceramics are consistently Rosa style. Internal pit structure feature traits were more similar to those of nearby communities than to those of distant communities. Surface room construction combined both eastern and western building styles but, being only one-room deep, was most often similar to surface room construction in the Rosa area. And, the context of interment of human remains (extramural rather than intramural) was most similar to the pattern documented in the Rosa area.

Whether these settlements can be considered socially meaningful entities or whether they are simply archaeological constructs may still be an empirical question. Social groups analogous to what anthropologists term *communities* are not necessarily present in every society (Hegmen 2002), and the social construction of a community is a process to be documented rather than assumed (Kintigh 2003; Schachner 2008; Varien and Potter 2008). That said, perhaps Pauketat's description of communities as *hybridities* is a productive way to view these early population centers (Pauketat 2008 citing Alt 2006). Hybridities are the places where "differences engage," and are the spaces for "the creation of new cultural forms" (Alt 2006:291). "When dissimilar agents occupy a common ground, their collective co-engagement has the potential to generate novel outcomes: hybridity" (Pauketat 2008:241). The tremendous variation and fluidity exhibited by Pueblo I communities suggest that this term characterizes these settlements better, perhaps, than does the classic term *community*.

Chapter 14: The Economy

James M. Potter

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)

Ware	ALP Project	Duckfoot[a]	DAP A.D. 775–825[b]	DAP A.D. 825–880[b]	Fruitland Project[c]
Grayware	87.7	89.8	88.8	91.0	88.8
Whiteware	11.1	5.0	2.5	4.6	3.4
Redware	1.0	5.2	8.9	4.4	7.8

[a] Etzkorn et al. 1993:Table 3.1
[b] Blinman 1986:Table 2.5
[c] 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 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 bullrush. 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.

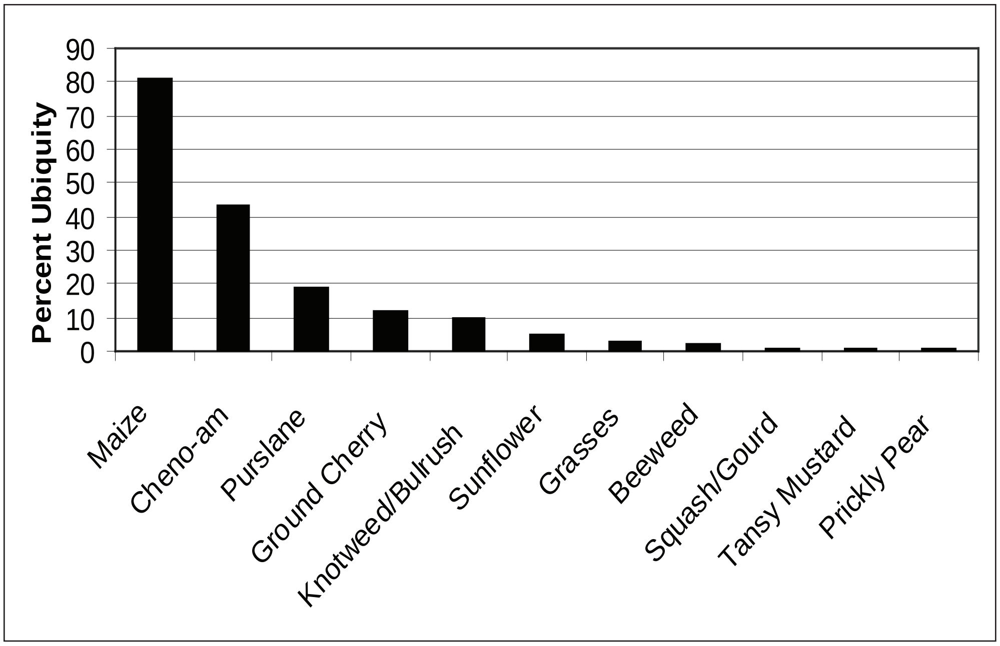

Figure 14.1. Percent ubiquity of major economic plant types from Pueblo I habitation sites in Ridges Basin.

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.

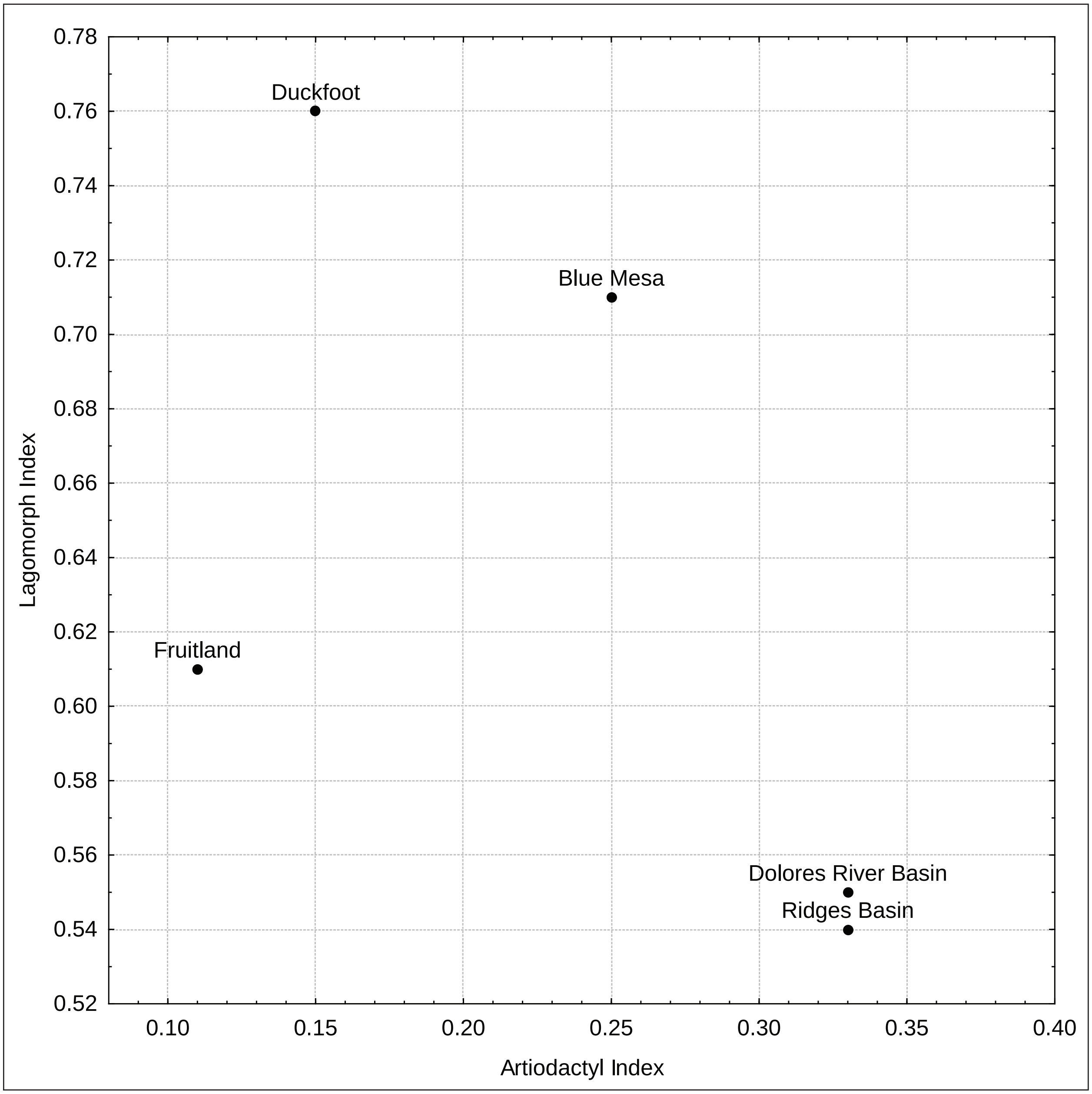

Figure 14.2. Plot of artiodactyl and lagomorph indices from five Pueblo I locales.

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.

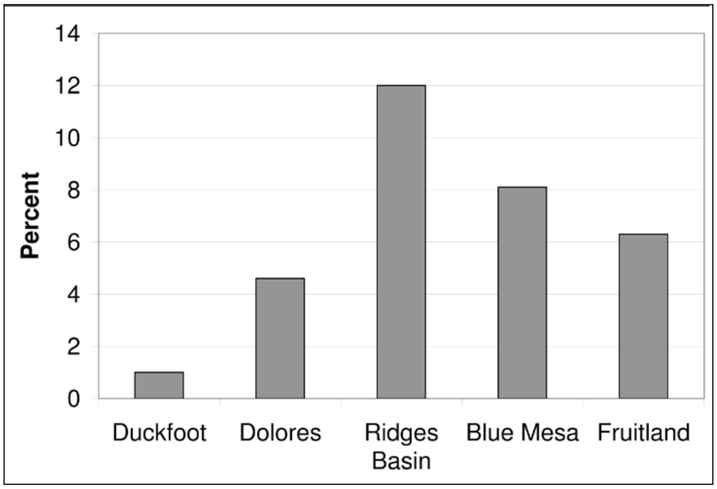

Figure 14.3. Avian percentages for assemblages from five Pueblo I locales across the Northern San Juan region.

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 piñon 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 piñon 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

Site Number	Architecture	Extramural Hearths/Pits	Ceramics	Flaked Stone	Ground Stone	Fauna	Charred Maize
5LP171	×		×	×	×	×	×
5LP181	×	×	×	×	×	×	
5LP183		×	×	×	×		
5LP186	×	×	×	×	×	×	×
5LP452			×	×	×	×	
5LP484			×	×	×		
5LP495			×	×	×		
5LP496			×	×	×		
5LP498	×	×	×	×	×		
5LP508			×	×			
5LP537			×	×	×		
5LP545			×	×			
5LP567	×		×	×	×	×	
5LP569			×	×	×		
5LP588		×	×	×		×	
5LP601		×	×	×	×	×	
5LP608		×	×	×	×		×
5LP635		×	×	×	×	×	
5LP1095			×	×	×		

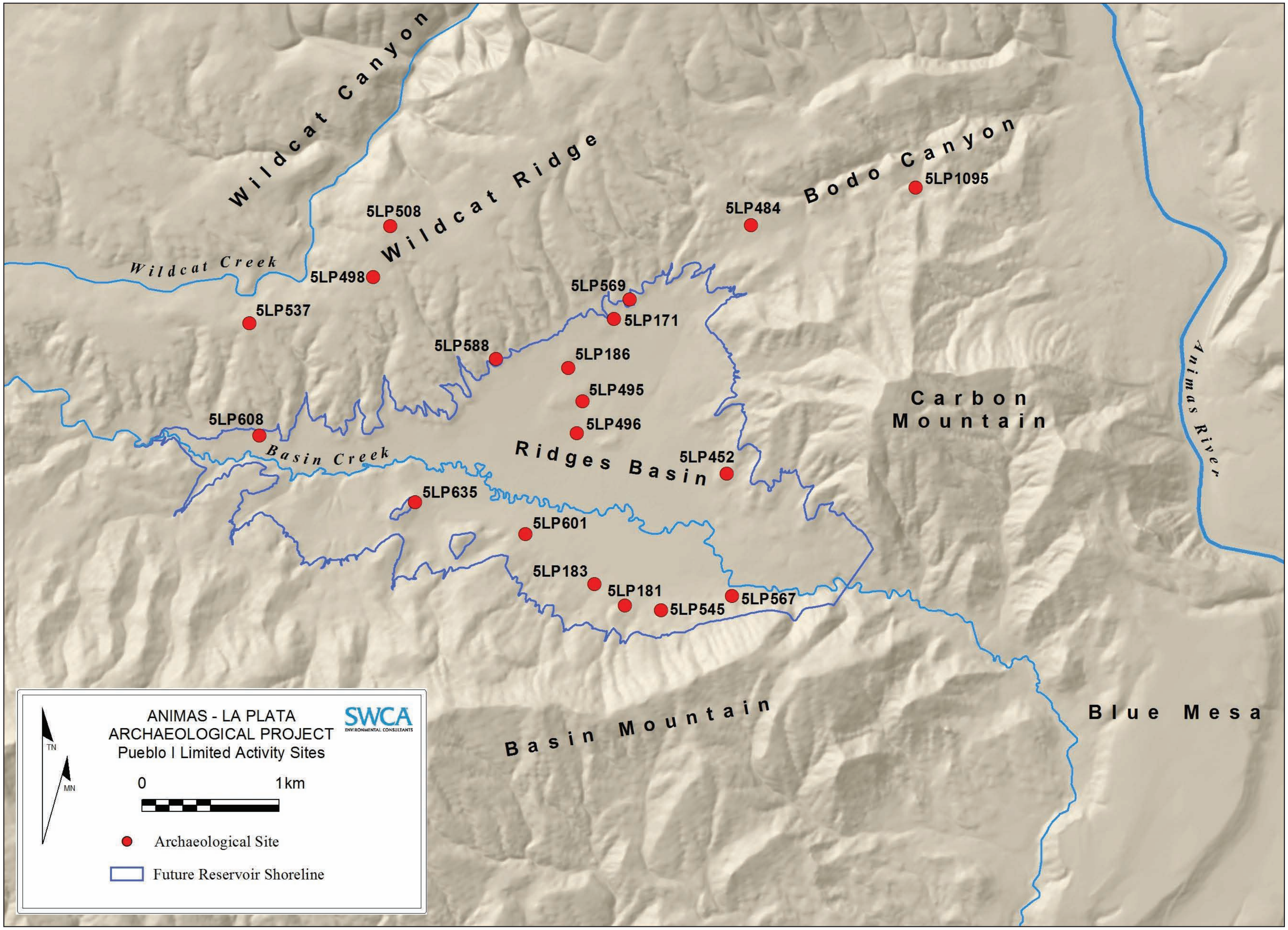

Figure 14.4. Map of Pueblo I limited activity sites in and around Ridges Basin.

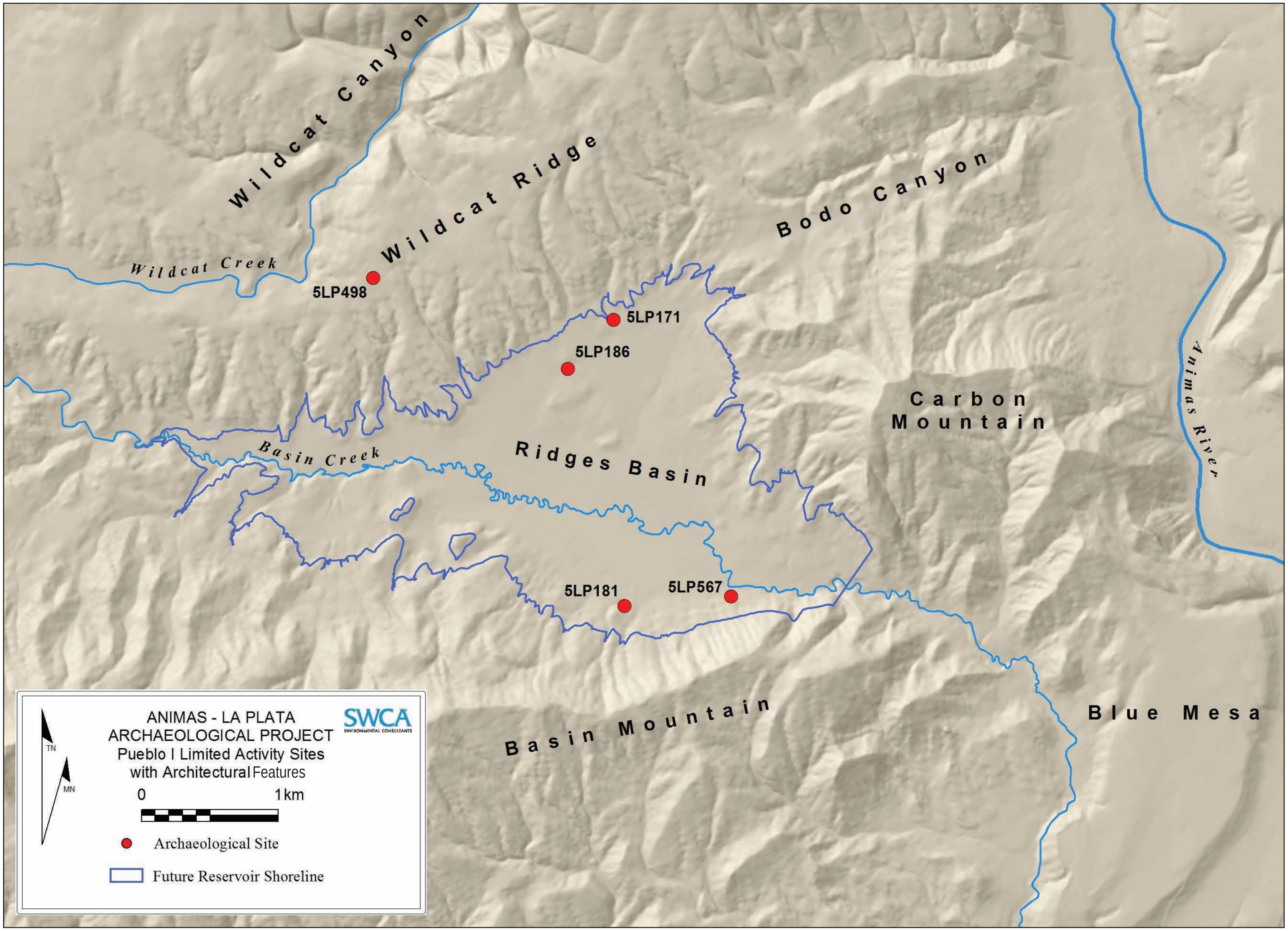

Figure 14.5. Map of Pueblo I limited activity sites containing architectural features in and around Ridges Basin.

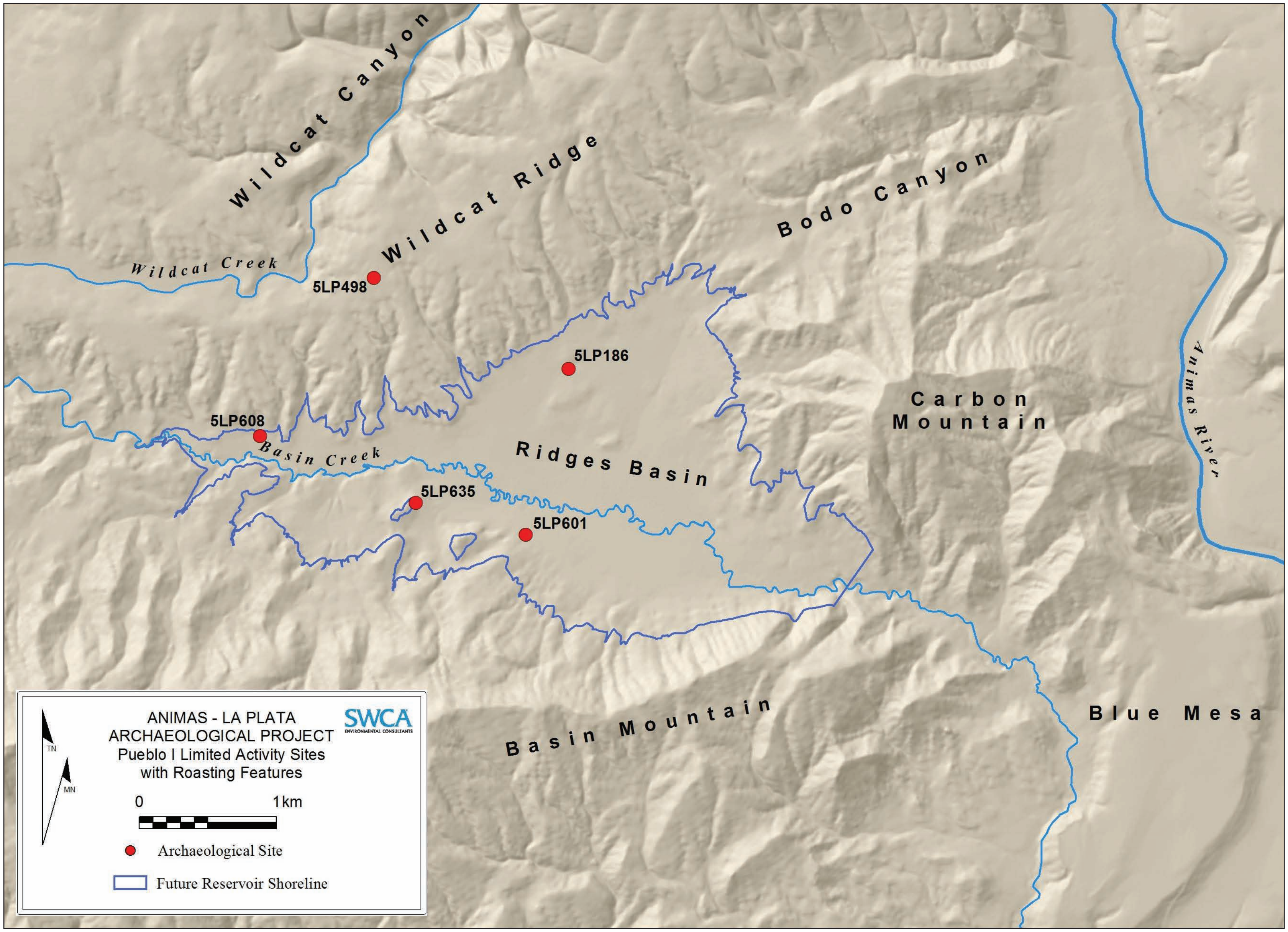

Figure 14.6. Map of Pueblo I limited activity sites containing roasting features in and around Ridges Basin.

Table 14.3. Pueblo I Limited Activity Sites with Pit Features

Site Number	Pit (function unknown)	Roasting/ Fire Pit	Slab-lined Storage Pit	Extramural Hearth
5LP181*	×			
5LP183	×			
5LP186*		×	×	
5LP498*		×	×	×
5LP588				×
5LP601		×		
5LP608	×	×	×	
5LP635		×		×

* Architectural sites

Artifacts

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

Site Number	Plainware	Whiteware	Redware	Bowl	Jar	Bowl-to-jar Ratio __:1
5LP171	59	1		10	4	2.5
5LP181	209	23	2	22	19	1.2
5LP183	93	35		33	16	2.1
5LP186	375	113	1	46	45	1.0
5LP452	5	1		1	0	–
5LP484*	272	87		79	4	19.8
5LP495	45	1		1	0	–
5LP496	5			0	0	–
5LP498	88	10		7	18	0.4
5LP508	10			1	7	0.1
5LP537	4			0	1	–
5LP545	2	2		2	0	–
5LP567	130	17		9	25	0.4
5LP569	10	2		2	1	2.0
5LP588		2		1	1	1.0
5LP601	134	23	1	22	5	4.4
5LP608	57	1		2	0	–
5LP635	270	20	3	25	27	0.9
5LP1095	3	1		1	0	–
Total/Mean	**1,771**	**339**	**7**	**264**	**173**	**1.1**

* 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.

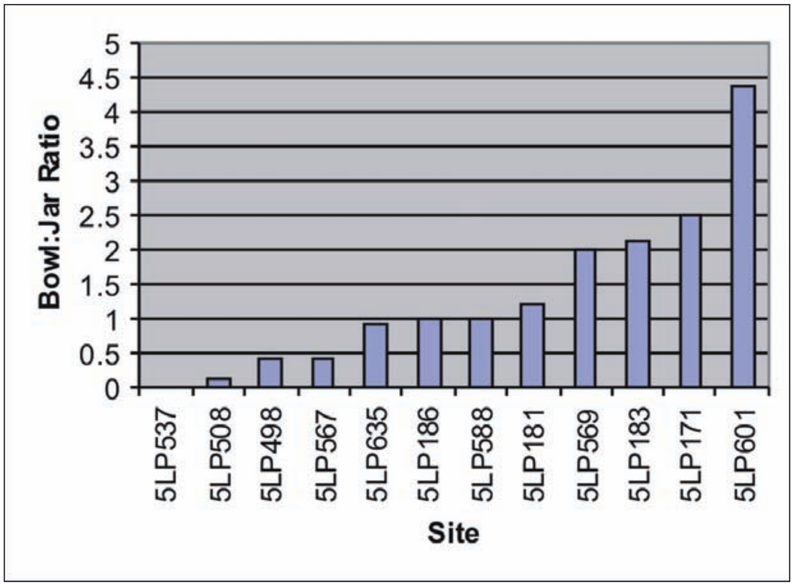

Figure 14.7. Bowl-to-jar ratios for Pueblo I limited activity sites. Sites on the left side had more jars than bowls. Sites on the right side had more bowls than jars. Sites in the middle had an even ratio.

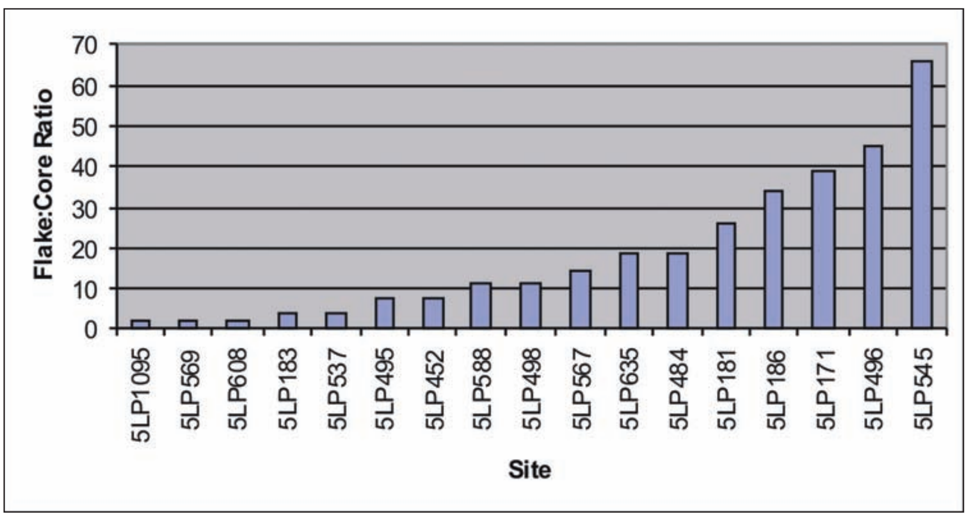

Figure 14.8. Flake-to-core ratios for Pueblo I limited activity sites. Sites on the left side had more cores than flakes. Sites in the center and on the right had more flakes than cores.

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 14.5. Flaked Stone Artifacts from Pueblo I Limited Activity Sites

Site Number	Cores and Flakes			Tools									
	Cores	**Flakes**	**Flake-to-core Ratio __:1**	**Hammer-stone**	**Used Flake**	**Scraper**	**Perforator/ Engraver**	**Chopper**	**Saw**	**Drill**	**Knife**	**Projectile Point**	**Total Tools**
5LP171	1	39	39.0	3	13	10	1			1			28
5LP181	3	79	26.3	3	2	1		2				1	9
5LP183	9	33	3.7		24	5							29
5LP186	4	136	34.0	4	26	9		1			1	4	45
5LP452	9	70	7.8	4	8	3					1		16
5LP484	11	206	19.0	15	16	16		4	2			1	54
5LP495	3	23	7.7									2	2
5LP496	1	45	45.0			1					2	1	4
5LP498	5	58	11.6	4	14	8					2	1	29
5LP508	0	21			1								1
5LP537	4	16	4.0		10	3							13
5LP545	1	66	66.0	1	15	4				1	1	1	23
5LP567	2	29	14.5	2	3	8		1					14
5LP569	4	8	2.0	1	7	4							12
5LP588	4	44	11.0	1	31	3						1	36
5LP601	0	60		2	61	18	3						84
5LP608	4	8	2.0	1	7	2							10
5LP635	6	109	18.2	1	2	1		11		2		4	21
5LP1095	4	7	1.8		4								4
Total	**75**	**1,057**	**14.1**	**42**	**244**	**96**	**4**	**19**	**2**	**4**	**7**	**16**	**434**

Table 14.6. Ground Stone and Flake Artifact Counts and Flake–to–Ground Stone Ratios from Pueblo I Limited Activity Sites

Site Number	Ground Stone Items	Flakes	Flake–to–ground stone Ratio __:1
5LP171	5	39	7.8
5LP181	8	79	9.9
5LP183	1	33	33.0
5LP186	12	136	11.3
5LP452	8	70	8.8
5LP484	11	206	18.7
5LP495	5	23	4.6
5LP496	2	45	22.5
5LP498	8	58	7.3
5LP508	0	21	–
5LP537	14	16	1.1
5LP545	0	66	–
5LP567	2	29	14.5
5LP569	2	8	4.0
5LP588	0	44	–
5LP601	3	60	20.0
5LP608	6	8	1.3
5LP635	39	109	2.8
5LP1095	5	7	1.4
Total/Mean	**131**	**1,057**	**16.9**

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

Site Number	Ungulate/ Deer/Elk	Dog-sized Mammal	Cottontail	Small Mammal/ Rodent	Total
5LP171	9		1	11	**21**
5LP181	1	16			**17**
5LP186	3			9	**12**
5LP452	1				**1**
5LP567	1				**1**
5LP601	1		1		**2**
5LP635	20				**20**
Total	**36**	**16**	**2**	**20**	**74**

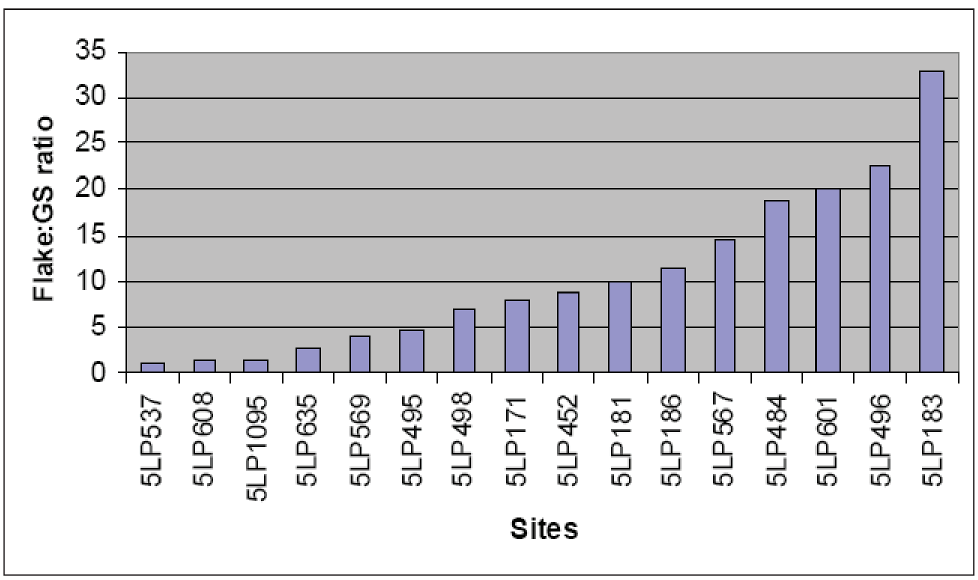

Figure 14.9. Flake–to–ground stone ratios for Pueblo I limited activity sites. Sites on the left side had higher ratios of ground stone.

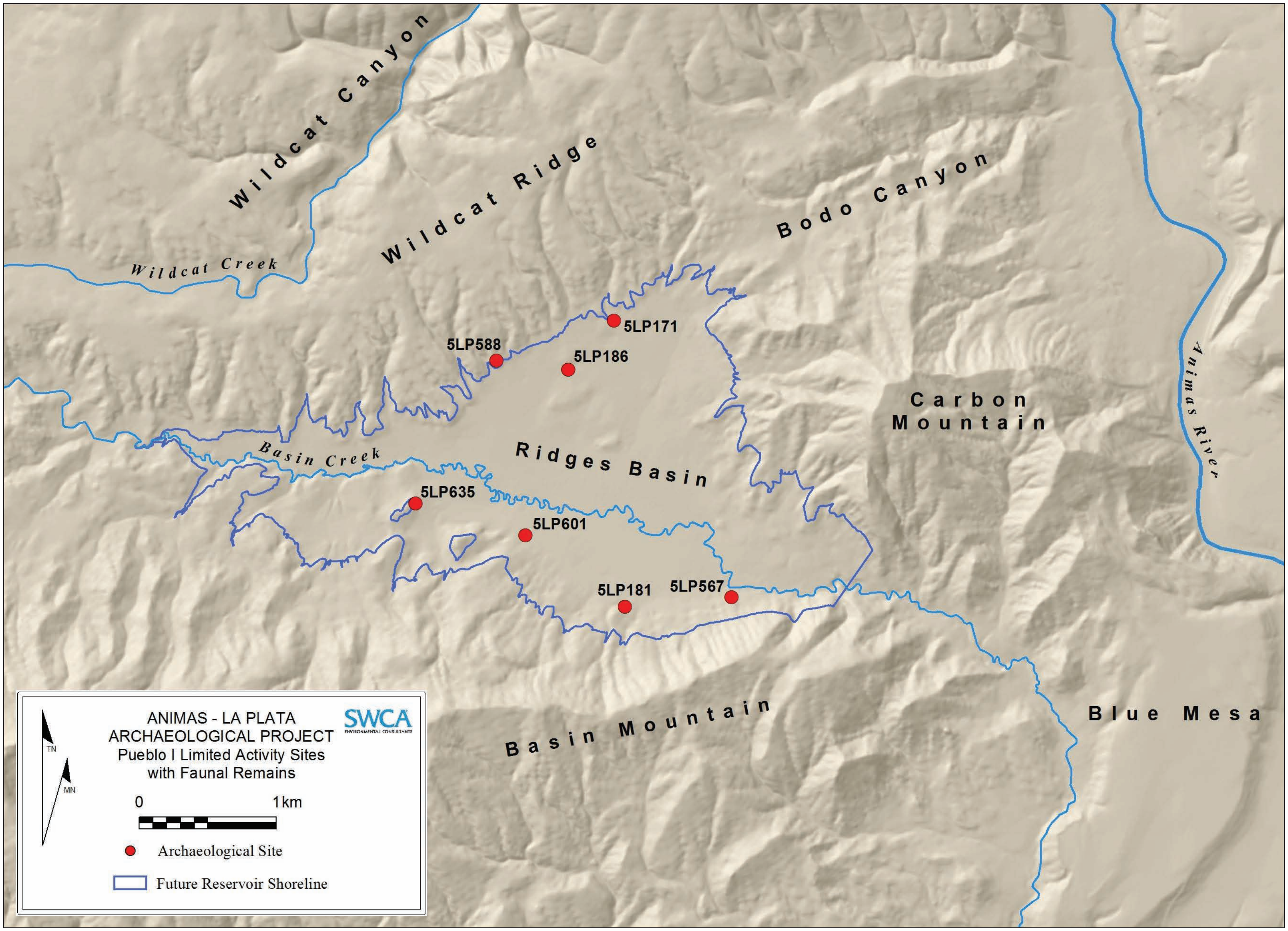

Figure 14.10. Map of Pueblo I limited activity sites with faunal remains.

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

Site Number	Short-term Living/Camping	Field Tending	Maize Processing/ Cooking	Wild Plant Collecting/ Processing	Game Processing	Core-reduction/ Knapping	Tree Felling/ Processing
5LP171	××		×	×	××	×	
5LP181		×		×	×	×	
5LP183	×				×		
5LP186	×		×	×	××	×	
5LP452				×	×		
5LP484	××				×	×	
5LP495				×			
5LP496						×	
5LP498	×			××			
5LP508							
5LP537				×			
5LP545						×	
5LP567		×			×		
5LP569	×			×			
5LP588	×				××		
5LP601	×			×	××		
5LP608			×	××			
5LP635	××			××	×		×
5LP1095				×			

× = 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 km^2), 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.

Chapter 15: Ritual, Social Power, and Identity

James M. Potter

Communal ritual is fundamental to constructing community life in Neolithic and Formative societies. The early Pueblo I community in Ridges Basin was no exception. Data from across the project area—in particular, patterning among bioarchaeological data, architecture, artifacts, and mortuary features—indicate that ritual was integral to the structuring of social relations within the community, and was part of constructing social identities and promoting social power differentiation among households. This chapter explores each of these material realms and their role in ritual practice and the development of social relationships in the Ridges Basin community. In addition, it notes the economic, political, and ritual dominance of the Sacred Ridge site (5LP245) within the Ridges Basin community and the potential reasons underlying this dominance, including the establishment of a pioneer settlement there and its subsequent control over ritual practices in the community.

Ritual is a form of behavior characterized by its formalism, traditionalism, invariance, rule-governance, sacral symbolism, and performance (Bell 1997; Rappaport 1979). Although archaeologists differ in how they conceive of the relationship between religion and ritual (Fogelin 2007; Insoll 2004), this chapter focuses on the effects of ritual on the social relations among ritual participants, regardless of underlying religious belief. In other words, the emphasis is on what ritual does rather than what it means. Of particular interest here is understanding the role of ritual in constructing social identities (Varien and Potter 2008), and examining the ways people used ritual to affirm or challenge power relations and the dominant social order (Bradley 1998; DeMarrais et al. 1996; Fogelin 2007; Inomata 2006).

As Rappaport (1979:174) states, ritual is "*the* basic social act," and for all rituals, performance is a constituent feature. "Performance as well as formality is necessary to ritual…. [I]f there is no performance there is no ritual" (Rappaport 1979:176). It is in the context of communal performance and participation that rituals communicate both canonical messages—those encoded in liturgy—and indexical messages—those aspects that communicate the ritual performer's status, identity, and state of being, and that rely on whatever opportunities the liturgy offers for variation (Rappaport 1979). Both types of information can promote social differentiation. Indeed, the control of ritual and differential access to ritual knowledge (the canons of the liturgy) has been argued to be the fundamental basis for social ranking in Pueblo societies (e.g., Adams 1989; Brandt 1994; Potter and Perry 2000; Spielmann 1998; Upham 1989; Whiteley 1988). But strategic manipulation of indexical messages—the potential for variation in otherwise invariant liturgy—may also promote social differentiation (e.g., Schachner 2001). For instance, there is always the possibility for variation in occurrence (i.e., whether or not to conduct the ritual at a particular time), who participates in a ritual performance, and the content of the ritual itself. The content of the ritual offers the potential for the greatest amount of variation. Even the most invariant of liturgical orders allows variations of a numerical sort. For example, as Rappaport (1979:183) notes of the Kaiko ritual of the Papua New Guinea group the Tsembaga,

> what is not specified by liturgy, but is of great importance to all concerned, is the order in which the names of the allies are called out. He who is called first is most honored. He who is called last may well feel dishonored.

Another important source of variation is quantity, which is most evident in potlatches, feasting ceremonies, and mortuary rituals. For the Tsembaga, during the Kaiko ceremony messages concerning worthiness and prestige are communicated by the numbers of pigs slaughtered and the amount of pearl shells, blankets, coppers, and similar valuables imparted as gifts. Similar messages may be communicated through the quantity and types of items placed in association with the deceased during mortuary rituals.

Indexical messages operate as public counting and ordering devices, which in turn reduce the vagueness of a social situation by facilitating social comparison, while canonical messages imbue those distinctions with authority and sacredness (Rappaport 1979:184). Power relations thus are created and sanctified through ritual performance by simultaneously expressing social distinctions and refuting their arbitrariness.

In addition to the messages communicated during ritual performance, constructing symbolically charged ritual spaces and limiting access to these spaces can be another strategy for creating power differences among community members.

> The construction of a sacred building… is an avenue toward sacred power; limiting access to the same building affirms that sacred power is restricted to a select few. Ritual, in this formulation, is also a form of materialized ideology. (Fogelin 2007:65)

Indeed, ritual architectural may come to symbolize the group that controls access to it and uses it to conduct rituals, dramatically enhancing the group's standing and altering or solidifying the identities of those in possession of such ritually sanctioned space (Hegmon 1989:8).

Mortuary rituals and features, too, are strongly linked to group identities. The construction of a mortuary feature in a particular location, the assignment of items in association with the deceased, and the performance of particular rituals all speak to who the deceased was and also to the identities of those who participate in the ritual, those who claim association with the deceased, and those who continue to live in proximity to the grave (Pearson 2003). Again, while many of these ritual acts are determined by the canons of the liturgy, any allowable variance can be used to communicate indexical messages through variation in, for example, the number and quality of grave goods, the energy spent in the construction of the mortuary feature and in the ritual performance, the placement of the interred in or near a particularly sacred place or previously interred individuals, the number and status of participants, or the inclusion of new rites and rituals in the performance. These messages can be used either to enhance social distinctions or to assimilate and integrate community members, or a combination of both at multiple scales. In this way, rather than simply passively reflecting society, mortuary ritual is seen as actively constructing social orders.

In sum, by controlling and manipulating the messages and the spaces of performance, ritual practitioners are able to use ritual practices, beliefs, and symbols to sanctify or claim authority, communicate category divisions and thereby construct distinctive social identities, and influence power relationships. Groups in Ridges Basin used three main materials to achieve these ends—ritual architecture, ritual items, and mortuary features.

RITUAL ARCHITECTURE

Oversized Pit Structures

If ritual is by definition performative, then the spaces in which rituals occurred must have, on some level, accommodated or enhanced performances.

Architecture, including buildings and bounded open spaces such as plazas, can provide that space (Hegmon 1989:7). Moreover,

> structures that house group rituals tend to be distinctive from ordinary habitations (Rapoport 1982:29–30) and to require construction investments that exceed utilitarian requirements (McGuire and Schiffer 1983:281). These expectations should be true even if the structure is not used exclusively for ritual. (Hegmon 1989:8)

As described in Chapter 13, The Community, the Sacred Ridge site contained five oversized pit structures that have been interpreted as communal ritual structures based in part on their large size. These structures contained unique floor features (conical floor pits) not found in smaller structures, enormous floor areas relatively uninterrupted by floor features, continuous and wide benches to accommodate large audiences, and elevated bowl sherd frequencies ostensibly resulting from the use of bowls to serve food (and the inevitable breakage of vessels that occurs with use) during ritual feasts (Allison 2008; Blinman 1989; Potter 2010a). The largest of these structures, Feature 49 in Locus 6, was also the earliest of these large structures, and it differed from the other four in that it had a ventilator entryway, was not paired with another smaller pit structure, and was fairly isolated on the eastern edge of the site (see Figure 11.11). The post-abandonment fill of this structure contained refuse and several burials, indicating that it went out of use relatively early in the occupation sequence of Sacred Ridge. Potter and Chuipka (2007a) suggest that it was used as a communal ritual structure from about A.D. 750 to 780 (see Figure 11.11), prior to the construction of the other four oversized structures, the remodel of the ridgetop features, and the construction of the tower. Thus, Feature 49 was not only spatially isolated but also temporally isolated in that it was the only shared ritual structure in the community before about A.D. 780. Feature 49 was associated with the highest proportion of bowl sherds among the loci at Sacred Ridge and, in fact, across the entire Ridges Basin community. Allison (2008) proposes that pot-luck-style feasting occurred disproportionately in association with this structure, whereby families from across the village or community brought prepared wet food to ceremonies performed inside or near the structure and served that food in bowls to the participants of the ceremonies. Blinman (1989) associates similar pot-luck feasting with oversized structures at McPhee Village, a late ninth-century community in the Dolores River Valley. Following Blinman's study, Potter (1997a) evaluated the faunal data from McPhee Village and found additional evidence for communal feasting at oversized structures in the form of high percentages of lagomorph remains. Historically, Pueblo groups often participated in communal rabbit and hare hunts before, and specifically for, communal feasts (Tyler 1975:134). As at McPhee Village, the assemblage from Locus 6 at Sacred Ridge (including Feature 49, the oversized structure) also exhibited relatively high proportions of rabbit and rabbit-sized mammal remains that may be related to communal feasting (Potter and Edwards 2008:266–274, 284).

As indicated in Chapter 13, oversized structures at Sacred Ridge were not enclosed by room blocks, as they were at McPhee Village. But they were, for the most part, associated with specific households. Thus, access to them may have been fairly controlled and restricted to segments of the village or community, as Schachner (2001) notes for oversized pit structures at Pueblo I sites in the west, such as McPhee Village. The exception is Feature 49, the earliest and largest of these structures. This structure may have functioned more as a great kiva than did the other four structures; not only was it larger than other structures but it also was not physically restricted from community access (Schachner 2001:180; see Chapter 13). In other words, it may have functioned as a truly communal structure.

The other four oversized structures—Feature 41 in Locus 3, Feature 117 in Locus 5, Feature 83 in Locus 7, and Feature 58 in Locus 9 (see Figure 11.11)—were all smaller than Feature 49 but were still large compared to other pit structures in the community. All four structures had a one-hole ventilator rather than a ventilator entryway. All had conical pits, large benches, and four main roof support posts like Feature 49, and all were cleaned out and burned at abandonment. Additionally, each was associated with a smaller, earlier structure (in use when Feature 49 was in use), and each appeared to have been overtly controlled spaces occupied by specific households. It is particularly interesting that these households appropriated the form of the oversized pit structure, including the conical floor pits, from the earlier, more communal Feature 49.

Unlike the oversized pit structures at McPhee Village, oversized structures at Sacred Ridge were not associated with other living rooms. Oversized structures at McPhee Village were adjacent to contemporary smaller pit structures and above-ground living rooms; at Sacred Ridge, the oversized structure was the only (or the main) structure occupied by the household. This suggests that these structures at Sacred Ridge, with the possible exception of Feature 49, were less specialized than those at McPhee Village and functioned as domiciles most of the time. Lekson sees a similar pattern in early Hohokam villages. At Valencia Viejo and Snaketown some families began building “Big Houses” (Lekson 2008:58). These were once interpreted as communal structures, but Lekson suggests instead that they were the domiciles of important families.

> Big Houses were the homes of important people: families that had better farmlands and more stuff (for example, turquoise) than anyone else. Big Houses often included unusual features that appear to have been ritual or ceremonial. Big House families, I think, co-opted or created ritual that consolidated power—political, ritual, or both. (Lekson 2008:58)

This scenario makes sense for the oversized structures at Sacred Ridge, as well. In addition to hosting feasts, as evidenced by the relatively high proportions of bowl sherds associated with loci containing oversized structures (Allison 2008; Potter 2010a), at least one structure (Feature 41 in Locus 3) was associated with an inordinately high proportion of deer and elk remains, which are high-value food resources (Potter and Edwards 2008). In addition, a relative abundance of turquoise (20 pieces) was recovered from a burial in the midden associated with Feature 58 in Locus 9 (Potter 2010b). These patterns suggest that, indeed, important families occupied these houses and were in control of communal rituals that occurred in them.

The Tower at Sacred Ridge

The top of the knoll at Sacred Ridge contained architectural elements that also may have been a locus for communal ritual (see Chapter 11, Settlement Clusters; Figures 11.14–11.19). The tower, in particular, had no obvious habitation or storage function and appears to have been a structure in which rituals occurred. It was a fairly small space, however, and would have accommodated only a small number of people at one time. The fire pit in the floor may have been used during rituals involving only a few select ritual specialists. Part of the ritual performance associated with this structure, however, may have included the participation of community members throughout Ridges Basin as they observed the smoke plumes emitting from the top of this impressive structure. The palisade-enclosed area adjacent to the tower—containing a remodeled pit structure serving as an entryway to a large storage feature—appears to have also been part of a ritual complex (see Activity Area 3 in Figure 11.19).

Architecturally defined ritual space structures interaction by defining and confining, excluding and including, concealing and enhancing. In the case of Sacred Ridge, the tower complex did all of these things. The tower itself was visible throughout Ridges Basin (Figure 15.1), yet the rituals conducted within the complex and in the tower were hidden from view, and access to them would have been highly restricted, as evidenced by the palisade enclosing the area. Those people in control of these features and the rituals conducted in them and who had privileged access to the area (perhaps those living on the ridgetop or in the oversized pit structures) would have been powerful individuals within the community.

It is of particular interest that all of the communal ritual architecture present in the Ridges Basin community was contained within a single settlement cluster—the Sacred Ridge site—and was associated with particular households. So, even if the rituals conducted in these structures were communal in scale, their exclusive association with a particular settlement and in some cases with particular households suggests a high degree of ritually sanctified social differentiation and hierarchy within the community.

RITUAL ITEMS

Ritual Fauna

The use of animals and animal parts—particularly the remains of mammalian carnivores and birds, including pelts and feathers—for ritual purposes is well documented ethnographically and archaeologically for Pueblo groups (e.g., Akins 1987; Beaglehole 1936; Bunzel 1992; Eggan 1950; Henderson and Harrington 1914; Judd 1954; Ladd 1963; Lange 1959; Neusius 1985; Olsen 1990; Potter 1997a, 1997b; Stephen 1936; Tyler 1975; Vivian and Matthews 1965). Throughout this literature, carnivores tend to be an uncommon source of meat. Instead, these species are sought for religious and ritual reasons (Neusius 1985:115). The Hopi, for example, regard badgers as a medicinal animal, and they use fox skins in ceremonies (Beaglehole 1936). Among the Keresan-speaking Pueblos, bears and mountain lions belong to a special class of game. One who kills either animal is eligible to join the Warrior's Society, just as though he had killed a man (Lange 1959:137). Bunzel (1992:492) notes the use of bear paws in Zuni medicine ceremonies. Additionally, foxes (Beaglehole 1936:9; Bradfield 1973), coyotes (Eggan 1950:85; Tyler 1975:154–183), and wolves (Stephen 1936:699–700) all possess ritual significance and associations for Pueblo groups.

Many bird species have been associated specifically with Pueblo rituals. Henderson and Harrington (1914) report that the Tewa did not eat red-tailed hawks. According to Vivian and Matthews (1965), the golden eagle was sought by many Pueblo groups solely for its feathers. Magpies figure into the mythology of the Tewa (Henderson and Harrington 1914), and were used by the Hopi for headdresses of warriors (Bradfield 1973). Bunzel (1992:500) describes the importance of feathers from ducks, eagles, wild turkey, jays, red-tailed hawks, orioles, bluebirds, hummingbirds, and roadrunners among the Zuni for the manufacture of prayer sticks. Ladd (1963:10) notes that the various prayer sticks of the Zuni, taken together, require feathers from 72 species of birds.

Potter (1997a) demonstrates a greater-than-expected abundance and diversity of carnivore and wild bird species associated with oversized pit structures at McPhee Pueblo and argues that this is due to the ritual significance of these species and their importance in the performance of communal rituals. The high diversity of species may also relate to the communal nature of the rituals. Ceramic data suggest that families from across the community brought food in pot-luck fashion to serve at communal feasts at these rituals (Blinman 1989), and they may have also brought with them their varied ritual practices, paraphernalia, and costumes for these communal events.

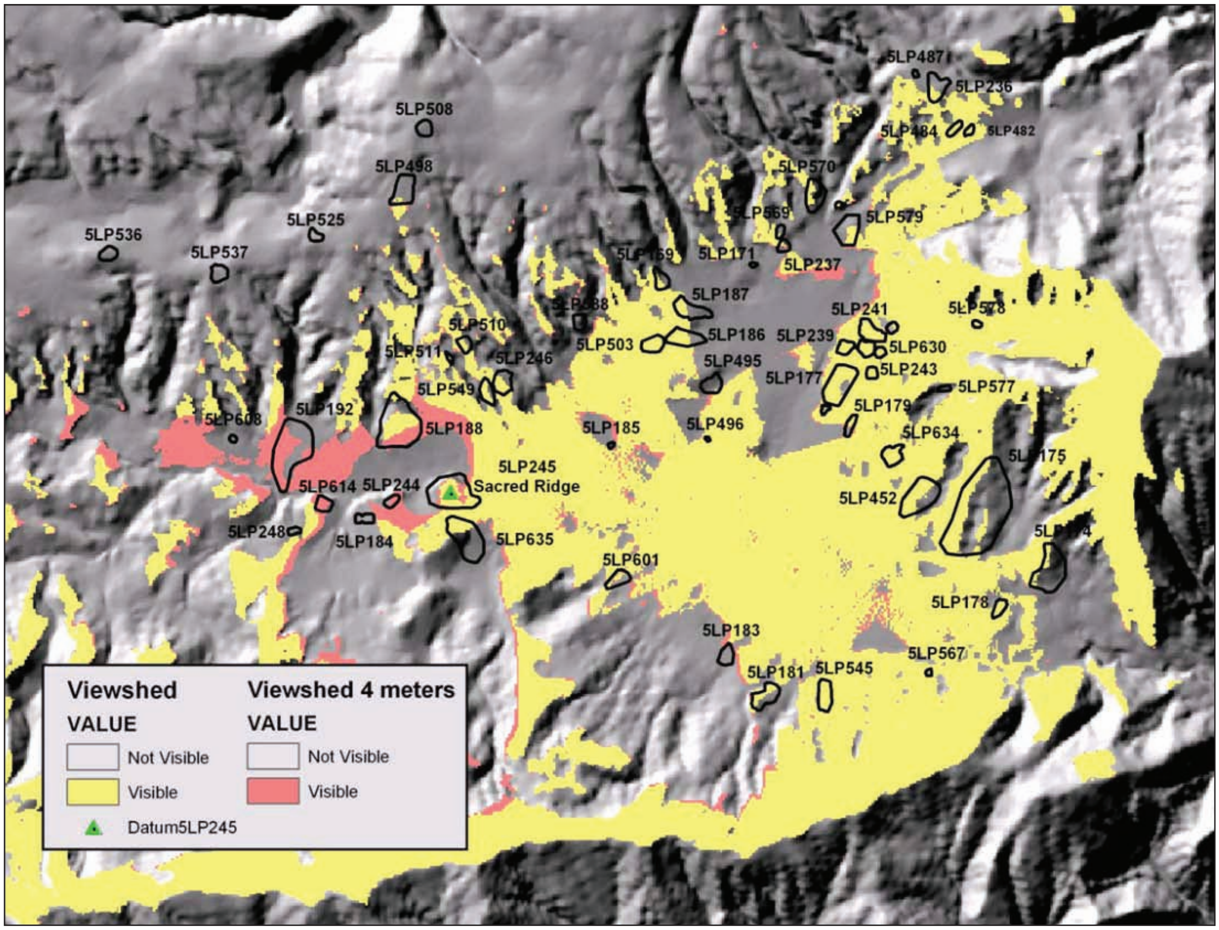

Figure 15.1. Viewshed analysis of Ridges Basin and surrounding landscape from the Sacred Ridge site (5LP245). The yellow shading represents areas visible from the ridgetop without the tower; pink shading is the added viewshed from atop a 4-m tower.

No similar associations were found in Ridges Basin. Wild bird and carnivore remains were not concentrated in any communal ritual settings but instead were strongly associated with the closure of structures and with mortuary features. This is particularly the case in the Eastern Cluster and at 5LP185. In the Eastern Cluster, animal burials in structures occurred in relatively high frequency. At 5LP177, Feature 2 (a pit structure) contained three animal burials on the floor—a swan or crane, a domesticated dog, and the articulated bones of a turkey wing (Subfeatures 2.01, 2.02, and 2.03, respectively). All of these remains appear to have been part of the closing ritual for the structure. A pit structure at 5LP239 (Feature 1) contained two domesticated dog burials. The dogs (Features 3 and 4) were resting on slabs placed on alluvial sediments that had been deposited shortly after the abandonment of the structure. The dogs had been severed in half at the mid torso and placed with their upper and lower body portions oriented in opposite directions. The dogs were found adjacent to each other at the same stratigraphic level, so it is likely they were sacrificed in a planned event related to the abandonment of Feature 1 and interred simultaneously shortly after the dismantling of the structure. The floor fill of this structure also yielded much of a gray fox hindlimb, including part of the pelvis and a left ulna; the left mandible of a bobcat (with cut marks); and multiple portions of a common snipe. These remains also appear to have been part of the closure ritual for the structure. In addition, two inhumations at 5LP239 contained numerous fox jaw pendants.

At 5LP185 in the North-central Cluster, pit structures also contained numerous carnivore and bird remains. The fill of one pit structure, Feature 10 in Locus A, contained a gray wolf humerus with cut marks, and the floor fill of this feature contained a porcupine femur. In addition, Subfeature 10.04, a subfloor pit, contained a whooping crane sternum. The fill of Feature 3, another pit structure at the site, yielded a gray wolf right distal humerus with cut marks and a porcupine humerus with spiral fractures. The floor assemblage of this feature includes a black bear phalanx and left radius. In addition to pit structures, this site contained numerous extramural human burials, and many of the rare and unique faunal specimens are associated with these features. For example, Feature 14, an inhumation, contained a gray wolf claw and a badger claw, which were either grave offerings or ornaments. Another inhumation (Feature 31) contained a bobcat lower third molar. Additionally, two sets of isolated human remains (Features 50 and 57) had possible associated faunal grave goods: Feature 50 had a domesticated dog tibia with cut marks, and Feature 57 had fragmented domesticated dog bones and a raccoon femur.

Animal burials were also discovered at 5LP185. A bobcat burial (Feature 78) was found in a pit that contained a combination of intentionally deposited secondary fill and naturally deposited post-occupational alluvial fill. All but the skull was present, and the animal was probably buried intact; no cut marks were noted. Tarsal bones and two partial socket portions of the pelvis of a bison were found in Feature 46, an extramural pit. The partial and disarticulated state of these remains suggests that the bones were buried after much processing, and the association of these remains with a particular burial pit feature rather than with the midden suggests that these remains were intentionally and ritually buried.

The abundance and variety of carnivores and birds associated with structure closing and mortuary rituals at these sites contrasts markedly with sites in the western portion of Ridges Basin, including the Western Cluster and Sacred Ridge. What is a striking, however, is not only the abundance of carnivores and birds but also their variety and their consistent association with particular depositional contexts. Waterfowl and shore birds are well represented, as might be expected given the proximity of these sites to the ancient marsh, but, additionally, a wide variety of non-aquatic species are also evident, including black bears, foxes, wolves, domesticated dogs, badgers, bobcats, bison, and turkeys, all found in association with houses and mortuary features in the Eastern Cluster and at 5LP185. This suggests that the inclusion of even the wetland species in these contexts was not entirely due to the proximity of these sites to the marsh, but rather because they were powerful, symbolically charged animals. It is rare to find specimens of these animals in any faunal assemblage, much less in special placements such as houses and mortuary features. Their disproportionate association with a specific settlement cluster and site suggests that these items were important for rituals conducted in these particular locales. These rituals involving animal burials appear to mark a transition in, or the end of, use and life for both houses and individuals. While birds and carnivores were rare in other areas of the project area, a few were evident at Sacred Ridge. At this site, the remains of the left and right wings of a long-eared owl and one bone from each wing of a northern harrier were recovered from the ventilator shaft of Feature 49, the early oversized pit structure in Locus 6. These most likely had been placed in the shaft during a closing ritual. And at features on the knoll were found a single element each from a fox, a badger, and kestrel. These items may have been associated with rituals conducted on the knoll, but sample sizes are too limited to substantiate this.

San Juan Red Ware

Blinman (1989) and Allison (2008) note that by the late A.D. 800s San Juan Red Ware was important for communal rituals at McPhee Village. Most San Juan

Red Ware vessels were produced at locations to the west of McPhee Village in southeastern Utah and acquired through trade, and some of these vessels were used to bring food to communal feasts, events that reinforced social integration and created group identities (Allison 2008:46; Blinman 1989).

In Ridges Basin, 100 years earlier, no such associations between San Juan Red Ware and communal ritual are evident. Redware is extremely rare in the Ridges Basin assemblage (Potter 2010a), and redware pots appear to have been most often sought and used by particular households for domestic needs and as burial items rather than for group gatherings (Allison 2008:61). A similar shift is seen in the use of ritual fauna (Potter 1997a, 2009). Allison interprets this as evidence that imported redware was more strongly associated with the creation of individual identities through differential access to these rare, exotic items than it was with the creation and reinforcement of group identities through communal ritual performance. However, as shown in Figure 15.2, the two loci at Sacred Ridge that contained massive ritual architecture, Loci 1 and 6, had comparatively high proportions of redware, perhaps partly due to the ritual significance of this artifact type.

Other Artifacts at Sacred Ridge

It appears that the exclusive control of ritual architecture and the performances that occurred in these structures translated into economic and political advantage for the occupants of Sacred Ridge. Root (1967:26) noted that many items of ground stone (13 metates and more than 30 manos) were found in association with the surface rooms at the northern end of the ridgetop. If Feature 2, the domed circular structure, was used to store maize surpluses, as suggested by Potter and Chuipka (2007a:418), these numerous ground stone tools may have been used to process communally stored maize. This also suggests an inordinate amount of centralized control over food surpluses within the community.

Root also found a relatively large number of exotic goods in association with the ridgetop, including a jet effigy of a macaw or parrot. Based on the presence of these items, he speculated that Sacred Ridge functioned as a trade center (Root 1967:24). Although SWCA did not find evidence of exotics such as jet effigies, as noted above, the ridgetop (Locus 1) did yield some of the highest relative frequencies of imported San Juan Red Ware ceramics at the site and in the entire community (Figure 15.2), despite the significant disturbance of this area by Root and his Fort Lewis College students during field schools in the 1960s (see Chapter 2, A History of Archaeological Work in the Durango Area).

Although the ridgetop loci did not produce inordinate amounts of exotic items other than slightly higher proportions of redware sherds, other loci at Sacred Ridge did. Of the 23 turquoise items recovered during the ALP project, 20 were found in association with a single burial in Locus 9 at Sacred Ridge. Additionally, Homer Root reported excavating a burial with similar grave goods in the midden of Locus 3. The individual was buried with a collection of quartz “diamonds” by the chest and 52 turquoise tiles and 24 turquoise fragments in a small jar next to the pelvis (Duke 1985). The Cerrillos Hills area in the Rio Grande Valley of north-central New Mexico is the most probable source of turquoise recovered at Pueblo I sites in the ALP project area (Eisenhauer 2009:317). The association of these items with mortuary features does not support Root’s hypothesis that the site operated as a trade center, however.

Finally, faunal data indicate that residents at Sacred Ridge had greater access to ungulate-sized mammals and high-utility ungulate remains than did residents of any other contemporaneous sites in the area, suggesting that access to high-value hunted resources was disproportionate within the Ridges Basin Pueblo I community. At Sacred Ridge, ungulate remains (not including antler) compose 5.3 percent of the assemblage, whereas for the project as a whole ungulates constitute only 3.0 percent of the total faunal assemblage.

Table 15.1. Rich Burials (from Potter 2010b:Table 2.18)

Location	Site 5LP_	Burial Number	Sex	Age	Mortuary Items										Total Items
					Ceramic Vessel	Quartz	Turquoise	Mineral/ Fossil	Shell	Flaked Stone	Fox Mandible Pendant	Faunal Bone (other)	Obsidian	Ground Stone	
5LP185	185	74	F	45–50	2	3	–	1	2	7	–	2	9	–	26
	185	76	F	40–50	7	–	–	–	52	–	–	–	–	–	59
	185	102	F	30–35	2	–	–	1	1	–	–	–	–	–	4
Eastern Cluster	239	7	F	45–50	2	–	–	–	–	–	6	–	–	–	8
	239	8	F	18–20	4	–	–	–	–	–	3	1	–	–	8
	240	16	F	18–20	3	–	3	–	1	–	–	–	–	–	7
	240	18	F	35–40	3	–	–	–	–	4	–	–	–	–	7
	240	19	SA	6–8	2	–	–	1	4	–	–	–	–	–	7
	177	59	F	45–49	2	2	–	–	–	–	–	–	–	–	4
	242	35	M	50+	4	–	–	–	–	2	–	3	2	–	11
Sacred Ridge	245	303	M	30–35	–	34	20	1	–	–	–	–	–	–	55
Western Cluster	184	131	M	Adult	1	2	–	3	–	4	–	–	–	3	13

Residents of Loci 1, 2, and 3 commanded the largest proportions of these resources. Whether all of these resources were consumed by the residents of these loci or whether they were shared communally during feasts at these loci is not known. Regardless, these loci appear to represent either high-status households or households that could organize communal hunts more effectively than other households within the community.

The ritual dominance of Sacred Ridge in the community was not total, however. While architecturally it dominated the landscape and appears to have reaped some political and economic advantage due to the exclusive control of rituals performed in these structures, occupants of other settlement clusters, particularly the Eastern Cluster, focused on other types of ritual to construct and signify distinct identities. The use of rare fauna in the closure rituals of houses and mortuary features has already been noted for the Eastern Cluster and 5LP185. Other aspects of mortuary ritual in these locales were even more distinctive and elaborate.

MORTUARY RITUAL

Mortuary ritual ranges in size and complexity from small private ceremonies to large public displays and mass gatherings (Pearson 2003). In the Pueblo I community of Ridges Basin, mortuary rituals were mostly small scale and did not involve the construction of large or elaborate mortuary features (Potter 2010b; see Chapter 13). Over three quarters of the burials in Ridges Basin occurred in extramural contexts, including midden areas. These extramural features were constructed as shallow, oval or subrectangular, and basin-shaped or straight-walled earthen pits. Mortuary features in pit structure fill were similarly constructed. Arrangement and positioning of the body were quite consistent, as well. All but one body (a male) was flexed or semiflexed. Thus, in general, very little effort or energy went into the construction of Pueblo I mortuary features and the preparation and arrangement of corpses, and it does not appear that these activities would have involved extravagant public ceremonies. Two elements of Ridges Basin mortuary ritual, however, were probably quite public and may have been to some degree communal in scale. These elements are the establishment and use of a cemetery at 5LP185 and the construction of rich burials through the placement of numerous, rare, and exotic funerary items.

Rich Burials

Twelve mortuary features in the ALP project assemblage are defined as rich based on the number of items and the rarity of some of the items they contained. Among features that contained items (not counting features that lacked items altogether), the median number of items is two. Burials were considered rich if they contained more than five items (the point at which they become statistical outliers) or if they contained four or more items, at least one of which was unusual or of rare material type, such as quartz crystal, olivella shell, or jet.

Table 15.1 shows the item content of these 12 rich burials. Three patterns are notable. The first is the high frequency of rich burials of females (8 of 12) as compared to rich burials of males and a subadult[1] (4 of 12). The second pattern is the distinction between the types of goods associated with female burials as compared to male burials. Rich female interments contained abundant shell and fauna, whereas males were associated with turquoise and quartz. Moreover, while ceramic vessels were associated with all rich burials except one, in no instance were they the most numerous items. It was the addition of shell, quartz, obsidian, minerals, turquoise, or faunal items that made these burials disproportionately rich. The third pattern is the spatial separation of rich male and female burials; male burials were found predominantly in the western basin, including at Sacred Ridge, and female burials were found primarily at 5LP185 and the Eastern Cluster.

The abundance of rich female burials in the Eastern Cluster (n = 5) is striking when this number is compared to the total number of female burials in this settlement

[1] This subadult may have been female, particularly given the associated shell items.

cluster (n = 10). In other words, half of the female burials in the Eastern Cluster were rich. Also, the richness of certain adult female burials (and male burials) is all the more notable when compared to the paucity of items found with subadults. Although there are some exceptions, even the richest of subadult burials do not compare to those of the adult females or males (Table 15.1).

As noted above, variation in the quantity and quality of funerary objects placed in the graves of particular individuals represents indexical messaging through ritual performance and participation. Ten items included in a grave are simply and obviously more than two. But what does the presence of more stuff actually translate into in terms of social power differentials in these contexts? Given that ritual simultaneously integrates social units and promotes hierarchy among them, what did rich burials and the rituals associated with assembling them represent in the Ridges Basin community? Were these burials of high ranking individuals? Or are there other possible reasons for the richness of some mortuary features compared to others in the assemblage?

Cross-cultural research by Tainter (1978) found that social rank was consistently marked by the degree of energy expended in body treatment, the construction and placement of the grave, and mortuary rites. Grave goods, on the other hand, marked social rank in less than 5 percent of cases. Carr's cross-cultural study (1995:153) corroborates Tainter's findings that social rank is most often signified by energy expenditure and grave form. Carr's study further indicates that grave goods (what he terms "grave furniture") most often symbolize personal identity and gender rather than social rank, per se. Moreover, when grave goods are linked to social rank, it is the quality rather than the quantity of items that indicates the status of the deceased. It seems unlikely that the significant patterning in the Ridges Basin assemblage is caused strictly by differences in social rank, because all graves in the Ridges Basin assemblage were low-energy features, body treatment appeared to be more or less undifferentiated, and grave forms were uniform.

Rather than social rank, then, the rich graves in Ridges Basin seem to represent attempts to elaborate and signal social identities within the community (Potter and Perry 2011). What is particularly intriguing is the strong pattern of rich female burials in the Eastern Cluster and at 5LP185 and rich male burials in the western part of Ridges Basin, especially the Western Cluster and Sacred Ridge. While the exact underlying causes of this patterning cannot be known, there are several possibilities. One is that females were considered more important as leaders in the Eastern Cluster and 5LP185 and males were more important in the western part of the basin, including at Sacred Ridge. The rich burials may reflect this gender distinction in leadership status. A second possibility is that among the people living at sites in the Eastern Cluster and at 5LP185 females adorned themselves more in life, or were adorned more lavishly in death, than was the case with females at Sacred Ridge. This may have been simply a matter of cultural tradition. This scenario is more consistent with Tainter's (1978) and Carr's (1995) cross-cultural findings that quantities of grave goods more often symbolize personal identity and gender rather than social rank. A third possibility—one that does not necessarily contradict the first two—is that female interments in the Eastern Cluster were elaborated with offerings to define, construct, and communicate a group identity in contradistinction to the male-symbolized Sacred Ridge site. Alternatively, if adult females in the Eastern Cluster and at 5LP185 were routinely honored with highly valued offerings for their abilities to integrate and represent the group, members of Sacred Ridge might have attempted to distinguish themselves by choosing male representatives. Regardless of the intentions of those carrying out these highly patterned ritual acts, the gender distinction among settlement clusters would probably have been notable to community members, and likely reinforced social and cultural distinctions within the community.

The Cemetery at 5LP185

Site 5LP185 contained many more interments than its three households and relatively short occupation span could account for, and it appears that after its use as a habitation was discontinued in the early or mid A.D. 700s, it was used as a cemetery by households occupying other sites (Potter 2008b:311–315). In all, 23 individuals were recovered from 18 features in two burial areas at the site. The burial areas had been heavily disturbed by prairie dogs, and therefore only a portion of the total number of individuals was recovered as intact interments with associated artifacts. Many more were recovered as isolated human remains (Stodder 2010a).

Site 5LP185 was situated directly between Sacred Ridge and the Eastern Cluster, yet in many ways mortuary features here were more similar to those of the Eastern Cluster sites, manifesting little variation in burial context (all but two burials were in midden or extramural contexts), similar grave items (e.g., redware, olivella shell, and faunal bone items), and rich mortuary assemblages associated exclusively with adult females. Potter (2009:11) suggests that the placement of this cemetery near the marsh in the central basin (see Chapter 9, The Natural Environment) was a strategy used by community members to lay claim to the faunal and floral resources associated with this particular landscape feature. It is also suggested that the spiritual and mythic significance of marshes and lakes as places of origin, creation, and power, and the socially legitimizing aspects of associating a village with these meaningful places was a motivating factor in the transformation of this locale into a cemetery.

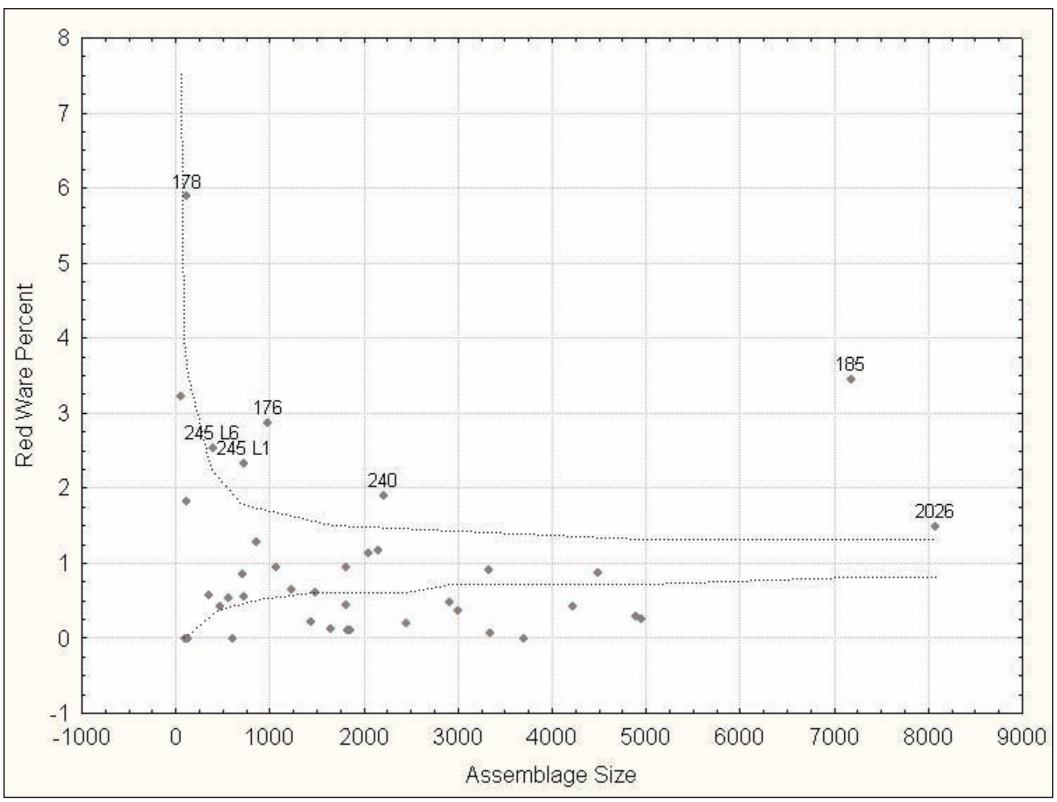

Figure 15.2. Plot of percentages of redware versus sample size for early Pueblo I habitation sites in the ALP project area. The dashed lines mark the upper and lower boundaries of a 90-percent confidence band for percentages based on the total ALP project Pueblo I assemblage. Labeled cases above the upper band are considered statistically significant. Site numbers preceded by 5LP. Sacred Ridge (5LP245) presented as separate loci (L). Not all cases labeled. (Reproduced from Potter 2010a:Figure 3.4).

RITUAL SUMMARY

In the context of Ridges Basin, communal rituals not only brought groups together and socially integrated them (e.g., Lipe and Hegmon 1989), but also distinguished and highlighted differences among them. Communal ritual therefore created an arena for the construction of social identities. In the Ridges Basin community, Sacred Ridge was distinguished by its exclusive control of ritual associated with elaborate ritual architecture, including communal feasting, and greater access to highly valued items such as turquoise, deer and elk, and redware. The Eastern Cluster, on the other hand, was differentiated by the use of ritual fauna in architecture closure rituals and inhumations and by numerous rich burials, the majority of which were adult females. It is suggested that in both cases ritual was used to actively negotiate power relations and construct social identities through the control of canonical messages and the manipulation of indexical messages. The following section further explores social identity construction with the Ridges Basin community, particularly as it relates to distinctions among settlement clusters.

IDENTITY CONSTRUCTION AND SETTLEMENT CLUSTERS

Identity refers to people's perceptions of themselves and how they relate to others. It is the totality of perceptions of ethnicity, nationality, tribal affiliation, linguistic group, sex, gender, and age that constitutes an individual's sense of self and that both informs and constrains social actions (Varien and Potter 2008). Although social identities take many forms and derive from many sources at a variety of scales, the focus in this section is ethnic identity, or ethnicity. Following Lucy (2005) and Levine (1999:168), ethnicity is viewed as a means of classifying people based on culturally constructed notions of shared origins. Ethnic groups are composed of members who "choose to do (some) things in similar ways to each other, and in different ways from others. These similarities and differences are then articulated as 'ethnic' ones (often framed in terms of members of the group having shared 'origins' or descent)" (Lucy 2005:86). Thus, for archaeologists, ethnic distinctions are often interpreted from behavior and the material culture affected by those behaviors rather than from biological relatedness per se (although relatedness certainly can and often does play into perceptions of origin and rules structuring behavior). Importantly, ethnicity is a means of social differentiation and becomes activated and reinforced when conditions call for it, particularly in the presence of an "other." It is thus conceived of as an organizational and oppositional strategy that works in tandem with and draws upon notions of relatedness and common origins (Knudson and Stojanowski 2009).

Potter and Yoder (2008) note that architectural variation is greater than expected in this community given its geographic position between two broad culture areas that have been defined for the Pueblo I period: the Piedra to the west and the Rosa to the east. As noted in Chapter 7, Pueblo I Research Questions, the Piedra area is typified by sites with square or rectangular pit houses with wing walls and one-hole ventilators. These sites correspond to the Northern San Juan Ceramic Tradition, which consists of pottery with crushed igneous rock temper and mineral paint (Allison 2008). Rosa sites, on the other hand, often contain circular pit structures with two-hole ventilators. Surface rooms are more ephemeral and built strictly of adobe. Rosa pottery assemblages are of the Upper San Juan Ceramic Tradition, characterized by sand or quartzite temper and organic paint decoration.

Potter and Yoder (2008) note, however, that although pit structure shapes in Ridges Basin included the square form typical of the Piedra area and the circular form noted in the Rosa area, but there were also oval, D-shaped, and sub-square (square sides with rounded corners) pit structures (see Figures 11.6, 11.7, 11.8, and 11.12). The most common pit structure shape in Ridges Basin was a flattened oval, or D shape.

What is most interesting, though, is that house shapes in one cluster, the Eastern Cluster, were consistent within the cluster and distinct from house shapes in other clusters, especially Sacred Ridge (see Chapter 11). Other clusters, such as the North-central and Western clusters were quite variable, and the latest structures in both of these clusters were large and looked similar to pit structures on Sacred Ridge—oval with large benches, large floor areas, four-post roof support systems, one-hole ventilators, and wing walls (Potter and Yoder 2008:Table 2.1) (see Chapter 11). These data suggest that some households used pit structures to actively negotiate and establish their identity as members of particular settlement clusters. Eastern Cluster occupants may have standardized the visible aspects of house style, most notably shape, so as to optimize a household's inclusion or acceptance into the settlement cluster and distinguish it as such. Other cluster members, by contrast, appear to have manipulated house shape to signal affiliation with Sacred Ridge. Potter and Yoder (2008) propose that this pattern is similar to that documented for Dela in northern Cameroon, a multiethnic community of about 1,100 people in which the form of domestic architecture "is one material strategy which local ethnic groups use to negotiate political self-interests" (Lyons 1996:351). Household compounds in this community contain different language groups with separate histories of origin. House shape is used as a conscious strategy to either enhance or suppress visible differences between individuals and groups, depending on whether a group's ethnic visibility is advantageous or detrimental to the self-interest in the political context of the community. As in Ridges Basin, less-visible attributes of the interiors of houses—for example, the furniture and the spatial organization of people, property, and activities—remain unchanged and reflect the diverse backgrounds of the community members. It is only the exterior shape of the house that is altered.

The Eastern Cluster is unique, or at least starkly different from Sacred Ridge, in other ways. As noted in Chapter 12, Settlement Cluster Variation, there are considerable differences in artifact assemblages, pit structure closure rituals, and extramural features. Most distinguishing was the composition, quantity, and gender of the rich burials (see above). All of these material culture distinctions reinforced social and cultural distinctions within the community.

Biological data corroborate these patterns. Using dental data gathered from the human remains assemblage for the ALP project, McClelland (2010a) examines whether Ridges Basin newcomers maintained previous group identities or whether they merged through social and ceremonial integrative mechanisms or through intermarriage. He concludes that although some admixture surely occurred within the community and across clusters, in some cases differences were maintained genetically within the community. He notes significant differences in permanent dental trait frequencies between the Eastern Cluster and the greater Ridges Basin population, and between the individuals from Sacred Ridge whose remains were processed (intentionally cut, broken, and burned) in one event and deposited in Feature 104 and all other individuals in Ridges Basin. (The following chapter discusses the processed human remains at Sacred Ridge in greater detail.)

> The highest number of significant differences in any…cluster is two for the Eastern Cluster. When we consider that the individuals represented by the processed remains from Sacred Ridge also differed in terms of a relatively low caries rate, a higher rate of dental calculus, and a higher rate of enamel hypoplasia, the differences between this subsample and the other samples within the basin are reinforced. (McClelland 2010a:237)

In an analysis of skulls from 26 individuals from across the basin, Douglas and Stodder (2010) found similar patterning, in particular the uniqueness of the Eastern Cluster population. “Nonmetric univariate comparisons revealed that the most differences were between the Eastern Cluster individuals and Outlier 1 (primarily between 5LP177 and 5LP185), and the next largest distinction was between the Eastern and Sacred Ridge clusters” (Douglas and Stodder 2010:221).

Douglas and Stodder also see in the skull data the same pattern McClelland (2010a) saw in dental data with respect to the Sacred Ridge processed remains. According to cranial biodistance data, “the individuals in the mass grave in Feature 104 at Sacred Ridge are biologically distinct from those in the normative burials at Sacred Ridge and from other Ridges Basin inhabitants” (Douglas and Stodder 2010:222).

When migrants moved into Ridges Basin—initially in the early A.D. 700s and again in another wave at about 750 (see Chapter 8, Pueblo I Chronology and Population)—they organized their habitation sites into clusters, some of which were more tightly aggregated and distinctly bounded than others. Potter and Yoder (2008:22) suggest that this process of clustering was one strategy used to “negotiate and establish boundaries of belonging and exclusion (in effect, clarifying the categories of us vs. them, or the ‘other’) within the community as it formed, ultimately as a way for households to gain perceived access to allocative and authoritative resources.” Two groups in particular appear to have gone to considerable lengths to maintain distinct social identities within the community: the people living at Sacred Ridge and the people living in the sites of the Eastern Cluster. These distinctions are manifested most acutely in architectural, mortuary, ritual fauna, and artifact variation and are mirrored in cranial and dental measures of biodistance. That only two of the five clusters investigated exhibit any degree of spatial, stylistic, or biological cohesiveness is notable, and it underscores the fluid and dynamic nature of ethnic identity. This dynamism is further exemplified by the different strategies of identity construction pursued by households—for example, the construction of houses that resembled Sacred Ridge houses in the North-central and Western clusters near the end of the Ridges Basin occupation. Other North-central Cluster households built houses near long-abandoned Basketmaker II habitation sites and used a cribbed roof construction similar to that used in Basketmaker II houses (see Chapter 4, Basketmaker II Sites). As Potter and Yoder (2008:29) suggest,

> variation in house appearance was the result of immigrant households from various origins actively working to establish and signal their identities. Some did this by harkening back to Basketmaker II times through the construction of cribbed roofs and the placement of their houses next to ancient Basketmaker II sites. One of the most effective ways to legitimize one’s claim to a landscape and create an identity that is rooted in tradition is to reference the remote past through architectural style, effectively signaling a historical connection—whether real or fictive—to place. Other people, instead, chose to create identities that were based on innovative new house styles, such as oval or D-shaped houses.

Attarian (2003:186) writes, “as groups of people enter into a new environment, their previous sense of identity will be challenged and reshaped by the new conditions that they must confront in order to survive.” It appears that in the Ridges Basin community different strategies were pursued to confront these new conditions. It seems clear that ethnogenesis—the process by which group distinctiveness is established and new ethnic identities emerge and are mobilized—was ongoing in Ridges Basin. The question is how complete the process was and whether these new ethnic identities survived intact when the community collapsed and fragmented at about A.D. 815.

First-comers and Latecomers

One of the factors that may have played a role in Sacred Ridge's dominance in the community is the establishment of an early pioneer settlement there. In the late A.D. 600s or early 700s, after a several-hundred-year hiatus following the Basketmaker II occupation of the Durango area, people began moving back into Ridges Basin. This first wave of settlers included families that established houses on the ridgetop at Sacred Ridge. Some of the earliest tree-ring dates from the project (A.D. 269 and 607) were recovered from the ridgetop (although both were "vv" dates and may have derived from old wood). In addition, seven radiocarbon dates were obtained from ridgetop structures. These dates suggest an early occupation of this part of the site followed by a remodel in the late eighth century. Three of the radiocarbon dates have intercepts in the late A.D. 600s, and four have intercepts at 770 or 780. The early dates were recovered from two pit structures, Feature 1 at the north end of the site and Feature 18 at the south end, and a pre-remodel context at Feature 23, suggesting that these three structures were some of the earliest at the site (see Figure 11.11).

At about A.D. 760, following the initial settlement of Ridges Basin, there appears to have been a construction boom in the basin (see Figure 8.2) that likely represents a substantial population increase. This occurred most dramatically at Sacred Ridge (see Figure 11.11). While a high birth rate may account for some of this population increase (Schlanger and Craig n.d.; Wilshusen and Perry 2008), it is hard to imagine that population movement did not play some part in the rapid increase in population in the basin at this time.

This pattern is consistent with what is expected during the settlement of a frontier by pioneer groups. Van Gijseghem (2004:87) outlines some essential features common to most migrations; three are particularly relevant to the Ridges Basin case.

- Migrations attract migrants. Almost invariably, once a migration has been undertaken by individuals and groups, a successful settlement will attract followers and kinfolk, and the development of a "migration stream" (Anthony 1990; Lefferts 1977).
- The initial migrants, the pioneers, often sponsor the arrival and settlement of the later migrants within the migration stream because they are in need of allies for mutual protection and labor to effectively exploit the frontier's resources.
- The pioneers also exert some power over resources, people and land in the new settlement; power that is legitimized by their seniority in the area, which results in the formation of a **primocracy** [emphasis in original].

Van Gijseghem goes on to define a primocracy as a pattern of authority and leadership that rests mainly on privileges and prerogatives given by seniority within a given sociopolitical landscape. "A primocracy is established by the strategies applied on the frontier and its people by pioneers sometimes called 'charter groups' (Drieder 2001; White and Fleras 1990)" (Van Gijseghem 2004:87).

> Pioneers and the kin-based networks that they establish on the frontier have the possibility of manipulating tradition and history, cementing and sanctifying their position of power….Their authority is economic, through the debt relationships that they establish (Hayden 1995:21); ideological and ritual, through their imposition of a cultural landscape and its juxtaposition with cosmology; and sociopolitical, through the stem of leadership that they represent as the "us," pioneers, founders, and their kin, vs. "them," the latecomers…." (Van Gijseghem 2004:124)

Van Gijseghem (2004:130) points out that the resultant society, the "new" society, generally remains relatively inert and unchanging for a generation or two, preserving and expanding some of the distinguishing features of the pioneer subgroup in terms of ritual and notions of status and power based on a "founder's effect." Over time, however, some features of the donor society are jettisoned and social innovations occur, particularly with respect to cultural manifestations of religious beliefs, group identity, political ideology, and ethnicity (Van Gijseghem 2004:125). This may explain the dramatic reorganization that occurred at the Sacred Ridge site at about A.D. 780 or 790 with the construction of the ridgetop complex, including the tower. To maintain and even enhance their standing as the ritual core of the community, descendants of the pioneers at Sacred Ridge may have developed new rituals, and designed and constructed new, highly visible architectural forms in which to house these new rituals. Concurrently, by constructing the four oversized pit structures along the southern and eastern slopes of Sacred Ridge, the occupants of Sacred Ridge deliberately elaborated communal ritual structures based on long-standing traditions in the community, that is, those traditions associated with the original communal ritual structure for the community (Feature 49). This pattern may relate to Van Gijseghem's (2004:128) notion that, "in time, new forms of expression will be elaborated based on old ones to cement the distinction between 'them' and 'us'." Indeed, enhanced efforts at identity construction is a process that consistently accompanies the colonization of a frontier, whether it is the maintenance of existing social identities (Duff 2002) or their deliberate alteration (Fortier 2001).

SUMMARY: ADDRESSING THE RESEARCH DESIGN

Sacred Ridge—with its monopoly on communal structures and exclusive control of the rituals they housed, its towering architectural feature visible from across the valley, the success its members had in obtaining imported items and large game, and the communal feasts it hosted—dominated the Ridges Basin community. As some of the earliest Pueblo I occupants of the basin, its settlers successfully attracted migrants and constructed a primocracy in which they became the most powerful group in the community through the control of ritual and feasts and through highly visible displays of authority. This primocracy was based on the premise of an us-versus-them dynamic between first-comers and latecomers. As Van Gijseghem (2008) notes, however, the dialectic between pioneers and latecomers can cause primocracies to be short-lived and inherently unstable. Pioneers establish a social order that places them at its apex, but there is a need for this structure to be open or flexible enough to attract followers. Frequently, the pioneers will emerge as elites based on this blend of traditional hierarchy and their economic and ideological position as founders. Over time, though, if appropriate strategies of social integration—communal rituals, the creation of exchange partners, intermarriage, and the development of work cooperatives—are not established, cleavages may develop in which the pioneers' power is contested. It appears that in Ridges Basin first-comers established themselves as the leaders of the community, and had exclusive control of architecturally based communal ritual and, presumably, primary access to resources such as agricultural land and hunting grounds. But this also created conditions that encouraged the construction and elaboration of ethnic groups in opposition to the primary group. This opposition is most evident in the Eastern Cluster, a cohesive and distinct group of sites at the eastern end of Ridges Basin that housed a relatively discrete biological group.

The main goals of this chapter have been to characterize ritual, social differentiation, and identity construction in the Ridges Basin community and to address the interplay of these aspects of community life. This final section specifically addresses the questions posed in Chapter 7 relating to these issues.

How many different ethnic or cultural groups made up the Pueblo I population of Ridges Basin? Where did they come from?

Based on dental and cranial biodistance data, there were at least three distinct biological groups in the community: one represented by the processed human remains at Sacred Ridge, one by the Eastern Cluster burial assemblage, and one by the rest of the community, including the formal burials at Sacred Ridge. The group that occupied the Eastern Cluster is also distinguished archaeologically through a relatively tight aggregation of houses, consistency in the external appearance of the houses, the use of animals in the closing rituals for houses, and the elaboration of adult female burials with exotic and rare grave goods. These material distinctions are arguably the result of an intentional construction of an ethnic identity, specifically in opposition to the identity created by the occupants of Sacred Ridge. If ethnicity can be reliably mapped onto biodistance, as it seems to with the Eastern Cluster group, the biologically related people represented in the processed human remains at Sacred Ridge's Feature 104 may have composed a third ethnic group. It is unclear whether the other households or settlement clusters in the basin exhibited distinct ethnic identities or what their perceived identities may have been. Some seem to have attempted to define themselves as related to ancient Basketmaker II groups, while others appear to have attempted to link their identity with Sacred Ridge. The question of how many ethnic groups is thus not a straightforward one to answer, but it appears there were at least three present in Ridges Basin in the late eighth and early ninth centuries.

The question of *where* these groups came from is even more difficult to address. Ezzo (2010) conducted strontium isotope analysis on a large sample of Ridges Basin human remains to address this question. Of the 98 individuals analyzed, 12 were identified as possible immigrants and only two (Burial 35 at 5LP242 in the Eastern Cluster and Burial 38 at 5LP503 in the North-central Cluster) were definitively of nonlocal origin (Table 15.2).

Seven possible immigrants from the San Juan Basin were identified. These samples yielded strontium ratio values intermediate between Ridges Basin and Blue Mesa, and Ezzo observes that they "may represent immigrants from a geologically younger region, such as the San Juan Basin, or they may indicate these people spent their first year of life obtaining food from both Ridges Basin and Blue Mesa or upland areas surrounding Ridges Basin" (Ezzo 2010:194). One of the possible immigrants originated from an environment where local soil derived from Cambrian sources. According to Ezzo, these soils are present along the Animas River between Durango and Silverton, so it is possible that this individual migrated from the north. The two confirmed immigrants also sourced to this location (Table 15.2). Four individuals possibly originated from Blue Mesa or the uplands surrounding Ridges Basin.

Although it is difficult to assess these relatively ambiguous results, several patterns are noteworthy. For instance, it is interesting that many of these outsiders may have derived from Blue Mesa or ate food grown on Blue Mesa as they were growing up. (As described above, because the San Juan Basin isotope signature is actually an intermediate value between that exhibited by Ridges and Blue Mesa, the individuals noted in Table 15.2 as having possible origins in the San Juan Basin may have grown up on both Blue Mesa and Ridges Basin.) If all of these individuals did, in fact, originate at Blue Mesa, they compose a substantial proportion (11 of 14) of the "immigrant" population in Ridges Basin. If this is the case, then all of the "outsiders" identified in the processed human remains were from Blue Mesa (see Table 15.2).

Also of note is Gladwin's (1957:55) observation that people in the Durango area might have origins to the north.

> [I]t looks as if their earliest settlements were made along the Animas River, within a radius of about ten miles of Durango, and this suggests that these people either came down from the north—through the central valleys of Utah, west of the Rockies—or in the from the east, through southern Colorado from the western plains.

While Gladwin was willing to extend the migration stream quite a bit farther northward than seems reasonable at this point, his scenario is roughly consistent not only with Ezzo's data but also with the chronological data presented in Figure 8.7. According to tree-ring dates, the Hidden Valley community, north of Durango, was a short-lived community occupied in the early A.D. 760s and abandoned sometime in the late 760s or early 770s, coincident with an increase in construction in Ridges Basin. These "northern people" may have been drawn into Ridges Basin at this time as part of the migration stream started by the original settlers of Ridges Basin.

Given the obvious links between Ridges Basin and the Rosa area, it is quite probable that some or even most of the population of Ridges Basin immigrated from the south up the Animas River drainage. Ezzo (2010) provides additional data to suggest that other areas also provided donor populations. This most likely contributed to the ethnic diversity we see expressed in the material culture of the Pueblo I community in Ridges Basin.

Table 15.2. Summary Table of Samples Identified as Possible or Confirmed Immigrants to Ridges Basin

Settlement Cluster	Site	Burial	Immigrant?	Possible Origin
Eastern	5LP177	40	Possible	San Juan Basin, northern New Mexico
Eastern	5LP242	35	Yes	Animas Valley north of Durango
North-central	5LP185	74	Possible	San Juan Basin, northern New Mexico
North-central	5LP185	50	Possible	Blue Mesa
North-central	5LP503	38	Yes	Animas Valley north of Durango
North-central	5LP237	139	Possible	Blue Mesa
Sacred Ridge	5LP245	F150/7	Possible	Animas Valley north of Durango
Sacred Ridge	5LP245	303	Possible	Blue Mesa
Sacred Ridge	5LP245	276	Possible	San Juan Basin, northern New Mexico
Sacred Ridge	5LP245	304	Possible	San Juan Basin, northern New Mexico
Sacred Ridge	5LP245	SKU058*	Possible	Blue Mesa
Sacred Ridge	5LP245	SKU085*	Possible	San Juan Basin, northern New Mexico
Sacred Ridge	5LP245	SKU093*	Possible	San Juan Basin, northern New Mexico
Sacred Ridge	5LP245	SKU117*	Possible	San Juan Basin, northern New Mexico

* From processed human remains assemblage in Feature 111

Chapter 16: Paleodemography, Health, and Violence in Ridges Basin

James M. Potter, Jason P. Chuipka, John A. McClelland, and Ann L. W. Stodder

During the ALP project, human remains were recovered from 22 Pueblo I sites in Ridges Basin. The first part of this chapter introduces the archaeological context of the ALP project skeletal collection and briefly characterizes the nature of the assemblage with respect to basic demographics, general health of the population, and age and sex distributions. The second part describes the considerable evidence of violence in the assemblage. Additional information on these topics can be found in *Bioarchaeology* (Perry et al. 2010), which is Volume XV of the ALP project report series.

The remains of approximately 279 individuals were represented in the ALP project skeletal assemblage. Three sites in Ridges Basin—the Sacred Ridge site (5LP245), 5LP185, and 5LP177—contained the largest proportion of the overall skeletal assemblage as represented by the proportions of formal burials (Figure 16.1). These sites had substantial numbers of isolated human remains[1] in addition to formal inhumations, and this was especially marked at 5LP185 where the burials had been disturbed by rodents and agricultural activity (Yoder et al. 2008). Site 5LP177 was a double-residence site in the Eastern Cluster that contained a substantial number of burials. Site 5LP185 was a multiple-residence site in the center of the basin that went out of use as a habitation site in the mid A.D. 700s and became a cemetery for surrounding habitations. Sacred Ridge was an aggregated village at the west end of Ridges Basin. The many mortuary features at this site were probably related to the numerous households associated with the site. Unlike 5LP185, it did not serve as a burial area for offsite households.

AGE AND SEX DISTRIBUTIONS

Fort Lewis College excavated a number of Ridges Basin sites in the 1960s, including Sacred Ridge, and as a result collected human remains and funerary objects. These items were housed at the college but were not analyzed or reported until the 1990s when Martin and Goodman took on the task as part of an early incarnation of the ALP project (Martin and Goodman 1995). Little or no contextual information was available for the 67 burials they analyzed, yet they were able to make some general observations on the demography and health of 50 individuals. Martin and Goodman (1995:25) determined that the population was quite healthy: “They were minimally bothered with the normal range of common ailments ranging from iron deficiency anemia to easily transmissible diseases.” Demographically, the small assemblage was underrepresented by children and older adults (Figure 16.2). The much larger assemblage recovered by SWCA from 2002 to 2005 augments the demographic profile of the population (Figure 16.3). When these two assemblages are combined, individuals under five years old are more numerous than other age categories, and individuals over 40 are also well represented (Figure 16.4). Note, too, that males and females are represented in roughly equal proportions in all age groups, even the 50–60 age group.

[1] Isolated human remains (IHR) are surface finds of human remains and those disturbed by looting. All IHRs have the following attributes: no burial pit, no funerary objects, and less than 10 percent of the skeleton present.

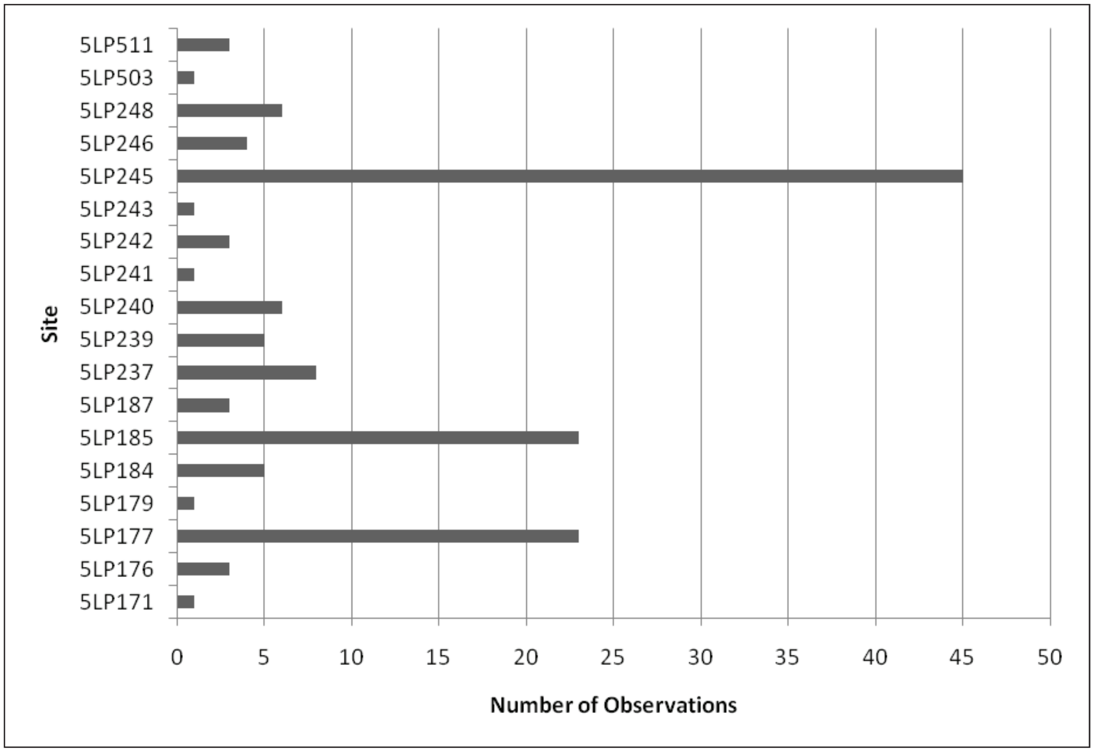

Figure 16.1. Distribution of formal burials by site in Ridges Basin. Does not include isolated human remains, out of context remains, or processed human remains. (Data from Potter 2010b:Table 2.1.)

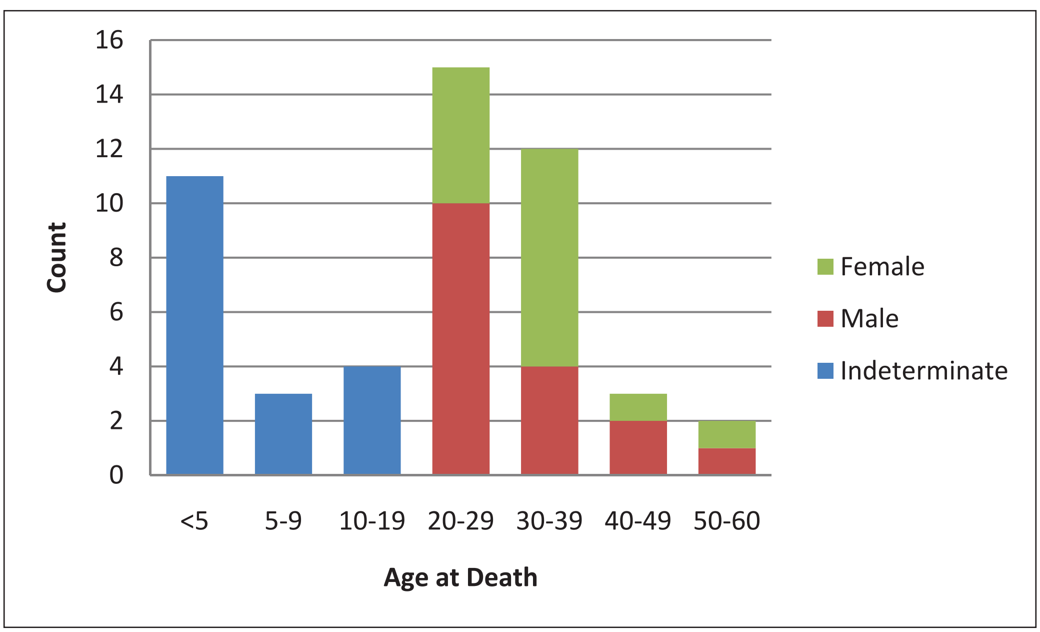

Figure 16.2. Age and sex distributions of individuals (n = 50) recovered from Ridges Basin during previous projects and analyzed by Martin and Goodman (1995).

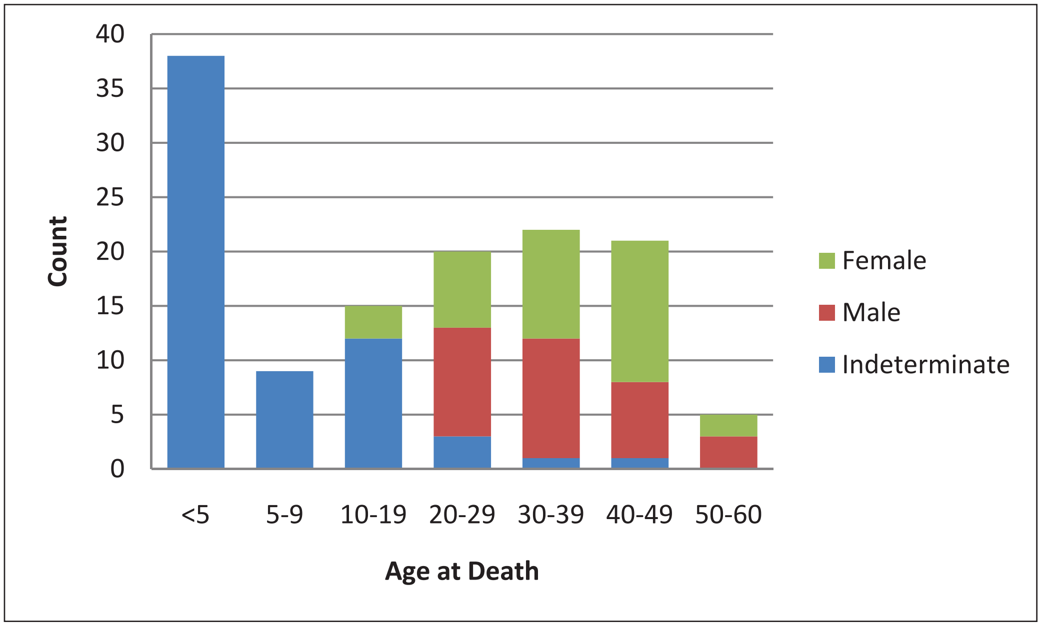

Figure 16.3. Age and sex distributions of formally interred individuals (n = 128) recovered from Ridges Basin by SWCA as part of the ALP project. Based on Potter 2010b:Table 2.3. Age intervals approximate. Individuals lacking age estimates excluded.

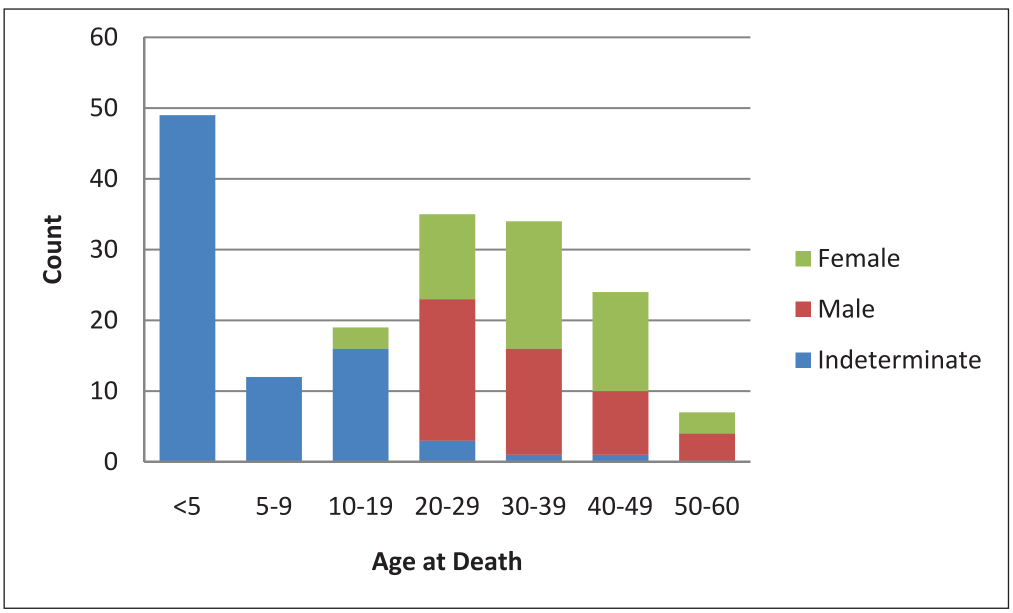

Figure 16.4. Age and sex distributions of individuals (n = 178) from the ALP project and from previous projects analyzed by Martin and Goodman (1995), combined.

This evenness of representation among the sexes is striking when compared to other burial assemblages from the Four Corners area. The La Plata Highway project burial assemblage contained far more males than females over the age of 40 (Figure 16.5). And among Pueblo I human remains recovered during the Dolores Archaeology Program (DAP), survivorship over 26 years of age was far greater for males than for females (Figure 16.6).

A more comprehensive treatment of demography is presented in Stodder 2010b, but in general, life expectancies for Pueblo I people living in Ridges Basin were good. "They were not the best in the region but better than the larger, later communities and those occupied during times of drought and pan-regional disruptions" (Stodder 2010b:72).

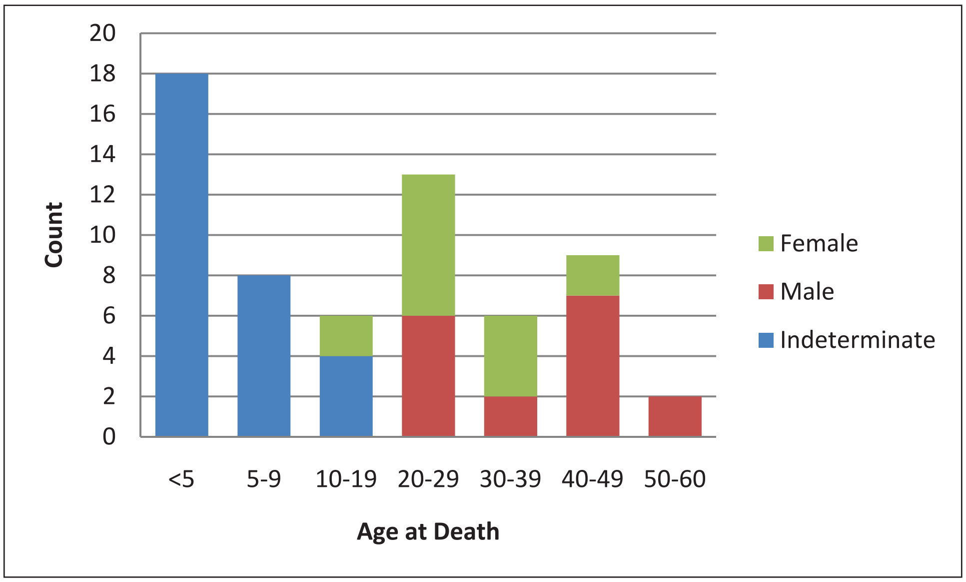

Figure 16.5. Age and sex distributions of individuals (n = 62) from the La Plata Highway project (Martin et al. 2001).

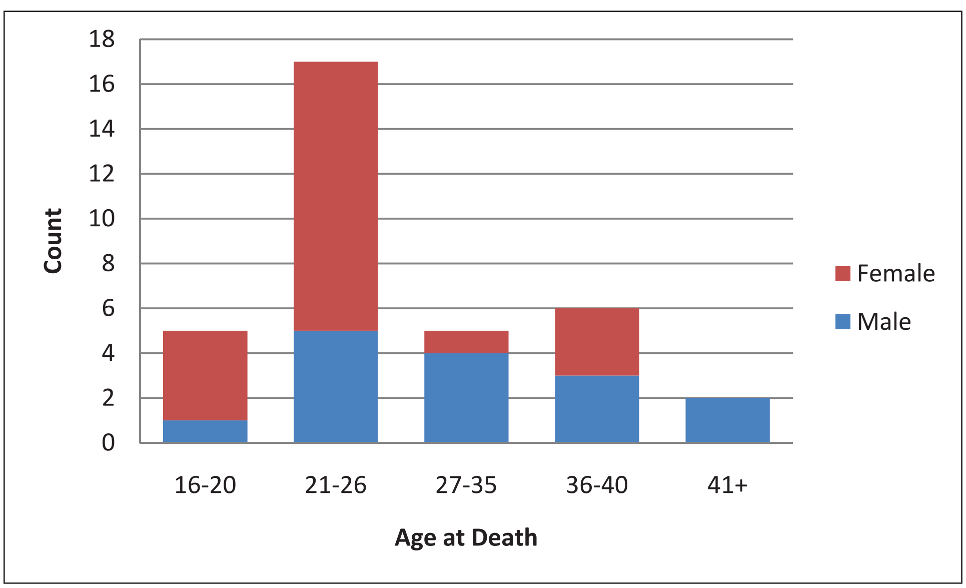

Figure 16.6. Age and sex distributions of Pueblo I individuals (n = 35) from DAP sites (Stodder 1987).

HEALTH AND DISEASE

Indices for disease in the ALP project skeletal assemblage are comparatively low to average for a prehistoric population in the Four Corners region, suggesting the Ridges Basin population was relatively healthy (Stodder et al. 2010a).

Cribra Orbitalia and Porotic Hyperostosis

Cribra orbitalia (pitting in the roof of the eye orbits) and porotic hyperostosis (the appearance of spongy, softened bone tissue) are the most common pathologies in ancestral Pueblo remains (Stodder et al. 2010a:90), and they are thought to derive at least in part from an iron-deficient diet, such as an unsupplemented maize-based diet, and/or a deficiency of vitamins C and B12 (Stodder et al. 2010a:90–91). Fourteen of 64 crania (22%) in the ALP project assemblage showed evidence of cribra orbitalia, whereas porotic hyperostosis was evident in five of 66 individuals (7.6%). Subadults (under 11 years old) exhibited a slightly higher occurrence, with 37 percent showing signs of either cribra orbitalia or porotic hyperostosis. This is a comparatively low rate. In assemblages from Mesa Verde, for example, 73 percent of individuals exhibit cribra orbitalia and 82 percent exhibit porotic hyperostosis (Stodder 2010a:94). In the Pueblo III assemblage for the Ute Mountain Piedmont, 80 percent of individuals had some indication of cribra orbitalia or porotic hyperostosis (Lambert 1999).

Rickets and Scurvy

Five individuals exhibited lesions that suggest scurvy, which is caused by a lack of vitamin C in the diet (Stodder et al. 2010a:96). This is within the range of other prehistoric communities in the Southwest, which tend to have no sign or low levels of scurvy (Stodder et al. 2010a:97). No case of rickets or osteomalacia (disorders causing skeletal changes due to vitamin D deficiency) were identified in the ALP project assemblage. In general, rickets is much less common than scurvy in the Southwest.

Osteoarthritis

Twenty-two individuals exhibited moderate to severe indications of osteoarthritis (OA) in one or more joint surfaces (Stodder et al. 2010a:123). But many individuals in the assemblage had no indications of OA. The most serious OA was evident in the shoulder and the elbow. Stodder et al. (2010a:124) note that the severity of OA increased with age in the ALP project assemblage, especially from young adult through middle and older adults. The overall mean score of OA is higher in adult females than in males. Comparing the ALP project data with later assemblages in the Southwest, Stodder et al. (2010a:133) note that the "higher incidence and difference in sex ratios suggests a different division of labor between males and females in this group of Pueblo I communities than prevailed six centuries later at Pecos [Pueblo]."

Stature

The skeletal morphology of the Ridges Basin Pueblo I people lies well within the range of morphological variation reported in regional skeletal assemblages. The estimated stature for females is slightly below the regional average (154.23 cm), whereas the estimate for males is slightly above the regional average (162.98 cm). Compared to other populations in the region, females in the ALP project assemblage displayed greater femur robusticity and above-average robusticity for the region. Male robusticity was slightly below average for the region. Average male stature was 6 percent higher than that of ALP project females, and most long bone length and breadth measurements were about 5 percent larger in males than in females. More detailed data on stature are presented in Stodder 2010c.

Dentition

The dental data from the assemblage (McClelland 2010b) generally corroborate the patterns noted above by Stodder et al. (2010a), and indicate typical health levels for a prehispanic Southwest population and possibly better general health than most other Southwest groups.

Wear Patterns

The permanent dentition of the early Pueblo I inhabitants of Ridges Basin exhibited wear patterns generally similar to those documented for other sites in the greater Four Corners region. Wear was heavy in both males and females, but there is no evidence that the rates of wear differed significantly between them. Females, however, did have much heavier wear in the mandible than did males. Antemortem chipping of the posterior teeth was quite common in this population, with no apparent differences between men and women. Based on the location of these defects, it is somewhat more likely that they came about from consumption of hard food items than through manipulation of foreign objects.

Caries

The caries rate in early Pueblo I Ridges Basin is much lower than that which has been reported for other sites in the Four Corners region from about the same time period. The findings of this study confirm previous observations by Martin and Goodman (1995) of burials from Ridges Basin recovered during previous projects. Women had somewhat higher overall frequencies of carious lesions, but the difference is not statistically significant. However, the locations of the lesions differed in male and female dental arcades.

Enamel Hypoplasia

The frequency of enamel hypoplasia in Ridges Basin permanent teeth was much lower overall than what has been reported for other sites in the region. The highest rates of occurrence were in the mandibular and maxillary canines. The difference between males and females for the mandibular canine nearly reached statistical significance, with the female rate higher overall. The processed human remains (remains that have been intentionally smashed, cut, burned, and broken) from Sacred Ridge (see below) had the highest rate of hypoplasia on the mandibular canine when compared with the other site clusters.

General Health

The most consistent signal with respect to the dental health of the early Pueblo residents of Ridges Basin is their relative health when compared with people in other sites that immediately postdate the Ridges Basin sites. Rates of dental caries, abscesses, antemortem loss of teeth, and enamel hypoplasia were consistently lower in Ridges Basin human remains than they were in remains from Black Mesa, the La Plata Valley, or the Dolores area (McClelland 2010b:178). The findings of this study confirm or extend the conclusions of Martin and Goodman (1995) in their examination of a small number of burials that were recovered from Ridges Basin in prior years.

Caries rates are highly sensitive to specific kinds of plant foods and are equally affected by differences in preparation technology. Yet, even though the overall dental health of the Ridges Basin sample was relatively good, it cannot necessarily be concluded that the subsistence economy in Ridges Basin was less agricultural or less focused on maize than it was at the other sites in the region. For example, high levels of dental calculus and periodontal disease suggest that the diet was not lacking in carbohydrates, but it is possible that differences in the specific types of wild plant foods or the relative amount of wild game in the diet conferred an advantage on the people of Ridges Basin. It is also possible that carbohydrate-rich foods were not as highly processed as they later were at the other sites in the region. The high frequency of antemortem chipping in the posterior teeth of the Ridges Basin population suggests that the diet included some harder food items, or at least food that was not intensively processed. Unfortunately, comparative data on antemortem chipping from the comparative sites are lacking, so the hypothesis cannot be confirmed.

Males and Females

Intriguing differences between male and female patterns of dental wear and pathologies were identified.

Women's dental health seems to have been at a consistent disadvantage when compared with men's, although the differences in absolute frequencies rarely reached statistical significance. More importantly, the distribution pattern of these pathologies within the dental arcade was very different. Women had much heavier wear in the posterior mandibular teeth, had many more caries and abscesses in these teeth, and experienced significantly more antemortem loss in this location. Two possibilities for these differences are proposed. One possibility is that women may have had different access to resources or different preferences in food that adversely affected them. The differences could have been in types of food, such as maize versus wild game, or in different methods of preparation, such as gruel versus flat bread. However, it is difficult to explain why such a difference in diet would have been consistently and disproportionately expressed in the posterior mandibular teeth. The other possibility is that women may have engaged in economic activities that involved placing abrasive foreign objects in the mouth. Activities such as chewing hide or softening plant fibers could have involved the posterior mandibular teeth to a much greater degree than the maxillary teeth, and these activities could result in the evident damage to these teeth.

Variation within Ridges Basin

In general, differences among the site clusters in dental wear and pathologies were not significant. Those differences that were apparent could often be explained by differences in the underlying age distributions of the subpopulations. However, the dental remains from the Sacred Ridge processed human remains (see below) seemed to vary consistently from the other site clusters. This assemblage had a somewhat lower caries rate, the highest frequency of enamel hypoplasia on the mandibular canine, and a significantly higher number of teeth with dental calculus deposits.

It is apparent that this subpopulation of individuals differed from those who were interred in a more conventional manner. The higher frequency of enamel hypoplasia suggests that individuals in this group may have experienced more nutritional deprivation or disease during childhood than did the individuals buried at the other site clusters. The greater amount of dental calculus suggests a diet relatively rich in carbohydrates or foods prepared in a manner that increased the adhesion of food particles to teeth. This may seem to conflict with the finding of a lower overall caries rate, but this apparent conflict may be explained by the relative youth of the individuals represented by the processed remains.

VIOLENCE

Cranial Trauma

Antemortem (healed or healing) cranial trauma was observed in 22 individuals (of 71 observable individuals [31%]) for a total of 30 wounds. The most common cranial traumas were depression fractures caused by blunt force at low velocity (present in 19 individuals). Although depression fractures can be caused by a fall, their presence on the front of the head is considered suggestive of interpersonal violence (Lovell 2008). Fifteen individuals had a depression fracture on the forehead or on the top or one side of the skull. One person had a nasal fracture and depression fractures on the forehead, and two others had nasal fractures. A total of 18 individuals—eight males, eight females, and two individuals of unknown sex—sustained nonlethal cranial or facial trauma suggesting assault.

No trauma was observed in the crania of infants or children. Among age groups, the highest prevalence was in adolescents: three of the four that were observable had cranial trauma. The average age at death of individuals with cranial trauma was 43 for males and 42 for females; including adolescents and young adults the average age was 36 years. Cranial fracture was more frequent in males than in females but not at a statistically significant level. In contrast to this markedly high rate of cranial trauma, the Ridges Basin population had a low rate of mostly typical accident-related postcranial injuries (Stodder et al. 2010a:143).

Across the basin, cranial fractures were most common in individuals from Sacred Ridge and the Eastern Cluster. Five of the eight observable females from Sacred Ridge had a cranial injury, as did five of the 10 observable males from Eastern Cluster sites. These two groups also had a high prevalence of nonspecific lesions. In the processed human remains assemblage at Sacred Ridge, 24 percent (n = 8) exhibited evidence of a cranial injury. Regarding counts for specific sites instead of settlement clusters, Sacred Ridge had the same number of individuals with cranial trauma as did 5LP185, but all the Sacred Ridge cases were female.

Cranial trauma (not including nasal fractures) was present on 28 percent of the sample of non-processed human remains. This percentage is higher than that of many prehistoric populations in the greater Southwest (Table 16.1). While sample sizes were quite small, the Ridges Basin assemblage exhibited one of the highest percentages of cranial trauma among the cases in Table 16.1 and significantly more than either Pueblo Bonito or Elden Pueblo. Indeed, there was more cranial trauma in the overall ALP project assemblage (28%) than in the Sacred Ridge processed human remains assemblage (24%). This amount of violence is notable, especially in light of the limited post-cranial trauma present in the overall ALP project assemblage.

Skeletons on Floors

Individuals found on the occupational surfaces of pit structures have been interpreted in a number of ways in the northern Southwest. Several of the individuals found on the floors of McPhee Village pit structures were interpreted as having been intentionally killed (Wilshusen 1986), whereas individuals in association with pit structure floors at the Duckfoot site seem to have been entombed in the house (perhaps the house they lived in) as part of a normal (nonviolent) mortuary sequence (Hoffman 1993:265–268; Lightfoot 1994:46–48).

In the Durango area the few instances of bodies associated with pit structure floors may not relate to standard mortuary practice. Two individuals found on a pit structure floor at 5LP481 in Bodo Canyon appear to represent individuals who were trapped in the structure when it burned (Fuller 1988:138). To Fritz and Honeycutt (2003), the positioning of an adult woman on the floor of a pit structure at 5LP379 on Blue Mesa suggests that this was not a formal burial.

Table 16.1. Antemortem Cranial Trauma Reported in Regional Skeletal Assemblages

		CR Depression Fracture			
Site / Site Group	**Time**	**n with / n observable**	**n with**	**Nasal Fracture Number***	**Reference**
Darkmold Site	Basketmaker II	4/14	29%	0	Mulhern and Charles 2008
Ridges Basin sites (Fort Lewis College)	Basketmaker III–Pueblo I	5/31	16%	1	Martin and Goodman 1995:37
Ridges Basin sites (ALP project) (non-processed human remains)	Early Pueblo I	19/71	28%	3/37 = 8%	
Sacred Ridge (processed human remains)	Early Pueblo I	8/33	24%		
La Plata Highway sites	Pueblo II–Pueblo III	9/39	23%	1 additional	Martin et al. 2001:104
Ute Mountain sites	Pueblo II–Pueblo III	6/26	23%	2/21 9.5%	Lambert 1999:142
Pueblo Bonito	Pueblo II–Pueblo III	6/61	10%	2/26 7.7%	Lambert 1999:142
Elden Pueblo	Pueblo III	2/30	7%	1/13 7.7%	Lambert 1999:142

*Observable numbers for nasal fractures were not always determined or reported; therefore, these numbers are expected to be smaller than the observable number of cranial vaults.
Source: Stodder et al. 2010a:Table 6.17.

> The individual was lying supine with arms bent and the hands adjacent to the head. The legs were splayed apart with the knees slightly bent and pointing outward. The body position implies that the individual died where she fell. (Fritz and Honeycutt 2003:3-20)

Two projectile points found in association with this individual (and potentially lodged in the soft tissue at death) led the authors to conclude that "the woman was killed in an act of violence and the pit house was then pulled down and burned over her body" (Fritz and Honeycutt 2003:3-21).

The single individual found on a pit structure floor in Ridges Basin as part of the ALP project also may have been killed. At 5LP237, the skeletal remains of a young adult male (Burial 137) were discovered on the floor of a burned pit structure. The pattern of burning on the remains suggests that the individual was lying on his left side when the burned roof collapsed. Two projectile points and remnants of a feather and yucca blanket were found in association with this individual (Eisenhauer et al. 2008e:244). One interpretation is that, as with the Blue Mesa example, this does not represent a formal burial but rather an incidence of violence. The victim may have been killed with arrows while sleeping on the blanket, and the house was then burned down over him. This is the likely explanation given this feature's resemblance to other nearby mortuary features thought to be the result of violence—and given the rarity of such features in Ridges Basin, in general.

It is also possible, however, that these individuals died elsewhere and were then placed on the floor of a pit structure, which was then burned down around them as part of a formal mortuary ritual. It is not known whether this has positive or negative connotations about the individual or the manner of death, but it might have been a rather expensive ritual if it required the roof beams and an otherwise useable structure to be destroyed. As Wilshusen (1986:254) notes about floor-associated interments at McPhee Pueblo,

> the fact that burials appear to have been deposited in ritual structures of secondary importance suggests that the individuals lacked social status at their death and yet that their demise had sufficient ritual importance to provoke the community into destroying a ritual structure in order to bury them (e.g., they were "witches").

Processed Human Remains at the Sacred Ridge Site

This section summarizes data on the archaeological context of the processed human remains at Sacred Ridge. The archaeological information in this section is gleaned from the excavation report on the Sacred Ridge Site (Chuipka 2009). This section also presents some of the demographic and biodistance data on the processed human remains assemblage, and these data are presented in greater detail in Perry et al. 2010. Three structures at the Sacred Ridge site dating to the latest phase of occupation (Features 58, 104, and 134) contained heavily processed human remains (Figure 16.7).

Feature 58

Feature 58, located at the southern edge of the site in Locus 9, was subrectangular and oriented southeast (Figure 16.8). It measured 7.9 × 6.8 m and was surrounded on three sides by a bench that measured 40–80 cm wide and 80 cm high. The downslope (southeast) side of the structure had a prehistoric depth of 1.4 m, whereas the upslope (northwest) side had a prehistoric depth of at least 1.8 m. Its original use was as a domicile. Just prior to the closure of the structure, human remains were processed around the hearth area. Following this processing event, the roof was burned, at which time only a small domestic artifact assemblage was in place. The structure may have been mostly cleaned out prior to the processing of the human remains, and the debris that was left behind may represent items used in the processing event.

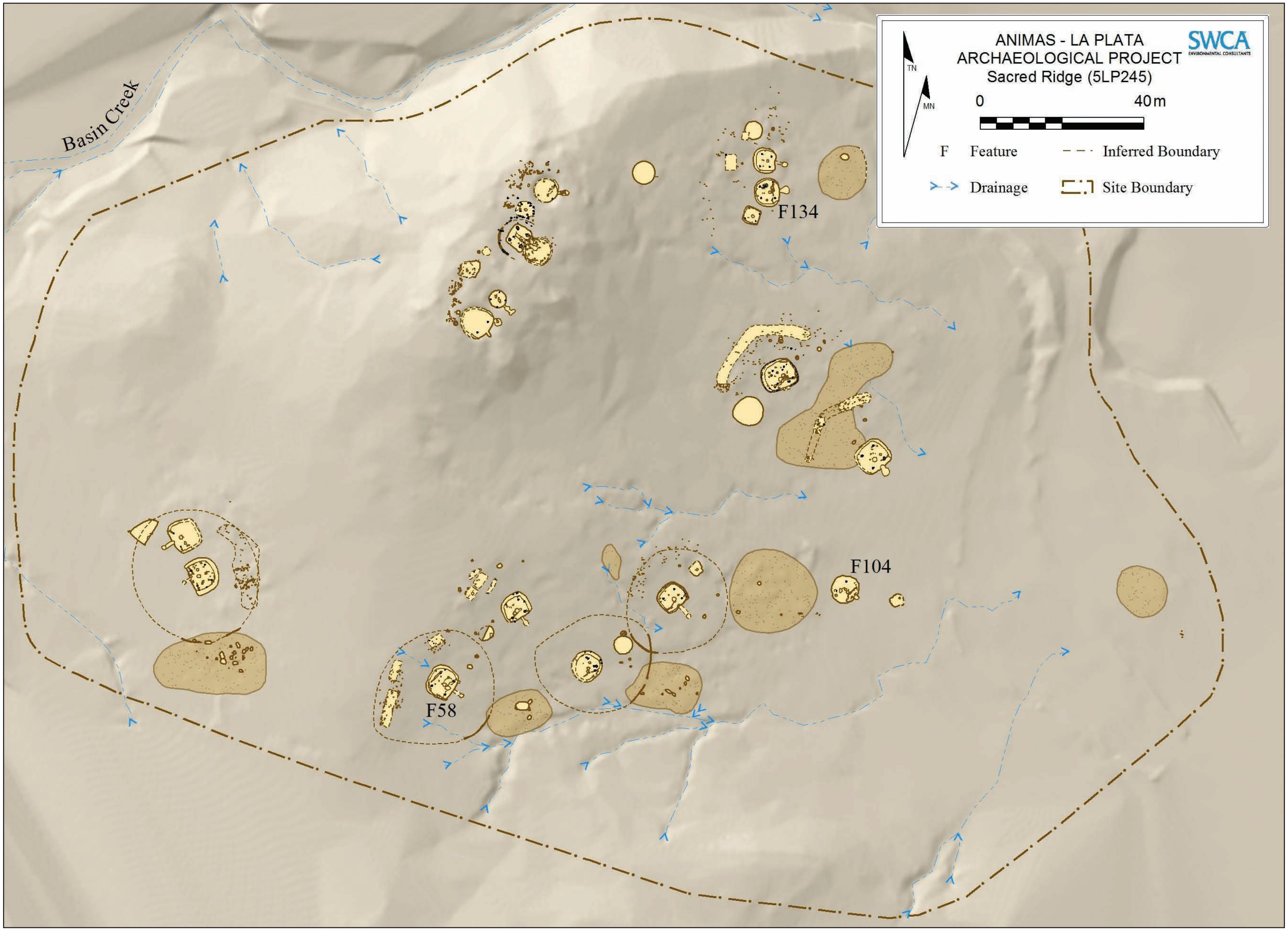

Figure 16.7. Map of Sacred Ridge. Features containing processed human remains are labeled.

The abandonment of Feature 58 was not as formal as at other structures excavated elsewhere in the project area. Instead, it appears to have been haphazard and hurried, with portions of the assemblage removed and the structure burned down around the remaining assemblage. The upper fill of Feature 58 was relatively clean compared to that of other pit structures in Locus 9 (Features 60 and 62), suggesting it was the last pit structure to be discontinued from use. The burning of Feature 58 is inferred to have coincided with the end of occupation of the locus.

Clusters of human remains showing varying degrees of fragmentation were found on the floor surface in the southeastern half of the pit structure (Figure 16.8). The densest deposits were found near and inside the hearth (Subfeature 58.28). Several fragments of human bone were also found in the southeastern corner of the structure (Subfeatures 58.27 and 58.30). Additionally, an incomplete inhumation of a subadult (Subfeature 58.29) was found on the bench surface in the northeastern corner of the structure. Because the human remains were so fragmented, it is unclear whether the clusters represented portions of a single individual or several individuals. Possibly, portions of the subadult on the bench were also part of the floor scatter. Some of the bone fragments in the hearth fill were charred, and some bone fragments in the other scatters were also thermally processed, as indicated by the extreme chalkiness and fragility of many of the fragments.

No funerary items were identified in association with these human remains. Two metates in the Subfeature 58.26 scatter appear to have functioned as anvils on which the bones were fractured with hammerstones. Indeed, one trough metate contained a human skull fragment and a hammerstone in situ (Figure 16.9). Also associated with the remains were several burned sandstone fragments.

Blood residue analysis (see Appendix B) was conducted on 19 floor artifacts and three artifacts recovered from the hearth (Subfeature 58.13). None of the hearth-associated artifacts (two flaked stone artifacts and a mineral item) were positive for human myoglobin (muscle). Six floor artifacts (two ground stone items, two flaked stone items, one ceramic item, and one mineral item) tested positive for human hemoglobin (blood) and myoglobin, including the trough but not the sides of the metate pictured in Figure 16.9.

This structure appears to have been a central processing area in which multiple human bodies were reduced to fragments and burned. The assemblage in the structures appears to be a mixture of the remnants of the domestic assemblage and the remains of processing, with many of the processed remains cleaned out of the structure prior to the structure roof being set on fire. The timing of the processing event was late in the occupation of the site and concurrent with other processing activities on the site, especially the secondary deposition of thousands of fragments of processed human remains into Feature 104 to the east of Feature 58 (Figure 16.7). Many of the remains processed on the floor of Feature 58 may have been deposited in Feature 104 (see below).

Feature 134

Located on the north end of the eastern slope of the ridge in Locus 4, Feature 134 was an oval to D-shaped pit structure oriented to the east. The structure measured 6.9 × 6.0 m and had a maximum prehistoric depth of 2.0 m. A poorly preserved 40-cm-wide and 50-cm-high bench surrounded the structure on three sides. The structure's abandonment appears to have been a planned event involving the burning of the roof and the removal of most of the domestic assemblage. In addition, a cluster of disarticulated and broken human remains measuring 94 × 63 cm was placed in the ventilator entry around the time the pit structure was abandoned. The jumble of highly fragmentary remains was recovered approximately 10 cm above the floor of the ventilator entry. No formal burial pit was evident in the overlying fill, suggesting that the remains were expediently deposited soon after abandonment. A single projectile point was the only artifact directly associated with the remains.

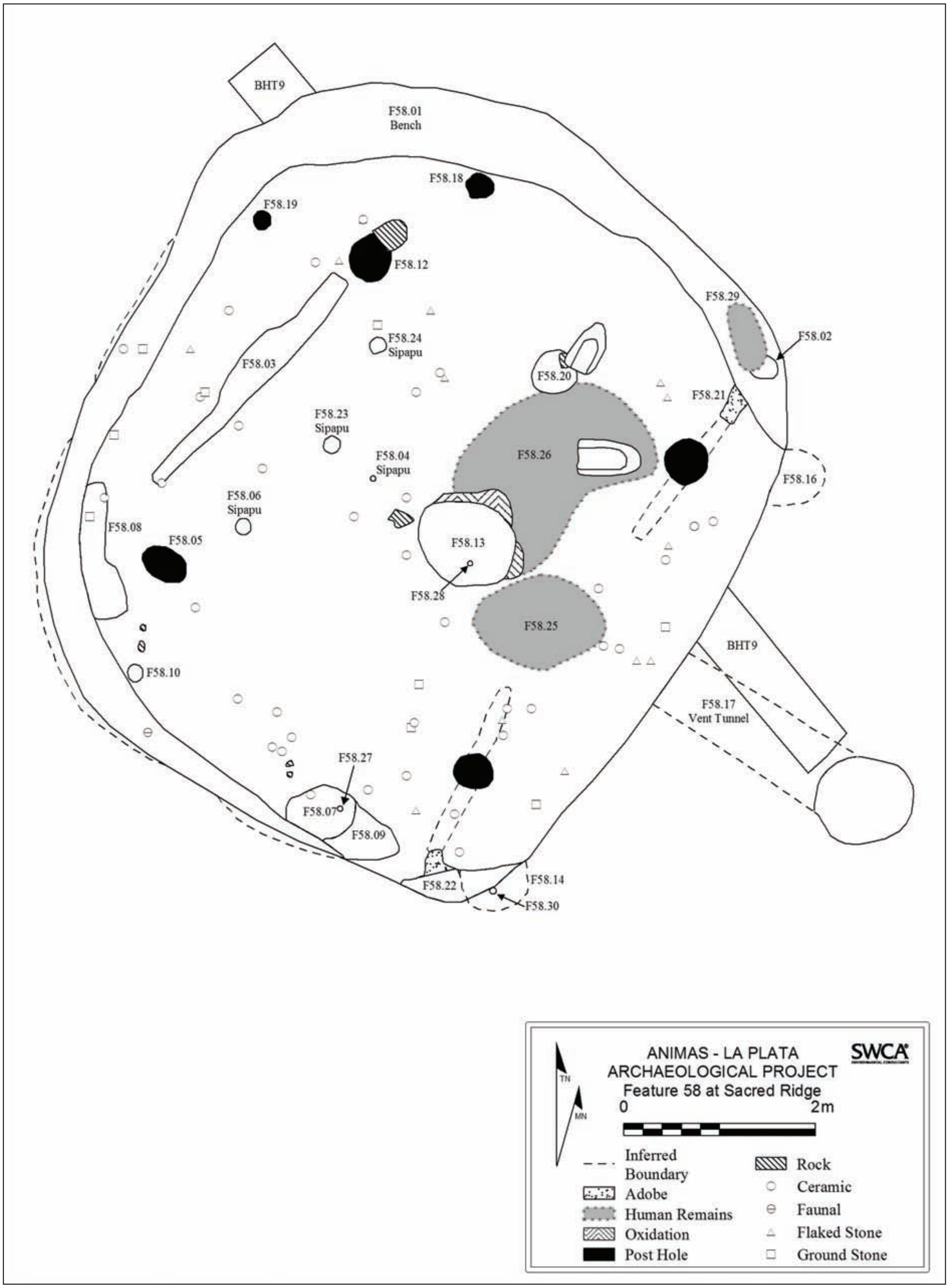

Figure 16.8. Plan map of Feature 58. Clusters of human remains shaded gray.

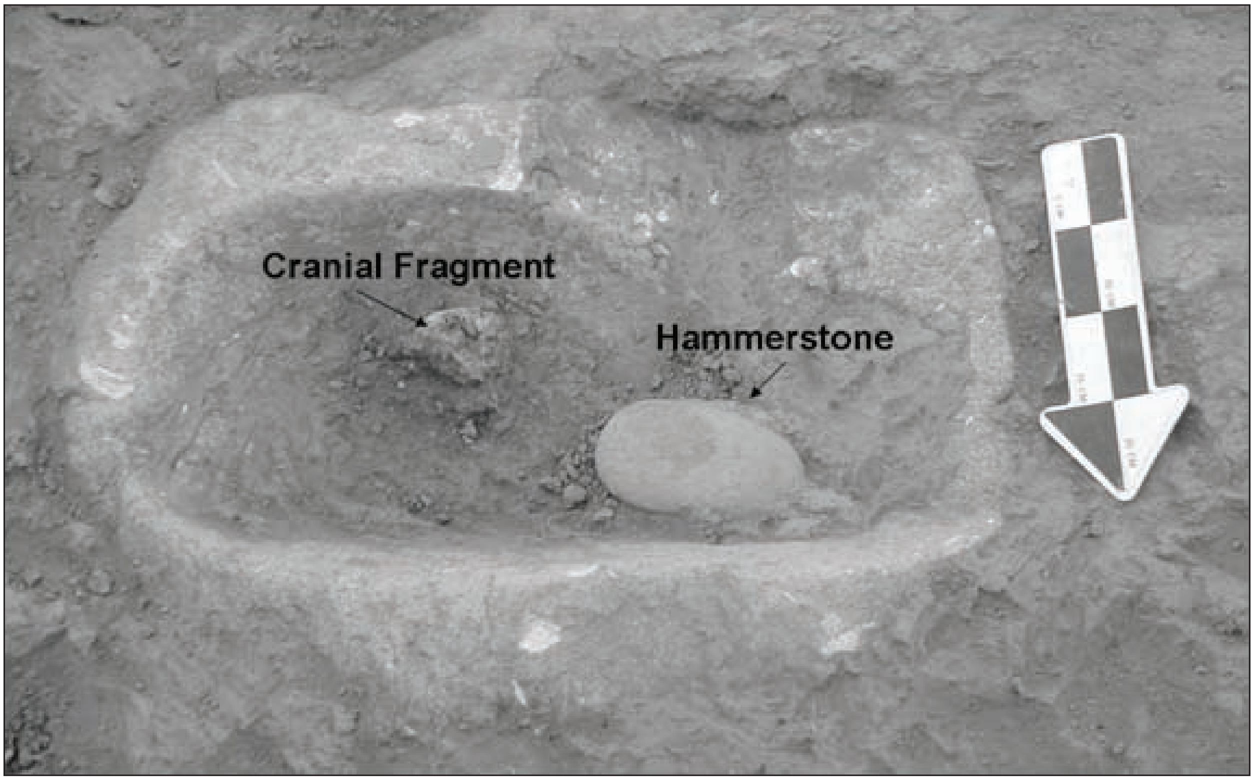

Figure 16.9. Photograph of human cranial fragments and hammerstone in a trough metate on the floor of Feature 58.

The remains represented less than 50 percent of a 45- to 49-year-old female with one subadult humerus fragment comingled. Skull fragments exhibited cut marks superior to the left orbit and oriented circumferentially, which is consistent with scalping. Perimortem fracturing of both left and right zygomatics was consistent with posteriorly placed blows to the side of the head. And a fragment of the mastoid process on the left temporal had an area of crushing on the super anterior surface, which is also consistent with crushing produced by blows to the side of the skull. In addition to the trauma evident on the cranial fragments, this individual exhibited numerous tool marks on her internal iliac fossa, possibly indicating disembowelment, and extreme fracturing and cutting of the long bones and vertebrae. The lower limbs in particular showed extensive processing in the form of multiple chop marks, cut marks, scrape marks, and perimortem fracturing. These remains exhibited very little burning.

The floor of Feature 134 did not contain any human remains. But 10 floor artifacts were tested for blood residue, and two artifacts returned strongly positive results for human hemoglobin and myoglobin (Appendix B). One of these artifacts was a grayware jar that tested positive on its interior in all three places tested: the bottom, the side, and the neck. The other was a two-headed axe or maul that tested positive on both ends. These data suggest that the processing of human remains likely occurred on the floor of this structure.

Feature 104

Feature 104, an unburned pit structure, was located on the eastern edge of Locus 7, where the eastern slope of the ridge met the Basin Creek floodplain. Feature 104 was oval and oriented to the southeast (Figure 16.10). It had a maximum prehistoric depth of 1.8 m and lower wall dimensions of 6.0 × 5.2 m. This structure did not have a bench and was the only structure excavated on Sacred Ridge with a bifurcated vent.

It also stood out for its oval shape and the large number of floor features, including a corner bin. In general, Feature 104 was more similar to structures found elsewhere in the greater Durango area than it was to neighboring structures at the Sacred Ridge site. Structures with a nearly identical morphology have been excavated on Blue Mesa and east of the Animas River on Grandview Mesa. Feature 104 functioned as a habitation that became the focus for the processing of human remains immediately before the structure was abandoned. Moreover, after it had gone out of use as a domicile and processing locus, it became the receptacle for the secondary deposition of massive amounts of processed human remains. No evidence was found to suggest that the structure had burned. Instead, the roof was disassembled after human remains were processed in the structure. Evidence of this processing is clearly evident in the Feature 104 floor assemblage, in the remains found in and around the hearth (Subfeature 104.10), and in the material recovered from the upper half of a thermal refuse pile (Subfeature 104.08).

After the roof was disassembled, an even greater amount of processed human remains and artifacts was deposited into the structure depression (Features 110 and 111). This larger deposit of broken human bone and artifacts was then buried somewhat expediently and the remaining depression was left to fill naturally.

Feature 104 Floor Assemblage

The Feature 104 floor assemblage included 1,508 human bone fragments from west of the wing wall–deflector complex, and 1,079 human bone fragments in Subfeature 104.08, a thermal refuse pile east of the wing wall–deflector complex (Figure 16.10). The human remains represented several individuals. Also present in both assemblages was a typical assortment of domestic artifacts, including several ceramic vessels, flaked stone scrapers and choppers, bone tools, manos, and metates. These point-located items likely represent activities that occurred in the structure immediately prior to and during the disassembly of the roof. The final activity that took place in the structure was the processing of both human and dog remains. At least four dogs are represented. Ungulate-sized and rabbit-sized mammals were also processed in the structure around the time of abandonment although in smaller numbers than dogs.

Almost every fragment of human bone in the Feature 104 floor assemblage exhibited some degree of burning, ranging from partial charring to being fully calcined. Given that the roof of the structure had not been burned at abandonment, this thermal alteration was likely cultural and likely took place in the hearth (Subfeature 104.10). Similarly, the degree of fragmentation of the bones does not appear to be natural. The damage to these remains is also assumed to be cultural and appears to have taken place in Feature 104 immediately prior to abandonment.

Blood residue analysis (Appendix B) was conducted on 12 floor-contact artifacts from Feature 104, including three ceramics, a mineral sample, four ground stone items, a worked bone, and a flaked stone item. Only one artifact, a grayware jar, tested positive. One soil sample from the floor was also analyzed and tested negative.

Features 110 and 111: The Upper Fill of Feature 104

The human remains recovered from the post-occupational fill of Feature 104 were designated Feature 110 and Feature 111 (Figure 16.11). This difference in designation is due partly to the method of excavation and partly to the fact that these two features appeared to have been differentially affected by cultural and natural formation processes. The features were similar in that the human remains were heavily fractured and were associated with artifacts and burned rock. A charcoal-rich matrix surrounded most of the cultural material in both Feature 110 and Feature 111. Feature 111 was the most extensive deposit in the post-occupational fill and measured 5.9 × 5.2 m. This dense deposit of artifacts, human bone fragments, and burned rock was separated from the floor assemblage by the collapsed roof material (Substratum IVa) everywhere but in the center of the structure, where it merged with the floor assemblage (Stratum V) around the hearth. Feature 111 was associated with the charcoal-rich Stratum III deposits of the Feature 104 fill and appeared to be the primary deposit. Feature 110 was the uppermost scatter of human bone fragments, artifacts, and rock that was recovered from the post-occupational fill (Stratum II) of Feature 104. Feature 110 is thought to represent material that naturally eroded out of Feature 111. The items provenienced to Feature 110 were widely dispersed both horizontally (over an area measuring 6.5 × 6.0 m) and vertically (throughout Stratum II). Features 110 and 111 contained more than 12,000 fragments of human bone, all within the context of the post-occupational fill of Feature 104. Distributed among these remains were nearly 600 artifacts that appeared to have been deposited at the same time as the bone fragments. All human remains and artifacts appeared to have been deposited in a single event after the structure roof was disassembled.

Most of the human remains recovered from Features 110 and 111 exhibited some form of modification or perimortem processing. The degree of fragmentation of these bones is most evident in the composite plan map of Feature 111 presented in Figure 16.12.

Burning was also a common type of damage to the bone fragments. Given the context of the remains, it is evident that much of the processing occurred elsewhere before the fragments were deposited in Feature 104. The processing was most likely perimortem, occurring soon after the individuals died.

The Bone Assemblage

The human remains on the floor and in the upper fill of Feature 104 consisted of a wide variety of mostly partial elements from the cranial and postcranial skeleton (Stodder et al. 2010b). A minimum of 35 individuals was represented in the assemblage; both males (n = 5) and females (n = 7) were present, with ages ranging from infant to adult (Figure 16.13) (Ezzo 2010:Table 8.1; McClelland 2010b:Table 7.1). The entire Feature 104 assemblage comprised 14,882 fragments, which is more than any other assemblage from the Southwest (Figure 16.14). With the exception of one partial foot and an elbow, no articulated skeletal elements and very few intact bones were recovered—there was more destruction evident in this assemblage than in any other known assemblage. In addition, the processing of these individuals was patterned; on several individuals the same damage is evident in the same anatomical locations. In each case, systematic destruction of the entire body was evident from head to toe. Even foot and toe bones were broken and the bottoms of feet were cut, chopped, and scraped. Several individuals had undergone removal of the scalp, nose, and/or ears, perhaps as trophies. Other common damage to the skull and face included the smashing of the front teeth, the disarticulation of the lower jaw, and blunt force trauma to the cranium followed by breakage and burning.

Bones were deposited into Feature 104 already broken rather than as intact elements. Because parts of the same skull and other conjoinable elements were recovered both from the floor of Feature 104 and from the upper fill, it appears that at least some of the bones processed on the floor of Feature 104 were removed prior to the dismantling of the roof and redeposited after the dismantling of the roof. Additionally, it is reasonable to assume that processing of human remains occurred in three additional pit structures at the Sacred Ridge site—Features 58, 134, and 79—all of which contained floor artifacts that tested positive for blood residue (Appendix B).

Biodistance Studies

Dental and cranial biodistance studies indicate that the people deposited in Feature 104 were biologically distinct from the rest of the Ridges Basin population. As a part of the ALP project, McClelland (2010b) analyzed teeth from 173 individuals from 18 Pueblo I sites in Ridges Basin, including the Sacred Ridge site.

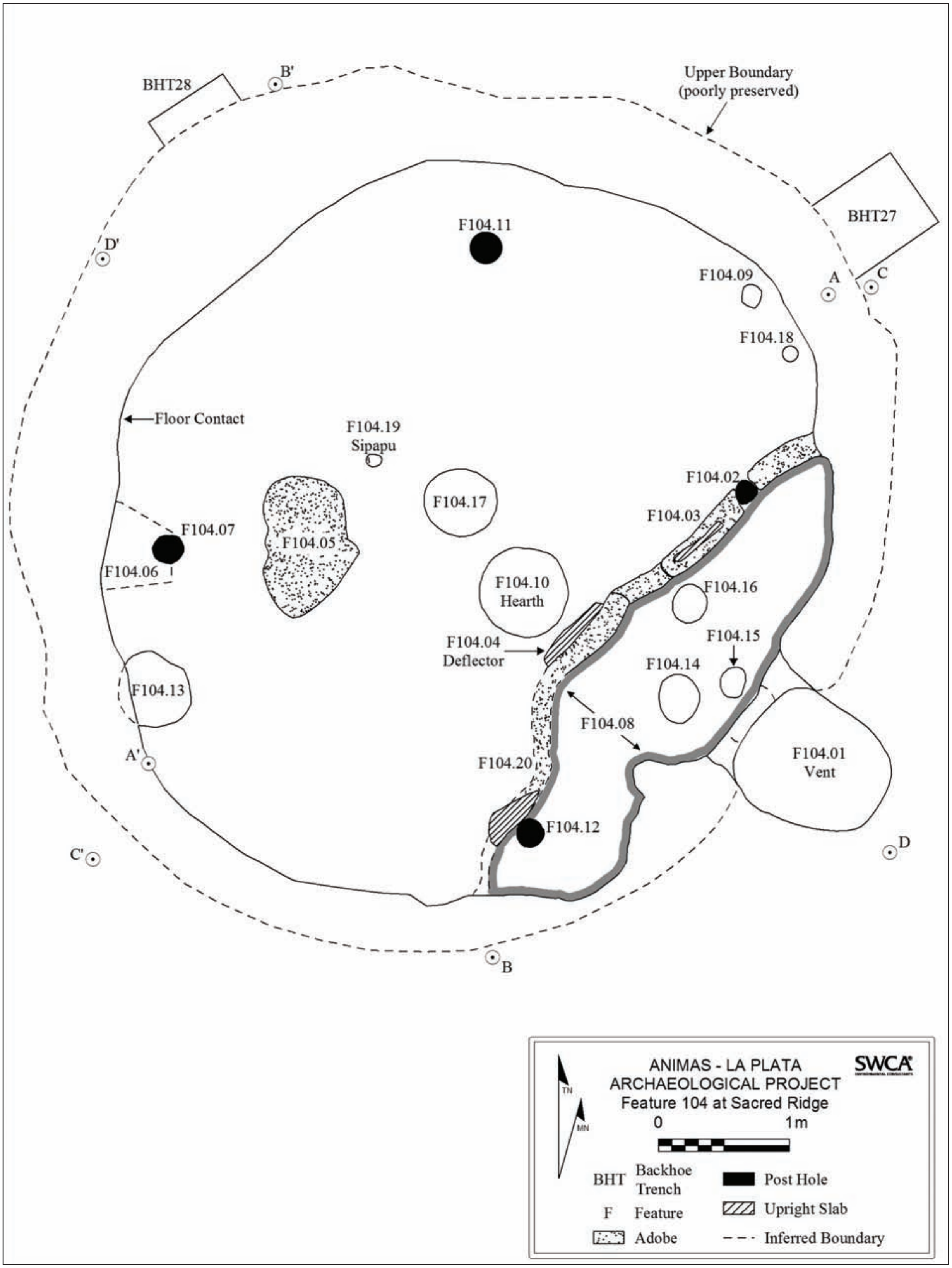

Figure 16.10. Plan map of Feature 104.

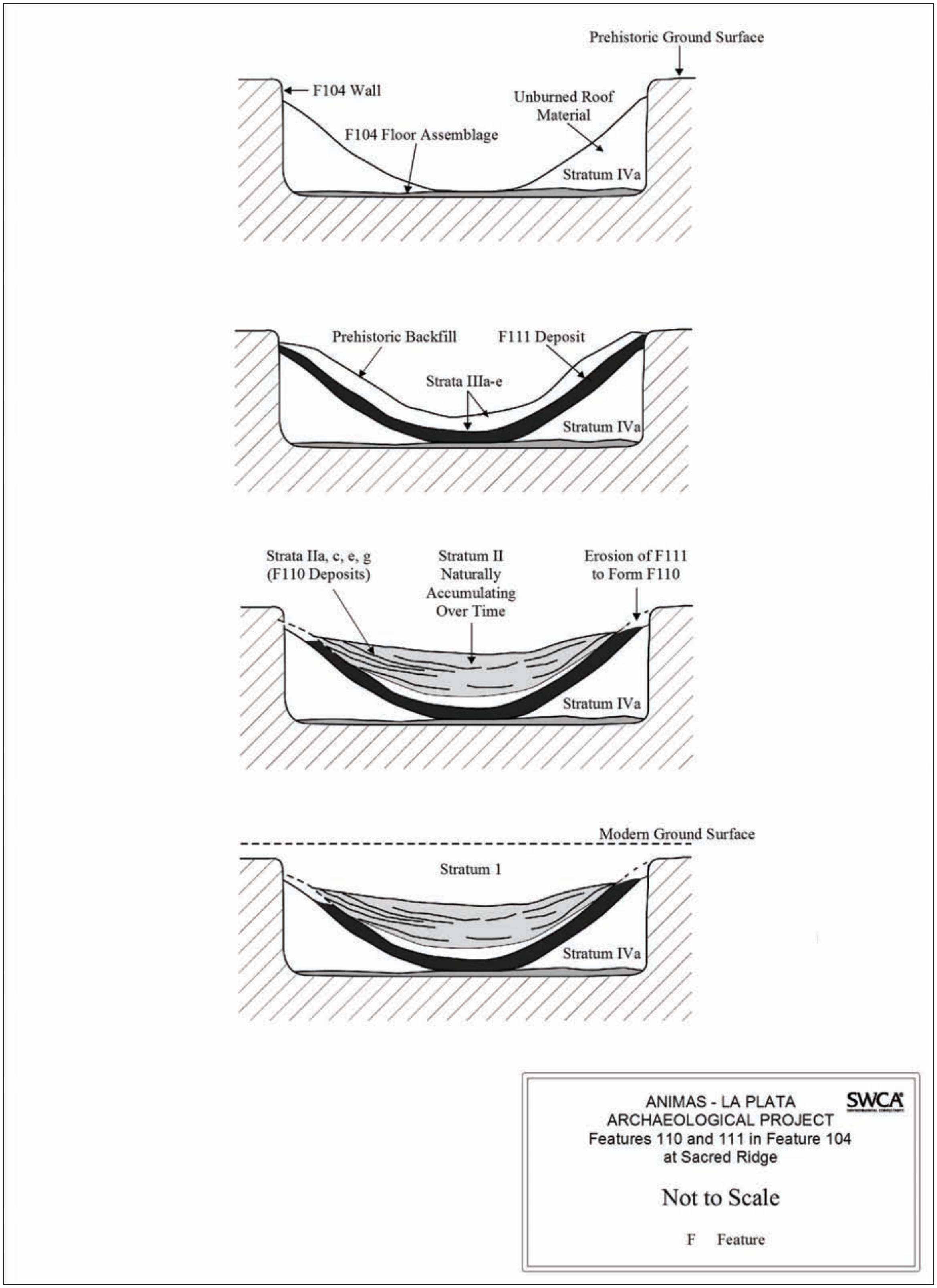

Figure 16.11. Schematic profile drawings showing the deposition sequence of Features 110 and 111, the upper fill of Feature 104.

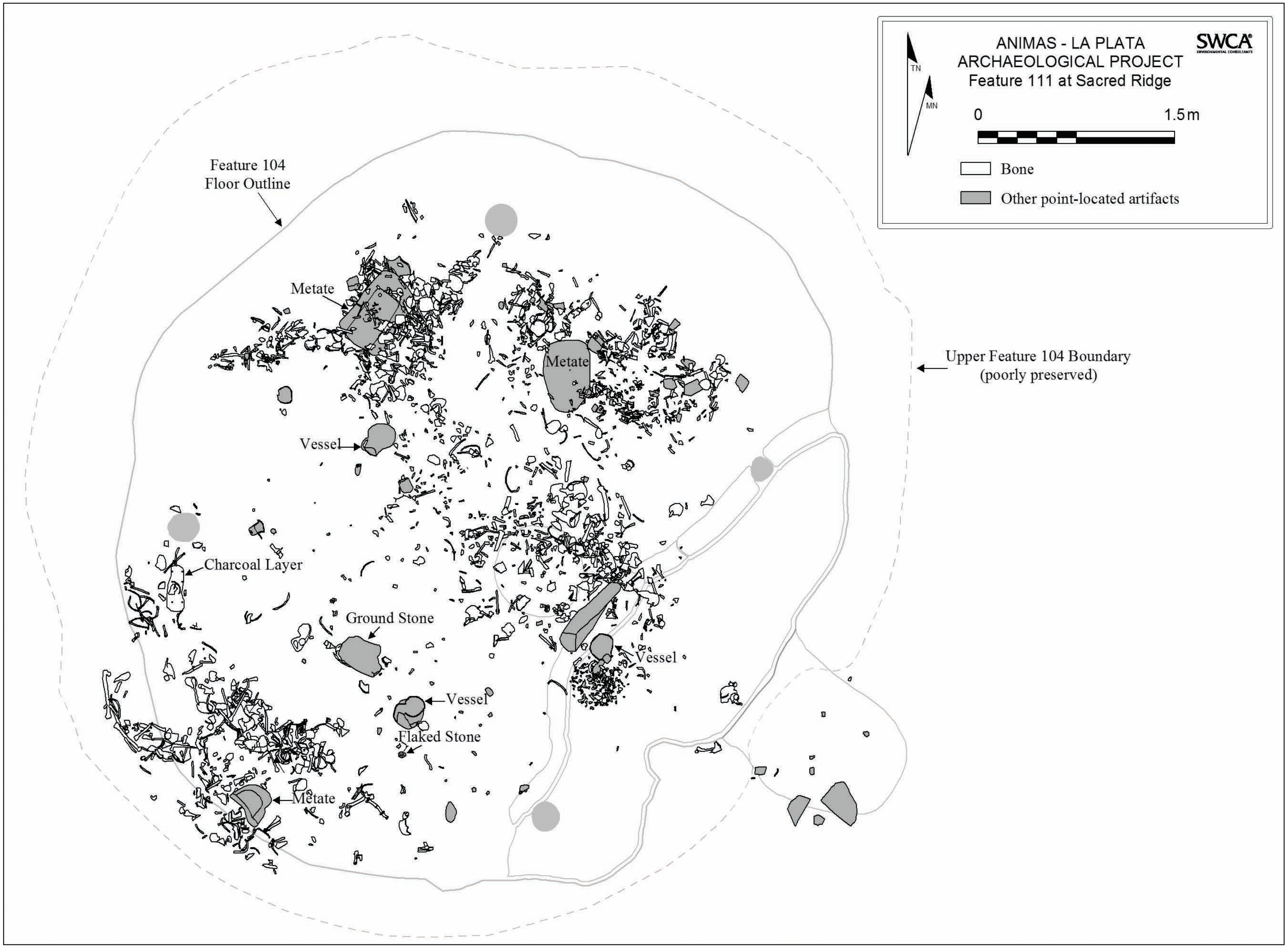

Figure 16.12. Feature 111 plan map showing locations of human bone fragments and associated artifacts.

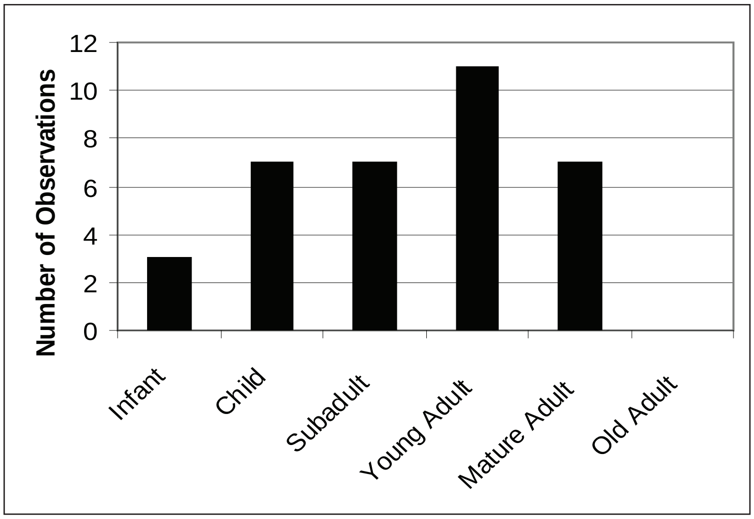

Figure 16.13. Age distribution for processed human remains in Feature 104 (n = 35) (data from McClelland 2010a:Table 7.1).

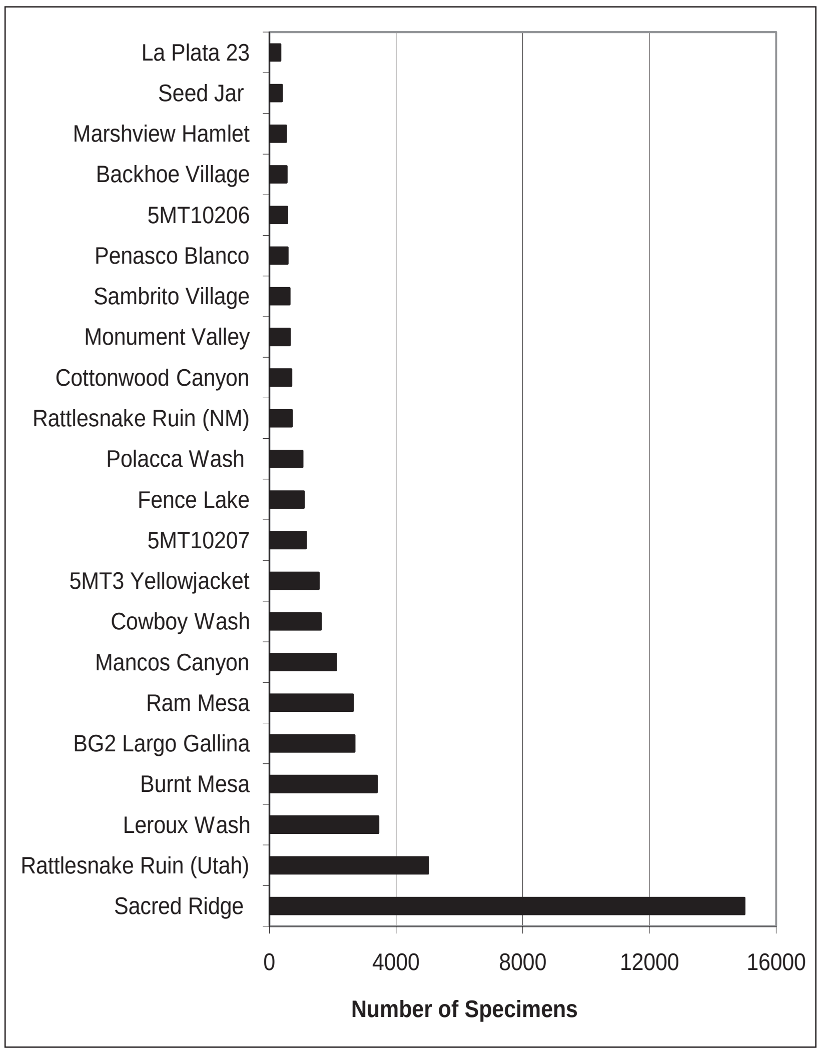

Figure 16.14. Number of bones or fragments from the large assemblages of disarticulated human bone in the northern Southwest (data from Turner and Turner 1999; Turner n.d.)

Among these samples, he found that the processed human remains assemblage from Sacred Ridge differed from all others in Ridges Basin in six dental traits (four at the $p = 0.50$ level and two at the $p = 0.10$ level).

> The individuals at 5LP245 whose remains were disarticulated and processed were not a random selection from among the overall population of Ridges Basin. In addition to the biological differences, they appeared to have had a somewhat different diet and may have experienced a higher level of juvenile growth disruption. (McClelland 2010b:237)

In an analysis of the skulls of 26 individuals from across the basin, Douglas and Stodder (2010) found similar patterning. "The nonmetric trait variation, supported by multivariate analysis, suggests the [processed human remains] assemblage was a familial group distinct from the [non-processed human remains] assemblage as a whole, and that it was also distinct from other individuals buried in a normative manner at the Sacred Ridge Cluster" (Douglas and Stodder 2010:220).

Ezzo (2010) collected samples of tooth enamel from 98 individuals from the Ridges Basin community and analyzed them for variation in their strontium isotope signature ($^{87}SR/^{86}SR$). Differences noted between local strontium ratios (as exhibited by local plants, animals, and geology) and the strontium ratios in the enamel of individuals, which forms during the first year of life and does not remodel, may signal the presence of immigrants to an area (Ezzo 2010). Twenty-eight samples were analyzed from individuals associated with Features 104 and 111. According to Ezzo (2010:194),

> of the 28 individuals who were analyzed, 24 patterned as local to Ridges Basin, one patterned local to Blue Mesa or the upland areas surrounding Ridges Basin, and three patterned as intermediate between Ridges Basin and Blue Mesa. None could confidently be defined as immigrants; the three intermediate values may represent immigrants from a geologically younger region, such as the San Juan Basin, or they may have spent their first year of life obtaining food from both Ridges Basin and Blue Mesa/upland areas surrounding Ridges Basin.

The strontium analysis suggests, then, that the people represented by the processed remains in Features 104 and 111 were part of the local population, perhaps from Blue Mesa, and were not outsiders or first generation immigrants. Nevertheless, cranial and dental biodistance studies indicate that they were a distinct group within the community, possibly a lineage or members of a distinct (and endogamous) ethnic group.

The Feature 111 Artifact Assemblage

In total, 463 artifacts were found comingled with the processed human remains in Feature 111: 205 ceramic items, 61 flaked stone items, 17 ground stone items, 178 faunal remains, and two minerals. In general, these artifacts typify a Pueblo I domestic assemblage. Of particular note, however, is the relatively large number of domesticated dog remains associated with the processed human remains. More than one third (33.7%) of the faunal remains recovered from Feature 111 were dog bones. For the project assemblage as a whole, domesticated dogs comprised only 13.7 percent (Potter and Edwards 2008:250). A higher-than-average number of dog remains was also found in association with the floor of Feature 104, and these appear to have been processed similarly to the human remains (Chuipka 2009:213).

Blood residue analysis was conducted on seven artifacts and four soil samples from Feature 111 (Appendix B). Four of the artifacts—a flaked stone item, two ceramic vessels, and the blunt ends (but not the flat sides) of a rock—tested positive for human myoglobin. The remainder of the artifacts (a flaked stone item, a mineral piece, and a ceramic sherd) and all four soil samples tested negative. These negative results suggest that the artifacts and portions of artifacts that tested positive did so not because of incidental contact with soil or human body parts, but rather because they were indeed used to process the remains and were deposited with those remains once the task was complete.

Interpretation of the Processed Human Remains

The Sacred Ridge processed human remains assemblage was similar to other assemblages from extreme processing events (Kuckelman et al. 2000) in the Southwest in that bodies were heavily processed and reduced, were subject to scalping and trauma to the head and face, and were associated with pit structures. Yet, the Sacred Ridge assemblage is unique in many ways and does not fit the expectations of warfare, social intimidation, starvation cannibalism, funerary rites, and witchcraft (Table 16.2) (see Potter and Chuipka n.d. for more detail on expectations for each model). The characteristics of the Sacred Ridge assemblage differed from those expected for intergroup warfare and violent social control by having faunal remains comingled with the assemblage. It varied further from the expectation of intergroup warfare by involving both men and women of all ages, especially infants, children, and subadults. By exhibiting extensive facial and cranial trauma, by involving a large number of victims killed at one time, and by exhibiting evidence of processing of all parts of the body, including the feet, the Sacred Ridge assemblage diverged considerably from the expected results of a starvation cannibalism episode. Moreover, formal preparation of the deceased may be discounted from the lack of formal burial and offerings and the enormous collection of comingled bones from many individuals.

In contrast, the attributes of the Sacred Ridge assemblage did exhibit many attributes of witch destruction, including extensive facial and cranial trauma, association with faunal remains (particularly those of domesticated dogs), the relatedness of the group members, and the spatial separation of contexts of execution and processing from the final disposal context (Darling 1999; Walker 1998). In addition, environmental conditions became dryer and cooler in the early A.D. 800s (Anderson 2008c), which may have added stress to a community dependent on dry farming and living at 6,800 feet, and, as a result, increased the likelihood of witchcraft accusations within the community.

One pattern at the Sacred Ridge site that did not fit well with the witch destruction scenario, however, is the extremely large size of this group of victims. At least 35 people, perhaps more, were killed and mutilated during this event. That would be an unprecedented number of people found guilty and executed at one time as a result of witchcraft accusation. For example, most witch trials on record at Zuni involved single individuals, and only one trial involved more than two individuals (Darling 1999:741; Smith and Roberts 1954). The Sacred Ridge assemblage, then, is many times larger than even the largest recorded group executed for witchcraft at Zuni. Is there another explanation that can better account for the patterning at Sacred Ridge?

Ethnic Conflict in the Pueblo I Period

Komar (2008) suggests that events like that recorded at Sacred Ridge offer evidence of an escalation of violence that has many of the hallmarks of modern genocide. She notes the legal definition of genocide as "the destruction, in whole or in part, of a national, ethnic, racial, or religious group" (Komar 2008:125; United Nations 1948), and further suggests that genocide may be visible in archaeological patterning if the following attributes are present (Komar 2008:131):

- Geographic concentration of previously dispersed populations
- Large-scale attacks, including the eradication of villages
- Indications of social inequality among groups
- Mass inhumations
- Extensive evidence of perimortem violence and trauma
- The inclusion of women, children, and elderly among the victims

Table 16.2. Expectations for Processed Human Remains as a Result of Warfare, Violent Social Control, Starvation Cannibalism, Preparation of the Deceased, and Witch Destruction

	Processing of Bodies, including Disarticulation, Fragmentation, Anvil Abrasions, Cut Marks, and/or Burning	**Formal Burial and/or Offerings**	**Extensive Facial and/or Cranial Trauma**	**Removal of Skeletal Parts for Trophies, especially Hands, Feet, and Crania, including Scalping**	**Missing or Reduced Parts Due to Marrow Processing**	**Faunal Remains Intermingled**	**Evidence of Nutritional or Environmental Stress**	**Old, Young, and/or Weak Preferentially Selected**	**Adult Males Preferentially Selected**	**Large Group of Victims Killed at One Time**	**Relatively Small Number of Victims at Any One Time**	**Reference**
Inter-group warfare	X		X	X			X		X	X		Kantner 1999; Kuckelman et al. 2002
Violent social control	X		X	X						X	X	Kantner 1999
Starvation cannibalism	X				X?	X?	X	X?			X	Kantner 1999; Rautman and Fenton 2005
Preparation of the deceased	X	X									X	Kantner 1999
Witch destruction	X		X			X	X				X	Darling 1999

X = expected. X? = questionable.

The Pueblo I period in the northern Southwest was a time of considerable cultural and ethnic diversity among village communities (Chuipka 2008b; Wilshusen and Ortman 1999). In addition to these documented intercommunity differences, Ridges Basin exhibits evidence of intracommunity cultural and ethnic diversity (see Chapter 15, Ritual, Social Power, and Identity). Spatially clustered patterns of distinct architecture (Potter and Yoder 2008), ceramics (Allison 2010), and mortuary features and associated artifacts (Potter 2010b; see also Chapter 15), as well as measures of biological distance (McClelland 2010b; Douglas and Stodder 2010) indicate that at least three biologically discrete, identity-conscious groups composed the Ridges Basin community.

Ancestors of some of these people may have lived in the Ridges Basin area prior to A.D. 700, but not many. Tree-ring data from the region indicate minimal occupation prior to A.D. 700 and substantial immigration into the basin in the eighth century (Potter and Chuipka 2007a; Potter et al. n.d.; Chapter 15). Thus Komar's first criterion—geographical concentration of previously dispersed populations—is met by the Ridges Basin data.

The second, fourth, fifth, and sixth criteria—large-scale attack, mass inhumation, extensive evidence of perimortem violence and trauma, and the inclusion of women, children, and elderly among the victims—are all met by the Sacred Ridge processed human remains assemblage. In addition, there is some evidence to suggest that a certain degree of social inequality was present within the community, meeting Komar's third criterion. Chuipka (2008b), for example, argues that the unique architectural features at the center of the Sacred Ridge site, including a two-story wood and adobe tower, indicate vertical social differentiation within the community.

In addition, this complex of features was associated with exotic goods, an excess of ground stone implements, elevated frequencies of San Juan Red Ware vessels, and a relatively high proportion of large game remains (Chuipka 2008b:215, 2009; Potter and Edwards 2008). These data suggest the disproportionate distribution of power and resources within the community (see also Chapter 15).

The genocide model certainly accounts for the large number of victims and also predicts that the people deposited in Feature 104 would be biologically distinct from the rest of the Ridges Basin population, as borne out by the dental and cranial biodistance analyses (Douglas and Stodder 2010; McClelland 2010b). Furthermore, the utter destruction of these people, and, in the process, their identity—particularly the extreme damage to the facial areas of the skull—seems consistent with the goals of genocide. Even the destruction of the dogs may have been designed to eradicate all that was identifiable with this group.

On the other hand, we are not suggesting that pre-contact American Indians were genocidal in the modern sense. One criterion often used to distinguish between ethnic violence, even extreme versions of it, and genocide, is the scale and extensiveness of the violence. Since only a single village was the subject of this event, the incident may be better characterized as extreme ethnic conflict, or ethnocide, rather than genocide, Komar's model notwithstanding.

Invoking ethnic conflict as an explanation of the massacre at Sacred Ridge does not rule out other goals and actions. The event may well have been accompanied by witchcraft accusations and attempts at social intimidation, for example. Cannibalism may also have occurred. The level of brutality and degree of processing suggests, however, that starvation cannibalism was not a primary motive and instead that it was the destruction of these people's identities that was the primary goal of the extreme perimortem mutilation evident at Sacred Ridge.

SUMMARY: ADDRESSING THE RESEARCH DESIGN

The ALP project skeletal population exhibited a mortality profile consistent with other populations in the northern Southwest. For example, both the ALP project assemblage and the La Plata Valley assemblage (Martin et al. 2001) contained about 40 percent infants and children under 10 years old, 3–4 percent people over 50 years old, and almost 50 percent between 20 and 50 years old. Female survivorship, however, was higher in the ALP project assemblage than it was in both the La Plata Valley and Mesa Verde assemblages, especially for older females.

Health and disease indicators suggest that the ALP project population was relatively healthy compared to other populations in the prehispanic Southwest. The most prevalent health risk aside from violence appears to have been anemia, evident as cribra orbitalia and porotic hyperostosis in 37 percent of the subadult population. This is a comparatively low rate, however. The Mesa Verde assemblage, for example, had 73 percent exhibiting cribra orbitalia and 82 percent exhibiting porotic hyperostosis, and 80 percent of the Pueblo III individuals in the Ute Mountain Piedmont assemblage had some indication of cribra orbitalia or porotic hyperostosis. Similarly, rates of dental caries, abscesses, antemortem loss of teeth, and enamel hypoplasia were consistently lower than occurrence rates reported from Black Mesa, the La Plata Valley, or the Dolores area.

Contrary to health and disease indicators, evidence for violence was more prevalent in the ALP project assemblage than in many other Southwestern assemblages. The frequency of cranial trauma, although not far from the range of many groups in the Southwest, was one of the highest among those compared in this study, suggesting endemic violence. Although not common, skeletal remains associated with pit structure floors may also represent violent acts among households in the community. Finally, the massacre and subsequent processing and disposal of at least 35 people in a pit structure at Sacred Ridge represents one of the most brutal and large-scale events in the history of the Southwest (prior to Spanish Conquest), and may be characterized as ethnocide.

The main goal of this chapter is to summarize much of the data in the ALP project volume *Bioarchaeology* (Perry et al. 2010) and, in the process, characterize the general health of the Ridges Basin population, including levels and intensity of violence. This final section specifically addresses the questions posed in Chapter 7, Pueblo I Research Questions, relating to these issues.

What do patterns of infant mortality, incidence of disease, achieved stature, and dental pathology in the Ridges Basin skeletal series indicate regarding the stresses experienced by the community?

Infant mortality, disease and infection, achieved stature, and dental pathologies all suggest that the Ridges Basin population was relatively healthy and well within the range of Southwest populations for these traits. Indeed, dental pathologies such as caries and enamel hypoplasia were lower than the rates of occurrence reported from other areas of the northern Southwest. It does not appear from the skeletal data that the community experienced more dietary stress or a greater disease load than other communities in the northern Southwest.

Do non-metric skeletal traits indicate the existence of discrete genetic groups?

Non-metric trait variation within the Ridges Basin skull assemblage suggests that there were biological differences among the site clusters and also among individual sites (Douglas and Stodder 2010). Non-metric data from crania suggest also that the processed human remains assemblage from Sacred Ridge represented a distinct group from those represented by the non-processed assemblage as a whole, and that it was also distinct from the formally interred individuals at Sacred Ridge.

Do variable incidences of dental opacities suggest various cultural origins for occupants of Ridges Basin?

Both the processed human remains and the remains found in conventional burials at Sacred Ridge differed significantly in the frequency of hypocalcification from those at other Ridges Basin sites (McClelland 2010b). There was also a significant relationship of hypocalcification to age, with juveniles affected to a much greater degree.

> The higher frequency of this condition in Ridges Basin juveniles might suggest that it is more reflective of growth disruption than by minerals in drinking water…. [T]his would indicate that the juveniles found at 5LP245 used a different water supply than did juveniles from other…site clusters. This could indicate migration from a different locality, but it is more likely that the juvenile component of the population represented individuals who were born in the basin. On balance, it seems more likely that the condition was related to stresses experienced during growth, and that one component of the Ridges Basin population had been exposed to a higher level of stress. (McClelland 2010b:234–235)

Did variable cultural practices and behaviors leave observable skeletal signatures in the ALP project assemblage?

Intracommunity variation is not evident in modification of the bones due to cultural practices. However, differences in osteoarthritis (OA) among male and female skeletal assemblages were present, and these sex-based differences contrasted with other assemblages in the Southwest, particularly those dating to later time periods. Both the ALP project remains and those recovered from the Pueblo II–III Ute Mountain Piedmont communities (Lambert 1999) exhibited higher overall mean scores for OA in females. However, in the Ute Mountain Piedmont assemblage,

> the average severity (scored from 0 to 4) of OA in an age-controlled sample of adults who died between 40 and 50 years of age reveals higher scores for females in seven of 10 joint surfaces (Lambert 1999:139). The highest prevalences of OA are in the neck (cervical vertebrae), lower back, shoulder, and wrist, and the greatest differences in OA between males and females are in the females' higher rate of OA in the neck, upper back, and hip. This contrasts with the ALP project results, in which the greatest differences are in the jaw, shoulder, and knee. These distinctions raise some interesting questions about activities and division of labor at these two localities. (Stodder et al. 2010a:133)

Was endemic violence or the perceived threat of violence an underlying cause of aggregation of settlement in Ridges Basin?

Expectations for four models were developed in the research design to understand the processes of settlement aggregation in the project area. One of the models predicted that aggregation occurred strictly as a result of escalating violence. Household aggregation can provide safety in numbers in a competitive and potentially violent environment. For this model we expected to find evidence of concern about violence in the presence of enclosures around houses and increased evidence of violence on skeletons. Although there is certainly evidence of enclosures around houses, they do not appear to have been substantial enough to have functioned as protective walls (i.e., palisades or stockades); many are simple cobble alignments, and some, particularly in the Eastern Cluster, only enclosed a portion of the settlement and appear to have operated primarily as flood control features. In contrast to the enclosure data, however, there is ample evidence of violence in the skeletal data in the form of antemortem cranial trauma, skeletons on pit structure floors, and processed human remains. Did the occurrence of violence encourage groups to aggregate their settlements for protection?

Several lines of evidence suggest that violence was related to the aggregation process but may not have directly encouraged groups to aggregate their settlements in the basin. Skeletons on pit structure floors, for example, occur exclusively in the northeastern portion of the basin—at sites 5LP237, 5LP236, and 5LP481—which was the least aggregated portion of the community. These incidences may have occurred as a result of the absence of tight aggregation, but they also may relate to these households not belonging to a cohesive group bearing a particularly strong social identity within the community. In other words, violence may have been perpetrated against these particular households because they were not identified members of the Eastern Cluster or Sacred Ridge groups. And the violence evident at Sacred Ridge in the processed human remains occurred at the end of the occupation of the settlement, not the beginning. Settlement aggregation, therefore, occurred prior to that event.

Aspects of other models may have been factors for the process of aggregation. But many may be discounted as well, based on patterns in the archaeological record versus the expectations generated by each of the models (see Chapter 7). The model holding that aggregation was the result of local population increase and a resultant shortage of agricultural land is largely refuted on the basis that there was apparently not a shortage of agricultural land even at the height of population levels in the basin (Bellorado 2007, 2009). Moreover, the tightest aggregation occurred in the least agriculturally productive areas of the basin, namely the Eastern Cluster and Sacred Ridge (see Chapter 9, The Natural Environment).

The model stipulating that strong, charismatic leaders encouraged households to cluster near them for protection, social status, and other social, ideological, and economic benefits that such associations could provide expected 1) elaborate architecture, which was present only at one settlement cluster (Sacred Ridge); 2) very large, tight aggregation, which again was only present at Sacred Ridge; and 3) aggregation early in the settlement of the basin rather than gradual clustering over time, which is not demonstrated by the record—aggregation appears relatively gradual over the course of occupation in the basin and was nonexistent prior to approximately A.D. 750.

Finally, the model predicting that aggregation occurred as a result of the development of matrilocal residence rules and avunculate-based sodalities was not supported by the ALP project data. The model assumes that above-ground room bocks served as primary domiciles and that pit structures served as kivas, “where male members of the lineage [the dispersed avunculate] could meet, temporarily reside, and conduct social and ceremonial duties pertaining to the maintenance of the descent group corporation, away from the prying eyes of their sisters’ resident husbands” (Ware 2002:85). However, in the ALP project area, surface room blocks were rare, surface rooms were rarely living rooms, and pit structures were most likely the main living space for the resident household rather than ceremonials structures, or kivas (see Chapter 10).

A more likely explanation for settlement aggregation is the co-presence of several identity-conscious social groups in the basin in the late A.D. 700s. The two most tightly aggregated clusters—the Eastern Cluster and Sacred Ridge—were also the most distinct biologically and materially. Aggregation could have been an additional strategy used by ethnic groups to distinguish themselves and create distinct social identities within the community (Potter and Yoder 2008). This accounts for the variable degrees of aggregation exhibited by various clusters (those with a stronger social identity or a perceived need to establish themselves as distinct may choose to aggregate more), their organizational variation (only one contained elaborate, special architecture), and the violence exhibited among them, culminating with the massacre at Sacred Ridge. In this sense, violence was related to aggregation but was not a direct cause of it. Indeed, violence may have been more causal to settlement abandonment—in fact, the rapid and complete depopulation of the basin in the early ninth century—than it was to settlement aggregation in the late eighth century.

Chapter 17: Depopulation and Migration – The End of the Ridges Basin Community

James M. Potter

The depopulation of Ridges Basin was roughly concurrent with the depopulation of the greater Durango area. The latest cutting dates from the Ridges Basin community derive from the west end of the basin, from 5LP244 with a date of A.D. 809 and from the Sacred Ridge site (5LP245) with a date of 803. Site 5LP515 at the eastern end of the basin, a site previously excavated as part of the Rocky Mountain Expansion Loop Pipeline Data Recovery Project (Horn et al. 2003a), produced two non-cutting dates from the early A.D. 800s (804 and 808). It seems clear that occupation in the basin came to an end soon after 810.

It is unclear exactly when the exodus from Ridges Basin began or what form the migration took, that is, whether it was single households migrating over several years, or larger groups moving out together, perhaps in a single year, or some combination of the two. What is clear is that by about A.D. 815, Ridges Basin and the Durango area—with the exception of one habitation site on Blue Mesa—were entirely devoid of population. Indeed, the post-815 dates from 5LP379 on Blue Mesa probably represent a very limited reoccupation of that small site (Chuipka and Potter 2007b; see Chapter 8, Pueblo I Chronology and Population).

WHY DID THEY LEAVE?

The causes of this mass migration were probably manyfold. In the northern Southwest, the climate during the early Pueblo I period, from about A.D. 725 to 808, when Ridges Basin and Blue Mesa were most heavily occupied, was relatively warm and wet—ideal conditions for dryland farmers. The climate during the early Pueblo I period is characterized as having a favorable seasonal distribution of rainfall. With perhaps one or two exceptions, drought years are not evident. Precipitation was relatively plentiful and consistently so. Interestingly, the year A.D. 809, which coincides with the latest tree-ring date recovered from an archaeological site in Ridges Basin, was an extremely dry year and the following 10 years were both dryer and cooler than average (Anderson 2008c; see Chapter 9, The Natural Environment), circumstances that would have substantially affected crop yields.

Population levels and their impact on the natural environment play an enormous role in determining how well people cope with crop failures. What the environment can provide per person depends not only on its productivity but also on the number of people who rely on it. Population levels increased significantly in the basin in the late eighth century (see Chapter 8). Over the 50- to 100-year period that Ridges Basin was occupied, hundreds of people hunted deer, elk, birds, and rabbits; cut down trees to build houses, fire pottery, cook, and keep warm; and cleared more and more field space for farming. The result was a significantly depleted environment, as is evident by the continued decrease in availability of juniper in the late eighth century (see Figure 9.1). These factors may have made people more dependent on agriculture as they tried to compensate for the diminishing returns from the natural environment.

Consequently, they would have become more susceptible to environmental downturns that would affect maize crops. A three-year drought coupled with shorter-than-normal growing seasons may have made farming untenable in Ridges Basin, especially when wild resources were increasingly difficult to come by and in short supply.

The fact that other areas of similar elevation, such as the Dolores area to the west, were not abandoned in the ninth century suggests that the factors encouraging migration out of Durango were primarily local ones—including the local social environment—rather than solely pan-regional factors such as climate change. In fact, the Dolores area seems to have drawn in fairly substantial populations, some of them probably from Ridges Basin (see below).

What is intriguing about the abandonment of the Durango area is the suddenness and totality of the exodus. Even with a climatic downturn and depleted local environment, the Durango area could have continued to support a smaller population. The entirety of the migration out of the Durango area suggests social factors also played a role, and any existing social tensions would have been exacerbated by worsening environmental conditions. The combination of an increasingly colder and dryer climate, an over-hunted and over-gathered local environment, unequal access to meat among households, a large population relying on limited soils to grow food, an ethnically diverse community, and an increase in social conflict to the point of a large massacre may have conjured a perfect storm of factors that convinced families—indeed, every family—to leave the Durango area for good.

WHERE DID THEY GO?

Wilshusen (2009) and Wilshusen and Ortman (1999) have proposed migration westward from Durango to the Dolores area in the early ninth century. They suggest that groups left Durango and settled large villages in the central Mesa Verde region. Population increases in the Dolores area in the mid A.D. 800s support this hypothesis.

> Recent research suggests that significant population movements are needed to account for the striking rise in the Mesa Verde–Dolores area population between A.D. 800 and 860 (Schlanger 1988; Schlanger and Wilshusen 1993; Wilshusen and Varien 1996). Potential source populations for these villages appear to have lived along the upper reaches of the San Juan River in New Mexico (Dittert et al. 1961; Roberts 1930; Wilshusen et al. 2000), along Elk Ridge in Utah (DeBloois and Green 1978), and in parts of the Durango area (Fuller 1988a, 1988b) between A.D. 790 and 840. Chain migration to the Mesa Verde–Dolores villages, beginning in A.D. 830 to 840, may have been responsible for…significant reductions in areas such as the Upper San Juan and Durango areas by A.D. 860. (Wilshusen and Ortman 1999:378–380)

More specifically, Wilshusen and Ortman (1999:382–389) note differences between the villages on the east and west sides of the Dolores River, and similarities in traits among the eastern Dolores River villages and sites in the Durango area, including a lack of internal symmetry in room block construction and the presence of Rosa style decorated ceramics.

> Of the white wares, there are over 150 locally made glaze painted sherds from multiple vessels that are very similar to Rosa Black-on-white, the typical pottery of the Upper San Juan [including Durango]. Such sherds are strikingly more frequent in early contexts in east-side villages, including Grass Mesa and Rio Vista, than in McPhee…. [T]he presence of glaze-painted pottery in east-side Dolores villages may indicate that at least some of their inhabitants were immigrants from the Upper San Juan. (Wilshusen and Ortman 1999:388–389)

More recently, data on perishables collected and analyzed by Laurie Webster as part of the ALP project provide additional evidence linking occupants of Pueblo I villages on the east side of the Dolores River with Durango groups (Webster 2009). Specifically, she has documented the occurrence of plaited sandals in sites throughout the Durango District and at Grass Mesa Village (Figure 17.1), despite the predominance of twined sandals in the central Mesa Verde region during the Pueblo I period and a corresponding lack of plaited sandals at McPhee Village. This suggests a historic connection between at least some occupants of Grass Mesa Village and the Durango District.

> The presence of [twill-plaited] sandals at Grass Mesa Village on the east side of the Dolores River and their apparent absence from other Pueblo I villages investigated by the DAP support Wilshusen and Ortman's (1999:380) hypothesis that the people of Grass Mesa Village had a cultural connection to the Upper San Juan not shared by the villagers on the west side of the Dolores River and may, in fact, be migrants from this region. (Webster 2009:115)

In addition to the westward movement of people as part of the Durango area depopulation in the early A.D. 800s, it appears there was also a southern migration. Tree-ring data indicate a corresponding increase in population to the southeast, in the Navajo Reservoir District (Figures 17.1 and 17.2), suggesting a movement of population to these warmer, lower areas in the early ninth century (Potter et al. n.d.). Indeed, given the violent end of the Ridges Basin occupation (see Chapter 16, Paleodemography, Health, and Violence in Ridges Basin), it seems likely that the Durango population fractured and went in several different directions in the early 800s.

Potter et al. (n.d.) note that tree-ring data, in fact, suggest two migrations into the Navajo Reservoir District, one in the early A.D. 800s and another larger one in the late 800s. They suggest that the earlier and smaller increase in population in this area is due, at least in part, to migration from the Durango area. The larger later population increase between A.D. 875 and 925 would then be from groups migrating southeast from the central Mesa Verde area when the Dolores villages were depopulated, as suggested by Wilshusen and Ortman (1999). By the mid 900s, all of these groups probably migrated south, many settling in Chaco Canyon (Wilshusen and Ortman 1999; Wilshusen and Van Dyke 2006).

Regardless of where the Pueblo I people of Ridges Basin and Blue Mesa went when they left, they never returned. Ultimately, the descendents of the Ridges Basin people settled communities along tributaries of the Rio Grande in northern New Mexico, communities such as Jemez Pueblo, Laguna Pueblo, Zia Pueblo, and Acoma Pueblo. For at least 600 years, the entire Durango area remained devoid of settled inhabitants until the Ute, Paiute, and Navajo people began using the area sometime between A.D. 1400 and 1600. Soon after, the Spanish passed through along the Old Spanish trail, and ultimately, beginning sometime in the nineteenth century, Euroamericans moved into the area to ranch, farm, and mine.

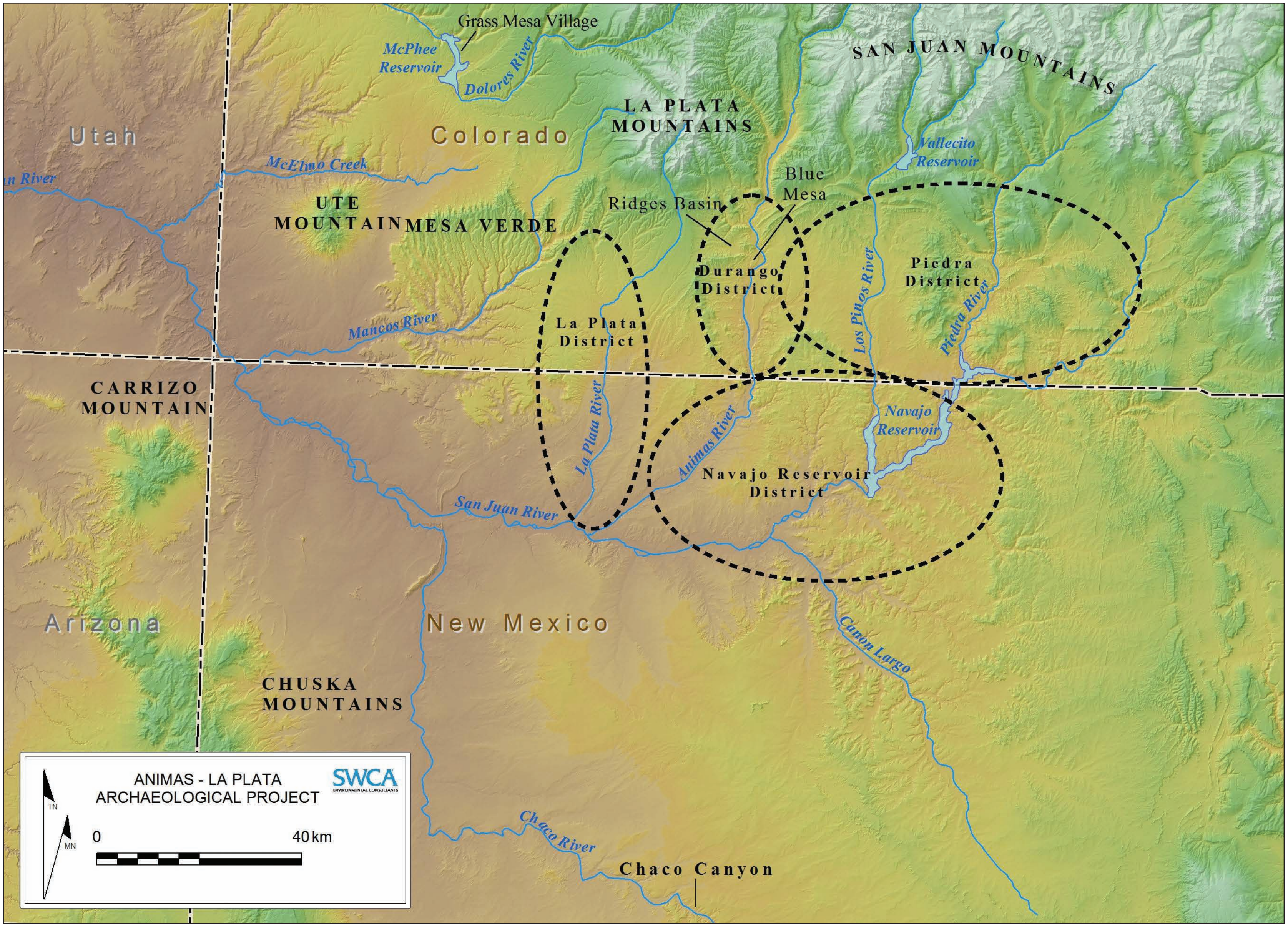

Figure 17.1. Map depicting the areas of population movement in the ninth century A.D.

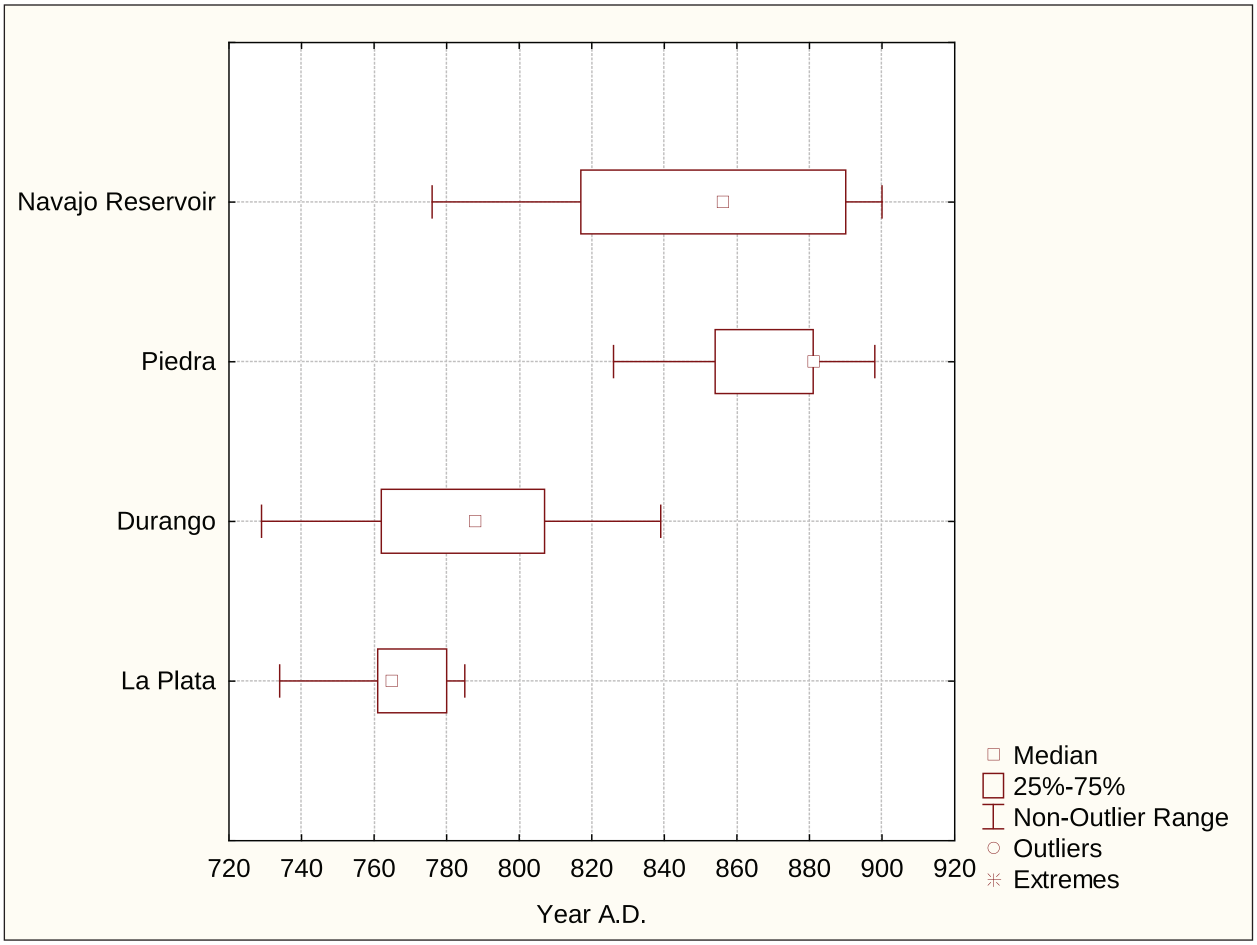

Figure 17.2. Box and whisker plots of cutting and near-cutting dates by archaeological district (source: Potter et al. n.d.: Figure 4.7.)

Section IV:
Post–Pueblo I

Chapter 18: Protohistoric and Historic Sites in Ridges Basin

Dennis Gilpin and Charles A. Bollong

Following its abandonment by Pueblo I peoples sometime after A.D. 825, Ridges Basin was not substantially occupied or used again until protohistoric groups such as the Ute, Paiute, and Navajo began moving through the area sometime between A.D. 1400 and 1600. As noted by Gilpin (2007), the subsequent history of the project area exemplifies several themes in the history of southwestern Colorado and much of the Rocky Mountain west, including Ute history, Spanish exploration, ranching, mining, railroading, and pioneer colonization.

This chapter summarizes data and information from five volumes of the 16-volume ALP project series: Volume I, *Research and Sampling Design* (Potter 2006); Volume V, *Miners, Railroaders, and Ranchers* (Gilpin 2007); Volume VI, *Historic Site Descriptions* (Gilpin and Yoder 2007); Volume XI, *Lithic Studies* (Railey and Wesson 2009); and Volume XIV, *Ceramic Studies* (Allison 2010). The chapter focuses on Protohistoric period archaeology as revealed through ALP project data and previous studies in the area, and especially on the historical archaeology of the Euroamerican occupation of the project area, which resulted in the most substantial archaeological record after that of the Pueblo I period. The Late Prehistoric period dates from about A.D. 1300, when long-term, year-round Pueblo occupations in southwestern Colorado ceased, to 1598, the time of permanent Spanish colonization in the Southwest. Because the Late Prehistoric period is represented by only a handful of ceramics (Allison 2010:14, 209), that period is not further addressed in this chapter.

The Protohistoric period is defined as the time from about 1598, when Juan de Oñate established a Spanish colony in New Mexico, to 1860, when Euroamericans began living in southwestern Colorado on a permanent basis. During the Protohistoric period, contact between Utes, Europeans, and Euroamericans was still sporadic, but the Utes acquired horses, which expanded their trade area and changed their lifestyle forever. The Historic period is defined as that time from about 1860 to the present, when Euroamerican settlement boomed, and mining and ranching became mainstay economic activities supported by railroads.

ALP PROJECT STUDIES OF NATIVE AMERICAN SITES DURING THE PROTOHISTORIC PERIOD

Given the limited amount of archaeological documentation of protohistoric Ute (and possibly Navajo) use of southwestern Colorado, the initial goal of SWCA's research on the Protohistoric period in the ALP project area was to vigorously seek out all protohistoric remains that existed within the project area. Any protohistoric sites found were to be thoroughly recorded and investigated to date them and possibly determine their cultural affiliation.

Identifying Protohistoric Ute sites and demonstrating their cultural affiliation was expected to be easiest if Ute pottery was found. Hill and Kane (1988) argue that Ute pottery was made using the paddle-and-anvil technique, which caused the clay plates to line up in a distinctive manner. Navajo pottery was produced using the coil-and-scrape method, which does not align the clay plates in the same way. Documenting whether this distinction could be observed among sherds from the ALP project area would be a useful contribution.

Protohistoric sites can also be recognized by the presence of Hopi Yellow Ware sherds, and different distinctive varieties of this ware have been dated to fairly specific time periods. Zuni and Eastern Pueblo trade wares, which are also relatively well dated, might also be found in the Ridges Basin area. We anticipated that dating of protohistoric sites in the ALP project area would be possible through the collection of tree-ring samples, because numerous tree-ring dates have been recovered from Protohistoric period contexts in the Dinétah region of northwestern New Mexico (e.g., Towner 1997). To the extent possible, tree-ring samples were to be taken from all suitable contexts in the ALP project area. We also anticipated that other forms of chronometric dating (such as radiocarbon) might reveal the presence of protohistoric components in sites originally selected for investigation on the basis of some other criterion. Although obsidian hydration measurements have demonstrated limitations as a chronometric method, we hoped that they might at least help distinguish protohistoric sites from Archaic ones.

Any site identified as protohistoric was to be excavated completely in order to document subsistence activities as well as the size and nature of the group using the site. Analyses of pollen, flotation samples, phytoliths, and faunal remains would also be conducted to examine subsistence. Should we encounter a suspected Ute site, we expected that Colorado Ute tribal members would participate in the data recovery effort because it would be their history being documented.

Depending on the number and types of protohistoric sites encountered, SWCA intended to investigate the settlement pattern reflected by those. Recent work in the Dinétah region (Dykeman 2003; Hovezak and Sesler 2002d; Marshall and Hogan 1991; Sesler and Hovezak 2002; Sesler et al. 2000; Towner 2003; Wilshusen 2010) provides a model. This work has focused on identifying households (represented by individual hogans), extended family residence units (hogan clusters), “outfits” (groups of related and cooperating families, represented by clusters of hogan clusters), and communities (clusters of clusters of hogan clusters, usually centered around a pueblito). Although SWCA expected the results for Ute sites to be different, we hoped that similar analytical methods would help to trace the composition and distribution of Ute settlements over space and time.

To examine Ute interaction with other groups, SWCA planned to analyze the numbers, types, and dates of trade wares found at Ute sites. Hopi, Zuni, Eastern Pueblo, and Navajo ceramics were expected. The frequency of imported lithic raw materials from known sources would be documented, as well as the frequency of non-local lithic raw materials, in general. If substantial trade in pottery and tool stone could be established, it would then be of interest to identify the products that Utes may have been exchanging for these goods. Although Spanish records provide some information on historic trade patterns in the Four Corners area, those documents probably do not reflect the full range of historic trade, and certainly do not inform on trade before the Spaniards arrived and altered the interregional economy.

An issue of particular interest in the research design was the documentation, commemoration, and interpretation of the Old Ute Trail (5LP4213) through Ridges Basin. The trail has been determined eligible for inclusion on the National Register of Historic Places (NRHP), and SWCA recommended mapping the Colorado portion of the trail between Towaoc and Ignacio, and documenting the history of the trail and its significance to the Ute people of Colorado. The trail route was also considered a logical place to look for protohistoric sites.

The Ute, Paiute, and Navajo during the Protohistoric and Historic Periods

The Utes

The Ute occupation in the West stretched from the Sevier and Utah lakes in the Great Basin to the west all the way to the Great Plains on the east, and from the present-day southern border of Wyoming on the north to the San Juan River, the Upper Chama and Rio Grande rivers, and the headwaters of the Canadian River in New Mexico on the south. In peaceful times, and in smaller numbers, Paiutes and Navajos lived among the Utes. The people who early Spanish accounts describe as “Payuchis” (Paiutes) living among the Utes were probably Weenuches, or ancestors of the Weenuches, whom the Spaniards considered a separate tribe.

The Utes were the primary Native American group in the ALP project area during the Protohistoric and Historic periods. They were hunters and gatherers, who, once they mastered the horse, had much greater mobility and could travel farther for hunting, trade, and raiding. The Utes (along with the Paiute) speak a Numic language thought to have originated in southern California. These groups subsequently migrated northeast into the region they occupied at the time of first European contact (Bettinger and Baumhoff 1982; Lamb 1958). Numic-speaking peoples are thought to have entered the Southwest around A.D. 1300 (Janetski 1994), although an earlier arrival date is possible, and they may have been responsible for the withdrawal of Pueblo peoples from some parts of the Southwest.

Wilshusen and Towner (1999) have summarized current knowledge about the Ute migration into southwestern Colorado (see also Madsen 1994). Archaeologically, Ute sites are identified by Rose Spring Corner-notched, Desert Side-notched, and Cottonwood Triangular projectile points (Holmer 1986; Jennings 1986; Reed 1994; Warren and Crabtree 1986); Shoshonean knives (Reed 1994); brownware pottery produced by the paddle-and-anvil technique (Buckles 1988; Hill and Kane 1988; Jennings 1978; Reed 1995); wickiups (Buckles 1971; Reed 1994; Reed et al. 1988; Scott 1988); peeled ponderosa pine logs (Reed 1994); and rock art (Schaafsma 1986). It should be noted, however, that none of these was made or used exclusively by the Utes.

Ute pottery is poorly defined, and “the range of technological variation in protohistoric Ute ceramics (temper, paste, vessel-building techniques) currently is poorly known” (Hill and Kane 1988:63). Desert Side-notched projectile points are often listed as diagnostic of Ute sites, but, in fact, these and similar points were made from the Great Plains to the Great Basin by numerous cultural groups. They are thus a horizon marker, but not diagnostic of any particular group. At 5LP4314 in the La Plata River valley to the west of the project area, Mabry et al. (2002) recorded petroglyphs depicting bison and attributed them to the Utes, citing Ute excursions to the plains of eastern Colorado and New Mexico to hunt bison (Delaney 1989; Pettit 1990; Rockwell 1956). However, bison are also depicted in Navajo petroglyphs in the Dinétah region (the ancestral Navajo homeland in northwestern New Mexico), and these representations probably date to the A.D. 1700s (Schaafsma 1980:262).

The Paiutes

Like the Utes, the Paiutes speak a Numic language. The Paiutes are divided into northern and southern groups. At one time the Southern Paiutes lived from the Death Valley area of southern California, across southern Nevada, and into southern Utah and the Arizona Strip. One Southern Paiute subtribe, the San Juan Paiutes, lived on the east side of the Colorado River south of the San Juan River and north of the Little Colorado River in what is now north-central Arizona and south-central Utah. Although Southern Paiute territory is not generally considered to have extended as far east as southwestern Colorado, the 1765 Rivera expeditions identified “Payuchi” camps on the Mancos River and on the Dolores River (Leiby 1984; Sanchez 1997). Most scholars believe that the Payuchis reported by Rivera were actually Weenuches or ancestors of the

Weenuches, but in 1765 the Paiutes and Utes were fairly fluid populations overlapping at their boundary, and by 1776 the Spaniards were distinguishing between Paiutes and "Ute Paiutes." Shortly thereafter the Spaniards began to recognize the Weenuches as a band of the Utes.

The Paiutes were also hunters and gatherers, although some Paiutes grew small amounts of corn, beans, and squash. The Paiutes lived in caves and overhangs, and constructed wickiups. Their arrows were tipped with Desert Side-notched and Cottonwood Triangular projectile points. Baskets were their most common containers, and their pottery was Southern Paiute Brown Ware (Baldwin 1950; Euler 1964; Fowler and Matley 1978; Hunt 1960), although some groups did not make pottery at all. In contrast to the Utes, the Paiutes traveled on foot and never relied on horses (Kelly and Fowler 1986).

The Navajos

The Navajos and Apaches of the Southwest all speak mutually intelligible dialects or languages of the Southern Athapaskan dialect complex (Young 1983). The route of the Southern Athapaskans into the Southwest has long been debated, with some researchers (Gunnerson 1956, 1972; Schaafsma 1996; Wilcox 1981) advocating a route along the Front Range of the Rocky Mountains, and other researchers (Brugge 1983; Hall 1944b; Harrington 1940; Huscher and Huscher 1942; Jett 1964; Worcester 1951) advocating a route through the Rocky Mountains. Gunnerson surmises that the Southern Athapaskans traveled down the Great Plains, reached the Southern Plains around 1525, and entered the Southwest between 1540 and 1583. By 1598 the Spaniards recognized the Apaches as a distinct group, and by the 1620s they were distinguishing between different groups of Apaches. Hancock (1997) excavated a site (LA55979) near Navajo Reservoir, New Mexico, consisting of the remnants of at least seven collapsed conical dwellings of wood or brush that were associated with Dinetah Gray pottery; two of the dwellings were tree-ring dated to 1541. This site suggests that Navajos were a recognizable cultural group living within the Southwest considerably earlier than indicated by Gunnerson, and that the Navajos may have first entered the Southwest via a montane route.

Protohistoric Navajo sites are recognized by the presence of hogans, Dinetah Gray and Gobernador Polychrome pottery, Cottonwood Triangular and Desert Side-notched projectile points, and rock art. By the time Spanish colonists began distinguishing Navajos from other Southern Athapaskans, the Navajos apparently were constructing forked-stick hogans—conical structures with a tripod frame and two doorposts extending east to frame the entry, to which wooden leaners were added before the entire structure was covered with mud. Archaeological manifestations of forked-stick hogans are often very difficult to distinguish from dwellings such as wickiups that were made by other groups (Schaafsma 1996:30). Navajo rock art has been described by Schaafsma (1980, 1992), and the Navajo rock art of the 1700s is dominated by pecked and painted depictions of *Ye'iis* (supernatural Holy People), maize, hunting, and warfare, and numerous depictions of horses.

When the Rivera expeditions passed through southwestern Colorado in 1765, the Utes and Paiutes were living side by side, visiting each other, and intermarrying. A report of a single hogan was the only evidence of Navajos observed in southwestern Colorado. Subsequently, from the 1780s to about 1900, interactions between Utes and Navajos intensified. Sometimes they were friendly, other times antagonistic. In 1876, "Navajos, Weenuches, and Paiutes were reported to be camping together on the La Plata River" (McPherson 1988:17). The material culture of Utes and Paiutes appears to have been very similar, and, in the case of lithic technologies such as projectile points, common styles extended to the Navajos as well, although Torres (2003) found that the Desert Side-notched projectile points produced by the Navajos were smaller than those produced by the Utes.

Native American Protohistoric and Historic Sites in the ALP Project Area

Protohistoric and historic Native American use of the area was represented by nine sites: the Old Ute Trail (5LP4213) and eight artifact scatters, some with features (5LP534, 5LP549, 5LP588, 5LP622, 5LP626, 5LP635, 5LP4870, and 5LP7634) (Figure 18.1; Table 18.1). In addition, Desert Side-notched projectile points and flaked glass were reported at other sites in the project area.

The trail that later became known as the Old Ute Trail was one of the main routes in a network of trails probably established in antiquity and used over centuries by successive groups. This network of trails appears to have been established as early as the Chacoan era, circa A.D. 1000, and use of it continued into historic times. The 1765 Rivera expeditions and the 1776 Domínguez and Escalante Expedition traveled trail routes that became segments of the Old Spanish Trail, and portions of the Old Spanish Trail were incorporated into the Old Ute Trail, which ran between Ignacio and Tawaoc in the late nineteenth and twentieth centuries. Euroamerican travelers along these trails provided much of the documentary evidence on the Utes and other Native Americans in the early historic period.

The artifact scatter sites provided some information on Ute and Navajo lifeways during the Protohistoric and Historic periods, primarily on material culture and on the role of small sites in protohistoric settlement patterns. These sites are summarized in Table 18.1.

The Old Ute Trail

The Old Ute Trail (5LP4213) was the main trail between Ignacio, Colorado, the present-day headquarters of the Southern Ute Tribe, and Towaoc, Colorado, the present-day headquarters of the Ute Mountain Ute Tribe. From Ignacio, the trail ran through Ridges Basin then forked. The northern fork ran northwest through the present town of Hesperus, then to Thompson Park, Cherry Creek, and along the north and west sides of Mesa Verde. The southern fork ran southwest to the present-day locations of Breen, Kline, Marvel, and Red Mesa, then went down the south side of Johnson Canyon to the Mancos River, which it followed to the mouth of the canyon, then proceeded north to Navajo Springs and, in later years, to Towaoc. The eastern portion of the trail, from Ignacio through Ridges Basin, and the northern portion, from the west side of Ridges Basin to the present-day city of Cortez, Colorado, incorporated segments of the Old Spanish Trail running from Santa Fe to California.

Table 18.1. Summary of Protohistoric Sites within the ALP Project Area

Site Number	Features	Pottery	Flaked Stone	Other
5LP534	Depression	untyped micaceous brownware	Present	–
5LP549	–	2 Ocate Micaceous sherds	–	–
5LP588	3 fire pits, 2 oxidized areas	1 Dinetah Gray sherd, 26 plain grayware sherds, 1 Jeddito Yellow Ware sherd	4 cores, 44 flakes, 37 tools, 22 angular debris	1 turquoise ornament, faunal remains
5LP622	–	1 Acoma-Zuni brownware sherd	Present	–
5LP626	–	1 Acoma glazeware sherd	Flaked stone, 3 projectile point fragments	6 milling stones
5LP635	–	5 Dinetah Gray sherds	–	–
5LP4870	–	32 Dinetah Gray sherds, 1 Gobernador Polychrome sherd, 7 Pueblo IV Northern Rio Grande whiteware sherds, 5 Pueblo IV glazeware sherds	9 cores, 125 flakes, 63 tools	–
5LP7634	–	Historic Pueblo polychrome	1 obsidian projectile point	–

Source: Gilpin 2007:Table 2.1

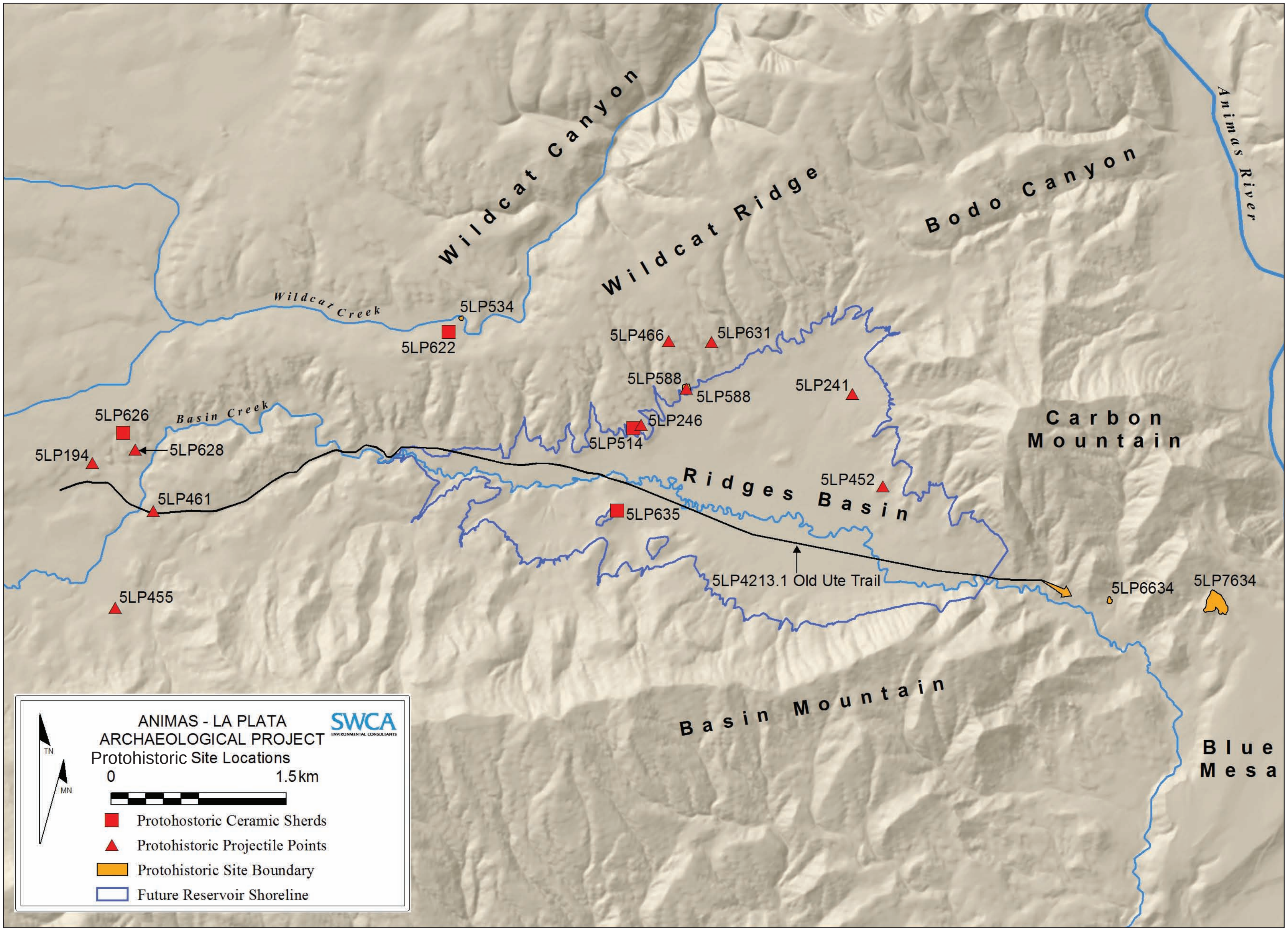

Figure 18.1. Map of protohistoric sites in the ALP project area (from Gilpin 2007:Fig. 2.2).

The Old Spanish Trail was actually a network of trails with three major routes. The central route ran northwest up the Chama River into southwestern Colorado and continued northwest through Colorado and east-central Utah. This is the route that ran through Ridges Basin and would later become known as the Old Ute Trail. The earliest historical accounts of travel on the Old Ute Trail were those of the two Rivera expeditions of 1765, followed by the Domínguez and Escalante Expedition, all three of which apparently went through Ridges Basin. From about 1829 to 1848 segments of the Old Spanish Trail from Santa Fe to California followed the same route, including segments through Ridges Basin.

In the 1870s the Old Spanish Trail was still a named route through southwestern Colorado, although after 1876 it bypassed Ridges Basin to go through Animas City (now subsumed by the northern portion of the city of Durango, Colorado). The Old Spanish Trail continued to be recognized as such as late as 1890. From about 1908 to 1915, the terms "Ute Trail" or "Ute Indian Trail" began to appear on U.S. Geological Survey (USGS) maps. The trail was shown heading west out of Ignacio and running as far as the Florida River. The name "Old Ute Trail" apparently first appeared in print in Morris's 1939 report, and was used to designate a southern branch of the trail in the La Plata River valley. Historical maps establish the probable route of the Old Ute Trail, its two branches west of Ridges Basin, and numerous other trails in the regional trail network.

As late as the 1930s, the southern branch of the Old Ute Trail was still visible crossing the La Plata River valley. One of the Ute Mountain Ute consultants for the ALP project, Mr. Terry Knight, Contract Coordinator for cultural resources on the Animas–La Plata Water Project, explained that the trail through Ridges Basin was the principal artery in a network of trails, with a branch going south toward Breen and another up to the La Plata Mountains.

Northern Arizona University and SWCA also recognized that portions of the Old Ute Trail followed the route used by Domínguez and Escalante in 1776 (NAU and SWCA 1996:267). Bolton's (1950) reconstruction of the route of the Domínguez and Escalante Expedition has the expedition passing through Ridges Basin on August 9, 1776, en route between the Animas and La Plata rivers. The NAU and SWCA ethnographic report also states that a segment of the trail running through the La Plata River valley was mentioned by Earl Morris in his report on the archaeology of that area (Morris 1939). However, at the time NAU and SWCA attempted to find the trail, it was no longer visible in Ridges Basin.

Other Protohistoric Sites in Ridges Basin

Historical documentation suggests that the main protohistoric habitation sites near the ALP project area were along the Animas River, probably in the vicinity of the present-day Bodo Industrial Park. The uplands of Ridges Basin were probably used for more limited activities during protohistoric times. The protohistoric sites identified in the project area ranged from a small habitation site to isolated artifacts, including projectile points and sherds (Allison 2010; Railey and Erhardt 2009). Perhaps the most heavily used protohistoric site, 5LP588, consisted of three fire pits, two oxidized areas, a concentration of flaked stone, and a scatter of artifacts. This appears to have been the camp of people hunting and processing deer, coyote, and jackrabbit. Ground stone was not observed at this site, but pottery (including Hopi tradeware) was present.

Site 5LP4870 may have been a similar small camp. Although no clearly protohistoric features were identified, flaked stone and pottery (including Dinetah Gray, Gobernador Polychrome, and Northern Rio Grande whiteware and glazeware) were present in numbers suggesting fairly substantial use. The absence of milling stones and the types of stone tools found indicate that hunting may have been more important than gathering at this site.

At four sites, the protohistoric occupations were difficult to interpret because they had been occupied multiple times. Site 5LP534 had a large number of protohistoric sherds, but their association with the flaked stone at the site could not be determined. Both 5LP622 and 5LP626 consisted of a scatter of lithic artifacts with a single protohistoric sherd, in each case a tradeware from the Acoma-Zuni area. The six ground stone artifacts found at 5LP626 were the only milling stones found with protohistoric pottery. Whether the lithic artifacts present were associated with the pottery could not be determined for either 5LP622 or 5LP626. Site 5LP7634 was a multicomponent site that dated primarily to the Pueblo I period, but historic polychrome pottery and a diagnostic obsidian projectile point were considered evidence of a protohistoric or historic use of this site.

Protohistoric use of two sites was represented by isolated sherds. Two Ocate Micaceous sherds were present at 5LP549, and five sherds of Dinetah Gray were present at 5LP635. At each of these sites, protohistoric activity could have been as little as a single event involving the breaking of a single pot. Similarly, Desert Side-notched projectile points at nine sites and as an isolated occurrence may have represented brief hunting forays into the project area.

Historic Native American use of the project area may have been represented by two scatters of flaked glass. One was found at 5LP579 (the Bodo Ranch) and the other was 5LP597.

Native American Protohistoric and Historic Sites Summary

The protohistoric archaeological sites in the project area reflect the complexity of ethnic relations reported in the historical literature. Distinguishing between Ute and Navajo archaeological sites on the basis of material culture is extremely difficult, partly because of the similarities in the material cultures of the two groups. Assigning cultural affiliation to protohistoric archaeological sites in the region between the La Plata Mountains and the San Juan River is made even more difficult by the complex and changing relations between Numic and Athapaskan speakers.

Two protohistoric sites in the ALP project area (5LP534 and 5LP588) contained both brownware and grayware that did not match either Ute pottery from the Uncompahgre Plateau or Navajo pottery from the Dinétah region. Another site (5LP4870) was dominated by Dinetah Gray and, in addition, contained Gobernador Polychrome (which is culturally Navajo) as well as tradewares from the northern Rio Grande River valley. Dinetah Gray was also found at two other sites (5LP488 and 5LP635).

As discussed by Schaafsma (1996), a data recovery project at the La Plata Mine (in the La Plata River valley just south of the Colorado–New Mexico state line) recovered protohistoric pottery that did not match the Ute pottery from the Uncompahgre Plateau reported by Buckles (1971), nor did it match Dinetah Gray as defined by Brugge (1963, 1981). However, because the pottery was putatively within Navajo territory, it was classified as a variant of Dinetah Gray. The protohistoric pottery from 5LP534 and 5LP588 could not be classified as Dinetah Gray because it lacked the dark cores and surface striations. Thus, although it may have differed from Ute pottery from the Uncompahgre Plateau, it also differed from Dinetah Gray pottery from the Dinétah region. This pottery therefore needs to be further examined by analyzing its composition, construction, finish, and firing, and comparing the results with pottery across a region stretching from the Dinétah region to the Uncompahgre Plateau.

Tradewares indicate wide-ranging interaction between the protohistoric peoples of the project area and other groups. Rio Grande glazewares, northern Rio Grande whiteware, and micaceous pottery, probably from the northern Rio Grande area (either Jicarilla Apache, Northern Tiwa, or even Tewa), indicate trade with the peoples of the northern Rio Grande River valley. Acoma-Zuni Brown Ware and Acoma Glaze Ware demonstrate trade with the Acoma-Zuni area, and one sherd of

Jeddito Yellow Ware indicates interaction with the Hopi pueblos to the southwest. Some indisputable Dinetah Gray pottery and one sherd of Gobernador Polychrome were probably produced in the original Dinétah region (if they date before about A.D. 1750) or in the expanded Navajo country of the period from 1750 to 1800.

As semi-nomadic hunters and gatherers, the Utes and the Paiutes lived lightly on the land, and their sites are often extremely hard to find. To a lesser extent, this is true of the Navajos as well, although they practiced agriculture and were somewhat more sedentary. Thus, almost any evidence of these groups is useful in plotting land use, tribal territories, and interaction. The protohistoric sites of the ALP project area demonstrate the presence of protohistoric peoples, show something of how these people used the land, and illuminate some of the relations between these people and their regional neighbors. The sites represent only an upland portion of a much broader settlement system in which, according to early Spanish accounts, the main habitation sites were located along the major rivers of the region. The diversity of flaked stone materials and pottery at the ALP project sites evinces both the geographical range of social interaction during the Protohistoric period and the complex and changing social relations and identities of this time.

ALP PROJECT STUDIES OF EUROAMERICAN SITES IN THE HISTORIC PERIOD

General regional issues and patterns for the Historic period are the context for research at ALP project historic sites. Thus, in addressing the historical archaeology of the project area, a discussion of the issues pertinent to the region, as well as to the project area, is necessary.

History of Southwestern Colorado

The history of southwestern Colorado parallels the history of much of the Southwest and Mountain West. Historical overviews of southwestern Colorado can be found in O'Rourke (1980), Stein and Ballagh (1995), and Winter et al. (1986) (see also Buckles and Buckles 1984). The earliest documentary accounts of the region date to the time of Spanish exploration (see, for example, Gilpin 2007:19–23). From 1761 to 1765, Juan María de Rivera led three expeditions into the area (Leiby 1984; Sanchez 1997), followed by the Dominguez and Escalante Expedition of 1776 (Vélez de Escalante 1995). New Mexico Hispanics subsequently established a trail through the region for their trade with California; in the early 1800s, fur traders also began using the route, and it was they who dubbed it the Old Spanish Trail. In the late 1860s, prospectors began to locate mining claims in the San Juan Mountains, and the U.S. military and mining interests restricted the indigenous Ute population to reservations. Farmers and ranchers moved in to supply the military and the miners, towns were established, and transportation and commercial systems developed to transport raw materials to markets on the East Coast and to bring in manufactured goods. The integration of the region into a national network of railroads, combined with an enormous demand for mining timbers, allowed the logging industry to develop. This period of economic development and integration was economically and socially dynamic as farmers, ranchers, miners, railroaders, loggers, merchants, and others established enterprises, exhausted resources, and adjusted to changing market conditions.

Historical Archaeology in Southwestern Colorado

To date, historical archaeologists working in southwestern Colorado have found no direct evidence (such as artifacts or campsites) of Spanish exploration, though the general route and a number of landmarks of the Old Spanish Trail are known (see Gilpin 2007:Figures 3.1–3.3). In fact, the bulk of historical archaeology in southwestern Colorado has focused on the American period, when citizens of the United States colonized the area. The three major historic projects conducted in the region to date are the Dolores Archaeological Program (DAP), the Dallas Creek Project, and the ALP project.

The DAP focused on archival research and oral history rather than historical archaeology (Baker 1983:37; Duranceau 1983). Kendrick's (1982) edited volume consists of four studies that show how different historic uses of the lower Dolores River valley were reflected architecturally. Each of these studies summarized the history of a particular use of the valley, and included maps, building plans, drawings of building elevations, and photographs that were compiled during the Historic American Building Survey (HABS) documentation of the sites.

The Dallas Creek Project (Buckles et al. 1986) dealt with the community of Dallas in a high mountain valley along the creek of the same name. Most of the valley was Ute Reservation from 1860 to 1881. Dallas was established in 1879 when gold was discovered, and the Utes were subsequently removed. Placer mining and farms constituted the initial Euroamerican uses of the valley, and later uses included transportation, merchandising, logging, and coal mining. After about 1890 Dallas served primarily as a farming area supplying food to Ouray and Montrose. After World War I, the local population declined as southwestern Colorado became more connected to national and international commercial networks. The Dallas Creek Project integrated historical archaeology, history, and oral history, and included detailed mapping of sites and recording of architecture.

In 1976 Centuries Research excavated the Corner Saloon, which burned in 1913, in Lake Valley (Baker 1983). During construction of skiing facilities in Telluride, an assemblage of historical artifacts dating from 1880 to 1920 were recovered and provided information on town life in Telluride during this early period (Baker 1988; Reed and Horn 1985). During stabilization at the site of Animas Forks (5SA153) in Colorado, a considerable number of artifacts was collected and analyzed during soil removal, but they were mixed assemblages from the 1880s on (Horn 1999) and are probably not particularly good comparative collections. Unfortunately, little historical archaeology has been conducted in Durango (Duke and Matlock 1999:53–56), but an excavation in the downtown area uncovered the remains of a lumber mill, a hardware store, a flour mill, a slaughterhouse, and a sewer system, as well as the old Durango jail and other historic features (Duke and Matlock 1999:54–56).

At 5LP1252, along the Animas City–Silverton Toll Road just north of Durango, Horn excavated a historic cabin, possibly a toll station, that returned a tree-ring date of 1876 (Horn et al. 1984, Horn et al. 1986). At 5LP357, along Rico Wagon Road near Durango, Horn tested two 1900–1910 structures thought to have been used by hay harvesters (Baker 1988; Horn 1986). Horn also analyzed artifacts from two twentieth-century sites, 5MT10969 and 5MV3966, near and within Mesa Verde National Park (Horn 1994). In the 1980s excavations were conducted at Marion, Colorado, an 1889 railroad construction camp in Curecanti National Recreation Area near Gunnison (Baker 1983:37; Rosillon 1984). Horn et al. (2003) report on several sites that were excavated for a project running through northwestern New Mexico and southwestern Colorado. Three were railroad-related: an 1890 construction camp for the Rio Grande Southern Railroad (5LP1915), a Rio Grande Southern section house known as The Hook (5LP1921) that dates to approximately 1892–1919, and a maintenance siding at Kane/Dix (5LP1920) that dates between the 1890s and 1920s; all are located between the present-day towns of Mancos and Hesperus. Site 5DL318 was a homestead just north of Dove Creek dating to the second decade of the twentieth century. Farther north, is Carbonero (5GF1562), a coal mining community that served the Uintah Railway north of Grand Junction; a large portion of this site was excavated as part of the same project. Numerous archaeological surveys in the region have identified a wide range of historic sites, as well. Thus, historical archaeology is accumulating data from a wide range of historic sites in southwestern Colorado that can be compared to provide a picture of everyday life of the Utes, farmers, miners, railroad construction workers, coal miners, and town dwellers that occupied the region from about 1860 to 1940.

Historical Archaeology as Social History

Given the amount of available data on the history and historical archaeology of southwestern Colorado, the ALP project presented an opportunity to use historical archaeology to examine the social history of southwestern Colorado in terms of broad, regional patterns and processes and also at the level of specific communities and even families. To what extent do the histories of the various high mountain valleys of Colorado (and others in the American West) replicate each other—and to what extent are they unique? What are the causes of similarity and variability, persistence and change? Dishman (1982) assessed each historical period in the Dolores area in terms of legislation, minerals and crops produced, organization of production of those minerals and crops, and the commercial networks that would have governed the markets for these products. For the ALP project, historical research was conducted in order to document the occupation in terms of comparable categories.

It was hoped the ALP project data would add to our understanding of the region's history in two ways: first, by identifying case studies for historical research, and second, by providing information not found in archives and documents. Archaeological studies commonly identify sites, settlement systems, and the material culture remains of people or groups that are not discussed in published local or regional histories. To investigate these sites and peoples, historical archaeologists typically compile documentary and archival data, oral histories, and archaeological data that transfer sites and settlement systems into the realm of coherent written history. The DAP historical research, the Dallas Creek Project, and the ALP project are examples of these types of studies.

Social historians (Limerick et al. 1991; Olin 1986; White 1991) have also focused on these groups of people who are underrepresented in historical accounts, and historical archaeology can assist in compiling this social history by providing information on daily life. By examining the archaeological traces of specific households, historical archaeologists have been able to ascertain the ethnicity, class, gender, occupation, and ideology of the occupants of such sites. When basic facts are available in census records or similar documents, the archaeologists can provide a wealth of detail about the quality of homes, domestic activities, and the goods being consumed by families of a known social subgroup. Such information has allowed historical archaeologists to reconstruct a much broader picture of the development of the American West than was available from traditional history, as Fuller (1989) noted in his research design, and as identified in SWCA's research design for the ALP project (Potter 2006).

Historical Archaeology in the Project Area

Previous Research

Overviews of the history of the project area can be found in Baugh (1989), Stein and Ballagh (1995), and Winter et al. (1986). Baugh focuses on coal mining in Wildcat Canyon. The other two sources provide histories of the project area as a whole. Historically, Wildcat Canyon was used most intensively as a coal mine served by the Rio Grande Southern Railroad. Ridges Basin was originally the summer headquarters of the vast Two Cross Ranch, but after 1888 was broken up into 30 homesteads, which in turn were consolidated into two big ranches.

Coal mining in Wildcat Canyon began in 1886, and in 1890 the town of Porter was established. That same year, the Rio Grande Southern Railroad reached the town and began hauling coal to the smelters in Durango. The Porter Mine became the largest coal mine in La Plata County, and by 1900 the town of Porter had a population of 437 and was scattered along two-thirds of a mile of Wildcat Canyon. It included a post office, the mine, a tipple, coke ovens, the Rio Grande Southern Railroad section house, a power plant, a water tank, two saloons, a boarding house, a school, and dwellings for several hundred people. By 1908, however, most of the coal deposits had been mined, and when a fire destroyed the coal chute, tipple, and several other structures, the mine was abandoned. By 1910 Porter had a population of only 155, and by 1920 it was essentially abandoned.

Ranching developed concurrently with mining and railroading in the Durango area. As early as 1877 the Hayden Expedition map of southwestern Colorado showed Thompsons Park in the La Plata Mountains, named after George Thompson, a wealthy landowner and stockman from southeastern Colorado. Thompson established the Two Cross Ranch, headquartered on the La Plata River in northwestern New Mexico, and grazed cattle between the San Juan River in northwestern New Mexico and the La Plata Mountains in southwestern Colorado. Around 1880 Thompson began using Ridges Basin as his summer headquarters. By 1887, when the first General Land Office map was produced for Ridges Basin, Thompson was one of several settlers in the basin. From 1888 to 1923, some 30 entrymen patented 36 parcels (including homesteads and cash entries) in and immediately adjacent to the project area. Most of the patents were in Ridges Basin; five patents were in Wildcat Canyon; and one patent was on the ridge between Ridges Basin and Wildcat Canyon.

Beginning about 1910, even before homesteading ended, the original entrymen began selling their property, and by about 1950 only two ranches, the Bodo Ranch and the Harper Ranch, remained headquartered in Ridges Basin. Some of the individual family histories demonstrate how individual decision making led to the sequence of development in the study area. Figures 18.2 to 18.8 illustrate the changing patterns of historical occupation in the project area.

George Thompson, the wealthy landowner from southeastern Colorado, established the Two Cross Ranch in New Mexico in 1877 or 1878, with its summer headquarters in Ridges Basin. Thompson's nephew George Thompson II ran the operation, and when Ridges Basin was opened for homesteading, George II, his father Doctor A. Thompson (Doctor was his given name), and George's brother William A. Thompson all homesteaded in Ridges Basin. The Thompson's in-laws, the Coopers, also homesteaded in Ridges Basin. The Thompsons continued to ranch there until the 1910s.

Lawrence and Mary Burns were immigrants from Great Britain who homesteaded in Ridges Basin in 1900 and patented their homestead in 1906. They had four daughters, each of whom married a homesteader in the area, two in Ridges Basin. Jemima Burns married Frank Hodgson even before the family left England, and Frank and Jemima homesteaded in Ridges Basin in 1899 and patented their homestead in 1905. Elizabeth Jane Burns married Tom Harper, and they homesteaded in Ridges Basin in 1896, patenting their homestead in 1904. Thomas and Elizabeth Jane Harper's son Lawrence and his wife Annie continued to live at the ranch until their deaths in 1969 and 1968, respectively, and Lawrence and Annie's children continued to operate the ranch while living in Durango until 2004. Thus, the Harper Ranch was the second-best-preserved ranch in Ridges Basin at the time of the 1980 archaeological survey. Tom and Elizabeth Jane Harper's daughter May Edith married Joseph Kikel, and they homesteaded in Ridges Basin in 1915, patenting their homestead in 1920, at which point they moved west into the La Plata River valley.

Michelle Bodo was an Italian immigrant who came to southwestern Colorado in 1898 to work in the coal mines. In 1905 he won the jackpot in roulette and returned to Italy to find a wife. He returned to southwestern Colorado with his new bride and continued to work in the mines until 1909, when he took up farming. In 1912 he purchased the George Thompson homestead with the old Two Cross Ranch summer headquarters house, and in 1919 he purchased the William A. Thompson homestead and moved his family there. Over the next 20 years, he and his son Mike, Jr., bought out other homesteaders, and by 1940 they controlled everything from Wildcat Creek to the summit of Basin Mountain and from the Harper Ranch in the western edge of Ridges Basin to the Animas River. Mike Sr. died in 1960, Rosetta in 1968, and Mike Jr. continued to run the ranch. After Mike's death in 1971, the Bodo family sold the ranch to the Nature Conservancy, which in turn passed it on to the Colorado Department of Wildlife to be used as a wildlife refuge.

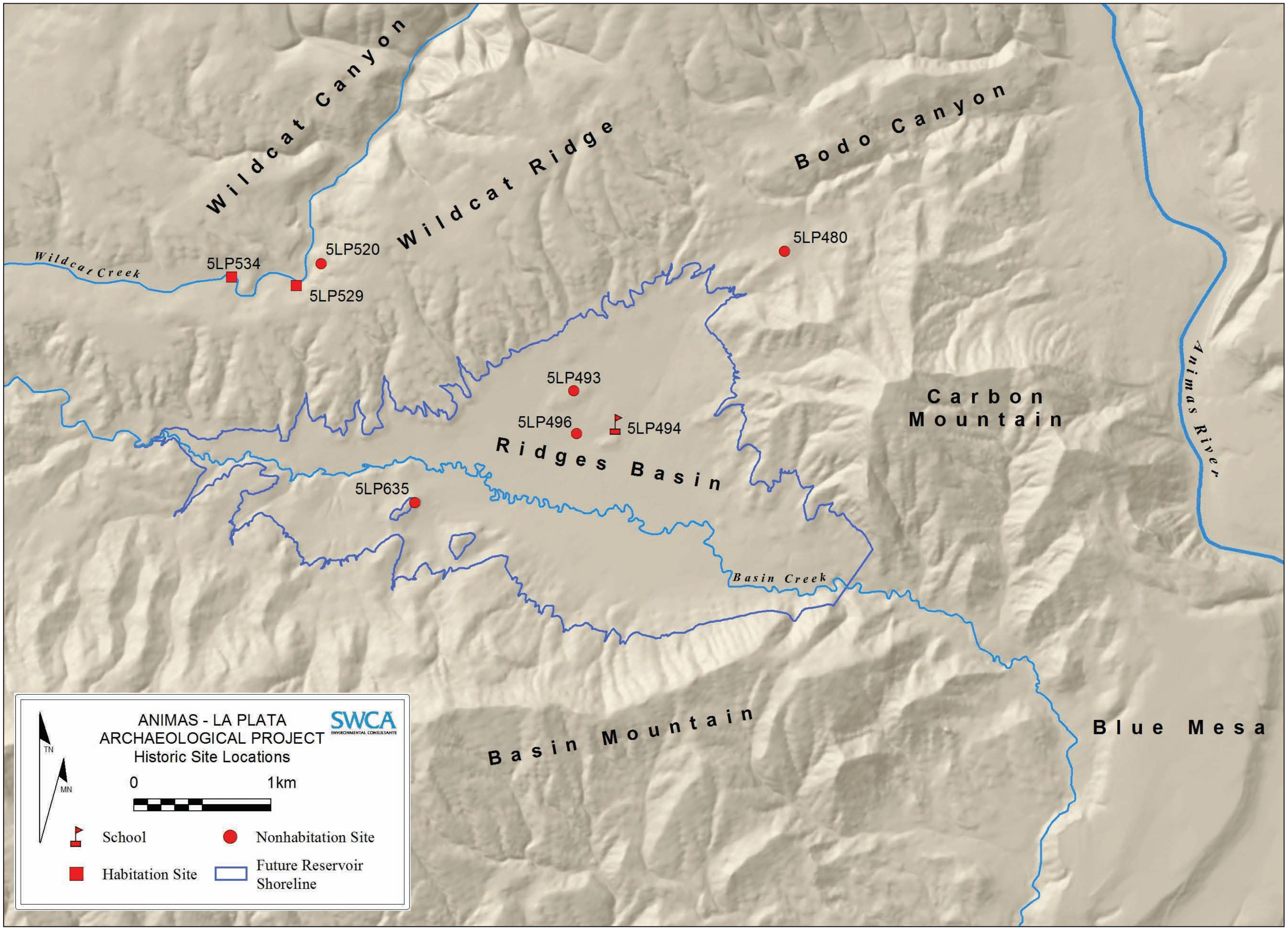

Figure 18.2. Location of habitation and nonhabitation sites in ALP project area, 1880 (from Gilpin 2007:Fig. 7.1).

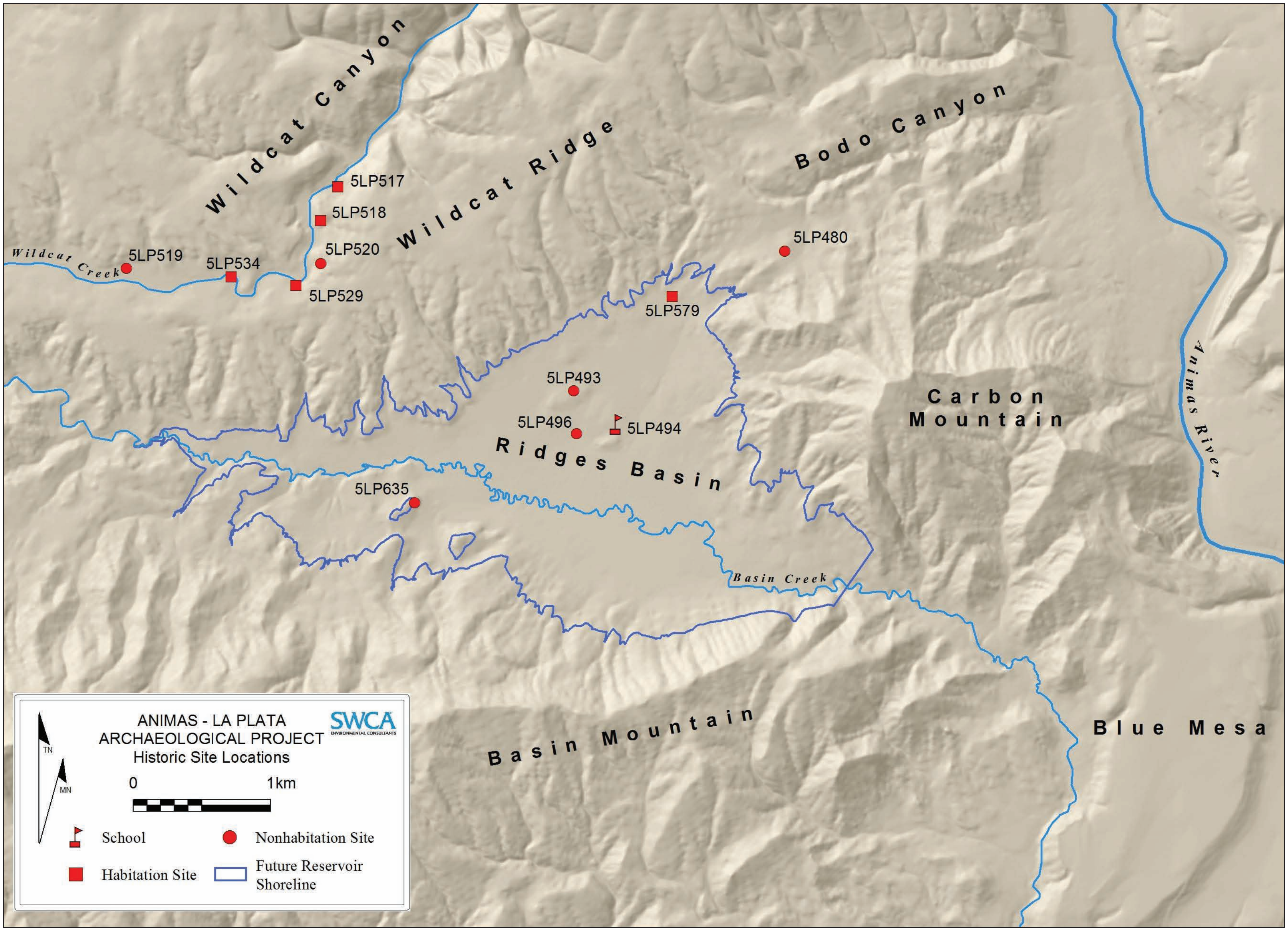

Figure 18.3. Location of habitation and nonhabitation sites in ALP project area, 1890 (from Gilpin 2007:Fig. 7.2).

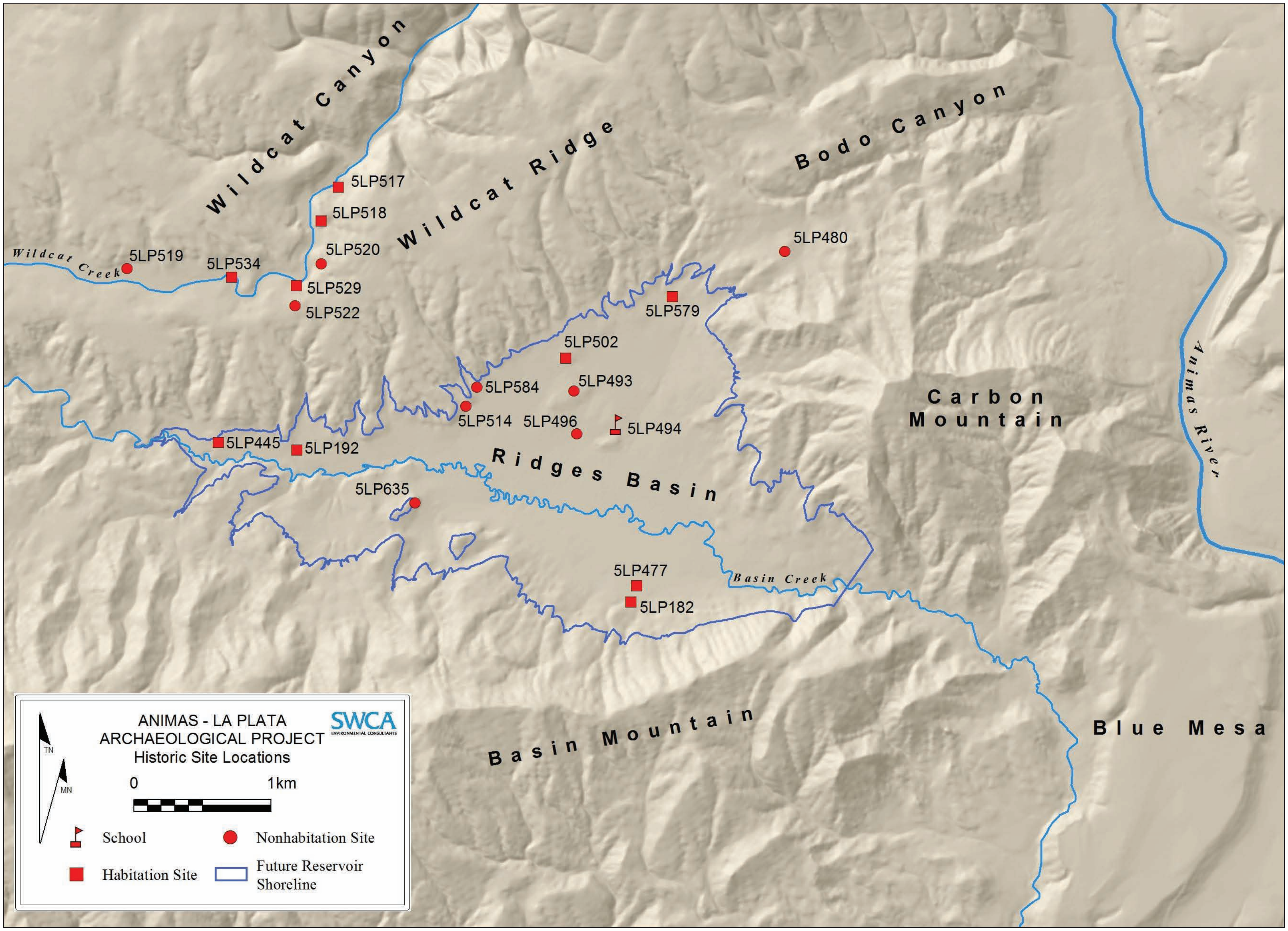

Figure 18.4. Location of habitation and nonhabitation sites in ALP project area, 1900 (from Gilpin 2007:Fig. 7.3).

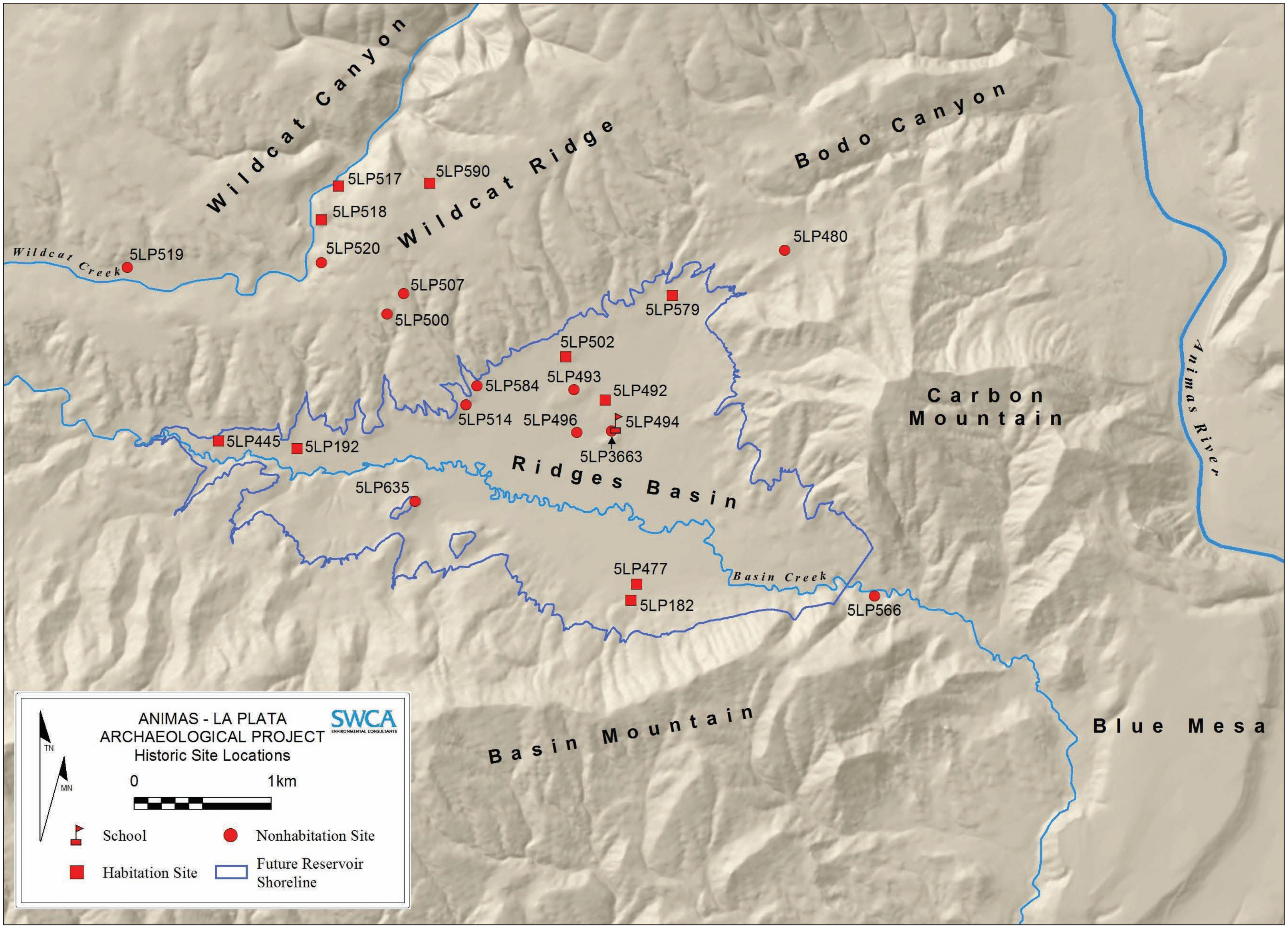

Figure 18.5. Location of habitation and nonhabitation sites in ALP project area, 1910 (from Gilpin 2007:Fig. 7.4).

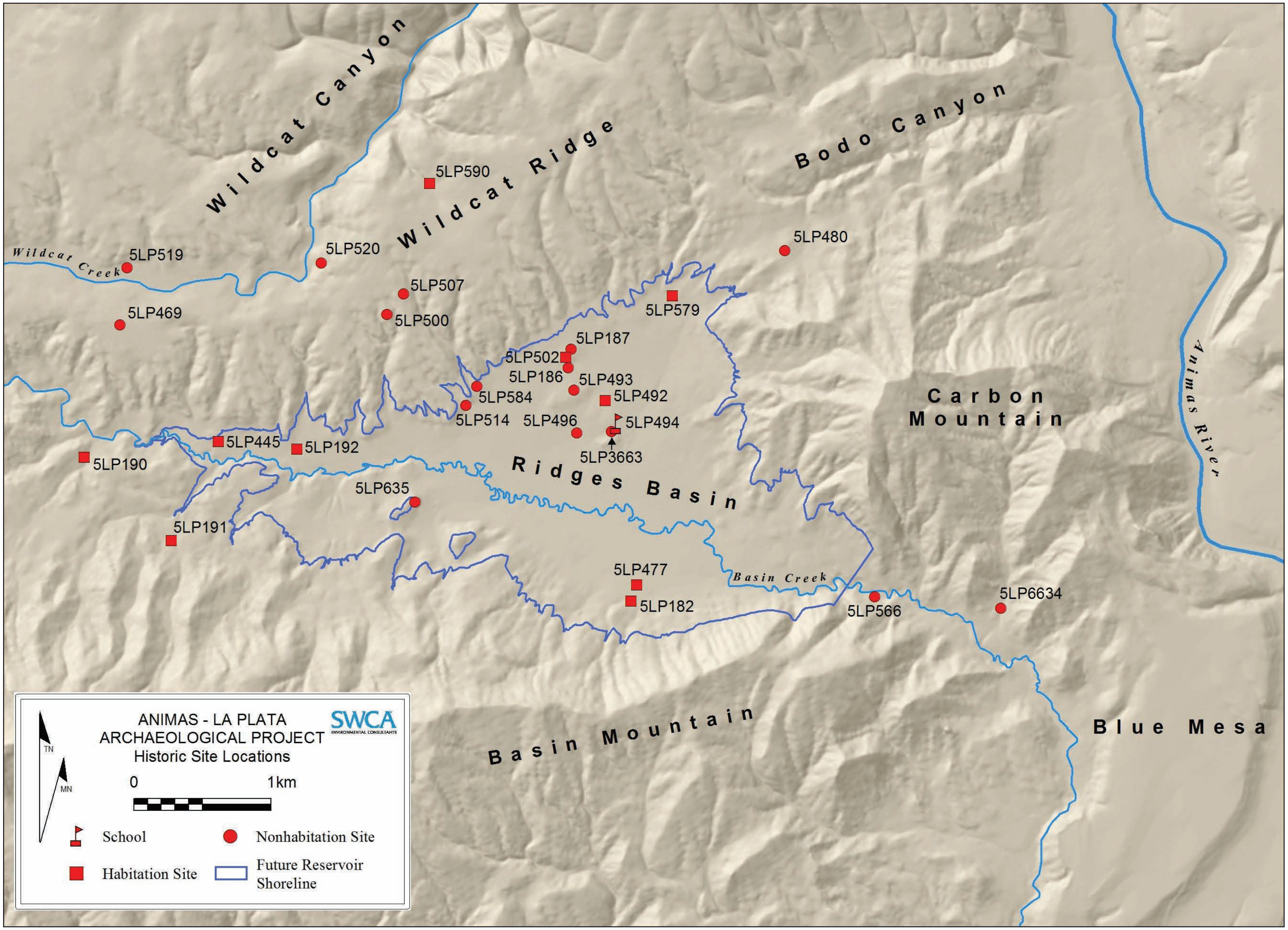

Figure 18.6. Location of habitation and nonhabitation sites in ALP project area, 1920 (from Gilpin 2007:Fig. 7.5).

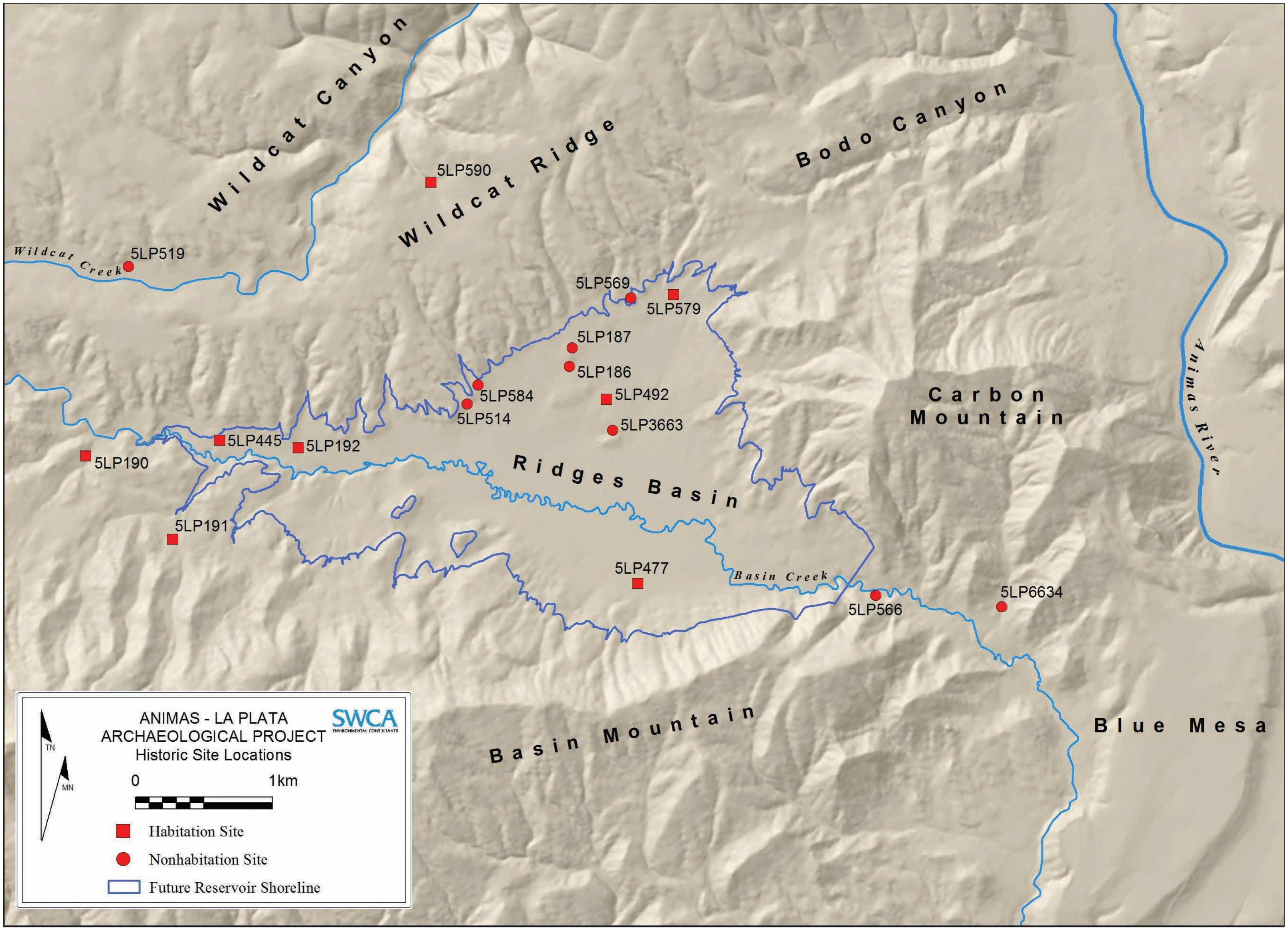

Figure 18.7. Location of habitation and nonhabitation sites in ALP project area, 1930 (from Gilpin 2007:Fig. 7.6).

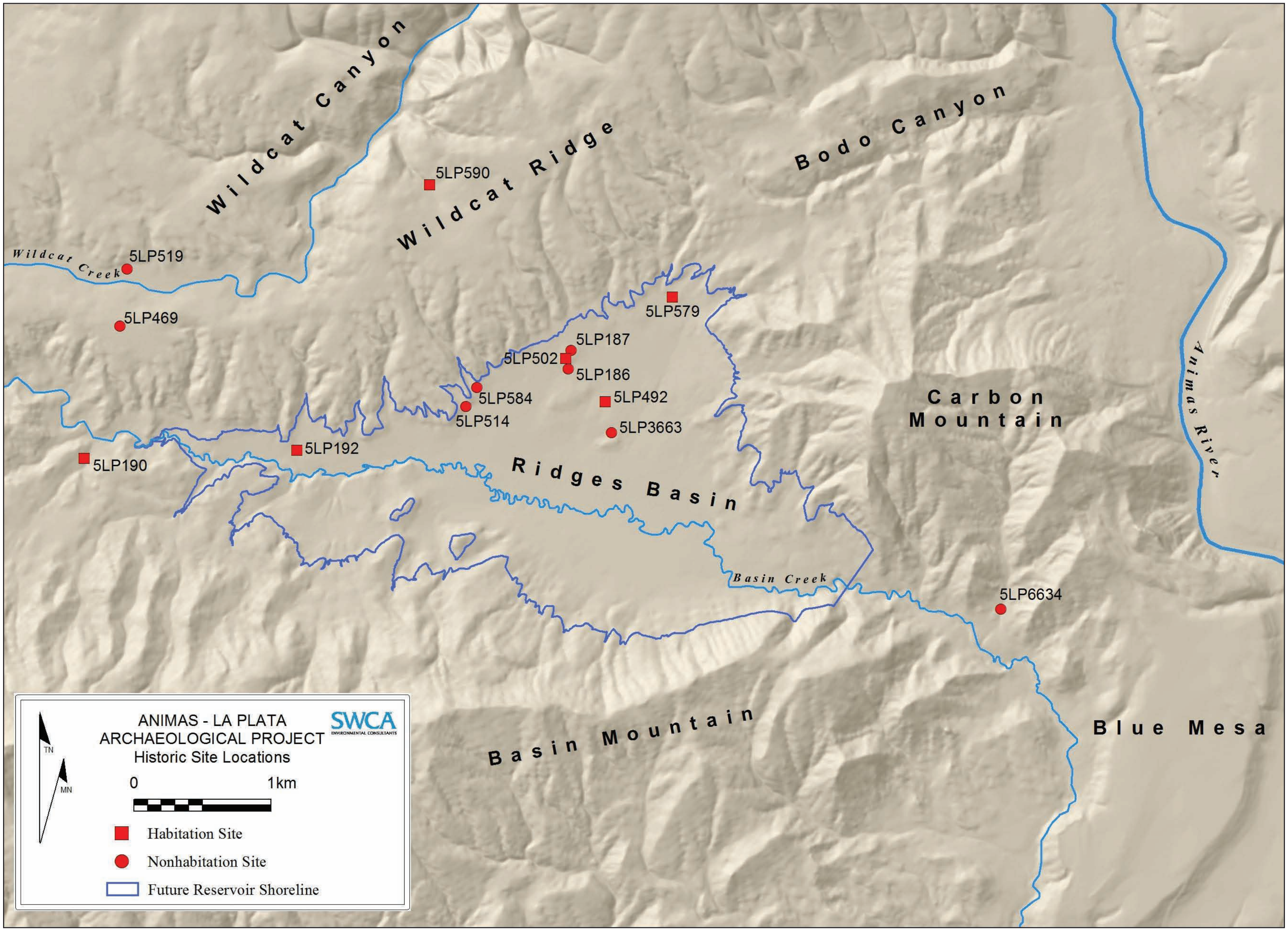

Figure 18.8. Location of habitation and nonhabitation sites in ALP project area, 1940 (from Gilpin 2007:Fig. 7.7).

At the time of the first archaeological survey of Ridges Basin for the ALP project, the old Bodo Ranch was still in use as the headquarters for the Bodo Wildlife Refuge and was thus the best preserved ranch headquarters in the project area.

Surveys of the Ridges Basin project area originally identified 38 historic sites. Based on Gilpin's 1994 inspection of these sites, Stein and Ballagh (1995) re-evaluated the NRHP eligibility of the sites in the project area, examining their archaeological potential and conducting archival research on their historical context. Stein and Ballagh recommended that nine sites be determined eligible for the NRHP and that six sites be further investigated to determine eligibility. Stein also identified three types of historical sites, which defined the three major research themes for the historical archaeology of the project area: the coal-mining sites of Wildcat Canyon, the railroad and railroad-associated sites in Wildcat Canyon, and the ranching sites of Ridges Basin. By the time data recovery for the ALP project began, however, the project boundaries had changed, necessitating changes in the research themes and in the sample of sites to be investigated, as discussed below.

Research Concerns

As mentioned above, Stein and Ballagh identified three research themes for the ALP project: coal mining, railroading, and ranching. Changes in the ALP project design, however, led to some changes in the research focus. Because development in Wildcat Canyon was to be less than originally planned, archaeological research on railroading in the canyon was limited to recording only a section of the railroad grade (5LP519) that was within an access road right-of-way. Only one other site in Wildcat Canyon was investigated: 5LP517, the central portion of the town of Porter, was mapped and recorded in detail.

Coal Mining

The primary goal of research at coal mining sites in Wildcat Canyon was to look at each of the buildings in Porter (5LP517) and ascertain, from architecture and artifacts, the function of each building (whether dwelling or commercial) and the ethnicity, class, demographics, and worldview of the households represented at dwellings. Once these social attributes were defined, the reasons for differences within the study area (for example, how coal-mining camps were different from other types of settlements) and between the study area and other parts of southwestern Colorado could be examined.

Railroading

Railroading is represented at two sites in Wildcat Canyon: 5LP519 (a railroad grade) and 5LP528 (a stone structure). For 5LP519 Stein and Ballagh (1995:69) recommended more detailed recording of the techniques and materials used to construct different segments of the grade. This work was completed at only a segment of the grade that was within an access road right-of-way. No additional work was done at 5LP528.

Ranching

Most ranching sites in the project area were in Ridges Basin, but a few are in Wildcat Canyon. Historical archaeological studies of ranching focused on both the ranching landscape in Ridges Basin as well as individual ranches. How did the ranching landscape of Ridges Basin form, and what did it look like? At one time the Mountain West was dominated by a continuous ranching landscape, but much of that landscape has disappeared. Research on ranching in the project area combined archival data, oral history, and archaeological investigation. In addition to the general published histories of the region (Smith 1992; Stein and Ballagh 1995; Wildfang 2002; Winter et al. 1986), a volume published by the History Committee of the Fort

Lewis Mesa Reunion, 1994 (1994) includes important historical information on Ridges Basin and Wildcat Canyon. The Bureau of Reclamation commissioned historical studies by Baugh (1990) and Miller (1992a, 1992b, 1992c, 1992d). A key source of information on ranching in the project area came from homestead proof files for each of the homesteaders, acquired from the National Archives. The Animas Museum in Durango houses records and maps that were useful in identifying individual ranchers and homesteaders. In the summer of 2005 Gilpin conducted on-site interviews with Ron and Randy Bodo (grandsons of Mike Bodo, Sr., and nephews of Mike Bodo, Jr.), who lived and worked at the Bodo ranch, and with Dan Harper (son of Lawrence Harper), who managed the Harper Ranch until it was acquired for the ALP project. Ron and Randy Bodo and Dan Harper provided documents and photographs related to their family histories, as well as detailed descriptions of the general operation of ranches in Ridges Basin and the history and functions of specific features at individual sites and across the landscape.

The effort included historical archaeological studies at sites, as well as photographing and otherwise documenting historical attributes of the general landscape. Bodo Ranch (5LP579) was recorded to the standards of the Historic American Buildings Survey, and Harper Ranch (5LP192) and the Ridges Basin Schoolhouse (5LP494) were also mapped and recorded in great detail. The Hodgson homestead (5LP502), the Daniel homestead (5LP182), and the Cooper homestead (5LP477) were mapped and recorded in detail; six features at the Hodgson homestead and one feature at the Daniel homestead were excavated; and backhoe trenches were excavated at the Cooper homestead, exposing the water well in profile. In studying individual ranches, SWCA investigated the architecture and artifacts of each of the buildings at each eligible ranching site in order to ascertain the function of each building (dwelling, barn, storage, etc.) and to gather social data on the members of the households represented.

As Stein (Stein and Ballagh 1995:24) commented, “Relatively little is known about specific agricultural improvements made by the aforementioned settlers or the agricultural goods produced by them.” One way to learn about early agricultural improvements was to map the irrigation system. When SWCA re-evaluated the historic sites in the project area in the fall of 1994, it was recognized that few irrigation features had been recorded as sites (Gilpin 1994, 2007). Also, most archaeologists simply ignore fence lines (and the reasons behind their placement) during survey. During the 2005 historic sites fieldwork, Gilpin recorded a number of previously unrecorded features of the historic landscape in Ridges Basin, including reservoirs, ditches, check dams, haysheds, and fences and fencelines, which, combined with historic maps and photographs and descriptions of ranch operations provided by Ron and Randy Bodo and Dan Harper, more fully documented the historic ranching landscape in the basin.

Archaeological Summary for the Euroamerican Sites

Some 47 sites in the project area had evidence of Euroamerican use between about 1875 and 1975. (These 47 sites include the 38 sites recorded during the original surveys and reassessed by Stein and Ballagh in 1995, as well as primarily prehistoric sites where historic artifacts and features were found during data recovery.) These sites included habitations; the Ridges Basin schoolhouse; specialized activity areas associated with mining, railroading, and ranching; and isolated artifacts and artifact scatters. Habitations included the coal-mining town of Porter (5LP517), a habitation (5LP518) probably associated with Porter, and nine homesteads: the Thomas Daniel homestead (5LP182), the Amos Carroll or Woodie Decker homestead (5LP190), the Joseph Kikel homestead (5LP191), the Harper Ranch (5LP192), the Lawrence Burns homestead (5LP445), the Jacob Cooper homestead (5LP477), the Frank Hodgson homestead (5LP502), the Bodo Ranch (5LP579), and the Charles Harbaugh homestead (5LP6634).

Some structural sites that could not be associated with individual occupants were 5LP492 (a structure on the Thompson homestead), 5LP528 (a stone structure on Wildcat Creek, possibly railroad related), 5LP529 (a brick pile site on Wildcat Creek), 5LP534 (a depression on Wildcat Creek), and 5LP590 (a collapsed building located in a side canyon of Wildcat Canyon). The Ridges Basin schoolhouse (5LP494) was a unique site, ultimately related to ranching. Specialized activity sites associated with mining were the Gates Mine (5LP566) and a drill hole (5LP623). Specialized activity sites associated with railroading were the Rio Grande Southern railroad grade (5LP519), and possibly 5LP528 (the structure on Wildcat Creek). Specialized sites associated with ranching included one site with a scale, corral, posts, and other features (5LP3663); corrals (5LP469, 5LP479, 5LP485, 5LP516, 5LP563); irrigation facilities (5LP187 (primarily a prehistoric site); 5LP456, 5LP514, 5LP522, 5LP584); erosion-control structures (5LP605, 5LP606); upright posts (5LP500, 5LP519); and an equipment storage site (5LP617). Two dumps (5LP480 and 5LP493) were associated with ranching. Artifacts and artifact scatters related to ranching were found at prehistoric sites (5LP167, 5LP185, 5LP186, 5LP187, 5LP240, 5LP496, 5LP634, and 5LP635) and at historic sites (5LP507, 5LP522, and 5LP526).

Roads, Ditches, and Other Landscape Features

In addition to cultural features and places recorded as sites, the project area contained cultural features and places that contributed to understanding the historic landscape of Ridges Basin. A number of these cultural features were noted during the 1994 reconnaissance (Gilpin 1994), and many of them were recorded in 2005 (Gilpin 2007). Among these features were roads, ditches, reservoirs, check dams, haysheds, and fences.

The major roads within the project area were the Wildcat Canyon Road, the Wildcat Ridge Road, County Road 211, a road past the Hodgson homestead, a road going from Ridges Basin to the top of Wildcat Ridge, a road going up the side canyon north of the Harper Ranch, and a road to Gates Mine.

Four major ditches provided water to Ridges Basin, and the 1887 General Land Office map for the area shows that even before Ridges Basin was opened for homesteading, settlers were drawing water from Basin Creek by means of irrigation ditches, a practice that continued into the twentieth century. In 1923, however, claimants in New Mexico filed suit for some of the water from the La Plata River, and all the farmers in Ridges Basin, except the Bodos, lost their irrigation water allocation (Miller 1992a:11, 1992b). The 1968 USGS 7.5-minute quadrangle for the area shows nine reservoirs in Ridges Basin. However, at least one irrigation complex and an associated reservoir are not shown on the map. Numerous other water control features such as check dams were not indicated on the map, but were recorded during the original surveys and during Gilpin's 2005 fieldwork.

Although three haysheds were present at one time or another on the Bodo property, only the remnants of one hayshed structure and a scale were recorded (at 5LP3663).

The earliest settlers in Ridges Basin began constructing fences, and several of these are shown on the 1887 GLO map. Homesteaders all reported fencing portions of their holdings. None of these fences were recorded as archaeological sites. By the 1960s, fences divided Ridges Basin into three irrigated fields (all owned by the Bodos) and probably six large pastures (four controlled by the Bodos, one by the Harpers, and one by the Kikels). The 1968 Basin Mountain USGS topographic quadrangle shows three fences, and archaeological fieldwork identified six others.

Commercially Manufactured Artifacts

In Gilpin's 1994 reconnaissance, his 2005 fieldwork, and SWCA's work subsequently, approximately 4,500 commercially manufactured artifacts were recorded. For analysis purposes, the artifacts were classified according to 1) materials and manufacturing technology and 2) function.

Data on materials and manufacturing technology were useful in dating sites. Formal material categories used were ceramics, glass, metal, and "other." The 566 ceramic artifacts included earthenware, stoneware, semi-porcelain, and porcelain. The 2,242 glass artifacts were classified in terms of color and form, as well as technological attributes and makers' marks. The 620 artifacts in the "other" category included bone, fiber, leather, rubber, plastic, shell, stone, brick, and wood.

Functional categories were domestic (food, condiments, drink, tableware, and cooking ware), household furnishings, household maintenance, architecture, transportation, communication, leisure and recreation (indulgences), personal (medicine, clothing, toys), arms and ammunition, tools, ranching, farming, and mining.

Beef, venison, canned meat, sardines, canned and bottled milk, and home-canned goods were among the foods represented in the artifact assemblages. Condiments included Heinz products, Log Cabin Syrup, lard, extracts, and spices. Coffee cans and lids, soda bottles and cans, and a juice bottle provided some evidence of what drinks were consumed. Evidence of cooking was mostly in the form of stoneware, although a sheet-metal frying pan and a few examples of enameled cooking ware were also recorded. Food was served mostly on hard-paste whiteware dishes, less frequently on semi-porcelain dishes, and more rarely on porcelain, glass, or enamelware. A small sample of eating utensils was also recovered.

Commonly recorded fragments and items of household furniture in the project area were stoves, stovepipes, bedsteads and bed frames, cots and cot frames, bedsprings, crates and boxes, drums and barrels, a kerosene lamp and lantern parts, and batteries. Site 5LP192 (the Harper Ranch) had the widest range of items related to household furnishings. Various items associated with household maintenance were also recovered. Artifacts representing architectural functions were overwhelmingly window glass and nails, although other materials were also present.

Artifacts on ALP project area sites indicated transportation by horse and wagon, railroad, bicycle, and automobile, and an interesting array of artifacts was classified as communications related (such as a Sanford ink bottle and two radio parts). Leisure and recreational activities were evident primarily as containers for alcohol and tobacco.

Personal items included artifacts related to medicine, clothing, toys, and music. At most sites the evidence for medicine was in the form of fragments of bottles, although some products (such as Mentholatum) could be identified more specifically. Clothing, or items related to clothing, as well as various parts of boots and shoes were also present. Toys included porcelain doll parts and remnants from a toy airplane. A single harmonica plate was also recorded.

The arms and ammunition category did not include any guns. Ammunition was represented by 30 cartridge cases from seven sites and four shot shells from two sites. Tools included knives and knife parts, shovel blades, a snow shovel base, an axe head, a hacksaw blade, a file, and a pulley wheel. An anvil, a forge, sawhorses, and ladders were also recorded as tools.

Ranching-related artifacts included fencing materials and objects associated with animal care. Fencing items included barbed wire, fence staples, and boxes for electric fence chargers. Animal care was represented by horseshoes, a horseshoe nail, harness parts, a roping horse, and a veterinary medicine bottle.

Evidence of farming was recorded in the form of farming equipment, hogwire, chicken wire, baling wire, and binder twine. Equipment included binders, seed drills, a shaker mill or seed mill, a mower blade, a storage box, a hay wagon and three smaller wagons, hay rakes, hand operated disks, John Deere cutters, small plows, and assorted metal parts.

Although mining occurred in the area, mining artifacts were quite rare. Three carbide lamps, a jack leg from a mine, and one 2-inch-diameter core sample were the only indications of this activity recorded.

Approximately 44 percent of the 4,507 artifacts recorded at ALP sites could not be assigned a function. Most of these were fragments of bottle and jar glass, or nondescript pieces of metal.

Population

The residents of the ALP project area in historic times can be divided into two major, contrasting populations. One group consisted of the residents of Porter in Wildcat Canyon, who were engaged in mining and railroading, and the others were ranchers and farmers, most of whom settled in Ridges Basin.

The Miners

The town of Porter was established in 1886, and the Rio Grande Southern Railroad reached the town in 1890 (Stein and Ballagh 1995). Census data show that in 1900 it had a population of 437; by 1910; however, after a fire destroyed many mining facilities, only 155 residents remained (Miller 1992c, 1992d). By 1920, the town no longer existed. In 1900 the town's population included 55 miners. Twenty-seven were married and living with their wives, 25 were single or did not indicate their marital status, and three were widowed or divorced. Fifteen miners were born in the United States, and 39 could be identified as immigrants, originating from the British Isles (20), Italy (13), Sweden (3), Germany (1), Austria (1), and Spain (1). By 1910 the mine had closed. Fourteen members of a railroad survey crew occupied the boarding house (along with two miners), but most other residents lived in 27 individual houses. In order to document the archaeology of mining in Wildcat Canyon, SWCA mapped and recorded a portion of the town of Porter that was in the project area (5LP517) (Figure 18.9). The Porter site, 5LP517, consisted of six building foundations, two dugouts, one cistern, two wells, three privies, two depressions (wells or privies), two roads, two rock alignments, one corral, one fence line, one borrow pit, one excavated area with cinder dumps and refuse, one cinder pile with brick, one cinder concentration, one rubble concentration, and one earthen mound. Only limited mining ever occurred in Ridges Basin. Three individuals purchased coal land, and the Gates Mine operated from 1910 to 1930.

The Settlers: Archival History, Oral History, and Historical Archaeology

SWCA was able to identify 30 entrymen who made 37 entries within or immediately adjacent to the project area. Seventeen of the entries were homesteads, 11 were cash entries, four were timber and stone entries, three were stock-raising entries, and two were desert land entries.

Archaeological surveys identified sites that may correlate with the homesteads of Lawrence Burns (5LP445), Jacob Cooper (5LP477), Thomas Daniel (5LP182), Woodie Decker (5LP190), Charles Lee Harbaugh or Ray Pierce (5LP6634), Thomas Harper (5LP192), Frank Hodgson (5LP502), Joseph Kikel (5LP191), and W. J. Thompson (5LP579, Bodo Ranch). Three sites (5LP528, 5LP529, and 5LP534) were structural sites, any one of which could have been the home of Frank Chabrand in Wildcat Canyon. The homesteads of 16 other individuals could not be identified. The four timber and stone entries were not expected to show any improvements, whereas other improvements are known to have been dismantled or removed from their original locations.

Types of improvements reported on homesteads included houses (identified at 21 sites), cellars (at 11 sites), wells (at 11 sites), chicken houses or coops (at 10 sites), barns (at eight sites), granaries (at four sites), stables (at three sites), a milk house, a coal house, a wood house, a shed, and unidentified outbuildings (at one site). Twenty-four houses were reported at 21 of 23 homestead sites. The only homesteads where houses were not constructed were the Desert Land Act homesteads of John Morgan, which was to be irrigated using water from the Pine Ridge Ditch, and that of his daughter, Brooksie Morgan, which was to be irrigated using water from the Wood and Morgan Power and Irrigation Ditch (which, in fact, was never completed). Fifteen houses were of frame construction and five were log cabins. The numbers of rooms per house ranged from one to six, with an average of 3.2.

That frame houses were more common than log cabins indicates the extent to which the homesteaders were dependent on and integrated into the commercial economy. The log cabins were among the first houses to be constructed, but most homesteaders eventually built frame houses. All of the log cabins were built prior to the mapping of Ridges Basin by the GLO in 1887 and its subsequent opening for homesteading. However, while some entries would not be expected to have associated structures, other homesteads that were described as having extensive improvements were not identified archaeologically. This is possibly due to the fact that some homesteads extended outside of the project area. But others, even some shown on the 1887 GLO map and the 1908 USGS quadrangle map, were not located during the survey. It is likely that some were destroyed or salvaged for other construction. For example, the Bodos are known to have salvaged material from sites to construct check dams and fences. The Colorado Division of Wildlife may also have removed some remains. Their construction of a pond at the Hodgson homestead (5LP502) apparently destroyed the main Hodgson house.

Most of the habitation sites recorded during the archaeological surveys of the project area consisted only of a few features. The headquarters of the two most successful ranches, Bodo Ranch (5LP579) and Harper Ranch (5LP192) (Figure 18.11), were much more complex, however. In 1986, when archaeologists first recorded Bodo Ranch in detail, it consisted of 12 buildings: the main ranch house, the hired man's living quarters, a garage for the family automobiles, a privy over an old well, the main barn, a calving and veterinary barn, a chicken house, a garage for farm equipment, a machinery shed, two pump houses, and a shed. Additionally, a garden and orchard, a pond, a corral, and a threshing machine associated with the Bodo's use of the site were present in 2002 (Figure 18.10), as well as a loading dock and a rifle range put in by the Department of Wildlife. No longer extant during the first recording of the site by archaeologists were a mobile home, an ice house, two cellars, a privy, a coal shed, a woodshed, and a shed for storing lumber, all of which existed at the site when the Bodos lived there. Harper Ranch (Figure 18.11) consisted of one house foundation, one cabin, one garage, two sheds, one well, one cellar, one smokehouse, one privy, one barn and corral complex, one corral complex, one work area (an outdoor blacksmith shop), one play area, one trash scatter, roads, a creek crossing, fences, and gates.

Research Issues

At its most general and theoretical level, the ALP project's historic sites research focused on reconstructing social action by the area occupants, identifying what kinds of social interaction occurred, how much variability was present, how much freedom of action there was, and how social action was constrained. Following the "New Western Social History" (Limerick et al. 1991; Olin 1986; White 1991), the ALP project's historic sites research examined 1) how the political economy of the region in the late nineteenth and early twentieth centuries influenced individual choices; 2) how social status, including ethnicity, class, and gender, affected the opportunities and experiences of the occupants; 3) how social action was represented in kinship, cooperation, and conflict; and 4) how each of these was reflected archaeologically.

Stein and Ballagh (1995) identified three historic contexts that framed the history of the project area: railroading, coal mining, and ranching. One of the key questions of the New Western Social History is how the political economy results in particular historical developments. The stereotypical view of the settling of the American West was that regions passed through stages of increasing development: "the buffalo…, the Indian, the fur-trader and hunter, the cattle-raiser, the pioneer farmer" (Turner 1972 [1894]:10). The New Western Social History emphasizes the role of government and corporations in the settling of the American West, and the ways in which ethnicity, class, and gender affected the experience. Research for the ALP project assembled archival data, oral history, and archaeological data on some of these topics.

Political Economy

The political economy of southwestern Colorado in the late nineteenth and early twentieth centuries was largely controlled by the policies and programs of the federal government and by corporations, and this control was reflected in the development of the economic mainstays of the region—mining, railroading, ranching, and homesteading. Government policies encouraging mining development included the General Mining Act of 1872 and the Sherman Silver Purchase Act of 1890. The development of Wildcat Canyon into a mining landscape and transportation corridor proceeded directly from corporate efforts. Mining corporations also affected the development of Ridges Basin but to a lesser degree.

Just as government policies encouraged the development of the American West through mining, so too did they create an environment in which farmers would develop the West. The initial cattle ranches in the project area were large outfits that used the open range. Several "cattle pools"—consortiums of stockmen—structured the way land was used by these large ranches. Beginning in 1888, the large ranches in the project area were replaced by homesteads made possible by such federal legislation as the Homestead Act of 1862, the Desert Land Act of 1877 (as amended in 1891), and the Timber and Stone Lands Act of 1878 (as extended in 1892). Among the earliest homesteaders were the Thompsons, who had operated the immense Two Cross Ranch, as well as small-scale settlers like "French Frank" Chabrand and Samuel Prudden, all of whom began living in the area before it was opened for homesteading. After about 1910 many homesteaders began selling out, primarily to such large partnerships and corporations as the Wood and Morgan Land and Live Stock Company and the Porter Fuel Company (later the Union Pacific Coal Company), and for a time it may have appeared that Ridges Basin would be under corporate control, but ultimately the businesses and corporations sold their lands to three local ranching families: the Bodos, the Harpers, and the Kikels.

The political economy of the project area was archaeologically manifested most strongly in settlement patterns and material culture. The mining and railroading landscape in Wildcat Canyon exemplified the industrial and corporate nature of coal mining. The evolution of the agricultural landscape in Ridges Basin began with the process of homesteading from 1888 to 1923, followed by the consolidation of small homesteads into larger ranches. The material culture at sites in both Wildcat Canyon and Ridges Basin indicated incorporation within the industrial world system. Government policies encouraged development of the American West by providing incentives for mineral development and agriculture.

Mining and Railroading

Government policies that encouraged mining were crucial in the development of the Durango area. The General Mining Act of 1872 essentially gave away minerals on federal lands to anyone who could mine them, while the Sherman Silver Purchase Act of 1890 provided much of the impetus for the silver mining boom in the San Juan Mountains. The repeal of the Sherman Act resulted in the Silver Panic of 1893, which had a strong negative impact on the Durango economy (Smith 1992).

Corporations, particularly railroad, mining, power, and land companies, were certainly important in the development of the Durango area and Ridges Basin. The Denver and Rio Grande Railroad (D&RG) was the single most important corporation in the development of Durango. The Rio Grande Southern Railroad was acquired by the D&RG in 1891, only two years after its completion. The Rio Grande Southern went into receivership in 1929 (Smith 1992).

The development of Wildcat Canyon into a mining landscape and transportation corridor proceeded directly from corporate efforts. Mining corporations also affected the development of Ridges Basin but to a lesser degree. Following the initial purchase of land in the 1880s, and over a series of sales and transfers, land in Ridges Basin was consolidated between 1941 and 1943 in the hands of three families: the Bodos, the Harpers, and the Kikels (Bodo n.d.; Stein and Ballagh 1995; Winter et al. 1986). Ultimately, the Bodos and the Harpers would be the only ranching families remaining.

Early Cattle Ranching

Early cattle ranchers in the project area controlled immense individual holdings on open range. Their summer range headquarters was in Ridges Basin. Lacking any ownership of the land, however, they had no way to prevent others from settling on it. By 1887 when the GLO map of Ridges Basin was published, several cattle pools were operating in the area. When Samuel Prudden applied for a cash entry into his Ridges Basin homestead in about 1891, he stated that the area was "not fenced in by any cattle pool. The La Plata Cattle Pool range over it" (National Archives, Land Entry Files, Box 557).

Homesteading

The initial homesteading boom was from about 1888 to about 1910, at which point many homesteaders began selling out. The Wood and Morgan Land and Live Stock Company, a local Durango enterprise, began acquiring property in Ridges Basin about 1910, primarily for ranching and farming. This was about the time when the Porter Fuel Company was buying up property, primarily for the possible coal reserves beneath the surface. For a brief time it may have appeared that Ridges Basin would be under corporate control, but Wood and Morgan got out of the ranching business after World War I, and the Union Pacific Coal Company liquidated their Ridges Basin holdings after World War II.

Ethnicity

The indigenous Utes were driven from the region by the terms of the Brunot Agreement of 1873 (see Gilpin 2007: Chapter 2), making possible the almost entirely Euroamerican settlement of the project area beginning about 1876. Nevertheless, the project area supported a substantial amount of ethnic diversity. The coal mining town of Porter (1890–1920) was populated mostly by immigrants in 1900, but by 1910 most of the miners had left, and railroad workers and farmers, mostly United States–born, were more common than miners, although about one-third were immigrants. SWCA's research identified only two African-American men in the project area: James Dyer and Ben Owens. The Bodo family had contact with Navajos in the second decade of the twentieth century, and in the 1950s or 1960s. The Navajos would pass through Ridges Basin on their way to the Durango fair every year from approximately 1910 to 1920. They would camp in the basin, have a feast, and continue on to the areas now known as Santa Rita or Centennial parks. At one time the Bodo family hired a Navajo man to work for them for two or three summers. He brought his family, who set up tipis on the ridge north of the garden and a loom under a piñon tree.

Dilcie Kikel recalled that several Japanese families lived in Porter (The History Committee of the Fort Lewis Mesa Reunion 1994). Although it was possible for immigrants to prosper in Ridges Basin (Italian immigrant Mike Bodo, Sr., was able to consolidate the largest ranch in the project area), Native Americans and African-Americans were largely excluded from participating in social and economic activities. No evidence of ethnicity was observed in the historic archaeological assemblage.

Class

The historic occupants of the project area ranged from wealthy landowners to working class individuals. The residents of Porter were almost entirely working class. The earliest settlers in Ridges Basin were the Thompsons, one of the largest landholding families in Colorado. A few settlers were probably middle class. Two women, Mrs. Alonzo Lee and Louise Schwenk, were teachers. John Morgan's daughter Brooksie listed her occupation as dressmaker, a working-class position, although that was probably one of the few occupations available to women at the time. Most of the settlers in Ridges Basin were probably working class.

Archaeological evidence of social class was limited. Social class might be indicated by architecture, furnishings, dress, diet, and tableware. Both archival data and archaeological data indicated that houses within the project area were generally fairly similar in style. Archaeological evidence of diet was also limited, and the assemblage of tableware was too small to provide much information.

Archaeological evidence of dress (see Gilpin 2007: Chapter 6) was largely limited to buttons and footwear in small numbers. Photographs of the Burnses, Harpers, and Bodos generally show them in formal settings, largely indistinguishable in their dress from any middle-class family of the time. Informal photographs of the Bodos show them in work clothes, or, in the case of Rosetta (Mike Bodo, Sr.,'s wife), a house dress.

The assemblage of tableware was a small sample, representing several individuals whose social class was indeterminate. There was as much variability within the overall assemblage as there was within the assemblage of a middle- to working-class family such as the Harpers.

Gender

Men were most evident in the archival records, in large part because men applied for homesteads for families. Archival data and oral history indicate a pronounced sexual division of labor, but it is primarily through oral history that the labor of women is evidenced. Archaeological evidence for gender was relatively indirect, and primarily in the form of domestic artifacts, household furnishings, and household maintenance artifacts.

Miller's (1992c, 1992d) census data on the residents of Porter in 1900 and 1910 show that in 1900 the population of Porter (437) included 55 miners, 27 of whom were married and living with their wives; 25 were single or did not provide marital status, and three were widowed or divorced. Eighteen of the married miners had children, two had none, and for the others the information was not recorded. One man was divorced with one child. One single man had children, and one man whose marital status was not indicated had children. No data were available for the other men. Miller also summarized census data on four women at Porter. One of the women was divorced with one child, two were single, and the marital status of the fourth is not known. Of the four women listed as homesteaders, some recorded information is available for three of them, while nothing is known of the fourth besides her name.

The wives of the married male homesteaders and ranchers are known largely through the information on their husbands and families. Most of them had children and lived the lives of farm wives. The Burns couple had four daughters, all of whom married local homesteaders. Alonzo Lee's wife taught at the Ridges Basin School. Rosalia (Rosetta) Bodo is the one woman settler in the project area for whom a fairly extensive biography exists (see Gilpin 2007: Chapter 3).

As noted for the social class category, archaeological evidence for gender-related activities was relatively indirect and primarily in the form of domestic artifacts, household furnishings, and household maintenance artifacts. Not surprisingly, the artifacts in all categories indicate a fairly simple life—although not without some few conveniences and comforts—and that women worked hard to maintain their homes.

Kinship

One strong pattern in the history of the project area was the way kin groups worked together to establish themselves in the area. Miller (1992c, 1992d) found that miners in southwestern Colorado were often multigenerational families that lived as extended family households, but he also noted the high turnover of miners at Porter. Among the agricultural and ranching settlers, the family was probably the most significant social institution at the local level. All of the evidence for kin relations between various families came from archival records and oral histories.

Cooperation and Conflict

Accounts of cooperation and conflict often indicate how societies worked, and what institutions, organizations, and social structures were most important. Cooperation appears to have been more prevalent than conflict in the history of the project area. Examples of conflict include the struggle between Utes and Euroamericans over control of all western Colorado, management and labor disputes in the coal mines in the Durango area, a dispute between ranchers from New Mexico and rustlers and outlaws from Durango, and disputes over homestead claims (one with racial overtones). Euroamerican settlement of the project area, of course, grew out of the Ute-Euroamerican conflict, "resolved" by the Brunot Agreement of 1873, which greatly restricted the Ute tribal territory and opened the area to Euroamerican settlement.

Examples of cooperation in the Euroamerican history of the project area include both formal institutions and informal social action. The town of Porter was the largest community within the project area, and it supported institutions and organizations such as the Porter Fuel Company, the Rio Grande Southern Railroad section house, the post office, a power plant, a water tank, two boarding houses, and two saloons. Prior to 1927 Ridges Basin had a population large enough to warrant operation of a school house (5LP494), perhaps the only formal institution serving most residents of Ridges Basin and only residents of Ridges Basin. Although most of the information on cooperation and conflict in the project area came from archival records and oral histories, social relations among the occupants of the project area were also evident in the changing settlement patterns of the historic period.

Archival records and oral histories provided little information about how conflicts were resolved in Porter. The coal mines of southern Colorado were involved in numerous disputes between management and labor, including strikes that led to violence. Some management-labor issues were reported in the Durango area. Both miners and smelter workers in Durango went on strike a number of times (Smith 1992).

Conflicts also occurred as the result of homesteaders moving onto range land. For example, the Thompsons' Two Cross Ranch, the earliest and by far the largest ranching operation in the project area, did not actually own the land, and the Thompsons were unable to prevent others from settling within the range land where they ran their cattle. In some parts of the Southwest, this type of competition led to range wars. However, in this case, it appears that the Thompsons actually had few conflicts with settlers. When Ridges Basin was opened for homesteading, the Thompsons applied along with others, received their patents, and stayed until about 1910.

Overall, the homesteading process appears to have contributed to the orderly development of the area and prompted cooperation among homesteaders, who often called upon each other to witness their homestead applications. Homesteading also created some conflicts, all of which, it appears, were resolved through the GLO in Durango.

Ditch companies organized to bring water into Ridges Basin would also have structured cooperation and potentially conflict among the settlers. The Pine Ridge Ditch Company, a subsidiary of the Porter Fuel Company, began operating in 1899, and construction of the Bodo–Pine Ridge Ditch began the same year. From the earliest days of settlement in Ridges Basin into the second decade of the twentieth century, various homesteaders constructed irrigation ditches off of Basin Creek, while others built ditches in Wildcat Canyon. John Morgan brought water from the Pine Ridge Ditch to his land in Ridges Basin around 1906. In 1923 New Mexico ranchers began litigation to assure their access to irrigation water, and virtually all of the Ridges Basin homesteaders except the Bodos lost their water rights.

From the 1880s to the 1920s, some homesteaders raised sheep and goats in the project area. There may have been some animosity between sheepmen and cattlemen, but any existing conflict between them was settled by cattlemen purchasing all of the sheep ranches. By the 1940s, Mike Bodo, Jr., had consolidated most of the land in Ridges Basin, in part by buying out the sheep ranchers.

Religious institutions were often important in establishing social relations among pioneer colonists in many areas of the American West. Archival records, oral histories, and archaeological remains provided little evidence of the role of religion in the project area. It may be that religious activities were centered in neighboring communities, primarily Durango.

Homesteaders also worked for each other and grazed livestock on each other's property. Samuel Prudden reported gathering cattle for one individual and driving cattle down to New Mexico for two brothers. John Houghton hired Prudden to plow 30 acres, allowed Prudden to graze three to five horses on his land, and said that he had use of some of Prudden's cows that were on his land. Mike Bodo, Sr., worked for Wood and Morgan and leased Wood and Morgan property, and Dan Harper worked for the Bodos. Thomas Harper cultivated George Thompson's ranch, and Mike Bodo and Joseph Kikel grazed between 300 and 400 head of cattle on Thomas Daniel's stock-raising homestead.

Pioneer Colonization

The concepts of frontier and pioneer colonization provide one theoretical framework for studying the history of regions such as the project area (see Gilpin 2007: Chapter 4). Here, Euroamerican settlement occurred as part of, and apparently in conformity with, the general process of settlement of the American West. After the project area was opened to homesteading in 1888, some 32 to 35 years were required to homestead virtually all of Ridges Basin. (The largest number of sites was patented in 1920; the last homesteads were patented in 1923.) The history of the project area exemplified the boom-and-bust cycle usually associated with the frontier in the popular conception. Mining brought hundreds of people into Wildcat Canyon, but the mine closed in 1908, and Wildcat Canyon quickly reverted to a rural landscape. Although some 30 homesteaders and their families came into the project area (or to lands immediately adjacent to it), by 1970 only the Bodo and Harper ranches remained headquartered there.

One of Turner's (1972 [1894]) points of emphasis was that the frontier gave the pioneers the freedom and opportunity to develop more democratic institutions. The largest settlement in the project area, however, was Porter, a company town that existed solely to house workers at the corporately owned mine. Once the mine closed, the town disappeared. The homesteaders in the project area were never numerous enough to constitute anything like a self-sufficient community. Among the homesteaders, the family was the most significant institution that existed, and the Ridges Basin community, such as it was, was constructed almost entirely through the quotidian interactions among them. The primary physical evidence of the community comprised (perhaps in order of significance) County Road 211, the schoolhouse, the irrigation system and other water sources, and two briefly operational slaughterhouses. The frontier environment of the project area did provide some opportunities that may not have existed elsewhere, but these opportunities were not unlimited. The Bodos, perhaps the most successful of the homesteaders (in the sense that they owned most of Ridges Basin at the time when the U.S. Bureau of Reclamation acquired the land for the ALP water project), were Italian immigrants. Mike Bodo, Sr., told his son that he would never have been able to accomplish as much if he had stayed in Italy. On the other hand, Native Americans and African-Americans were prevented from establishing homesteads in Ridges Basin.

When Turner first proposed his “frontier hypothesis,” he meant it to explain no less than the American character. But his optimism was brief. Even though later scholars found the frontiers and pioneer colonization to be useful concepts, such broad models typically explain only small portions of the variability of the historical setting. Such models point to avenues of research and suggest types of data to be recorded and analyzed, but the real understanding of the history of a time and place and the lives of people who lived there comes from examining the lives themselves, the conditions in which people found themselves, their responses to those conditions, and their social actions in everyday life.

CONCLUSION

The ALP project documented the history of two small drainage basins, Wildcat Canyon and Ridges Basin, in southwestern Colorado. During the late prehistoric and Protohistoric periods, the project area was primarily occupied by Ute groups, with Paiute and Navajo visitors. These peoples were still in the project area at the time of Spanish exploration, first by the two Rivera expeditions of 1765 and later by the Domínguez and Escalante Expedition of 1776. Between about 1829 and 1848, there was substantial travel through the project area on the Old Spanish Trail. The most intensive occupation of the area, however, occurred between about 1880 and 1975, when coal miners and ranchers colonized the area. Coal mining was most prominent in Wildcat Canyon, where the Porter Coal Mine, the town of Porter, and the Rio Grande Southern Railroad were located. After the Porter Mine closed in 1908, occupation of Wildcat Canyon declined. The canyon continued to be used as a transportation route, but otherwise was used for ranching.

Ranching was the primary activity in Ridges Basin. The location of the summer range headquarters for the Thompsons’ Two Cross Ranch as early as 1880, Ridges Basin opened to homesteading in 1888. From 1888 to 1923, some 30 entrymen patented 36 parcels in and immediately adjacent to the project area, most in Ridges Basin, a few in Wildcat Canyon, and one on the ridge between the two drainages. Around 1910, even before homesteading ended, the original entrymen began selling their property, and by about 1950, only two ranches were headquartered in Ridges Basin.

Archaeological survey and data recovery in the project area identified nine sites with evidence of the Native American occupation of the area and 47 sites with evidence of a Euroamerican presence. The nine protohistoric sites included the Old Ute Trail (which, in Ridges Basin, probably followed the route of the Old Spanish Trail, generally along the route of the 1765 Rivera expeditions and the 1776 Domínguez and Escalante Expedition), one or two possible habitation sites, artifact scatters, and isolated artifacts on prehistoric sites. The 47 Euroamerican sites included the town of Porter, a railroad grade, ranching habitation sites, a schoolhouse, corrals, and other ranching features, as well as artifacts and artifact scatters, some on prehistoric sites. Not all of the homesteads documented in archival records could be identified archaeologically. Still, enough archaeological evidence—artifacts, site plans, and changing settlement patterns—remained to allow a reconstruction of the cultural landscape that was both created by social action and in which social action occurred.

In terms of general development, the histories of Wildcat Canyon and Ridges Basin are similar to, and perhaps representative of, the patterns of development for much of the American West, and specifically southwestern Colorado. Government policies and programs fostered development and influenced how it occurred. Individuals, cooperative associations, and corporations took advantage of these government policies and were instrumental in developing the project area.

In more specific terms, however, the development of Wildcat Canyon and Ridges Basin illustrates some of the variability in the development of the American West and southwestern Colorado. Although Wildcat Canyon and Ridges Basin were adjacent to each other, the development in each was strikingly different. Wildcat Canyon was an industrial landscape and boomed from about 1886 to 1908, after which it was used primarily as a transportation route and for ranching. Ridges Basin, in contrast, was a more pastoral environment, in which a large number of homesteaders settled between 1888 and 1923, but whose holdings were, by the 1940s, consolidated into one large and two smaller ranches. The development of the two areas was also linked in that many of the settlers of Ridges Basin were miners in Wildcat Canyon. In the lives of specific miners and ranchers (often the same people), the most fine-grained examples of general trends and variability can be observed.

While all of the early Euroamerican settlers were recent arrivals in southwestern Colorado, and while many came to the area to work in the mines and later became homesteaders, the early settlers came from several foreign countries and several states. They came as large landholders and poor immigrants. They were men and women, married and single. Some stayed only long enough to acquire, improve, and sell their property, while others stayed for generations. In these ways, the history of the ALP project area reflects similar trajectories in the development of many such valleys in the American West.

Chapter 19: Animas–La Plata: A Native American Project

James M. Potter

The Animas–La Plata archaeology project was a Native American project. Its purpose was to facilitate the fulfillment of the long-standing water rights of the Ute and Navajo people; it was administered by the Ute Mountain Ute Tribe; it employed and trained numerous Native American archaeologists; and it involved the excavation of the remains affiliated with modern Pueblos. This chapter briefly elaborates on the unprecedented involvement of Native Americans in every facet of the project, describes the history and ultimate outcome of the project, and details the extraordinary accomplishment that the project represents for tribes—particularly the Ute Mountain Ute Tribe.

THE HISTORY OF THE PROJECT

The ALP project has a long and complicated history. Named for the two rivers from which it was to draw water, the ALP project has been controversial since its conception. Its origins go back to 1968 when the U.S. Congress authorized the project as a gigantic 191,200-acre-foot water supply project to serve multiple purposes, including irrigation, recreation, and municipal and industrial uses. Over the course of the next 20 years, many alternative plans were offered, including a reservoir near Aztec, New Mexico; one in upper La Plata Canyon at the base of the La Plata Mountains; one along Cascade Creek north of Durango, Colorado; and one in Howardsville near Silverton, Colorado. By the 1980s, the field of options was narrowed to two locations: one on the Colorado–New Mexico border southeast of the La Plata River that was referred to as the Southern Ute Reservoir; and one in Ridges Basin (Figure 19.1). This incarnation of the project also involved the proposed irrigation of a sizable portion of the La Plata River basin north of the Colorado–New Mexico border, and portions of the Mancos Valley farther west.

The ALP project was supposed to follow directly on the heels of the Dolores Archaeological Program (DAP), which required the excavation of hundreds of late Pueblo I sites in the Dolores River Valley. It was imagined that as excavations of the DAP sites were completed and the dammed waters of the Dolores River began to rise, crews of archaeologists would simply transfer to Ridges Basin for the ALP project. In fact, DAP archaeologists had shovels in the ground, and archaeologists were already surveying Ridges Basin for archaeological sites in anticipation of dam construction.

But in 1981, with the ALP project ready to begin, the federal government suspended the initiation of new public-works water projects. As a consequence, the DAP and McPhee Reservoir were completed, but the ALP project, with the exception of the archaeological survey, never got off the ground. This was the beginning of a series of events and decisions that delayed the project and dramatically changed its scope and focus.

In 1986, to offset some of the project's cost, the U.S. Department of the Interior developed a cost-sharing arrangement that called for state and local entities to provide 38 percent of the up-front funding for the project. Another cost-reduction compromise at this stage was the removal of the Southern Ute Reservoir from the overall project.

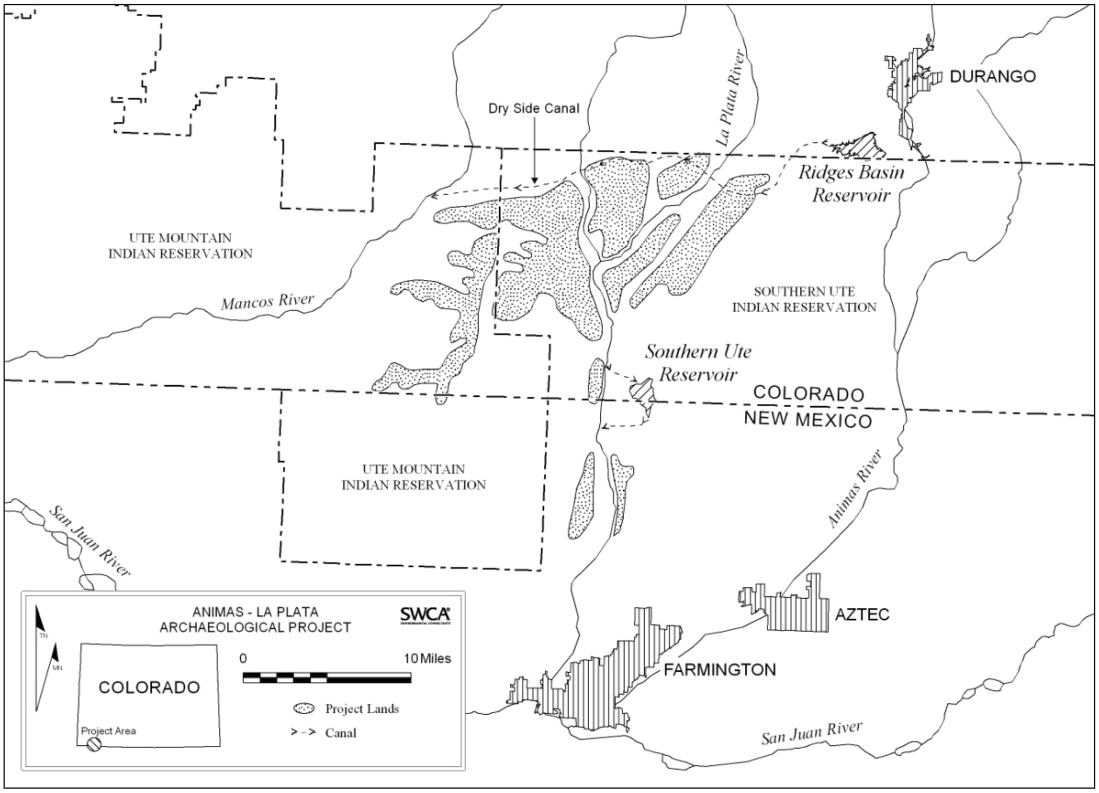

Figure 19.1. Map of the once-proposed Southern Ute Reservoir, Ridges Basin Reservoir, and irrigated lands in La Plata and Mancos valleys.

Another major event that changed the scope of the ALP project was the 1988 passing of the Colorado Ute Indian Water Rights Settlement Act. The act resolved long-standing water rights claims of the Southern Ute and Ute Mountain Ute tribes by guaranteeing the tribes a secure water supply. With this act came a brand-new rationale for the ALP project. Now the reservoir was no longer necessary to irrigate the La Plata River and Mancos River basins for agricultural, industrial, or municipal purposes, but rather to fulfill Ute water rights. As a result, the Ute tribes would become major players in the project.

First, though, the planning of the ALP project had to withstand the turbulent 1990s, during which two environmental complications arose. In 1990, the U.S. Fish and Wildlife Service issued a draft biological opinion concluding that the proposed Ridges Basin Reservoir—the only surviving reservoir of the original ALP project—would jeopardize the existence of the Colorado pikeminnow, an endangered species that lives in the San Juan River (affecting flows in the Animas affects flows in the San Juan, which in turn affects pikeminnow habitat in the San Juan). As a result of these findings, water depletions from the Animas River were ultimately limited to 57,100 acre-feet per year, and an endangered species recovery program was put in place to protect the Colorado pikeminnow.

The second "environmental" obstacle of the 1990s was actually an archaeological obstacle, and it proved more formidable than the first. A lawsuit put forth by environmental groups (primarily the Sierra Club) opposed the project on many grounds, but mostly because it would disturb a Native American burial ground in Ridges Basin. At this time, the Bureau of Reclamation had contracted Northern Arizona University (NAU) to begin archaeological fieldwork for the project and, indeed, NAU archaeologists were in the field surveying and re-mapping sites in preparation for excavation when the lawsuit again halted the project in 1993.

It was not until 1998 that a substantially scaled-down version of the project was proposed—"ALP Lite," as it had come to be known. This proposal eliminated irrigation as a project purpose and brought the project in line with the Endangered Species Act, the Clean Water Act, and the Native American Graves Protection and Repatriation Act (NAGPRA), thereby addressing many of the environmental concerns raised by the lawsuits of the 1990s.

Congress authorized the scaled-down project with the passage of the Colorado Ute Settlement Act Amendments of 2000. These amendments authorized construction over a seven-year period of a reservoir, a pumping plant, and an inlet conduit with an average annual intake from the Animas River of 57,100 acre-feet. Reservoir capacity was set at 120,000 acre-feet (63% of the original ALP project size). In 2001, the final design for the dam and pumping plant began. In the summer of 2002, thirty-four years after the ALP project was first authorized, archaeological excavations in Ridges Basin finally commenced.

Although it is perhaps difficult to view the three decades of ALP project planning and delays without a bit of skepticism, whether you're someone who still opposes the project or someone who is frustrated by the slow pace of government bureaucracies, the long delay of the project did have some benefits. By the time it was implemented, it had become a much more environmentally attentive project than when it was originally proposed. The much-reduced ALP design developed (or destroyed, depending on one's point of view) less than half of the originally proposed project area and affected far fewer archaeological sites[1] and wildlife resources than the original project would have affected. The delays also allowed the science of archaeology to advance an additional 20 years beyond the DAP. This is not to say that the DAP archaeologists used methods that today would be considered primitive. On the contrary, many of the exact same techniques DAP archaeologists developed for studying Pueblo I sites were employed 20 years later by ALP archaeologists. However, if the ALP project had started immediately after the DAP, as initially planned, several differences would be apparent. The first is that the technologies, especially computer technologies, used in the science of archaeology have improved dramatically since the early 1980s. Relational databases and geographic information systems (GIS), integral parts of the ALP project, were not widely available 20 years ago. And the use of computerized mapping equipment and digital cameras in the field allows for more accurate and precise field recording of sites than was possible 20 years ago.

Additionally, the science of archaeology has advanced theoretically and empirically over the last 20 years. Archaeologists have had that time to digest the results of the DAP, and, at the beginning of ALP, we knew much more about the Pueblo I period and were better equipped to ask more sophisticated questions. We were fortunate to have legacies like the DAP and other advances in the discipline of archaeology to build upon.

Finally, and perhaps most importantly, the slow evolution of the ALP project over time provided a vehicle for the federal government to act on its commitment to fulfilling Ute water rights claims. The treaties that forced the Utes onto reservations in 1868 held promises that are only now being fulfilled. The ALP project represents the culmination of more than 100 years of concessions and compromise between the Ute tribes and the federal government. It is difficult to convey here how important this project has become to the Ute people.

The Utes

Historically, the Utes were a nomadic people who lived by hunting and gathering. They speak a Shoshonean language, which is a branch of the Uto-Aztecan language group and related to Paiute, Goshute, Shoshone, Bannock, Comanche, Chemehuevi, and the languages of some tribes in California. Historically,

[1] It is estimated that approximately 600 archaeological sites would have been impacted if the irrigation part of the project was authorized (personal communication, Warren Hurley 2010).

the Utes were a loose confederation of seven bands: the Mouche and Capote (who today compose the Southern Ute Tribe), the Weeminuche (now also known as the Ute Mountain Ute Tribe), and the Tabegauche, Grand River, Yamparicas, and Uintah (now known as the Northern Utes). Prior to the 1860s, the range of these bands comprised the entire state of Colorado and much of Utah.

In the 1800s, hostilities and tensions between the Utes and Euroamerican settlers increased dramatically. As a result, in the 1860s the federal government began a program to move the Ute people to reservations. Two were established: the Uintah Valley Reservation in Utah and the Consolidated Ute Reservation in Colorado. The treaty of 1868, also known as the Kit Carson Treaty, decreased the area controlled by Utes in Colorado by more than 66 percent to approximately one third of their original Colorado territory (Figure 19.2). The Brunot Agreement of 1873 took away from the Utes nearly a quarter of the Consolidated Reservation that had been established just five years earlier, including much of the San Juan Mountains and all mining claims in that area. By the turn of the century, all Utes were forcibly moved to three separate reservations that approximate the boundaries still in existence today for the Northern Ute, the Ute Mountain Ute, and the Southern Ute tribes. Interestingly, one of the last pieces of land taken from the Ute people was the land that now makes up Mesa Verde National Park. More than 52,000 acres of land was acquired in 1911 for the park by the federal government in exchange for some irregularly shaped acreage on the northern boundary of the Ute Mountain Ute Reservation.

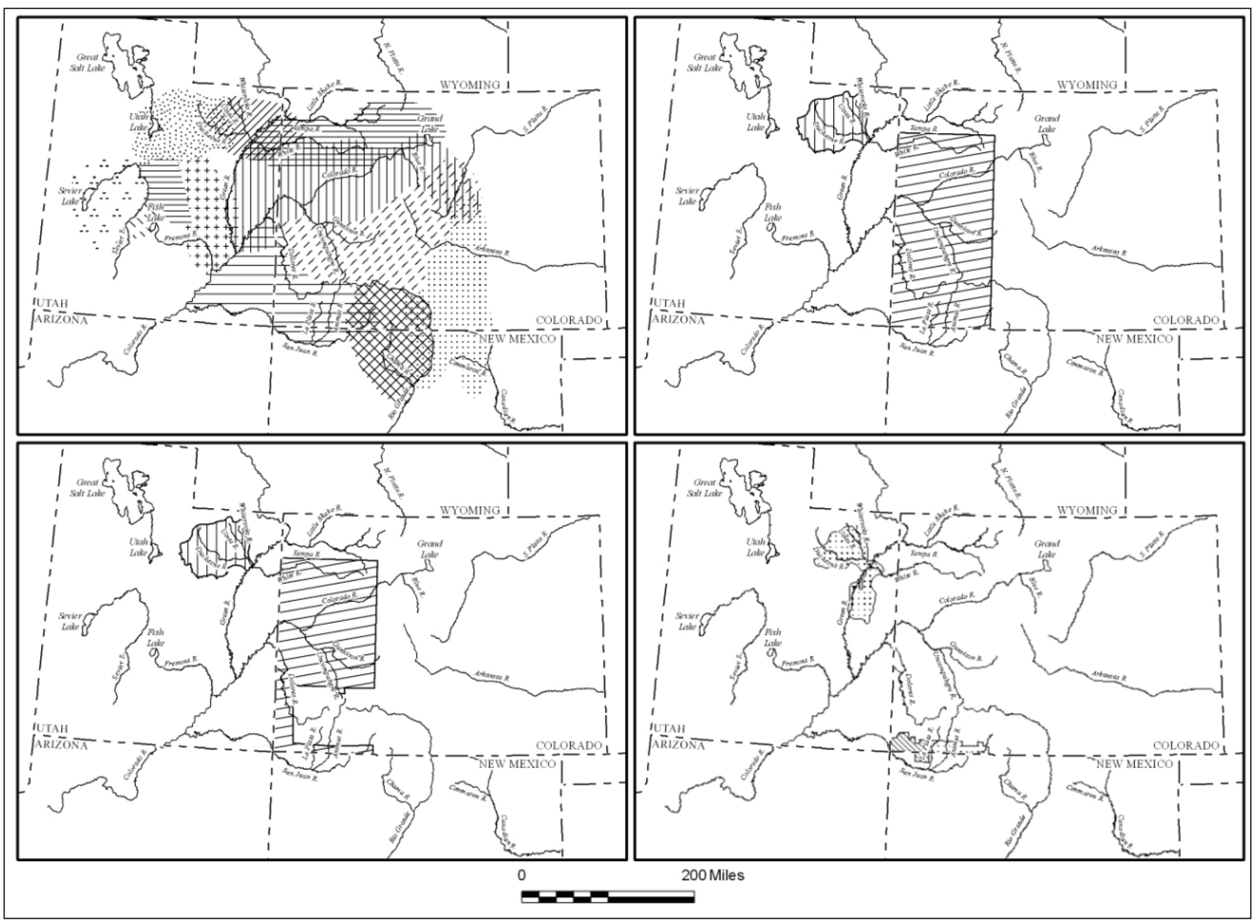

Figure 19.2. Maps of Ute territories through time. Upper left, pre-1860; upper right, 1868; lower left, 1873; lower right, 1911 to the present. (Figure after Simmons 2000.)

By the 1930s, government policies began shifting from the "internal colonialism" of the 1800s and early 1900s. In 1934, the Wheeler-Howard Act, also known as the Indian Reorganization Act, or the Indian New Deal, provided for self-government by Native American tribes through tribal councils composed of elected members and a chairman. The Wheeler-Howard Act began the trend toward Native American self-governance, but up until 1970 tribal constitutions and bylaws required the approval of the Bureau of Indian Affairs (BIA), moneys provided to tribes by the federal government were managed by the BIA, and tribal budgets were subject to approval by the Secretary of the Interior. It was President Richard M. Nixon (1970) who publicly proclaimed a new era in Native American affairs—that of true self-determination.

> We must assure the Indian that he can assume control of his life without being separated involuntarily from the tribal group. And we must make it clear that Indians can become independent of federal control without being cut off from federal concern and federal support.

Following Nixon's proclamation, the Indian Self-Determination and Education Assistance Act of 1975, Title I (Public Law 93-638) was passed to provide maximum Native American participation in the governing and education of Native American people. Subsequent amendments to the act, including the Self-Governance Demonstration Act of 1988 (Public Law 100-472), the Tribal Self-Governance Demonstration Act of 1991 (Public Law 102-184), and the Indian Self-Determination Act Amendments of 1994 (Public Law 103-413) provided for the full participation of tribes in programs and services conducted by the federal government for Native Americans.

These measures mean that when any Department of Interior project significantly affects a tribe, their education, health services, economy, or way of life, the tribe and tribally owned enterprises have the right to contract with the government to provide services or administration for that project. Because the ALP project would have significantly affected the lives of the Ute people by providing them water, the project fell under the purview of Public Law 93-638 (also simply called "638") and its amendments. As a consequence, construction of the dam for the reservoir was contracted to a Ute-owned company, Weeminuche Construction Authority, and the required archaeological work was contracted directly to the Ute Mountain Ute Tribe.

Because the Ute Mountain Ute Tribe did not possess the infrastructure or personnel to manage a large archaeological project, it was put out to competitive bid and awarded and subcontracted to SWCA Environmental Consultants (SWCA). Thus, SWCA contracted with the Utes on a federal project primarily concerned with the archaeological remains of ancestral Pueblo people. Much of the challenge here lay in negotiating the complex intersection of different interests—scientific, economic, political, and cultural—involved in the project. This made for an extraordinarily interesting project involving the unprecedented situation of a tribe administering a self-determination "638" contract on federal land (rather than tribal land—the usual), and the Ute Tribe working in partnership with the Bureau of Reclamation in consulting with more than 20 other tribes claiming ancestry in the area and affiliation with its archaeological remains.

Cultural Affiliation

The Native American Graves Protection and Repatriation Act (NAGPRA) came about as a response to more than a century of disrespectful treatment of Native American human remains by archaeologists, museologists, anthropologists, and pot hunters. One need only read an account of Durango's past to get an idea of the severity of the problem. Esther, a Basketmaker II "mummy" found at Falls Creek Rock Shelter just north of Durango, is a case in point. Named after a cartoon character and described in the press as having the "unbalanced head of the animal kingdom," she was found illegally by a pothunter on federal land and then rented to an archaeologist for study. Esther was put on public display in a glass box at Mesa Verde National Park, and her image graced postcards and life-size posters. There are even stories of her being put on floats for parades down the streets of Durango. In 1990 the unacceptable treatment of Native American human remains and unmarked graves on federal and tribal lands came to an end with the passage of NAGPRA, an act brought about by significant Native American protest and political and legal involvement. NAGPRA assigns custody and control of Native American human remains and associated funerary objects to Native Americans. The law establishes requirements for the treatment of Native American human remains and funerary objects found on federal land, and provides for the protection, inventory, and repatriation of these items. It further requires archaeology projects and museums that receive public funds to consult with Native Americans. And it gives Native Americans the power to decide what happens to museum collections of human remains and grave goods. When these items are inadvertently discovered in the field, NAGPRA calls for temporarily ceasing activity, making a reasonable effort to protect the items, and notifying the appropriate Native American tribe(s).

The requirement to relinquish NAGPRA items found in the field to culturally affiliated tribes makes the already-complex process of archaeology even more complicated. The process involves many steps, including writing an agreed-upon plan for dealing with the discovery of human remains in the field, determining who is, in fact, culturally affiliated with the remains, and transferring custody of NAGPRA items to the lead affiliated tribe. In addition, reburial was an element of the ALP-specific NAGPRA plan because the consulting tribes specified that this was the desired form of repatriation. As a result, an area for reburial was selected that will be protected in perpetuity. Each of these steps requires a lot of consultation with a lot of different tribes, and it is an enormous amount of work not only for the archaeologists and the federal government, but also for the tribes involved.

ALP and the NAGPRA Process

One substantial hurdle was determining the cultural affiliation of the interested tribes to the burials and associated funerary items. NAGPRA defines cultural affiliation as

> a relationship of shared group identity which can be reasonably traced historically or prehistorically between a present-day Indian Tribe or Native Hawaiian organization and an identifiable earlier group. Cultural affiliation is established when the preponderance of the evidence—based on geographical, kinship, biological, archaeological, linguistic, folklore, oral tradition, [or] historical evidence, or other expert opinion—reasonably leads to such a conclusion.

This language resulted in several questions for the ALP project: 1) How do we convincingly link present-day peoples with a prehistoric community that existed 1,200 years ago? Is it even possible? 2) What do we do about multiple groups claiming affiliation, as was likely to occur given the number of tribes with whom we were consulting? 3) Do we weigh each line of evidence equally or variably according to either the level of certainty or the strength and magnitude of the data?

The issue of linking modern tribes with groups of the distant past continues to be one of the greatest challenges of the NAGPRA process. The famous case of the Kennewick Man highlights this. Found in July 1996 near Kennewick, Washington, this nearly complete 9,000-year-old human skeleton holds immense scientific value for its potential to address questions about the earliest peoples of the New World. Scientists desperately wanted to study the individual; Native American groups wanted the remains to be respectfully reburied without study. Consequently, scientists and Native Americans entered a six-year-long legal battle for control of the Kennewick Man until it was determined in 2002 by the United States District Court, District of Oregon, that "the evidence in the record would not support a finding that Kennewick Man is related to any particular identifiable group or culture, and the group or culture to which he belonged may have died out thousands of years ago." In other words, Kennewick Man was too old to be conclusively and clearly associated with any modern groups.

For the ALP project, we were dealing with a time span of 1,200 rather than 9,000 years, and many of the tribes we spoke with still have strong oral histories about their links to the Four Corners area in general and the Durango area in particular. For these reasons, we could comfortably say the Pueblo I remains in Ridges Basin were ancestral to today's Pueblo people. But many Pueblo groups were potentially affiliated. How would we tell which tribes in particular were the rightful claimants?

We consulted with each tribe and asked about their physical, historical, and spiritual connections to Ridges Basin. We scoured the archaeological, ethnographic, and historical records for evidence of any and all Pueblo connections to the area. In these ways, we compiled evidence for every group with whom we consulted. All had some connection to the area, but some tribes exhibited more or stronger evidence of a connection than did others. Weighing this evidence was our next challenge.

To avoid bias, we decided to consider each criterion equally. We did not want to weigh archaeology more heavily than oral tradition, for instance, or vice versa, so we regarded the criteria as presence/absence variables. This bothered a few archaeologists. When we sent our cultural affiliation study out for review, some colleagues remarked that we were weighing oral tradition too heavily and that we should consider the archaeological evidence more strongly. Although this may have changed our results, we disagreed and stuck to our original findings. A "preponderance of evidence" in our opinion related to how many criteria were met, not how strong the archaeological data were. Determination of affiliation is as much a consultation process as it is a scientific process.

We presented our findings not in absolute terms but in relative terms. That is, we ranked tribes on their affiliation with the understanding that all of the consulting tribes were affiliated to a certain degree (Perry and Potter 2006). Based on all the criteria, we determined that three tribes were most closely affiliated: the Pueblo of Acoma, the Pueblo of Laguna, and the Pueblo of Zia. Culturally, these pueblos are closely related to each other, and all speak the Keresan language. The Pueblo of Acoma offered to take the lead as the representative tribe for further NAGPRA consultations, and all the tribes agreed that this would be appropriate given the findings in our affiliation report. This was a particularly important accomplishment because with a lead tribe in place we could streamline the consultation and start planning the most important part of the NAGPRA process—the return of the human remains to the lead affiliated tribe and, ultimately, back safely to the ground. But first we had to analyze the remains in the laboratory and establish an area where they could be reburied and never again disturbed.

Human Remains and Analysis

There was very little in the Bureau of Reclamation's NAGPRA plan of action that addressed the kinds of laboratory analyses that were allowed on NAGPRA items, including human bone. The plan of action simply stated that the handling of NAGPRA items "will be carried out in a respectful manner," and that "it may be necessary to conduct more in-depth analysis to assist in determining cultural affiliation." As researchers, we very much wanted to collect basic data from the skeletons prior to reburial to address as many of our research questions as possible. The plan of action did not prohibit laboratory analysis outright, but to ensure that we were complying with the spirit of the plan, we again consulted with representatives from the Pueblo of Acoma. They visited our laboratory in Durango and were comfortable with our facilities and how we were handling the remains, which included washing and classifying the bones and conducting basic nondestructive osteological analysis involving simple observations and measurements. The remains were stored in locked cabinets in a cool and dry atmosphere until the time they were to be transferred to Acoma representatives for reburial.

Reburying the Dead

The ultimate goal of NAGPRA, if avoiding human remains in the field is not possible, is to return the excavated remains to the rightful claimants. For ALP, the NAGPRA plan also stipulated that, if the claimants so desired it, the remains would be safely reburied. Ensuring the safety of the remains is a great responsibility and entails not just the proper care of the remains prior to reburial but also their long-term security after reburial. The reburial location must be close to the original burial site, out of the general public's sight, and not likely to be developed or disturbed. And it must be on land managed or owned by someone willing to protect the reburial site in perpetuity. Finding just the right place that meets these criteria is a tall order. For the ALP project, all of the consulting tribes—not just the Pueblo of Acoma—were satisfied with the spot we chose when we showed it to them.

NAGPRA stipulates that public notification of the determination of affiliation must be made twice prior to repatriation, once 60 days prior and again 30 days prior to the transfer date, to allow any counterclaims to the official claimants, in this case Acoma, Zia, and Laguna pueblos. Once the date was set—after Acoma's busy summer ritual schedule—we posted notices in every newspaper in the Southwest. Because we had already consulted extensively with all of the tribes who had legitimate claims, no counterclaims were made.

The Acoma representatives had some very specific requests for how they wanted the reburial to occur. The individuals should be laid out next to each other along a deep, 6-foot-wide, north-south-oriented trench, the floor of which should be covered with 6 inches of clean sand. Each individual should be placed on his or her back, face up, with the bones in correct anatomical position and with his or her head oriented to the east. Associated funerary items should be set to the right of the head. A small amount of sand should then be placed by hand over the body and the grave goods. All of this should occur before noon. Once we had complied with these instructions, we should leave and let the spiritual leaders conduct their rituals in privacy. When they were through, we were to come back to fill in the trench and, soon after, revegetate the top of the trench.

The first reburial ceremony occurred in November 2004 and involved only the five burials from the first season; the second occurred in October 2006 and entailed the reburial of 125 individuals. One final reburial occurred in 2010 and involved more than 100 individuals as well as the processed human remains from Sacred Ridge.

Traditional Cultural Properties

The National Historic Preservation Act protects traditional cultural properties (TCPs) by requiring consultation with Native Americans about locations or sites that have special cultural, historical, or religious significance for Native Americans. Also eligible for the National Register of Historic Places, TCPs can range from plant- or mineral-gathering areas to entire mountain ranges that have spiritual significance. For the ALP project, SWCA consulted with 25 tribes claiming ties to the area and asked them to identify any TCPs in the project area, to explain their significance, and to advise us on how to mitigate any negative effects the reservoir might have on these sites. Two TCPs were identified. The first was represented by a historic trail segment that ran through Ridges Basin. Known as the Old Ute Trail, the trail connected Ignacio and Towaoc, Colorado, and tribal consultants informed us that this had been the main east–west communication and transportation corridor between the Ute Mountain Utes based in Towaoc and the Southern Utes based in Ignacio. Furthermore, at least some of the trail may have been part of the Old Spanish Trail and may have been used by the Dominguez and Escalante expedition of 1776 (see Chapter 18, Protohistoric and Historic Sites in Ridges Basin). The second TCP was a mineral-gathering area that is still used by members of the Pueblo of Jemez. Although the Jemez Pueblo consultants would not reveal the specific location of this gathering area, they did outline a general area of avoidance well above the reservoir's high-water line.

None of the work for these TCPs required archaeology. Instead, SWCA consulted directly with modern tribes to document the sites and their importance to native communities and to assess their eligibility for inclusion on the National Register of Historic Places.

Educational, Work, and Training Programs

In addition to consulting with tribes on NAGPRA issues and TCPs as part of the ALP project, the Ute Mountain Ute Tribe and SWCA established several programs to aid in the education, hiring, and training of Native Americans. In 2003, a Native American student training program was launched. This program brought college students from around the country to earn college credit as cultural resource interns. Students spent five weeks participating in actual fieldwork with the crews, working in the lab processing artifacts, helping maintain and monitor four experimental garden plots in the project area, and conducting research on the Old Ute Trail. Four students participated in this program in 2003; five in 2004.

In addition to the college training program, SWCA worked with a Southern Ute company, Michael A. Frost Environmental Services (MAF), to hire and train Ute Tribe members in the laboratory and the field. This was a highly successful partnership; at several points a full third of ALP project employees were Native American, including many Ute Tribe members hired through MAF.

EPILOGUE: THE UTE MOUNTAIN UTE TRIBAL HISTORIC PRESERVATION OFFICE

The intense and prolonged involvement of the Ute Mountain Ute Tribe in all facets of the ALP project allowed the tribe to gain valuable experience—managing a large cultural resource project, consulting with a multitude of tribes about NAGPRA and TCP issues, gaining an understanding of state and federal cultural resource laws, engaging the public on cultural resource findings, and treating and protecting archaeological sites—to such an extent that by the end of the project they felt equipped and comfortable embracing the responsibilities of managing the cultural resources on the Ute Mountain Ute Reservation. In 2009, the tribe successfully established Colorado's first Tribal Historic Preservation Office (THPO). By this token, an objective of Public Law 93-638 ("self-determination") was achieved.

The Ute Mountain Ute THPO mission is to plan and implement protocols for the preservation and management of the cultural and historic properties within the Ute Mountain Ute Tribe Reservation; to advise and work with federal agencies on the management of tribal historic properties; to educate and inform tribe members and the general public on the rich cultural heritage associated with the reservation; and to advise the Ute Mountain Ute Tribal Council on historic preservation protocols and policy. It is now the responsibility of the Ute Mountain Ute THPO to ensure the proper management of cultural resources on the reservation, and serve as the educational resource for cultural information and instruction for the tribe. In this regard, it is hoped that the THPO will create a strong sense of Native American identity for tribe members. Moreover, the creation of a THPO will allow for more direct control and management of the reservation's immensely important cultural resources. The THPO will draw in more federal support for these efforts than was possible before, encourage the training of tribe members in historic preservation, and increase community awareness on the importance of the cultural heritage associated with the reservation.

Native Americans are stakeholders in the archaeology of their ancestral lands, in the management of cultural resources, and in public education—especially that of tribal membership. The tribes involved in the ALP project demonstrated a commitment to these ideals on an unprecedented scale, particularly in the level of cooperation among tribes. If the success of the ALP project is any indication, the success of Colorado's THPO is imminent, as is the continued engagement of tribes in the preservation of their heritage, past and future.

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