Farming and Foraging on the Southwestern Frontier:
An Overview of Previous Research of the Archaeological and Historical Resources of the Greater Cedar Mesa Area

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Editor’s Preface

This volume is the ninth in a monograph series designed to examine and interpret the prehistoric cultures of Utah. The Antiquities Section Selected Papers (ASSP) monograph series was created in 1975 by then State Archaeologist David Madsen. The series was begun with three goals:

1) to provide a vehicle for the publication of research carried out by the Antiquities Section;
2) to provide an outlet for archeological reports which do not have a general distribution (i.e., investigations done in conjunction with environmental impact statements); and
3) to allow publication of valuable manuscripts now on file and republication of articles now out of print and unavailable (David B. Madsen, June 1975. Editor’s Preface to Antiquities Section Selected Papers Volume 1).

With the advent of digital publishing, we are now able to make manuscripts available at a fraction of the cost and effort of producing printed copies. All volumes of the ASSP will now be published digitally. Volumes I – VII are now available digitally as well, on the Division of State History website.

Manuscripts from all sources, including state and federal agencies, educational institutions, and private individuals, will be accepted for examination and possible publication. Submitted articles will be reviewed by the Antiquities Section staff or other qualified reviewers in the case of ancillary reports. Papers will be published on an irregular basis, depending on the number and quality of reports on file.

Kevin T. Jones, with help from David B. Madsen
Acknowledgments and Disclaimers

An overview of the voluminous cultural resources found in the Greater Cedar Mesa area would not have been possible without the assistance, guidance, patience and encouragement of those who have spent a lifetime of research in this region. In particular, the Colorado Plateau Archaeological Alliance would like to express our sincere gratitude to Dr. William Lipe of Washington State University, William E. Davis of Abajo Archaeology in Bluff and Winston Hurst of Blanding for their invaluable contributions. In addition, the compilation of this report was facilitated by the steadfast commitment of the Antiquities Section of the Utah Division of State History, which provided site forms and reports, GIS support and office space. We also thank the many individuals and institutions who provided photographs and graphics, especially James M. Aton, Sally Cole, Bruce Hucko, the Utah State Historical Society, the Peabody Museum at Harvard, the Utah Museum of Natural History and the Carnegie Museum of Natural History. And most important, we acknowledge the commitment of Richard Moe, president of the National Trust for Historic Preservation, whose passion for the cultural resources of this region led directly to this effort.

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Preface

This report constitutes an overview of previous archaeological research in the Greater Cedar Mesa area, an area of about 475,000 acres bounded generally by the San Juan River on the south, the Abajo Mountains on the north, Comb Ridge on the east and the Glen Canyon and Natural Bridges areas on the west. Although only about 2,500 sites have been formally documented in this area, the region is home to an estimated 100,000 archaeological and historical sites, a large percentage of which are believed to be eligible for listing on the National Register of Historic Places. The exceptional aesthetic qualities of many of these sites, along with the wilderness character of the region, attract tens of thousands of visitors annually.

Archaeological inquiry in this region has a long and colorful history, beginning in the final decades of the 1800s with a flurry of museum expeditions to acquire artifact collections and continuing through the present with the scientifically oriented research of the Cedar Mesa Project and the efforts of several public-private partnerships, particularly in the Comb Wash area. Collectively, cultural sites within the study area represent human adaptations to the canyons and plateaus of southeastern Utah over the past 10,000 years, although evidence of a substantial occupation by hunter-gatherers prior to about 500 B.C. is quite rare. By about A.D. 1, perhaps earlier, large numbers of Basketmaker II farmers had arrived in the region, perhaps from southern Arizona. These groups were organized at the family level, used a variety of irrigation techniques to grow maize and squash, constructed large storage cists in alcoves and rockshelters, and interred their dead in relatively rich funerary contexts. By about A.D. 400, the region had been largely abandoned, perhaps due to deteriorating climates that made farming less viable.

The region appears to have remained sparsely occupied, if at all, until about A.D. 650 when Basketmaker III farmers returned. These farmers used dry farming techniques to exploit the sandy loams on the mesa top, constructed larger and more elaborate pithouses, also on the mesa top, and manufactured distinctive grayware ceramics that may have been a technology associated with cultivation of beans. This florescence was brief, lasting maybe 50 to 75 years, and the intensity of the occupation was not as great as that witnessed during Basketmaker II times. By the early A.D. 700s, the mesa-top farms had been abandoned, perhaps in response to deteriorating climates. Some populations may have shifted to higher elevations northeast of Cedar Mesa where rainfall was more predictable, and others may have concentrated along Comb Wash. An abandonment of the entire study area during Pueblo I times is not supported, although the intensity of the occupations appears to have been considerably less than during Basketmaker II and Basketmaker III times.

By about A.D. 1060, arming of Cedar Mesa and surrounding environs had resumed, as evidenced by a proliferation of dispersed family farms. This florescence was apparently facilitated by regional climatic conditions that were exceptional for dry farming. The Pueblo II florescence in the Greater Cedar Mesa area occurs at the same time that Chaco Canyon emerged as a regional socioeconomic and ceremonial center. There is minimal evidence in the Cedar Mesa area of population aggregations or large community centers such as those in northwest New Mexico, although a number of smaller centers with great kivas and great houses have been identified. These may have integrated the dispersed Cedar Mesa households into a larger social network. The initial Pueblo II expression here exhibits influences from the Mesa Verde region to the east, but by about A.D. 1100 the influences were clearly from the Kayenta Anasazi region to the southwest. This could reflect radical changes in social networks or an outright colonization of the Cedar Mesa area by groups from northeastern Arizona.
By about A.D. 1165, or the beginning of the Pueblo III period of time, the dispersed farmsteads again exhibited a greater affinity to the Mesa Verde region. The Pueblo III period was characterized by greater climatic variability, with short periods when farming was viable and other periods of extended drought. Farmers shifted their homes to the edges of canyons closer to water sources, and constructed defensible granaries and small kivas on the cliff ledges and in alcoves and rockshelters. Habitations in defensible positions on cliff faces and prominences are common throughout the Southwest at this time, but they are quite rare in the Cedar Mesa region. By about A.D. 1270, the entire region had been abandoned. This abandonment was perhaps the result of an extended drought and the resulting social conflicts arising over limited food supplies. Most of the archaeological resources observed by casual visitors to the region are attributed to the Pueblo II-III period of time.

The Greater Cedar Mesa area appears to have been unoccupied for several centuries following the Pueblo III abandonment. The earliest evidence of Numic and Athapaskan hunter-gatherers suggests these groups arrived in the study area sometime after A.D. 1600. The Numa, or ancestral Utes, migrated into southeastern Utah from the north and west, and their ancestral homeland is found in the southern Great Basin. The Athapaskans, or ancestral Navajos, arrived in the Four Corners region by way of the Rocky Mountains or the Great Plains, and their ancestral homeland is found in western Canada. Although relations between the ethnically unrelated groups were hostile throughout the region, ethnohistoric, ethnographic and historic records indicate the two groups coexisted peaceably in southeastern Utah, with some evidence of economic cooperation and intermarriage. The Late Prehistoric and Historic Period utilization of the Cedar Mesa area by Utes and Navajos was more reminiscent of Archaic hunting and gathering, although there is some evidence of Navajo farming during historic times.

The first EuroAmericans in the study area may have been the U.S. government exploring expeditions of the mid 1870s, although it is possible that Spanish explorers, fur trappers, prospectors and adventurers passed through much earlier. Most of the Euroamerican history of the region is associated with the settlement of the region by Mormon pioneers and the famed Hole-in-the-Rock Expedition, which passed through Cedar Mesa and Comb Ridge on their way to establishing a settlement at Bluff in 1880. Ranching was clearly the dominant economic activity in the Greater Cedar Mesa area during historic times, both by EuroAmericans and Native Americans. The area has also experienced a minor gold rush, oil drilling and uranium mining, although minimal archaeological evidence of these activities has been documented.

The scientific and aesthetic qualities of the cultural resources of the Greater Cedar Mesa area constitute a national treasure worthy of more aggressive federal management to foster their long-term protection. Only about 2 percent of the study area has been formally investigated, no research has been initiated in several major drainages, and the nature and extent of cultural resources remains largely unknown over much of the study area. Very little is known about human adaptations here during the Archaic, Pueblo I and Late Prehistoric times. Although the archaeological record constitutes a vast library of untapped scientific knowledge, the integrity of this record continues to suffer from ongoing vandalism, looting, improper visitor behavior, off-road vehicles, livestock grazing and other activities. The extent of site degradation cannot be quantified due to the near-absence of baseline data for most of the area. The paucity of baseline data makes it difficult for land managers to develop strategies whereby adverse impacts can be avoided or minimized. In short, land managers cannot manage archaeological resources if they do not know what those resources are, where the resources are located, the significance of those resources and the nature of the threats to the long-term preservation of those resources.
Chapter 1

The Greater Cedar Mesa Area: Project Overview and Environmental Context

Introduction

Located in the southeast corner of Utah, Cedar Mesa is renowned the world over for its scenic beauty, coupled with an abundance of well preserved archaeological sites, ranging from jaw-dropping cliff dwellings to spectacular rock art images that inspire speculation about long-vanished societies (Figure 1.1). It is a wilderness where one can get lost from the hustle and bustle of the fast-paced life so common in today’s world, a place where grand vistas stretch hundreds of miles, contrasted by intimate red and white canyons with crystalline pools, ribbons of lush green vegetation and gothic formations sculpted by eons of time. Visitors here might be tempted to believe they could be the first to have set foot in this desert paradise that inspires wonder and speculation (see Barnes and Pendleton 1992; Beard 2003; Kelsey 2006; Kemper and Schaaf 1996; Matlock 1989; Peterson 2002; Roberts 1997, 2005; Tassoni 2001; Wilson 2000; Zwinger 1986).

Indeed, such perceptions are illusions. Cedar Mesa has been home to families for roughly 11,000 years, some leaving only tantalizing traces of their occasional passing through the region and others putting down roots, building homes and granaries and places of worship to the gods who brought them here. A review of available data on file with the Bureau of Land Management (BLM) and the Antiquities Section of the Utah Division of State History revealed this area contains more than 2,000 documented archaeological sites, a total that represents an estimated 1 to 2 percent of the actual number of sites located here. These sites are vestiges of all known cultural affiliations for the region, including Paleindian hunters, Archaic hunters and gatherers, Ancestral Puebloan (Anasazi) farmers and the more recent arrivals, the Navajos, Utes and Euroamericans.

While some visitors to the Cedar Mesa area come for the natural beauty, most of the estimated 20,000 people who visit here annually are lured by the aesthetically impressive cultural resources. The crush of visitors, most of whom are hikers, backpackers, off-road vehicle enthusiasts and equestrians, has resulted in cumulative deterioration of the resources found here. Structure walls are crumbling under the weight of people standing and leaning on them, artifacts are collected as souvenirs of the visit, rock art images are traced and chalked to enhance their contrast for...
photographs, campers have taken shelter in the alcoves and contaminated scientific evidence with their own campfires, and in some cases people have destroyed the scientific record by digging into cultural deposits in search of saleable artifacts. Such activities have prompted the Bureau of Land Management (BLM) to institute new policies and regulations that attempt to better manage recreational visitation by limiting where and when camping can occur, limiting the number of people in a given area at any one time, and limiting access to sensitive sites (BLM 2008; see also Lipe 1980).

This report, funded through a partnership between the Colorado Plateau Archaeological Alliance and the National Trust for Historic Preservation, constitutes a Class I overview of known and reasonably available archaeological data from the Cedar Mesa area, and as such it is the first report of its kind to synthesize previous research in this specific region. The primary purpose of this study was to compile a comprehensive cultural resource database in order to identify, and then work to close, gaps in our knowledge of the archaeology of the region so that land managers can better protect, preserve and manage these irreplaceable cultural resources for the future. We believe this report will be a fundamental component of the BLM’s documented intent to develop a Cedar Mesa management plan for culturally sensitive areas (BLM 2008:61). As stated in the Monticello Record of Decision and Approved Resource Management Plan (ROD/RMP), the Cedar Mesa management plan will:

... include protective measures such as restrictions and limitations on recreation around cultural at-risk areas and sites, Native American consultation, and regulatory compliance. These plans will also include but not be limited to developing cultural monitoring systems; identifying sites and areas in need of stabilization and protective measures (e.g., fences, surveillance equipment); developing research designs for

selected sites/areas; designating sites/areas for interpretive and educational development; identifying areas for cultural inventory where federal undertakings are expected to occur; and developing specific mitigation measures. The plan will designate sites, districts, landmarks, and landscapes that will be nominated for inclusion on the NRHP [2008:61].

This report also includes recommendations we believe will be useful to land managers attempting to address preservation and conservation issues throughout the region. The compilation of the database used here was structured to arrive at a better understanding of the temporal and cultural affiliation of the archaeological sites in the immediate region and settlement and mobility patterns through time, as well as to provide a regional synthesis of the archaeology of the Cedar Mesa area. Subsequent research and analyses have the potential to build upon the work presented here. Complementary to this objective, we believe that archaeological data gathered over the past century or more should be presented to the public in a manner that inspires greater awareness of the resources and their vulnerability, and through which the public can be actively engaged in the protection and preservation of these resources.

Location and Topography

The study area, herein referred to as the Greater Cedar Mesa area, is located in the west-central portion of San Juan County in southeastern Utah (Figure 1.2). It is roughly 72.4 kilometers (45 miles) west of the town of Blanding, and 34 kilometers (21 miles) west-northwest of the town of Bluff, Utah. The area encompasses roughly 192,526.5 hectares (475,743.5 acres) and is bounded on the west by the Red House Cliffs and Lower Grand Gulch, on the south by the San Juan River, on the east by Comb Ridge, and on the north by those slopes draining the southern portion of Elk Ridge with an arbitrary north boundary at the north rim of Arch Canyon.
and its tributaries. Geographically this area consists of broad, sloping mesas that are deeply dissected by narrow canyons, most of which drain Elk Ridge, a long southwest-trending ridge originating at the southern end of the Abajo Mountains west of Monticello, Utah. Runoff from these higher elevations flows in a southerly direction to the San Juan River, and ultimately to the Colorado River, which is approximately 63 kilometers (39 miles) west of the center-point of Cedar Mesa (Figure 1.3).

The study area includes parcels of land owned by a number of different entities (Figure 1.4, see also Appendix A: Map 1). It encompasses portions of the Glen Canyon National Recreation area (National Park Service), the Manti-LaSal National Forest (U.S. Forest Serv-
ice), the Grand Gulch Primitive Area and other publicly held lands (BLM), Utah School and Institutional Trust Lands Administration (SITLA) parcels, Goosenecks State Park (Utah Division of State Parks), and privately held properties. The area covers all or portions of 37 Township and Ranges within the Salt Lake Meridian (Zone 12), at a base elevation of 1311 meters (4,300 feet) above mean sea level. The area is located on 21 different U.S. Geological Survey (USGS) 7.5 Minute topographic maps (see Table 1.1; Township and Range information is provided in Table 1.2).

Located south of the Abajo Mountains and north of the San Juan River (Figure 1.5), the Greater Cedar Mesa area is characterized by broad mesas (Figure 1.6) with pinyon, juniper and sagebrush parklands in the central and upper portions, and sparse vegetation dominated by blackbrush in the lower portions. Cedar Mesa proper is on the crest of the Monument Upwarp and slopes significantly in places to both east and west from the approximately north-south trending divide. The mesas are intermittently dissected by narrow, deep canyons with an abundance of natural alcoves and rockshelters (Figure 1.7). Among the larger drainages are Armstrong Canyon, Grand Gulch, Johns Canyon, Road Canyon, Mule Canyon, Fish Creek, Owl Creek, Slickhorn Canyon and Comb Wash. These larger drainages feature many smaller tributaries. Generally, these canyons are the focus of most recreational visitation due to the
Figure 1.4: Land ownership status within the Greater Cedar Mesa area (see legend above) with the study area boundary indicated by the red line. See Appendix A: Map 1 for greater resolution.
Table 1.1: U.S. Geological Survey 7.5 minute quadrangles relevant to study area.

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<td>Woodenshoe Buttes, Utah (1985)</td>
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Table 1.2: Townships and ranges relevant to the study area.

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Figure 1.5: View of the San Juan River demarcating the southern boundary of the Greater Cedar Mesa area.
Figure 1.6: Environmental view of Cedar Mesa looking southeast.

Figure 1.7: Example of a large alcove common in the Greater Cedar Mesa area. Such alcoves were typically used as habitations and storage locales throughout prehistory. Photo courtesy of Andrew Yentsch.
prevalence of alcoves and sheltered settings that have facilitated greater preservation of architectural features.

For the purposes of this discussion, we have delineated the Greater Cedar Mesa area in a manner similar to Stokes’ (1986) definition of the Monument Upwarp subdivision of the Colorado Plateau Physiographic Province. Boundaries are best defined on the north by those slopes draining the southern portions of Elk Ridge, the eastern edge by Comb Ridge, the western edge by the Red House Cliffs, and the south edge by the San Juan River (see Figure 1.3 above). Elevation in this area ranges from 2,713 meters above mean sea level (8,900 feet) on the Woodenshoe Buttes to 1,311 meters above mean sea level (4,300 feet) in the bottom of the San Juan River corridor. The topographic variability provides for a wide range of ecological diversity.

Environment

Effective human exploitation of plant and animal resources in a marginal desert environment would have required intimate knowledge of a large geographic area, probably encompassing several thousand square kilometers and a full range of ecozones. The hunting and collecting of terrestrial plants and animals would have focused on many edible species as each was in season (Jennings 1978:15). As discussed by Bye (1972), Harrington (1967), Kelly (1964) and others, ethnographically observed that populations utilized virtually all flora and fauna to some extent, and most, if not all, resources offer some nutritional, pharmaceutical or functional values. Hence, the problem facing archaeologists in the region is not whether prehistoric populations exploited certain species. Rather the question should be which species could be procured efficiently and economically, and which were opportunistically exploited versus systematically exploited. Furthermore, questions as to how this procurement occurred, how changes in climate and anthropogenic factors precipitated changes in the distribution of biotic resources, and how human populations responded to increasing or diminishing resources remain a subject of ongoing research in the region (see Johnson 2003; Muir and Driver 2002; Van West and Dean 2000; Varien et al. 2007).

A basic premise of this overview is that human groups throughout time would have responded to the nature, density and distribution of certain environmental resource. They would have adopted strategies that ranged from residentially mobile groups who move their primary residence several times a year, often within a preplanned seasonal round, to logistically mobile groups who rarely moved their primary residence, but instead dispatched task-specific groups on trips to procure food and lithic materials and to trade with other groups for critical resources (cf. Binford 1980). Kelly (1992) also observed that mobility may also be a function of the seasonal availability of resources, age and gender of those who comprise the social unit, and the individual skills of those involved. Most of the archaeological record of the Cedar Mesa region reflects more sedentary populations who were heavily reliant on domesticated foods, primarily maize. And while they would have access to the same suite of resources as foragers in a given area, sedentary populations would be constrained by the distribution of adequate soils for cultivation, the qualitative nature of precipitation patterns and temperature (effective moisture) and a sufficient frost-free growing season conducive to growing domesticated plant resources (see Matson et al. 1990 for a more comprehensive overview of the Cedar Mesa environment).

Geology

The Greater Cedar Mesa area lies within the Monument Upwarp subdivision of the Colorado Plateau Physiographic Province, as traditionally defined (Stokes 1977, 1986). It is a nearly flat-topped anticline that formed during the Laramide Orogeny Event in late Cretaceous and early Tertiary times (Longpre 2001). The most notable feature here is Comb Ridge (Figure 1.8), a geologic feature similar to those in the San Rafael Swell and Circle Cliffs where a prominent hogback has been lifted from Jurassic and Triassic strata that dip steeply along the eastern margin of the anticline (Stokes 1986). Comb Ridge is a tec-
tonically uplifted feature encompassing an area 6,475 square kilometers (2,500 square miles) with more than 914 meters (3,000 feet) of relief (Kelly 1955). Much of the higher-elevation (interior) portions of this subdivision are relatively flat topographically, due to the erosion of the softer formations overlying the more resistant limestone strata below (Stokes 1986).

Exposed geologic formations evident in the study area are dominated by the Cedar Mesa Sandstone (a member of the Cutler Formation), as indicated by the dark blue in Figure 1.9 (the yellow vertical band is Comb Ridge defining the eastern boundary of the study area). Cedar Mesa Sandstone is comprised of Permian Era sediments deposited about 260 million years ago (Table 1.3). Older, Pennsylvanian (Halgaito Shale) deposits are visible along the San Juan River (Longpre 2001). Geologic features most evident in the study area are discussed briefly from lower to higher:

- Cedar Mesa sandstone is a very light (almost white) colored rock layer that reaches up to 356 meters (1,200 feet) in thickness in some areas. It was formed from sand deposited by an invasion of an inland sea during the Permian Era.
- The Organ Rock Shale and Moenkopi formations are found immediately overlying the Cedar Mesa sandstone. These formations are difficult to differentiate, as they are both comprised of marine shale, siltstone and fine-grained mudstone.
- Above the Moenkopi formation is the Shinarump member of the Chinle formation. This sediment, comprised of stream deposited gravels, sand, and shale, is also a whitish color (McVickar 2001). This stratum contains uranium that was highly sought after during the closing days of World War II and the two decades after the war. This layer also contains silicified wood and fossilized remnants of plants and animals.
- Above the Shinarump layer is a reddish-colored stratum known as the Moss Back formation. These deposits were also laid down by streams, consisting of sandstone, siltstone and conglomer-
Figure 1.9: Cedar Mesa area geologic map. Comb Ridge is the north-south yellow line, and the study area is to the left in blue. This map is included only to reflect the uniform nature of geological deposits in the study area, and the original large-scale map (Woodbury-Clyde Consultants 1982) should be consulted for greater resolution and detail regarding individual formations.
ate materials. This stratigraphic level is also a member of the Chinle formation, dating to Triassic times, and it is most visible in the cliffs and ledges of the Moss Back Cliffs and Woodenshoe Buttes.

- Windgate sandstone is found above the Moss Back formation. It is very red in color and is composed mainly of small, rounded quartz grains. This layer is a cliff-forming stratum in the region, due to its composition, cross-bedding and better resistance to erosion.

Lithic toolstone materials in the form of nodules of quartzite, limestone, siltstone, silicified wood and chert originating from these strata can be found at several locations on mesa tops and in the drainages of the region (Davis 1989; Keller 1979, 1982). Siltstone, sandstone and mudstone of the upper portions of the Chinle formation, along with exposures of decomposed shales of the Morrison formation east of Comb Ridge, were likely sources of clay to the prehistoric inhabitants of the region (Severance 2003).

### Soils and Hydrology

Soils throughout the Greater Cedar Mesa area are highly variable, ranging from very shallow to depths up to 152 centimeters (60 inches) in isolated areas on the mesa tops and on gentle slopes. These well-drained, moderately permeable sandy loams derive from the decomposition of local sandstones that are deposited in alluvial and aeolian contexts (Hansen and Fish 1993), although the principal mesa-top surficial deposits are eolian materials similar to, and very likely part of, the Mesa Verde loess (Arrhenius and Bonatti 1965) that comprises the predominant agricultural substrate in southwestern Colorado and southeastern Utah. Organic content is low, resulting in blocky and structurally weak soils that are highly susceptible to wind and water erosion. Surface soil tends to be loosely consolidated, often stabilized only in those areas where cryptobiotic colonies have established themselves, retaining moisture and promoting soil development as nutrients are provided (Hansen and Fish 1993). As slickrock and bedrock sandstone are abundant throughout the region, areas with deeper soils and gentle slopes appear to have been better suited for dry farming, and may have been focal points for the prehistoric occupations in the area.

While the canyon bottom sediments contain higher organic content than those on the mesa tops and could be irrigated with floodwater techniques, several factors limited or largely precluded their productive capabilities. Periodic seasonal flooding (Figure 1.10), primarily during the summer monsoonal cycles, occasionally results in periodic channel down-cutting (Figure
Figure 1.10: Flash flooding at the mouth of Arch Canyon in 2006, northeast portion of study area.

Figure 1.11: Down-cutting evident along Comb Wash, northeastern periphery of the study area, resulting from monsoons in 2006.
1.11), and would likely have limited productivity in the absence of monumental water-control systems. Also, limited acreage and cold-air drainage common in the narrow canyon bottoms would also diminish the attractiveness of these locations to larger socioeconomic groups (see Agenbroad 1975).

Hydrologically, the Colorado Plateau typically exhibits exterior runoff. Throughout the mesa, precipitation drains towards the San Juan River, and ultimately to the Colorado River. Water flow in the canyons can be plentiful during the summer monsoon season, and flash floods are a common occurrence. Typical of these canyons is Grand Gulch, a south-flowing tributary of the San Juan River that drains most of the interior of the Monument Upwarp. Several drainages on the eastern mesa (e.g., Mule Canyon, Fish-Owl Creek, Road Canyon) flow east into Comb Wash. Most of the drainages within the Greater Cedar Mesa area are intermittent streams, drying up during the more arid months. Only a few drainages have perennial flowing water (Figure 1.12), and none in significant quantities. Springs and seeps also are common throughout the region, and these ap-

Figure 1.12: Arch Canyon Creek at normal flow.

Figure 1.13: Water pool in McLoyd Canyon.
pear to produce continuous water during periods of higher precipitation. Additionally, precipitation collects in pools and bedrock potholes throughout the region (Figure 1.13) and can retain water for extended periods of time, giving the appearance of being permanent water sources.

Agriculture in the American Southwest is and always has been highly contingent on the quantity of moisture available to sustain domestic crops. The moisture from summer monsoonal cycles, either direct rainfall or floodwater runoff diverted to fields through check dams and diversions, would have been essential for the viability of the prehistoric farming in the region. Heavy or above-normal precipitation allowed the possibility for large-scale flooding that could have obliterated mesa top and/or canyon bottom agricultural plots; below normal precipitation without some means of irrigation could potentially have resulted in crop failure. Given the rarity of permanent flowing water that could have been diverted to fields, it is assumed that a variety of dry farming techniques were employed to maximize the delivery of available rainfall to domestic plants.

Vegetation

The plant communities occurring in the area contain taxa characteristic of the Upper Sonoran Life Zone as traditionally defined (Cronquist et al. 1972). Vegetation grades from a desert shrub community dominated by black brush (Coleogyne ramosissima) and grasses in lower elevations (less than 5,000 feet elevation) to pinyon (Pinus edulis) and juniper (Juniperus sp.) woodlands occasionally broken by sagebrush parks at mesa elevations above 5,000 feet. Secondary taxa occurring within the pinyon-juniper zone include native woody shrubs such as big sagebrush (Artemisia tridentata) and low sage (Artemisia arbuscula), with rabbit brush (Chrysothamnus nauseosus) present in better watered areas. Four-wing salt bush (Atriplex canescens), shadscale (Atriplex concinna), greasewood (Sarcobatus vermiculatus), Mormon tea (Ephedra viridis) and black brush are less abundant but also appear in this zone, as do roundleaf buffalo berry (Shepherdia rotundifolia), little rabbit brush (Chrysothamnus puberulus), Utah serviceberry (Amelanchier utahensis), western chokecherry (Prunus virginiana), hackberry (Celtis occidentalis), barberry (Berberis fremontii), cliff rose (Purshia mexicana), curl-leaf mountain mahogany (Cercocarpus ledifolius), squaw bush (Rhus trilobata) and scrub oak (Quercus gambelii).

Prickly pear cactus (Opuntia spp.), claret cup cactus (Echinocereus triglochidiatus), goosefoot (Chenopodium spp.), narrow-leaf yucca (Yucca angustissima), banana yucca (Yucca baccata), Indian rice grass (Oryzopsis hymenoides), galleta grass (Hilaria jamesii), broom snakeweed (Gutierrizia sarothrae), bitterbrush (Purshia tridentata), vetches (Astragalus spp.), skyrocket gilia (Ipomopsis aggregata), wild onion (Allium canadense), wild turnips (Brassica rapa) and wild buckwheat (Eriogonum spp.) are but a few of the other plant species found intermixed with the pinyon and juniper. Also intermixed with the aforementioned species are globe mallow (Sphaeralcea ambiguca), evening primrose (Oenothera Biennis) and daisies (Erigeron utahensis). Douglas fir (Pseudotsuga menziesii), aspen (Populus tremuloides), and ponderosa (Pinus ponderosa) can be found in isolated stands in a few of the better shaded and watered canyons within the Greater Cedar Mesa Area, but primarily grow in the higher elevations, mainly on Elk Ridge and Moss Back Butte.

Areas of riparian vegetation can be found in the canyon bottoms and along the rare watercourses in the region. Species include cottonwood (Populus fremontii), willow (Salix spp.), ash (Fraxinus anomala), boxelder (Acer negundo), arrow cane (Phragmites spp.), sedges (Carex spp.), rushes (Juncus spp.) and numerous water-dependent shrubs, forbes and grasses. Non-native Russian olive (Elaeagnus angustifolia) and tamarisk (Tamarix ramosissima) have invaded the riparian zone in some locations in the canyon bottoms during historic times.

Many of these species were used ethnographically as food, medicinal, construction and technological resources, and these have been documented in both the archaeological (Asen 1984;
Androy 2003; Rylander 1994; Minnis 1989) and ethnographic (Whiting 1939; Stewart 1942) records. While these records should be consulted for a more in-depth review of the uses of these plants, known economic utilities for some of the more common resources include:

- **Pinyon pine**— The small nuts in cones are nutritious and high in lipids. Pine pitch was used as a medicinal emetic and a starvation food resource, and was chewed. It was also used to seal baskets. The wood was commonly used for construction.
- **Juniper**— Small berries that are blue-to-purple in color were often mixed with other foods. The twigs, leaves, and bark were used in tea, dyes, cordage and textiles. The wood was used as construction material, for bows and as fuel.
- **Serviceberry**— The reddish-purple berry is an edible fruit. The wood was also sometimes used to make bows, digging sticks and arrow fore-shafts.
- **Mountain mahogany**— The branches were used for bows, digging sticks, hoes, dyes, and construction materials.
- **Squawbush**— This plant produces small, red-to-yellow, tart berries used in a lemonade-like drink. The wood was also used for making bows, arrow fore-shafts, digging sticks and basketry.
- **Yucca**— The flower petals and fruit pods were eaten; the leaves were used in basketry, cordage, footwear and other textiles; and the roots were used as soap.
- **Prickly pear cactus**— The fruit and pads were eaten, either raw or roasted.
- **Ephedra**— The twigs were used for dyes and as a stimulant by brewing into drinks.
- **Indian rice grass**— Common as a food plant throughout the Colorado Plateau, these grasses produce very small, hard seeds at the top of the plant that were roasted and ground into meal.
- **Sagebrush**— These plants produce very small seeds that are known to have been eaten by aboriginal populations in California ("Chia"). The bark and branches were used as fuel, clothing, textiles and dyes, and the leaves were eaten or boiled into drinks.
- **Rabbit brush**— The branches, flowers and bark were used mostly as fuel and to make dyes. The branches were also used as arrow fore-shafts.
- **Greasewood**— This plant produces a very small, edible seed that would serve as a food resource in times of scarcity (although it also has many spines that make the seeds difficult to collect). The branches were used as fuel, for dyes, to make rabbit sticks, arrow fore-shafts, digging sticks and as construction materials.
- **Willow**— These were used in basketry, for bows and arrow main-shafts, and cradleboard frames. The leaves were used to make dyes.
- **Aspen**— The tree bark was mixed with tobacco and smoked, as well as chewed or eaten to relieve headaches.

In addition to these wild plants, corn (*Zea mays*), squash (*Cucurbita pepo*), beans (*Phaseolus vulgaris*) and cotton (*Gossypium hirsutum*), are known to have been utilized by residents of the study area. Although the timing and processes by which these items moved north into the Four Corners region remains debatable (see Wills 1995; Matson 1991; Berry and Berry 1986), recent findings show that Basketmaker II populations in the Four Corners were heavily reliant on maize by about 400-500 B.C., with beans and cotton appearing in the archaeological record sometime after about 400-500 A.D. (Minnis 1989; Coltrain et al. 2007; Chisholm and Matson 1994; Matson and Chisholm 1991; Aasen 1984; Lepofsky 1986. Evidence related to the introduction of domesticated plants is discussed in greater detail in Chapter 4.

It is highly likely that for the duration of human occupancy of the region prehistoric vegetation communities were similar to the present (West 1978), although the density and distribution of these plants shifted in response to changing climatic patterns and anthropogenic factors, e.g., the clearing of pinyon-juniper forests for agricultural purposes (Matson et al. 1990; see...
also Van West 1994; Van West and Dean 2000; Varien et al. 2000). Many resources mature at different intervals (times of the year), providing sustenance throughout the year. Plant production, however, is highly correlated to climate. Less than optimal conditions can cause the reduction or absence of plant production, sometimes for multiple years. Optimal conditions, on the other hand, can result in “bumper” crops with overabundant yields creating surpluses that enhance the need for additional storage (McVickar and Eininger 2001).

**Fauna**

Historically, the Greater Cedar Mesa area has been home to a diverse array of wildlife, dominated by species associated with the San Juan Subcenter of the Canyon Lands Province of the Colorado Plateau Faunal Area (Durrant 1952). Coyote (*Canis latrans*), wolves (*Canis lupus*), mountain lion (*Puma concolor*), bobcat (*Felis rufus*), black bear (*Ursus americanus*), wolverines (*Gulo gulo*), beaver (*Castor canadensis*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), badger (*Taxidea taxus*), and muskrat (*Ondatra zibethicus*) have all been documented in the historic record. Although elk (*Cervus canadensis*) were reported by early settlers up to the turn of the twentieth century, they are no longer present in the immediate area, but are found in the Abajo Mountains. Commonly seen mammals include mule deer (*Odocoileus hemionus*), desert bighorn sheep (*Ovis canadensis*), striped skunk (*Mephitis mephitis*), porcupine (*Erethizon dorsatum*), ring-tailed cat (*Bassariscus astutus*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*) and a variety of rodents including woodrats (*Neotoma spp.*), chipmunks (*Eutamias spp.*), mice (*Dipodomys ordii, Peromyscus spp., Perognathus sp.*), ground squirrels (*Spermophilus sp.*) and bats (*Myotis spp.*).

A wide variety of raptors, passerines and hummingbirds can also be seen in the Greater Cedar Mesa area. Red-tail hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), turkey vultures (*Cathartes aura*), peregrine falcon (*Falco peregrinus*), American kestrel (*Falco sparverius*) and great horned owl (*Bubo virginianus*) have been documented by residents or visitors to the area. Golden eagles (*Aquila chrysaetos*) are frequently seen in the region, bald eagles (*Haliaeetus leucocephalus*) are known to winter in the area, and Mexican spotted owls (*Strix occidentalis*) occur and possibly nest here. In addition, turkeys are sometimes seen in the area. It has been hypothesized that this species (*Meleagris gallopavo*) originated in Mesoamerica and were kept by the Ancestral Puebloan populations of the region (Aasen 1984; Matson and Chisholm 1991), surviving the abandonment of the region by those populations. Recent DNA research at Washington State University suggests, however, that Cedar Mesa Basketmaker II turkeys are actually *Meleagris gallopavo merriami*, a sub-species indigenous to the Rocky Mountains that are very different from the Mesoamerican species (Bill Lipe, personal communication 2009; see also Muir and Driver 2002 for an overview of the increased dependence on domesticated turkeys through time). Ducks also appear in the iconography of artifacts and rock art (Figure 1.14), particularly in Basketmaker II times.

Reptiles include the collared lizard (*Crotaphytus collaris*), short-horned lizard (*Phryno-
soma hernandesi), the Western whiptail lizard (Cnemidophorus tigris), the plateau whiptail lizard (Cnemidophorus velox), sagebrush lizard (Sceloporus graciosus), the side-blotched lizard (Uta stansburiana), orange-headed spiny lizard (Sceloporus magister cephalojlavus), and Eastern fence lizard (Sceloporus undulatus). Snakes include the Western terrestrial garter (Thamnophis elegans), black-necked garter (Thamnophis cyrtopsis), bull snake (Pituophis melanoleucus), Hopi rattlesnake (Crotalus viridis nuntius) and prairie rattlesnake (Crotalus viridis).

Like the plant resources found in the area, many of the faunal resources were utilized by the prehistoric occupants of the area for food, ornamentation, tools and clothing. While optimal foraging theory suggests that the larger animals such as deer and bighorn sheep would be utilized for their higher return rates (which they were), smaller animals such as jackrabbits, cottontail, mice, ground squirrels and reptiles are more commonly found in archaeological contexts of the region (Brand 1994; Reinhard et al. 2007; Muir and Driver 2002; Emslie 1981). Smaller-bodied animals assumed even greater importance during later Puebloan times (Johnson 2003). Macroregional examinations of faunal remains at archaeological sites in the Four Corners area also demonstrated that human reliance on faunal resources varied through time. Greater dependence on deer and rabbits was observed during earlier periods and more intensive use of domesticated turkeys during later periods, a trend that could reflect the decreased availability of wild animals through over-exploitation by larger populations and the increased costs associated with procuring wild animals from more distant areas (Muir and Driver 2002).

Climate and Paleoclimate

The Greater Cedar Mesa area has a semi-arid climate with hot summers and cold winters. Yearly average temperatures range from 30 degrees Fahrenheit in the winter to 87 degrees Fahrenheit in the summer, with minimum and maximum extremes of -23 and 110 degrees Fahrenheit respectively (Hansen and Fish 1993). Annual precipitation ranges from a low of 15 centimeters (6 inches) to a high of 40 centimeters (16 inches), with an average rainfall of 30.5 centimeters (12 inches), varying with elevation and exposure. January, May and June are typically the driest months. July, August and December are the wettest months with most summer precipitation falling in July and August during the monsoon season (Hansen and Fish 1993; Longpre 2001). The growing season ranges from 133 to 174 frost-free days with a degree of variability coinciding with topography. Prevailing winds are from the southeast (BLM 2007).

It is assumed that the cyclical patterns of drought evident today were also characteristic of prehistoric times. It is generally agreed that human adaptation to environmental change is manifested in one of two ways (Kay 1982:80-81). Low-frequency change is seen as a slow process viewed as the background to long-term cultural adaptation and evolution (e.g., the Desert Culture concept, which subsumed 10,000 years of Great Basin prehistory into a single adaptive strategy). Low-frequency environmental processes are characterized by cycles lasting longer than one human generation and are responsible for phenomena such as variation in stream-flow and groundwater levels, as well as episodes of sediment deposition and erosion along water courses. High-frequency change is seen as an immediate adaptation to short-term conditions, situations to which human populations are fairly well-adapted. Unlike low frequency processes, which are usually not apparent to humans, high frequency processes, such as seasonal and annual climatic variability and fluctuations in natural resource and agricultural productivity, are extremely apparent to human populations (Dean et al. 1985).

Although temporally broad environmental reconstructions (low-frequency change) have been fairly well documented, less is known about high-frequency environmental changes that would have influenced biotic productivity and, consequently, human responses to shifts in the distribution of those resources in the Greater Cedar Mesa area. Given the rarity of paleoenvironmental studies conducted in the Cedar Mesa region specifi-
cally, any reconstruction of prehistoric climates and biota in the study area requires regional generalizations from paleoenvironmental data from the Great Basin, Rocky Mountains and Colorado Plateau (see Table 1.4). As noted by Kay (1982), any attempt to draw inferences from the limited data is inherently subject to statistical bias. He observed “there is some question as to the appropriateness of the modern normal as an analogue for the full range of variation” and because “even a short period of time, but of sufficient duration to supposedly produce stable statistics, may exhibit considerable, perhaps significant, variation” (1982:80). Furthermore, generalizations from adjacent regions may be invalid due to the influencing effect of local topographies on climatic patterns and the distribution of floral and faunal resources. In the absence of quantitative local paleoenvironmental reconstructions, a brief overview of regional trends is offered here (see also Table 1.5).

**The Pleistocene (Pre-8000 B.C.).** The Pleistocene in North America was characterized by colder temperatures and greater effective moisture than at present. These climatic conditions precipitated glaciation over much of the continent and an expansion of grasslands that may have facilitated a subsistence strategy focused to some extent on large fauna. General circulation-model retrodictions (COHMAP Project Members 1988) for the last glacial maximum at 20,000 years ago have reconstructed a jet stream that was split in two, with one jet stream to the north and the other to the south of the Laurentide ice sheet, and both flowing west to east. Interaction of these streams produced strong anticyclonic surface winds that resulted in cold, dry summer winds. Winters were probably no harsher than at present, but colder summers resulted in reduced seasonality. Annual temperature in the region was 8 to 12 degrees centigrade colder than at present. The summer Arizona monsoons were absent, and the Pacific subtropical high was very weak (Adams and Petersen 1999).

Other paleoenvironmental data from the region indicate Lake Bonneville was higher than

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<td>Historic Low</td>
<td>Recession</td>
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<td>Low</td>
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<tr>
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<td>Stable</td>
<td>Holocene High</td>
<td>Early/Middle Neoglacials</td>
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<tr>
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<td>Cool/Dry</td>
<td>Cool/Winter Precipitation</td>
<td>Stable</td>
<td>Holocene Low</td>
<td>Recession</td>
</tr>
<tr>
<td>6000</td>
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<td>Cool/Dry</td>
<td>Somewhat Stable</td>
<td>Holocene Low</td>
<td>Recession</td>
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<tr>
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<td>Pinedale Deglaciation</td>
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<td>18000</td>
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Table 1.4: Regional paleoenvironmental models. Modified from Spangler (2001).
Table 1.5: Overview of Holocene environmental trends. Modified from Spangler (2001).

at any time since, due to low transevaporation rates (Currey 1990). At about 15,000 B.C., at the height of glaciation, the region contained active mountain glaciers in the Uinta Mountains (Carrara et al. 1985), Wasatch Range (Currey and James 1982), Colorado Front Range (Benedict 1973, 1981, 1985), San Juan Mountains (Carrara et al. 1991) and Wind River Mountains (Richmond 1986). Major streams were controlled by glacial discharge (Schumm and Brakenridge 1987). Steppe tundra existed at northern locations (Mears 1981; Wells 1983) and supported a variety of Pleistocene fauna (Grayson 1991, 1993). In the Great Basin and Colorado Plateau generally, shrub communities dominated the lower elevations, and forest communities were elevationally depressed during the last full-glacial period (Wells 1983; Coats et al. 2008).

At about 13,000 B.C., changes in the geometry of the Earth’s orbit and axial tilt initiated a warming trend and an increase in seasonality (COHMAP Project Members 1988). The Pacific subtropical high remained too weak to provide much moisture to the Southwest. A northward shift of the jet stream occurred, but it was too weak to produce monsoonal flow (see Coats et al. 2008). Consequently, drier conditions began to prevail. By 12,000 B.C., the once extensive ice cap on the Yellowstone Plateau had disappeared (Richmond 1986), and mountain glaciers in the Rocky Mountains receded (Porter et al. 1983), although later deglaciation is reported in the southern portion of the region (Elias et al. 1991; Feiler and Anderson 1993). Pluvial lake levels dropped to post-glacial lows (Currey 1990). Dry conditions dominated the Great Plains and Rocky Mountains (Haynes 1990). Rapid deglaciation of the Laurentide ice sheet occurred after 11,000 B.C. (Teller 1987), and many plant species in the northern Great Basin began to form Holocene-like communities.
A wide variety of now-extinct Pleistocene fauna were present, including bison, mammoth, horse and camel (Grayson 1991, 1993; see also Chapter 3).

Haynes (1990) has suggested a millennium of severe drought occurred between 10,000 and 9000 B.C., and Currey (1990) has indicated that the Lake Bonneville system may have been lower at 10,000 B.C. than at any time during the post-glacial/Holocene era. This drought may have coincided with the first human presence in the region (Frison 1991) and the extinction of some Pleistocene fauna (Grayson 1991). Worldwide temperatures were as much as 2 to 4 degrees centigrade higher than at present (COHMAP Project Members 1988), seasonality was very pronounced and summer warming caused the jet stream to shift northward, producing stronger monsoonal flows from the Gulf of Mexico and the Gulf of Cortez into the American Southwest and southern Great Basin (Thompson et al. 1993). In the Glen Canyon region just west of Cedar Mesa, the late Pleistocene was characterized by a sagebrush-steppe upland with a riparian community near the streams with a vegetation community that was nearly identical to plant communities now found at 4,000 feet higher in elevation (Agenbroad and Mead 1990a:56). Also relevant to the study area, stronger late Pleistocene and early Holocene monsoons have been hypothesized (Coats et al. 2008; Beiswenger 1991; Davis and Sellers 1994; Friedman et al. 1988; Markgraf and Scott 1981; Thompson et al. 1993; Whitlock and Bartlein 1993) that would have affected the Southwest and the Colorado Plateau (Friedman et al. 1988; Markgraf and Scott 1980).

Early Holocene (8000 to 5500 B.C.). The temporal boundary between the Pleistocene and the Holocene has been placed at 10,000 years ago by the Holocene Commission of the International Quaternary Association, a date chosen because it was a nice round number. The collective paleoenvironmental record of the Early Holocene indicates an intense period of increased effective precipitation occurred between 9000 and 7000 B.C., although there may be significant regional variability. High elevations in the central Colorado Rockies witnessed a shift from periglacial conditions to cool, moist forest conditions between 8600 and 6100 B.C. (Feiler and Anderson 1993). The Great Salt Lake record indicated that effective moisture began to decrease around 8000 B.C. (Currey 1990), and Murchison (1989) noted the lake fell to an Early Holocene low between 6800 and 5800 B.C. He noted a minor rise occurred between 5600 and 5000 B.C., before dropping to Middle Holocene low levels between 4800 and 4000 B.C.

Climatic warming increased seasonality, and a strengthened monsoonal flow yielded moist conditions in the Southwest (Beiswenger 1991; Carrara et al. 1991; Whitlock and Bartlein 1993). In the southern Colorado Plateau, timberline rose and the lower treeline descended as a result of a strengthened monsoon (Carrara et al. 1991; Markgraf and Scott 1981; Petersen 1988). Pollen and plant macrofossil data from the San Juan Mountains (Carrara et al. 1991) suggested that timberline was at least 80 meters higher between 7600 and 3400 B.C. than at present, indicating a strong monsoon pattern from the south. In the San Juan Basin, sagebrush grassland was present in lowland areas that are now desert shrub (Hall 1990). Packrat midden analysis from the Colorado Plateau suggests an increase in subtropical moisture between 8000 and 4000 B.C. (Betancourt 1990; see also Coats et al. 2008).

Based on current environmental and archaeological evidence, the post-glacial period appears to have been one of gradually decreasing soil moisture, while the biotic evidence suggests a series of climatic fluctuations culminating in a trend toward decreasing effective moisture and a continued shrinkage of grasslands (AiKens 1983:240). Generally, the Early Holocene was cooler and perhaps wetter than today, but warmer and drier than the preceding Pleistocene. Although spatial and temporal variability in climates has been documented, the period was also characterized by gradually warming conditions, a reduction in effective moisture and establishment of modern desert biotic communities. This climatic trend toward increased aridity occurred first in the Southwest.
Middle Holocene (5500 to 2500 B.C.). The Middle Holocene has typically been described as a period of intense aridity (Altithermal drought) that forced the abandonment of much of the West between about 7,000 and 4,500 years ago (Baumhoff and Heizer 1965). Reexaminations of the Middle Holocene paleoenvironmental record (Aschmann 1958; Bryan and Gruhm 1964; Grayson 1982; Mehringer 1977), however, indicate that the severity of the Altithermal drought has been greatly overstated. Archaeologists today seldom in the kinds of broad-scale interpretations that once suggested the arid Altithermal climate drove human occupants away from hundreds of thousands of square kilometers in the Intermountain West and Great Plains (see Aikens 1983:239).

Desert conditions much like those of the present prevailed by about 5500 B.C., and the drying trend evident in the latter part of the Early Holocene continued through the early Middle Holocene. Paleoenvironmental evidence suggests that effective moisture reached its lowest level between about 5500 and 2500 B.C. (Aikens 1983:239), although there were short-term periods of increased effective moisture during this time, particularly in the Southwest. As discussed by Grayson, the Middle Holocene was not a period of unrelenting aridity, but rather a period of high climatic variability within a relatively arid interval (Grayson 1993:216). The arid conditions adversely affected populations of certain mammals, allowed shadscale communities to replace sagebrush ecotones, and permitted the continued proliferation of pinyon trees. The subsequent resurgence of wetter and/or cooler Late Holocene conditions did not correspond to a resurgence of mammal populations or a replacement of the shadscale communities with sagebrush (1993:220-221).

In the Southwest generally, pollen and macrofloral data suggest a continued high timberline and warm temperatures in the San Juan Mountains until 4000 B.C. resulting from monsoonal flow (Carrara et al. 1991). Petersen (1988) noted that pinyon was not yet a major component in the La Plata Mountains, and pinyon was just beginning to spread northward into the northern Great Basin at this time (Madsen and Rhode 1990). Desert shrub migrated at the expense of sagebrush-grassland in both the northern Great Basin (Mehringer 1985) and in the San Juan Basin (Hall 1990). In the central Colorado Rockies, cool, moist forest conditions gave way to drier, more open forests between 6100 and 2600 B.C. (Feiler and Anderson 1993).

Hall (1990) has described the Gallo alluvium (4700 to 400 B.C.) in the southern Colorado Plateau, suggesting it formed under arid conditions conducive to flash flooding. Karlstrom (1988), on the other hand, identified the Tsegi alluvium (3800 B.C. to A.D. 1450) in the Black Mesa area, but interpreted it as having formed under relatively warm, moist conditions. These data imply that generally xeric conditions prevailed over much of the West, but that certain areas experienced periods of increased precipitation. Packrat middens at Fish-eye Cave just east of the study area indicate that modern floral and climatic conditions had become established by middle and late Holocene times (Betancourt and Biggar 1985).

Late Holocene (2500 B.C. to Present). The Late Holocene is the most extensively researched of the three periods, and is generally characterized as that period of time when climates approached modern conditions, becoming somewhat cooler and moister than the preceding Middle Holocene. The increasing effective moisture corresponded with apparent human population increases associated with the florescence of Silver Lake, Pinto Basin and Little Lake projectile point complexes in the Great Basin, the San Jose, Picosa and Chiricahua complexes of the Southwest and the McKean Complex of the Great Plains. All of these reflected a hunting and gathering economy adapted to fully desert conditions, although horticulture may have appeared as early as 2000 B.C. in the Southwest. The extensive paleoenvironmental record after about 2500 B.C. has prompted many researchers to propose specific climatic periods within the Late Holocene, specifically an Early Neoglacial from 3000 to 1500 B.C., a Middle Neoglacial from 1500 B.C. to A.D. 1050, and a Little Altithermal from A.D. 1050 to 1450.
The relationship between improved climatic conditions and expanding human populations is likely not coincidental. Synchronic explanations that human populations increased in direct proportion to increases in effective moisture, however, fail to adequately accommodate paleoenvironmental data that indicate the Late Holocene was, in fact, a period characterized by significant climatic fluctuations. Periods of increased effective moisture were often punctuated by alternating periods of drought and cold. The effect of short-term fluctuations on human population dynamics was likely significant. Aschmann (1958) has hypothesized that highly mobile foragers were pre-adapted to withstand climatic variability. The relative size and number of resource patches might grow or diminish with fluctuations in effective moisture, but the basic climatic and physiographic structure of the region guaranteed the continued availability of these resources. Human populations were obliged to adjust their procurement strategies in response to local and regional productivity of resources, but the basic resources remained the same (see also Aikens 1983).

In the Southwest generally, the Gallo and Tsegi alluvials continued to aggrade in the southern Colorado Plateau at this time. As mentioned above, Hall (1990) suggested the Gallo alluvium (4700 to 400 B.C.) formed under arid conditions conducive to flash flooding. Karlstrom (1988) has interpreted the Tsegi alluvium (3800 B.C. to A.D. 1450) as having formed under relatively moist conditions. Human populations were obliged to adjust their procurement strategies in response to local and regional productivity of resources, but the basic resources remained the same (see also Aikens 1983).

Pollen evidence from the Colorado Plateau indicates that cooler temperatures and winter precipitation patterns were dominant from 1700 to 1300 B.C., producing an expansion of woodlands. These woodlands then became more restricted in the middle Neoglacial. Between 1000 and 900 B.C., cool and dry conditions prevailed, followed by a shift to summer moisture and warmer temperature regimes that persisted to about A.D. 1 (Newman 1993a, 1993b; Petersen 1988). High-elevation pollen and plant macrofossil data from the Four Corners area indicate a period of maximum warmth occurred between 2600 and 100 B.C. (Carrara et al. 1991). On the northern Colorado Plateau, Lindsay (1980) suggested slightly cooler conditions at Cowboy Cave between 1300 B.C. and A.D. 150. The alluvial record at Pint-Size Shelter indicated a wet-
ter moisture regime between 1390 B.C. and A.D. 160, followed by drier conditions to about A.D. 1300 (Currey 1976).

On the southern Colorado Plateau, pollen and hydrologic evidence indicate a peak in effective moisture between about A.D. 600 and 700, a period coinciding with a major expansion of Basketmaker III horticulturalists into adjacent areas of Arizona, New Mexico, Utah and Colorado. A second peak in effective moisture between about A.D. 950 and 1250 corresponded with another expansion of human populations throughout the Southwest. Upland plateau areas that had been only sparsely populated before this time experienced major population growth (Aikens 1993:241; see also Berry 1982 for a more detailed discussion of environmentally influenced Basketmaker migrations northward into Utah).

A final interval of increased effective moisture has been documented between about A.D. 450 and 1350 in the northeastern Great Basin and between A.D. 950 and 1150 in the Southwest (Euler et al. 1979; Mehringer 1977). A subsequent period of reduced effective moisture began about A.D. 1150, reaching its lowest point about A.D. 1450. Cook et al. (2004), however, present contradictory data suggesting a roughly 400 year period of elevated aridity from A.D. 900 to 1300, broadly consistent with the Medieval Warm Period. During this period of time, horticultural lifeways were abandoned throughout most of the Colorado Plateau as groups apparently withdrew to large pueblos in Arizona and the upper Rio Grande valley in New Mexico. Euler et al. (1979) have argued that moister climatic intervals prior to A.D. 1150 fostered an expansion of horticulturists into previously drier and/or warmer areas, and that major droughts triggered movements toward cooler and wetter regions. Elsewhere on the Colorado Plateau, Petersen (1988) suggested cooling and drying after A.D. 1100 wherein upper elevations would have had insufficient growing seasons. Newman (1988, 1993a, 1993b), on the other hand, documented a warming but mesic interval beginning about the same time in both the Colorado Plateau and eastern Great Basin areas.

**Cedar Mesa Climates.** While climatic variation is generally similar across broad regions (Stokes and Smiley 1968; Cook et al. 2004; Euler et al. 1979; Jeffrey S. Dean personal communication 2008), the majority of available paleoclimatic data from areas outside the Greater Cedar Mesa area does not allow for resolution of local climatic differences (microclimatic variation) and human responses to that variability within the immediate study area. More relevant are climatic reconstructions created by McVickar and Eininger (2001) for the Natural Bridges National Monument immediately north of the study area, wherein the Palmer Drought Severity Index (PDSI), a meteorological index of drought severity, was used to track the severity of moisture deficit for the Natural Bridges, Grand Gulch and Cedar Mesa areas from A.D. 100 to 1300 (McVickar and Eininger 2001), using data compiled for the Southwest Paleoclimatic Project by the Laboratory of Tree-Ring Research, based on a continuous 1,500 year tree-ring sequence derived from both archaeological and live-tree samples (Jeffrey S. Dean, personal communication 2008; McVickar and Eininger 2001). These data are summarized in Table 1.6.

PDSI values show an interval from A.D. 100 to 250 characterized by normal to moderately wet conditions, although with moderate to high variability in effective precipitation and drought patterns that were prevalent until roughly A.D. 180 that would have been unfavorable to agriculture. Higher effective moisture and cooler temperatures persisted from A.D. 180 to about A.D. 255, creating conditions more favorable to agriculture. After A.D. 255, climatic variability increased for about 70 years. Overall moisture, however, remained at or slightly below normal. During this time, short-term droughts increased in frequency but not severity, and conditions probably did not affect prehistoric farmers to any great extent (McVickar and Eininger 2001). After A.D. 340, there was a gradual decline in moisture, reaching a low in A.D. 362, although it is equivocal whether conditions had deteriorated to a point where agriculture was not viable. After A.D. 362, climate generally became more stable and moderately arid as variability decreased through about A.D. 455.
### Table 1.6: Cedar Mesa paleoclimates and corresponding culture history phases.

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<th>Cedar Mesa Human Responses</th>
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<td>AD 100</td>
<td>Normal to wet, high variability in precipitation and drought patterns to A.D. 180. Conditions unfavorable to agriculture</td>
<td></td>
</tr>
<tr>
<td>AD 180</td>
<td>Higher effective moisture and decreased variability in precipitation, optimal for agriculture</td>
<td>Beginning of Grand Gulch Phase, pithouse occupations on the mesa top, dependence on maize, dry farming, storage in alcoves</td>
</tr>
<tr>
<td>AD 200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AD 225</td>
<td>Increase in climatic variability, moisture at or slightly below normal, increase in short-term droughts, may not have affected viability of agriculture</td>
<td></td>
</tr>
<tr>
<td>AD 340</td>
<td>Decline in moisture, climates became more stable but more arid, decrease in climatic variability, may not have affected viability of agriculture</td>
<td></td>
</tr>
<tr>
<td>AD 362</td>
<td>Moisture reaches its lowest point, climates stable, low climatic variability</td>
<td>End of Grand Gulch Phase, Cedar Mesa abandoned</td>
</tr>
<tr>
<td>AD 400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AD 455</td>
<td>Climates normal to slightly wetter, stable conditions, conditions acceptable for agriculture</td>
<td></td>
</tr>
<tr>
<td>AD 512</td>
<td>Severe 5-year drought, followed by 30-year dry period, conditions for agriculture would have been marginal</td>
<td></td>
</tr>
<tr>
<td>AD 542</td>
<td>Generally stable climates with above average precipitation with optimal conditions for agriculture</td>
<td>Beginning of Mossbacks Phase, sparse occupation, pithouses adjacent to mesa-top fields, on-site storage</td>
</tr>
<tr>
<td>AD 650</td>
<td></td>
<td>Mossback Phase ends early A.D. 700s, Cedar Mesa abandoned, or people disperse to higher elevations, perhaps to Comb Wash</td>
</tr>
<tr>
<td>AD 725</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AD 738</td>
<td>High climatic variability, effective moisture slightly greater than normal, highly unpredictable precipitation, conditions for agriculture extremely risky</td>
<td></td>
</tr>
<tr>
<td>AD 860</td>
<td>High climatic variability but less than before, above normal precipitation, agriculture would have been risky and would have required multiple contingency strategies</td>
<td></td>
</tr>
<tr>
<td>AD 1060</td>
<td>Stable climates, strong hydrological systems, precipitation predictable, optimal conditions for agriculture</td>
<td>Beginning of Windgate Phase, dispersed farmsteads, dry farming, Mesa Verde influence</td>
</tr>
</tbody>
</table>
Table 1.3: Cedar Mesa paleoclimates and corresponding culture history phases (cont.)

<table>
<thead>
<tr>
<th>AD 1100</th>
<th>End of Windgate Phase, beginning of Clay Hills Phase, dispersed farmsteads, Kayenta influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD 1130</td>
<td>End of Clay Hills Phase, Cedar Mesa briefly abandoned</td>
</tr>
<tr>
<td>AD 1150</td>
<td>Maximum climatic variability, fluctuating between extreme highs and lows, precipitation normal to slightly higher than normal, generally unfavorable to agriculture</td>
</tr>
<tr>
<td>AD 1165</td>
<td>Beginning of Woodenshoe Phase, resurgence of Mesa Verde influence, dispersed farmsteads, appearance of great houses and kivas (?)</td>
</tr>
<tr>
<td>AD 1200</td>
<td>End of Woodenshoe Phase, beginning of Red Hills Phase, Mesa Verde influence, habitations shift to canyon rims near water sources, defendable granaries, kivas in cliff ledges and shelters</td>
</tr>
<tr>
<td>AD 1273</td>
<td>First of two droughts (other at AD. 1276) mark end of high climatic variability cycle, onset of generally cooler temperatures and increased precipitation, unfavorable for agriculture</td>
</tr>
<tr>
<td></td>
<td>End of Red Hills Phase. Cedar Mesa abandoned</td>
</tr>
</tbody>
</table>

Generally, conditions evident on Cedar Mesa from about A.D. 100 to 450, a period typically subsumed within Basketmaker II temporal sequences, feature cycles of both high variability and stability, with optimal conditions for agriculture from about A.D. 180 to 250, and moderate although deteriorating conditions between A.D. 250 and 450. These favorable-to-moderate conditions are not duplicated on the southern Colorado Plateau where Dean et al. (1985) noted more extreme conditions characterized by a drastic drop in water tables from A.D. 235 that remained depressed until roughly A.D. 400.

The favorable climatic regimes evident in the PDSI records at about A.D. 180 are generally consistent with the beginning of hypothesized Basketmaker II adaptations on Cedar Mesa at about A.D. 200 (Grand Gulch Phase). This manifestation continued to about A.D. 400, or throughout much of the time when climates were deteriorating and effective moisture was declining. Cedar Mesa was abandoned about A.D. 400, perhaps in response to climatic extremes that deteriorated beyond the threshold where agriculture was viable. There is no evidence that Cedar Mesa was reoccupied after A.D. 450 when climates had once again stabilized, even though the increased moisture and conditions would have been acceptable for agriculture.

After A.D. 455, climates remained at normal to slightly wetter than normal levels with generally favorable and stable conditions that persisted until around A.D. 512. Agriculture would have been very viable at this time. A severe drought occurred from A.D. 512 to 517, which started a cycle in which drought frequency and amplitude increased for approximately 30 years, during which time conditions for agriculture would have been marginal. At about A.D. 550, this drought pattern had ameliorated and was replaced by a generally stable climatic pattern with greater than average precipitation that continued until...
about A.D. 738 (McVickar and Eininger 2001). These conditions would have been optimal for agriculture, although there is no evidence of agriculture on Cedar Mesa between A.D. 550 and 650. The optimal conditions for agriculture are also evident in the southern Colorado Plateau at this time (Dean et al. 1985).

The Basketmaker III occupation of the Cedar Mesa area begins around A.D. 650 and extends only through the early A.D. 700s (Mossbacks Phase), a period of time that reflects only a small portion of the extended period of generally favorable climatic conditions and low-frequency variation. Although precipitation fluctuations are noted during this time, variability remained fairly low and conditions remained fairly favorable until A.D. 738. The end of the Mossbacks Phase at about A.D. 725 is generally consistent with the onset of deteriorating climatic conditions. There is little evidence the mesa itself was reoccupied until more than 400 years later at about A.D. 1060 (Matson et al. 1988; Haase 1983).

After about A.D. 738, climatic variability on Cedar Mesa increased, although effective moisture was slightly higher than normal until around A.D. 860. This period was characterized by unpredictable precipitation patterns and high-frequency climatic variability that would have made agriculture extremely risky. This highly volatile climatic pattern corresponds to a hypothesized abandonment of Cedar Mesa during Pueblo I times and perhaps a population shift to higher locations and the eastern fringes of Cedar Mesa along Comb Wash (see Chapter 5). At about A.D. 1060, the climatic variability ameliorated, resulting in stable climatic conditions with near-normal to slightly above normal precipitation levels until A.D. 1150. Precipitation regimes were fairly consistent, hydrologic systems were strong and conditions were favorable to expansion of agriculture. This period (Windgate Phase and Clay Hills Phase) marked a major expansion of farmsteads through the Greater Cedar Mesa area.

Extreme climatic variability resumed after A.D. 1150, fluctuating drastically between extreme highs and lows. Precipitation remained generally normal to slightly higher than normal during the Pueblo III period despite high-frequency variability that would have been generally unfavorable to agriculture. Dean et al. (1985) have suggested a prolonged drought lasting from A.D. 1150 to nearly A.D. 1300 in the Southwest. The Greater Cedar Mesa area PDSI reconstructions do not support an extended drought during that interval, although they do reflect unfavorable conditions. In the Cedar Mesa area, these highly variable conditions can result in inconsistent water tables, and stream entrenchment (down-cutting) may have constrained floodplain agriculture (McVickar and Eininger 2001; Matson et al. 1990).

Despite these highly variable conditions, Pueblo III populations proliferated on Cedar Mesa from roughly A.D. 1165 to 1270 (Wooden Shoe Phase and Red Hills Phase). Two severe droughts, one at A.D. 1273 and another at A.D. 1276, mark the end of the highly variable climatic cycles and the abandonment of the Greater Cedar Mesa area (McVickar and Eininger 2001; Matson et al. 1990). After about A.D. 1276, conditions remained relatively stable for roughly 600 years with more precipitation and cooler temperatures that may have precluded agriculture at higher elevations. No major reoccupation of the Greater Cedar Mesa area has been suggested after about A.D. 1270. This period is often referred to as the Little Ice Age, which is characterized by generally cooler temperatures and more precipitation (Cook et al. 2004; Fagan 2000; Dean 1994) that would have limited the viability of agriculture.

**Summary**

Reconstruction of prehistoric environments is critical to an understanding of human subsistence and settlement patterns that were predicated to a greater or lesser degree on the availability of biotic and hydrological resources that responded directly to climatic changes (cf. Muir and Driver 2002; Van West and Dean 2000; Varien et al. 2000). In an area of chronically low rainfall, an increase of a few inches per year would result in marked increases in the density and/or distribution of flora and fauna. In an arid or semiarid environment, “such fluctuation in re-
sources would have almost immediate consequences in the density and viability of the human population” (Jennings 1978:13). The paucity of quantitative paleoenvironmental reconstructions conducted in the Cedar Mesa area hampers any fine-scale understanding of localized human adaptations to prehistoric climates and how those climates may have changed through time, although broad regional patterns may be applicable to the study area.

It is generally assumed that modern floral and faunal regimes are similar to those in prehistoric times, although there were certainly short-term fluctuations in the distribution of those resources. These fluctuations would have been influenced by shifts in summer monsoonal climatic patterns that would have affected the viability of agriculture; predictable economic plant species that matured at different times of the year at different elevations would have mandated at least some seasonal movement between resource patches; seasonal availability of migratory game, would have influenced mobility strategies; periodic and persistent droughts would have resulted in fluctuations in the density and distribution of certain food resources; and the location and accessibility of critical, high-quality resources such as fuel wood, tool stone and arable lands would have influenced land-use patterns through time.

Variations in climate patterns undoubtedly influenced how humans adapted to specific environmental niches through time, although climate change was likely one of many factors that shaped human adaptations. Recent research has demonstrated that human responses, as reflected in changing land-use patterns, community structure and population demographics, reflect a considerably more complex response to changing climates, environmental limitations of local landscapes, human alteration of the landscape through over-exploitation of critical resources, and sociocultural stimuli, not all of which are visible in the paleoenvironmental record. For example, Varien et al. (2007) have noted that population aggregation in the Mesa Verde region peaked during periods of population decline at A.D. 880-920 and again at A.D. 1260-1280. Through paleoclimatic reconstructions, they demonstrated that maize agriculture was not as marginal in the Mesa Verde area as is traditionally assumed, and that the land was productive enough that people could have remained in villages through the worst droughts of the late 1200s (Varien et al. 2007: 290). This example illustrates how environmental change, while certainly influencing human adaptations in the region, was not the only factor that must be considered when explaining human responses through time as evidenced in the archaeological record.
Chapter 2

A History of Previous Archaeological Research in the Greater Cedar Mesa Area

Introduction

The Greater Cedar Mesa area, as defined in Chapter 1, has witnessed almost 130 years of archaeological “investigation” of one kind or another. During that time, the science of archaeology has evolved from the frenzy of collecting parties haphazardly digging prehistoric sites for artifacts for distant museums, to minor documentations of artifact and feature descriptions while in the process of collecting for museums, to scientifically and theoretically driven research projects aimed at obtaining a better understanding of how prehistoric humans utilized this landscape. An intensive search of all documented sites and related reports was conducted at the Antiquities Section of the Utah Division of State History in Salt Lake City, as well as at the Bureau of Land Management office in Monticello, Utah, and the offices of Abajo Archaeology in Bluff, Utah. Additionally, an intensive search of both the “gray” and easily obtainable “public” literature was performed to obtain a representative collection of information and data available for the Greater Cedar Mesa area. The following discussion provides a summary of those investigations undertaken within the immediate study area. Northwest of the present study area, work performed within Natural Bridges National Monument has been summarized by Janet McVickar (2001).

The Surveyors

The archaeological resources of the Four Corners area were a source of intrigue to first generations of early explorers, some of whom wrote colorful descriptions of vanished peoples. The earliest references are found in the 1776 journal of Spanish friar Silvestre Velez Escalante, who with Francisco Atanacio Dominguez, led an exploring party to find an overland route to the Spanish mission at Monterrey, California. Dominguez, the visador comisario of New Mexico, and Escalante, ministro doctrinero of Zuni, departed New Mexico in late July 1776 in the company of seven others: Juan Pedro Cisneros, the alcalde mayor of Zuni; Bernardo Miera y Pacheco, a retired captain and resident of Santa Fe; Lorenzo de Olivares, a citizen of El Paso del Norte; interpreter and guide Andres Muniz, of Bernalillo; his brother Antonio Lucrecio Muniz, of Embudo; Juan de Aguilar, of Bernalillo; and Simon Luzero, a servant of Cisneros (Hill 1930:7). The expedition crossed into Colorado by early August, following the Dolores River north while paralleling Utah (Lavender 1982; Warner 1976).

Ancient ruins were first encountered and described in the Dolores River area of southwestern Colorado (Warner 1976; see also Brew 1946) as the party was proceeding north from Santa Fe. Although not mentioned specifically, it is likely that archaeological sites in northern Arizona were noticed by the Dominguez and Escalante expedition while returning to Santa Fe after aborting the expedition near present-day Cedar City, Utah. Escalante may have been the first to record a relationship between the archaeological remains of Utah and Colorado and the eighteenth century occupants of New Mexico. He compared prehistoric ceramics to those of eighteenth-century Puebloan peoples, and rock art styles found in northwestern Colorado to those of Athapaskan peoples. Of the area north of New Mexico, he wrote “... the land by way of which the Tihuas, Tehuas and the other Indians transmigrated to this kingdom; which is clearly shown by the ruins of the pueblos which I have seen in it, whose form was the same that they afterwards gave to theirs in New Mexico; and the fragments of clay and pottery which I also saw in the said country are much like that which the said Tehuas make today” (in Tyler 1951:195).
Government exploration of the Four Corners region commenced in 1849, or about the same time as the first Mormon explorers arrived in the region in 1850 (Mormon settlers would not arrive until 1879-1880 with the renowned Hole in the Rock expedition that settled at Bluff along the San Juan River). Between 1849 and the late 1870s, surveyors and scientists J.H. Simpson, J.N. Macomb, J.S. Newberry, W.H. Jackson, F.V. Hayden, W.H. Holmes and others explored the Four Corners area, discovering, describing and photographing many archaeological sites in southwestern Colorado and southeastern Utah.

The first surveys of the West were conducted within the context of scientific inquiry and description, although with healthy doses of speculation. By 1840, the United States had become obsessed with westward expansion, fueled not only by romanticized accounts of trappers and adventurers but by a growing fascination with scientific discovery. This fascination prompted a wave of government-sponsored exploration, initially under the auspices of the U.S. Army Corps of Topographical Engineers, and later the Smithsonian Institution and the U.S. Geological Survey. Called the “Great Reconnaissance” by William Goetzmann (1967), the era was defined by richly illustrated geological and zoological surveys that described all realms of scientific discovery.

Several of these early expeditions, led by soldiers, intellectuals and naturalists, also focused on the aboriginal inhabitants of North America and, in rare cases, on prehistoric remains. These accounts were highly speculative and romanticized, but reflected prevailing intellectual attitudes during a period before archaeology and ethnology emerged as scientific disciplines. “As men like Captain Cook and Humboldt and Mungo Park came into actual contact with the primitive and exotic peoples of the earth, concrete studies based on collections of empirical data replaced deductive speculation. The unique types of mankind began to be studied and appreciated for their own sake or, alternatively, as part of the great riddle of the descent of man from his Biblical forbears” (Goetzmann 1967:324).

The Great Reconnaissance encompassed the “whole range of human knowledge — in cartography, geology, paleontology, botany, zoology, archaeology and ethnology ... a search for the broad outline, the comprehensive catalog” (Goetzmann 1967:329). Within this context early government explorers in the West described native peoples and archaeological resources. Other surveys were initiated as quasi-governmental endeavors — public surveys in the sense that Congress funded them, but private in the sense they eschewed any military oversight, instead drawing their expertise from an emerging academic climate that fostered inquiry into the natural sciences, including the origins of early humans (Foster 1994; Worster 2001). Among these government sponsored (and sometimes overlapping) surveys of the American West were non-military expeditions led by scientists John Wesley Powell, Clarence King and Ferdinand Hayden, all of whom had a strong orientation towards the geology of the West; King and Powell were instrumental in the subsequent creation of the U.S. Geological Survey and Bureau of Ethnology.

The first noteworthy observations of the archaeology of the region were offered by Lieutenants William Emory and James W. Abert at Pecos Pueblo and Casas Grandes (Abert 1848) and Lieutenant James Hervey Simpson at Chaco Canyon (Simpson 1850). In 1859, a military expedition under the command of Captain J.N. Macomb, also with the U.S. Army Topographical Engineers, led an expedition from the Rio Grande country north to the Dolores River and Moab, Utah, areas before turning south toward present-day Monticello, Utah. The expedition passed near Alkali Ridge to the San Juan River east of the current study area (Macomb 1876; Newberry 1876). Geologist J.S. Newberry offered descriptions of archaeological sites, including traces of irrigation ditches, in northern New Mexico and southwestern Colorado, and observed, based on ceramics and architecture, that the San Juan Valley “was once occupied by a race probably of the same origin and character as the Pueblo Indians extant in New Mexico” (cited in Brew 1946:18).
Because of the delay in publishing the reports of the Macomb expedition, due in part to the outbreak of the Civil War, the archaeological resources of the Four Corners area remained largely unknown to the general public. In the 1870s, Congress appropriated funds for four major surveys of the American West, one of which, the Hayden Expedition, expended considerable time and energy in southwestern Colorado and southeastern Utah, offering detailed scientific observations and colorful archaeological descriptions (Jackson 1878). The Hayden Survey had garnered international attention with its earlier surveys of the Yellowstone area, boosting Hayden to celebrity status and well ahead of his rivals, King, Powell and Lt. George Wheeler, in the competition for congressional funding. His decision to abandon the Yellowstone country in favor of surveys of Colorado, beginning in 1873, is viewed as either a government need to survey Colorado territories in the wake of the discovery of gold and silver (Brew 1946), or a calculated move on Hayden’s part to exploit the dramatic Rocky Mountain landscapes in much the same way that Yellowstone had brought him fame (Foster 1994:241).

The Hayden Survey, which was actually an amalgamation of seven loosely connected exploring parties (Foster 1994), first ventured into the San Juan River country in 1874, when it described archaeological resources in the Mesa Verde and Yellowjacket areas of Colorado. By 1875, W.H. Holmes, a landscape artist who also had a deep interest in archaeology, was given the additional assignment of examining prehistoric remains. Holmes led one archaeological exploring party, and William Henry Jackson, a photographer and naturalist, led another. These exploring parties investigated and described numerous ruins in the Dolores, LaPlata, Mancos, McElmo and Yellowjacket areas. Also in 1875, Jackson extended his surveys into eastern Utah, describing archaeological sites in Montezuma Canyon, near Alkali Ridge and along Comb Wash, then called Epson Creek (Brew 1946:19). The subsequent reports (Jackson 1876a, 1876b, 1878; Holmes 1876, 1878) offered detailed archaeological descriptions, maps, photographs and artifact illustrations. Jackson’s photographs (Figure 2.1) of the Comb Ridge and Fish Creek areas may constitute the first photographic images of cultural resources within the study area. Holmes later became a pioneer in the

Figure 2.1: William Henry Jackson photograph of Hayden Expedition at Comb Ridge in 1875. Photo courtesy of U.S. Geological Survey.
emerging science of archaeology through his role as director of the Bureau of Ethnology at the Smithsonian Institution.

The Collectors

Precipitated by the colorful descriptions of western explorers such as Frederick Dellenbaugh and William Henry Jackson, as well as the Wetherill family’s highly publicized discoveries of spectacular ruins at Mesa Verde, public interest in prehistoric peoples of the western United States underwent a marked revival in the 1880s. In direct response, official archaeological efforts became focused largely on the acquisition of artifact collections for eastern museums. Large museums such as the Peabody at Harvard University in Cambridge, the Smithsonian Institution in Washington, D.C., the American Museum of Natural History in New York City and the Museum of the American Indian, Heye Foundation, also in New York, sponsored numerous expeditions specifically to gather spectacular collections for display. Given the paucity of scientists trained in the emerging science of archaeology, the demand for artifact collections created a lucrative market among local residents for antiquities. These efforts constituted little more than officially sanctioned looting of archaeological sites, particularly in the Southwest where the dry climate facilitated the preservation of perishable artifacts (Janetski 1997).

Archaeologist Warren K. Moorehead, who led an expedition into southeastern Utah in 1892 (see Knipmeyer 2006), decried the wanton collection of artifacts and the destruction of ancient ruins. He blamed a

... number of wealthy relic collectors in the East who have been corresponding with traders with a view of securing specimens from the caves and ruins. They do not care to make primitive man a study, but are mere curiosity hunters, such as ones seen about the ruins of a city swept by a cyclone or flood. They do an immense amount of damage by encouraging the taking of pottery and other objects by persons incapable of handling finds properly [in Janetski 1997].

The driving force behind early archaeological explorations in the Greater Cedar Mesa area from the 1880s through about 1908 was clearly the collection of awe-inspiring artifacts for large and prestigious museums in the East, and in some cases wealthy individuals seeking personal collections. Richard Wetherill certainly fueled this frenzy, selling collections he had acquired and hiring himself out to private expeditions as a local expert and guide. It was within this environment of artifact acquisition that archaeology began to emerge as a scientific discipline. In 1891, Frederick Ward Putnam was named chief of the Department of Ethnology at the World’s Columbian Exposition in Chicago, an unprecedented exhibit of aboriginal artifacts to be opened to the public in October 1893. Putnam used his position to secure funding for “original research and exploration to enable ... as much new scientific material as time would permit” (in Phillips 1993:110). As discussed above, he also demanded more rigid methods for scientific excavation of archaeological sites.

At Putnam’s behest, Utah officials created the Utah Territorial World’s Fair Commission and appointed geologist Don Maguire of Ogden as chief of the Department of Archaeology and Ethnology. Maguire was assigned to make a collection of artifacts for a Utah exhibit at the Columbian Exposition (Kelly 1933; Maguire 1894), and toward that purpose he enlisted the help of University of Utah naturalist Henry Montgomery (Figure 2.2), whose interest in archaeological resources took him to the Uinta Basin, southeastern Utah and southwestern Utah. Montgomery’s interests went beyond making collections, however. He was particularly interested in architecture, and he commented on the uniformity of houses and other artifacts found throughout Utah, arguing that all pottery-making, house-building peoples of the Southwest were peripheral to the greater civilizations of Mexico (Janetski 1997). Montgomery and Maguire proceeded with
The Early Expeditions

Until the late 1880’s only a few local ranchers were familiar with the Greater Cedar Mesa area. Frank McNitt (1957) reported that Charles Lang was the first to make a collection of artifacts from Grand Gulch in 1880. A number of exploring parties followed, and many of the sites they excavated can be located by signatures written in bullet lead or charcoal, or scratched and pecked inscriptions on the canyon walls (Figure 2.3). To date, more than 500 historic inscriptions have been located and documented throughout the Cedar Mesa area mostly through a reverse archaeology project conducted by Fred Blackburn and others (Blackburn and Atkins 1993; Blackburn and Williamson 1997). Among the most prolific collectors through the 1890s were Charles McLoey, brothers J.H. Graham and Charles Graham, and later the Wetherill brothers, all from southwestern Colorado (Blackburn and Williamson 1997; McNitt 1957; see also Hurst 1996 for a more detailed overview of the history of artifact collecting in southeastern Utah).

great energy to investigate numerous locales in the state, and they also purchased or borrowed collections from local residents. Near the study area considered here, Maguire and photographer James Crockwell left inscriptions in Cottonwood Wash and at River House ruin near the mouth of Butler Wash.

The current location of artifacts described by Montgomery and Maguire is unknown. It is possible the materials remained with the Columbian Exposition in Chicago, now housed with the Chicago Field House of Natural History. The artifacts described by Montgomery may have been part of the C.B. Lang Collection, some of which was acquired by the Deseret Museum in Salt Lake City sometime prior to June 1894. This collection was later divided between the LDS Museum of Church History and Art in Salt Lake City and Brigham Young University in Provo. Unfortunately, a considerable portion of the collection was subsequently misplaced or improperly cataloged (Phillips 1993:113).
Charles McLoyd and Charles Cary Graham (Figure 2.4) left Colorado for Grand Gulch in December 1890 and stayed through March 1891, arriving by way of the Hole in the Rock Trail first blazed by Mormon pioneers. Once at Kane Gulch they constructed a trail to the bottom of Bullet Canyon, carried down their gear and then led in their horses. They began their excavations at Perfect Kiva (42Sa5795), and then continued through Bullet Canyon to Grand Gulch. They explored Grand Gulch to Shangri La Canyon near the San Juan River. Having little luck finding sites with potential artifacts, they returned to upper Grand Gulch above Bullet Canyon, excavating heavily in the large cliff dwellings between Bullet Canyon and Kane Gulch (Blackburn and Williamson 1997; Blackburn and Atkins 1993). They are known to have excavated at Turkey Pen Ruin (42Sa3714), as attested by graffiti on the wall of the shelter (Lipe 1979).

Graham kept a day-by-day account of where they were excavating in the Gulch and which artifacts they had collected (Daniels 1976). This collection was sold to Rev. C.H. Green for $3,000 in the spring of 1891 (Moseley 1966). Green then accompanied Charles McLoyd and others from Durango, Colorado, back to Grand Gulch to photograph sites and to supplement the artifact collection. This larger collection was exhibited at the World’s Columbian Exposition of 1893 in Chicago, Illinois, and, along with Green’s photographs, was later purchased by the Field Museum of Natural History in Chicago (Blackburn and Williamson 1997; Phillips 1993; Hayes 1993; see also Green 1894).

In his own journal, C.C. Graham wrote about several different expeditions to “the Canyons of the Colorado.” Some of the artifacts collected by McLoyd and the Graham brothers were purchased from John R. Kunz by B. Talbot and Fred Hyde, and this collection was given to the American Museum of Natural History and was called the “Kunz Collection” (sometimes spelled Koontz). This collection is now part of the holdings of the National Museum of the American Indian in Washington, D.C. (Figure 2.5) Another portion was purchased by C.D. Hazzard in 1892. This latter collection was exhibited at the World’s Columbian Exposition, and it is now part of the “Hazzard Collection” at the University Museum, University of Pennsylvania (Phillips 1993). McLoyd and Graham are known to have collected in Grand Gulch and Kane Gulch, and at Salt Cave and Sandal Cave (Moseley 1966; see also Moorehead 1892).

In August 1891, Warren K. Moorehead was appointed leader of the Illustrated American Exploring Expedition (IAEE) to explore, survey, map, photograph and acquire specimens in the upper Colorado River, San Juan River and the smaller tributaries in southeastern Utah. Although the IAEE collection of artifacts was very small, Moorehead and members of his expedition wrote enthusiastically and romantically about their adventures and discoveries in a series of articles for the American Illustrated Magazine (Phillips 1993;
Figure 2.5: Woven basket collected from Grand Gulch that is now part of the Kunz Collection, American Museum of Natural History. Photo courtesy of Bruce Hucko.

see Gunckel 1892a, 1892b, 1892, and Moorehead 1892a, 1892b, 1892c, 1892d, 1892e, 1892f, 1892g). Their descriptions of alcoves in Butler Wash are notable for their detailed descriptions and maps (see also Knipmeyer 2006).

Richard Wetherill (Figure 2.6) subsequently led two expeditions to Grand Gulch, the first in the winter of 1893-94, and the second in late 1896 and/or early 1897. Richard Wetherill’s Hyde Exploring Expedition of 1893-1894 was significant and well documented for that time. Photographs from the expedition are now curated at the University Museum, University of Pennsylvania (Figure 2.7). Eleven caves were excavated east of Comb Ridge prior to turning their attention to Grand Gulch itself. Approximately 22 other alcoves and cliff dwellings were documented and/or excavated by this expedition within Grand Gulch and in Butler Wash (Blackburn and Williamson 1997; Blackburn and Atkins 1993; McNitt 1957). A major discovery of the expedition was a cave containing 96 skeletons with evidence of a violent slaughter (Hurst and Turner 1993). Wetherill excitedly wrote several letters from southeastern Utah about “making new discoveries, having found a people still older than the cliff dwellers who occupied the same caves” (Wetherill 1893).

This expedition was financed by B. Talbot Hyde and Fred Hyde, and the collection was later given to the American Museum in New York City (Phillips 1993; McNitt 1957).

Hints of the prevailing approach to archaeological excavations and single-minded focus on collections, in particular burials, can be found in an 1894 letter from Richard Wetherill to B. Talbot Hyde that states “I saved all the skeletons from the first cave as I thought you would want them for study, but I will not save any more ... but will save the skulls,” and “they [Basketmaker II people] are a larger race than the cliff dwellers. I have measured none of them, but I know from comparison, as I have now handled more than one hundred of each” (Wetherill 1894).

Richard Wetherill began his second expedition to Grand Gulch during the winter of 1896-1897, financed by C. E. Whitmore and George Bowles. Unlike the first expedition,
Wetherill headed directly to Grand Gulch. Excavations were undertaken in 12 separate alcoves, most of which had been disturbed by previous expeditions and relic seekers, and little Basketmaker material was found. A combination of weather, lack of artifacts and difficulty with their pack animals forced an early ending of the expedition (Blackburn and Williamson 1997; Blackburn and Atkins 1993). The Hyde Brothers purchased this collection in 1897 and gave it to the American Museum of Natural History (Phillips 1993), where photographs from the expedition are now curated (Figure 2.8). The 1897 expedition was much better documented than the first, and notes include good site sketch maps whereby subsequent researchers have been able to determine almost exactly where the artifacts were recovered.

A typewritten transcript of the 1896-1897 expedition report reveals remarkable attention to local environments and site and feature measurements, as well as a flair for drama. The latter is evidenced by Wetherill’s description of the loss of nine pack horses that fell from cliffs to their deaths or were left behind when they became incapacitated (Wetherill n.d.:1). Although there remained a preoccupation with burials and some were indeed recovered, a closer reading of the brief report reveals that undisturbed alcoves and rockshelters with a potential to contain such deposits were becoming increasingly difficult to find, and the expedition even resorted to re-excavating some alcoves previously excavated by Wetherill, McLoyd and others.

Also active in the Cedar Mesa area at the same time was Charles B. Lang, a Bluff resident who made several collections in the canyons of southeastern Utah between the 1880s and 1900. Lang, who at one time was in the photography business with Richard Wetherill, left his inscription at area sites as early as 1888. He recorded depths of artifacts, measurements and specific locations of caves, and he recorded associated artifacts as they were found. His collections, which were incorporated into the Utah Exhibit at the Chicago World’s Fair in 1893, are now located at the Field Museum in Chicago, the Taylor Museum in Colorado Springs, and
In 1896, T. Mitchell Prudden visited Grand Gulch on the first of many expeditions to southeastern Utah, resulting in his article, "Elder Brother to the Cliff Dweller," published in Harper’s New Monthly Magazine (Prudden 1897; see also McNitt 1957). Photographs indicate that he traveled much of Cottonwood Wash and Grand Gulch following routes and excavations of the Hyde Expedition of 1893-1894. Prudden’s collections are at the Peabody Museum of Natural History at Yale University (Phillips 1993; see also Prudden n.d.).

One significant scientific outcome of the early collecting expeditions was the recognition, first articulated by Richard Wetherill, of an older culture that predated the "cliff dwellers." The temporal distinction between what Wetherill called the “cave dwellers” or “basket people” and later “cliff dwellers” evoked considerable disagreement, and decades passed before Samuel J. Guernsey and Alfred V. Kidder (Guernsey and Kidder 1921; Kidder and Guernsey 1919) thoroughly defined the Basketmaker culture to which specific material culture traits could be assigned (the evolution of the current term Basketmaker is discussed in Chapter 4). The debate over the existence of a Basketmaker culture antecedent to the Cliff Dwellers provided the theoretical context within which later researchers would conduct pioneering research within the Four Corners area. It should also be noted the public backlash from the frenzy of artifact collecting by Wetherill and many others contributed to the establishment of Mesa Verde National Park and passage of the Antiquities Act, both in 1906.

Archaeologists as Scientists

Early scholars such as Gustaf Nordenskiöld had encouraged the collectors to take more systematic approaches to documenting sites and recording the provenience of artifacts, and indeed there is a marked improvement in the level of descriptions through time. But with its focus on artifact collections, American archaeology at the turn of the century lacked problem-oriented direction (e.g., how, when and why prehistoric cultures emerged) and was instead focused almost entirely on descriptions of artifacts and architecture (Wille and Sabloff 1980:44-47; see also Nordenskiöld 1893; Roberts 1935a, 1935b, 1937). A major theoretical shift in American archaeology occurred about 1914, characterized by a preoccupation with cultural chronologies, taxonomies and classification. This period of archaeological research resulted in the systematic application of stratigraphic, seriational and classificatory methodologies designed to generate syntheses of cultural history. For the most part, these syntheses
tended to be mere skeletons of history — pottery type or artifact sequences and distributions .... The old close relationship between American archaeology and ethnology led easily to the use of ethnographic analogies in interpretations of use and function in prehistoric cultures; and the interest in the relationships between culture and the natural environment that had its beginnings in the culture-area concepts of the ethnologists provided a base for cultural-ecological study [1980:83].

This theoretical approach is epitomized in Kidder's landmark excavations at Pecos Pueblo where he used stratigraphic evidence of material culture to define successive occupations and to establish cultural nomenclature that remains largely intact today. This classic study, published in 1924 (reprinted in 1962), proved profoundly influential on early archaeological research in the study area and throughout southeastern Utah, influencing the new generation of university-trained archaeologists, such as J.O. Brew, who conducted landmark excavations at Alkali Ridge east of Blanding, beginning in 1931 (Brew 1946).

The origins of university-affiliated research in the region can be traced to Byron Cummings, a professor of classical languages at the University of Utah, and colleague Edgar Hewett, a professor at what is today New Mexico Highlands University. Together they made several trips to the Four Corners area, joined by students: Neil Judd from the University of Utah, A.V. Kidder from Harvard and Jesse Nusbaum from what is today New Mexico Highlands, all of whom would become major figures in Southwestern archaeology. Cummings, working under Hewitt's permit issued to the Archaeological Institute of America, led surveys into White and Armstrong Canyons during their reconnaissance of the San Juan region as early as 1906-1907 (McVickar and Eininger 2001). And in 1908, Judd, Kidder and Cummings (among others) excavated part of one large ruin on Alkali Ridge and at Cold Spring Cave in Butler Wash, both east of the study area considered here (Kidder 1910). In 1909, Judd, Cummings and John Wetherill, among others, conducted surveys in the Rainbow Bridge and Navajo Mountain areas where they "were the first white men to see Betatakin, Inscription House, Ladder House and other ruins" (Judd 1954:155; see also Judd 1927; Babbitt 1990). Unfortunately, Cummings wrote no detailed reports on those surveys, and it is unknown from the limited information available whether he conducted surveys within the Greater Cedar Mesa study area.

Research in the Greater Cedar Mesa area was resumed in 1920 under the auspices of the American Museum of Natural History when Nels C. Nelson conducted surveys and limited excavations. His efforts were geared toward gathering information from several areas poorly known to the archaeological community (Lipe 1979). At the time, Nelson was curator of the American Museum of Natural History and in charge of the Wetherill collections. His motives for conducting investigations in the Greater Cedar Mesa were quite simple: He wanted a better understanding of the existing collections for which he was responsible. He spent two weeks in the area, guided by John Wetherill. Nelson documented 80 sites in the region (Blackburn and Williamson 1997), although he was only able to re-locate only two of Wetherill's sites (McNitt 1957): 42Sa3712, or Basketmaker Rockshelter, and 42Sa5106, or Junction Ruin). The American Museum of Natural History's investigation of the lower San Juan River in 1929 also brought Earl Morris and Charles Bernheimer to the area, but they spent only one day in White Canyon and a short time exploring Arch Canyon and excavating burials at two sites in Comb Wash before moving on in search of larger, more impressive sites (McVickar and Eininger 2001; Hobler et al. 1978; Anderson 1978).

Expeditions into the region were sporadic or poorly documented until 1941 when Gila Pueblo sent Deric Nusbaum to the White Canyon area within and adjacent to Natural Bridges National Monument, and also in Butler Wash just east of Cedar Mesa. At this time, Gila
Pueblo was one of five facilities in North America that were heavily involved in collecting wood samples for tree-ring analyses (Nash 1999). Nusbaum, who changed his name and is known in subsequent reports as Deric O’Bryan, surveyed the upper portions of White Canyon, collecting tree-ring samples from several sites (Hobler et al. 1978). Investigations in Cedar Mesa itself were apparently not resumed until the 1950s when the massive Glen Canyon Dam project prompted wide-ranging surveys by the University of Utah and the Museum of Northern Arizona.

**The Salvage Projects**

With passage in 1956 of Federal Public Law 485 authorizing four major reservoirs in the upper Colorado River basin, the National Park Service immediately entered into negotiations with the University of Utah and the Museum of Northern Arizona for the systematic salvage of archaeological information. The area to be inundated by the Glen Canyon Dam, the largest of the four reservoir salvage projects, was given highest priority by federal bureaucrats, not only because of imminent construction on the reservoir, but “because the Glen Canyon had long been reputed to contain archeological material of importance” (Jennings 1959:3). In fact, participants expected no less than to discover spectacular architectural sites comparable to Mesa Verde, Canyon de Chelley or Hovenweep (Jennings and Sharrock 1965:39). The fact “the enterprise was begun in high romantic hope in an ecstatic state of expectation of adventure” was quickly tempered by the recognition of “the scholar’s task of collecting, ordering and describing an enormous body of new data even though no earth-shattering firsts were in prospect” (1965:36).

The University of Utah initiated investigations in the Glen Canyon region on June 22, 1957, with the stated objective of locating “all sites threatened with inundation by waters of the Glen Canyon reservoir from the Escalante drainage to the Wahweap drainage” (Jesse D. Jennings, in Lister 1958: I). The National Park Service, however, afforded considerable flexibility as to where field investigations could be initiated. According to a letter of instruction to the university, “you should not concern yourself only with the land which will actually be flooded but should extend your surveys, wherever possible or desirable, to and somewhat beyond the canyon rims. We shall not attempt to set a specific limit, or to ask you to search for sites to a line a certain distance from the rims” (in Jennings 1959:5). Throughout the seven years of Glen Canyon field work, the University of Utah and the Museum of Northern Arizona liberally applied that flexibility, investigating the lower San Juan River drainage and the northern portion of Cedar Mesa.

Three 1957 surveys approached the west and southwest edges of the Greater Cedar Mesa, all conducted by the Museum of Northern Arizona, one by William Y. Adams and Nettie K. Adams, another by John A. Frost, and the third by William Adams and M.E. Cooley. Collectively, these surveys recorded 26 sites (Adams and Adams 1959:2). They concluded the deeply entrenched San Juan River could not have been an effective east-west transportation corridor, and that prehistoric inhabitants entered the canyon from both the north and the south through several overland canyon routes. Consequently, “it follows that they did not necessarily constitute a single homogenous social or cultural group. On the contrary, each colony quite probably constituted a separate community. That the inhabitants of the north and south river banks were, in fact, members of somewhat different although contemporaneous culture groups is clearly indicated by ceramic evidence” (1959:12). From 1958 to 1960, museum investigators also conducted excavations in the San Juan River area (Lindsay, Turner and Long 1964). It appears these investigations were conducted just outside the study area considered here.

University of Utah crews first visited the Cedar Mesa area in 1958 as part of the San Juan Triangle intuitive survey (Weller 1959), and again in 1959 as part of a broad-ranging survey by James Gunnerson (Gunnerson 1962). A handful of sites were recorded near the mouth of Arch Canyon, as was Lewis Lodge (42Sa256) just below the rim of an Arch Canyon tributary (Figure
2.9) and 42Sa261 and 42Sa262 in Butler Wash. The report of investigations (Weller 1959) makes only passing references to sites at the mouth of Arch Canyon, offering brief descriptions of 42Sa277 and 42Sa278. Cedar Mesa was not visited again until 1962 during the final year of the Upper Colorado River Basin Salvage Program, when crews identified four sites in the Coyote Ridge area (Day 1964). Basketmaker III-Pueblo I shallow pithouses were excavated at the Sage Park Site (42Sa314) and Pueblo III pithouses and a kiva at the Coyote Ridge Site (42Sa315). Both were considered to be evidence of Mesa Verde Anasazi occupations, based on pottery evidence (Sharrock 1964). The reports resulting from the Cedar Mesa surveys offered no significant discussion of how sites in the Cedar Mesa area might relate to the Kayenta Anasazi manifestations documented in the Glen Canyon region (but see Lipe 1967, 1970 for a discussion of population movements into and out of the Red Rock Plateau west of Cedar Mesa).

Also in the 1950s, the Greater Cedar Mesa area was included as part of the Navajo Land Claims Project. The goal of these surveys was to locate and document historic Navajo occupations during a time when the Navajo Nation was attempting to expand reservation boundaries to include land traditionally inhabited by the Navajos. David Brugge identified Navajo habitation and activity areas north of the San Juan River in Butler Wash, Cottonwood Wash, Comb Wash and in the Bears Ears area (McVickar and Eininger 2001; Anderson 1978). Tree-ring samples and a small number of ceramic sherds were collected, and are now housed at the Laboratory of Tree-Ring Research and Arizona State Museum (respectively) at the University of Arizona at Tucson.

Philip and Audrey Hobler worked in the northernmost portion of the study area in 1960 and 1961. They documented 200 sites and collected surface ceramics and tree-ring samples in Upper White Canyon. Ninety of these sites are within Natural Bridges National Monument boundaries (Hobler et al. 1978) just outside the study area. They suggest that regular use of the White Canyon area began around 2,000 years ago, covering the Basketmaker II through Pueblo III periods, but with scant evidence of Late Prehistoric occupations. Their research questioned the purely ceremonial function of kivas in this region. Based on their size and distribution, they hypothesized that kivas were built and used primarily as dwellings, and were considered evidence of an in situ development of cultural traits similar to (and influenced by) other areas of the San Juan River drainage, but not as a direct result of migrants from the Kayenta or Mesa Verde centers (Hobler et al. 1978: 65).

In 1969, the Laboratory of Tree-Ring Research at the University of Arizona published a
compilation of all tree-ring-dated archaeological sites from southeastern Utah that had been collected up to that time (Bannister et al. 1969). Thirteen sites from the Greater Cedar Mesa area are included in this summary, as are 18 sites from Natural Bridges National Monument.

One of the largest salvage projects in the Cedar Mesa area occurred in the early 1970s when the Utah State Department of Highways contracted with the University of Utah to conduct surveys and excavations along re-routed portions of U-95 in the northern portion of the study area considered here, primarily sites in the Mule Canyon drainage (Dalley 1973; Wilson 1974). The survey area extended roughly from Cottonwood Wash west to Grand Flats. Excavations were conducted at 17 sites, including five of 12 rooms at Mule Canyon Ruins, which has since been stabilized for public visitation (Figure 2.10). Ceramic analyses corroborated researchers’ hypothesis that Kayenta Anasazi influences predominated during the Basketmaker III period and declined markedly during the terminal Basketmaker III. From the late Basketmaker III through Pueblo III, Mesa Verde ceramics dominated the assemblages, with a strong influence of Kayenta style ceramics reappearing on a smaller scale during the late Pueblo II-Pueblo III period. These fluctuations in ceramics were interpreted as evidence of population migrations (Dalley 1973). Both preliminary reports are rather superficial. A detailed final report with interpretive discussions was prepared, but it was subsequently lost before it could be released by the University of Utah (Winston Hurst, personal communication 2009).

The Cedar Mesa Project

Archaeological research in the Cedar Mesa area underwent a renaissance of academic inquiry in the late 1960s, fueled in large part by William D. Lipe, an archaeologist who had been a crew chief for Jennings during the Glen Canyon Project. During the summer of 1967, Lipe (Figure 2.11) turned his attention to Cedar Mesa, conducting a brief reconnaissance that would provide the foundation for a much larger project in the years to follow. At that time, he was a faculty member in the Department of Anthropology at the State University of New York at Bingham-

Figure 2.10: Mule Canyon Ruins after stabilization as seen in 2009.
occupation of the Cedar Mesa-Grand Gulch region, with emphasis on the open mesa-top sites of this period; (2) to collect data on post-Basketmaker II periods in order to describe Anasazi settlement patterns in the region; and (3) to locate sites in Grand Gulch where Richard Wetherill had encountered Basketmaker II and later materials during two expeditions in the 1890s. This last goal was intended to provide at least general provenience data for the Wetherill collections from southeastern Utah that are housed at the American Museum of Natural History in New York (Lipe and Matson 2007; Blackburn and Williamson 1997).

The survey had two parts: an intensive block survey, and a non-intensive survey of portions of Grand Gulch. The block survey encompassed an area bounded by Sheiks Canyon,

Lipe's initial investigations in 1967 constituted a low-intensity reconnaissance, largely intuitive in nature, and sites were recorded in minimal fashion and no collections were made. These data, however, provided information Lipe used to plan the surveys and excavations he directed on Cedar Mesa from 1969 to 1970. The objectives of the 1969 and 1970 survey and related excavations (Lipe 1978a) were (1) to document the Basketmaker II
Coyote Canyon, the rim of Grand Gulch, and a portion of the Sheiks Flat road that crosses from the Coyote Canyon drainage to the Sheiks drainage. A few sites were also recorded between Sheiks and Bullet Canyons, south of the main block survey area. Specially-designed survey forms were filled out for each site, and surface collections were made from most sites (Lipe and Matson 2007).

The non-intensive survey covered portions of Grand Gulch, primarily between the mouth of Kane Gulch and a point not far below the mouth of Sheiks Canyon. It also included a segment of the canyon extending a short distance both upstream and downstream from the mouth of Collins Spring Canyon. The Grand Gulch portion of the survey was assisted by Richard Wetherill’s notes from 1896-1897 and Nels Nelson’s survey notes from 1921. The attempt to relocate these sites was partially successful, especially for those sites where Wetherill had excavated in 1897. Small surface collections were made from several of the Grand Gulch sites (Lipe and Matson 2007).

The survey and the related excavations were financed by grants from the National Geographic Society and from the State University of New York. Grand Gulch, rather than Cedar Mesa, was considered the geographic focus of the 1969 and 1970 fieldwork. The majority of the sites were located on the mesa top, rather than in the entrenched canyons, prompting Matson and Lipe to suggest that Basketmaker II groups were farming in the canyons in the summer and hunting and gathering on the mesa tops at other times of the year, and that dry farming of the mesa tops would have been initiated during Basketmaker III times (Matson and Lipe 1975a:65; see also 1975b).

Excavations were also conducted concurrently with the 1969 and 1970 surveys (Lipe 1978a, 1978b). These were focused on mesa top sites, and included work at several late Basketmaker II habitation sites located in the primary block survey area (Pollock 2001). Two additional sites were tested in the area between Sheiks and Bullet canyons: a Basketmaker II pithouse site and a Basketmaker III site having several occupation areas but no identifiable structural remains (Lipe 2007; Lipe and Matson 2007). A small pilot survey, called the Todie-Long Survey, was initiated in 1971 by Matson and Lipe in a portion of the upper drainages of Todie and Long Canyons on Cedar Mesa. This small project resulted in the documentation of several sites and the collection of a small amount of material (Lipe and Matson 2007). These data are the subject of ongoing research at WSU by Erin Barrentine (not yet reported).

Research: 1972-1975

With financial assistance from a National Science Foundation grant, Lipe and Matson resumed field work in the Cedar Mesa area in June 1972 (Matson and Lipe 1975a, 1975b). In the summer of that year, Lipe became assistant director of the Museum of Northern Arizona (MNA) in Flagstaff, and a short time later Matson became an assistant professor of anthropology at the University of British Columbia. The grant was subsequently renewed in 1974, with the main research goals being (1) to reconstruct the adaptive strategies of the prehistoric cultures of the region, (2) to identify the environmental limits of these adaptations, and (3) to attempt to account for stability and change in cultural adaptive strategies (Lipe and Matson 1971 a, 1971 b; Matson and Lipe 1975a, 1975b; Matson et al. 1990).

From 1972 to 1975, co-directors Lipe and Matson undertook field studies and related analyses. At the core of their investigations were two sub-projects, subsumed within the larger Cedar Mesa Project: the 1972-1974 Quadrat Survey and the 1972-1975 Canyon Inventory and Collecting study. The Quadrat Survey consisted of a stratified sample of 76 quadrats, each 400 meters square. These quadrats were selected at random from five drainage in the central and west portions of Cedar Mesa: Upper Grand Gulch, Bullet, North Road, Hardscrabble and West Johns (Matson and Lipe 1975b). The Canyon Inventory and Collecting study involved inventorying sites in the entrenched portions of the same five drainages, and then doing intensive documenting and artifact collecting at a stratified sample of the sites found during the initial inventory. In addition, partial results
from several other sub-projects, especially the 1972-1973 Site Testing program and the 1974-1975 Tree-Ring and Architecture Survey and Collecting program were undertaken and have been reported (Lipe 2007; Matson et al. 1990). The records, reports and artifact collections stemming from this research are curated at Washington State University and are readily available on the Internet through WSU Research Exchange.

The Quadrat Survey initiated at this time became a major component of the larger Cedar Mesa Project. The conceptual basis of the work and the sampling methodology are described in Lipe and Matson (1971a, 1971b, 1975), Matson and Lipe (1975a, 1975b, 1978) and Chapters II and III of Matson et al. (1990). The survey was based on a stratified random sample of the approximately 800-square-kilometer Cedar Mesa study area (Figure 2.13). This area was partitioned into 20 drainage units which were then divided into north and south strata. Three drainages (Upper Grand Gulch, Bullet and North Road) were selected from the northern stratum and two (West Johns and Hardscrabble) were selected from the south. Each drainage unit was considered to be a cluster of 400-meter-square quadrats, and a random sample of quadrats was selected from each of the five drainages, for a total of 76 quadrats. Altogether, the Quadrat Survey methods resulted in a very thorough and systematic collection of visible artifacts and feature data (Lipe 2007). The results of the 1972-1974 Quadrat Survey are covered in depth in Matson et al. (1990).

In general, the Quadrat Surveys found that Basketmaker II and Pueblo II-III sites were relatively abundant, that Basketmaker III sites were rare, and that Pueblo I and early Pueblo II sites were absent. The surveys also noted substantial differences in site distributions by individual drainages (Matson and Lipe 1975a:64). Preliminary data indicated a Basketmaker II occupation of the mesa top closer to the canyon rims, a Basketmaker III shift to the mesa tops with deeper soils, a hiatus during Pueblo I and early Pueblo II times, and a strong resurgence of occupation during late Pueblo II and Pueblo III times (1975a:67). This interpretation was subsequently modified to suggest that Basketmaker II settlement patterns were similar to those in Basketmaker III and Pueblo II-III times (Matson et al. 1990). The Quadrat Survey also appears to be the first in the area to “record small sites and isolated artifacts that may be clues to activities that took place away from main habitation sites” (Matson and Lipe 1975a:68).

In addition to the Quadrat Surveys, Matson and Lipe directed an inventory of sites located in the entrenched canyons in the five drainage units described above. Because the canyons occupy only a small percentage of each drainage by area, it was anticipated that it would be very difficult to characterize the occupation of the canyons based on quadrats randomly selected for the drainage unit as a whole. On the other hand, the canyons clearly provided an important environment for settlement, and sites there often had well preserved architecture.

Instead of being based on randomly selected quadrats, the canyon survey employed an actual inventory of sites located in the entrenched canyon portion of each of the five drainage units. Quasi-quadrats were created by overlaying adjacent 400-meter squares on an aerial photo mosaic of each entrenched canyon system. Although the coverage was thorough, a number of small or inaccessible sites were undoubtedly missed. Once the canyon inventories had been completed, a stratified random sample of canyon sites was selected for intensive recording and surface collecting. The sample was stratified by drainage unit, chronological period and site type, as described in Chapter III in Matson et al. (1990) and Morton (2002). Crews returned to these selected sites to conduct mapping and collecting, using methods as similar as possible to those applied in the basic quadrat surveys (Lipe 2007).

Some of the sites located in the Quadrat Survey were also judgmentally selected for test excavations. This work was done concurrently with the Quadrat Survey and the Canyon Inventory and Collecting Survey, and was also funded by the same NSF grants. Most of the test excavations were directed by Joseph Winter under the
Figure 2.13: Location of the quadrat survey parcels (small squares inside shaded areas). Graphic courtesy of Washington State University.
general supervision of Lipe. Priority for testing was given to sites that had the possibility of yielding datable tree-ring samples, and/or samples useful in environmental or economic reconstructions (e.g., pollen, flotation, faunal remains). In some cases, priority was also given to sites or portions of sites where testing could link surface characteristics to particular types of architecture or features, or where middens could provide pollen samples and large samples of sherds for seriation studies (Matson and Lipe 1977; Matson et al. 1990; West 1978).

**Non-Survey Research.** Based on the survey data, several complementary research projects were initiated. A discriminant analysis of the ceramic evidence was used to identify temporal and spatial relationships that established four temporal sub-periods spanning a period of almost two centuries from A.D. 1070 to 1270. Mesa Verde ceramics dominated early in the sequence (Group III) from A.D. 1070 to 1100; Kayenta ceramics dominated from A.D. 1100 to 1140 (Group IV), and Mesa Verde ceramics again dominated from A.D. 1150 to 1250 (Group I and Group II). Researchers have suggested that shifts in ceramic preferences could be related to groups with different ceramic traditions moving onto and away from the mesa, or that there may have been a time when Kayenta ceramics were popular among those living along the western border of the Mesa Verde tradition, either through intermarriage or extensive trade (Matson and Lipe 1977:55; Matson et al. 1990; Haase 1983). This issue is the topic of ongoing studies by Donna Glowacki (not yet reported).

Michael Brand’s (1994, 1995a) analysis of faunal remains relied largely on specimens collected as part of the 1972-1974 testing program. In addition, Matson and Chisholm (1991) and Chisholm and Matson (1994) reported on stable carbon isotope values of human and non-human animal bones from Cedar Mesa. These studies were based on specimens recovered during the 1972-1974 Testing Program, as well as from surface collections made in the other surface survey areas (Lipe 2007).

One site not part of the Quadrat Surveys, Turkey Pen Ruin (42Sa3714), was also tested by Matson in 1973. Located in a large natural shelter in Grand Gulch, Matson’s crew excavated and removed a 140-centimeter-deep by 50-centimeter-square column of midden. All or virtually all of the deposit appears to have accumulated during Basketmaker II times (Lipe 1979; Matson 1991). Human coprolites, pollen samples and botanical samples from this column have yielded significant data about Basketmaker II subsistence (Aasen 1984; Arakawa et al. 2001; Cordas 2000; Lepofsky 1986; Matson 1991; Matson and Chisholm 1991; Radomsky 2000; West 1978). The Turkey Pen site was very seriously vandalized in the late 1970s (Lipe 1979; Powers 1984), and the remaining middens were churned, making the intact column recovered by Matson even more valuable to future researchers.

In 1974 and 1975, several canyon segments outside the five primary drainages were inventoried, and several sites were judgmentally selected for detailed architectural mapping and collection of beam cores for tree-ring dating. Funding was provided by NSF under the same grant that supported the other parts of the project. The fieldwork was carried out in the summer and fall of 1974, and in the summer of 1975, under the Lipe’s direction. Personnel from the Laboratory of Tree-Ring Research (LTRR) at the University of Arizona collaborated with this fieldwork.

Most of the sites investigated were in canyons that were not included in the Canyon Inventory and Collecting surveys. In these cases, a segment of canyon was selected on a judgmental basis because it contained several well-preserved cliff dwellings. These canyon segments were inventoried with the same methods used for the canyons of the five primary drainages. The sites selected for detailed recording and beam coring were those judged to have the greatest promise of yielding tree-ring dates from in situ beams, as well as data on building sequences and the functions of structures (Lipe 2007).
Much of the dating information from this tree-ring initiative was reported in Matson et al. (1990) and resulted in the establishment of the Cedar Mesa phase sequence (Haase 1983; Matson et al. 1990), discussed in detail in Chapters 4 and 5. The architectural details and associated tree-ring dates are thoroughly reported in two masters’ theses (Bloomer 1989; Bedell 2000). Other theses and dissertations that use data from the 1974-1975 Tree-Ring and Architecture Inventory and Collecting project include Ahlstrom (1985); Glowacki (2006); and Schlanger (1980). Ortman (2000) also analyzed potsherds from the Moon House complex.

Several other research projects that were peripheral or complementary to the Cedar Mesa Project were initiated during this period. One was an attempt to determine which lithic materials were locally available on Cedar Mesa, and which had been imported from adjacent areas such as Elk Ridge or the San Juan Valley. Donald Keller, a crew chief on several CMP surveys, also visited a number of potential lithic source areas and collected non-archaeological samples of raw material (Keller 1979, 1982). And Philip Salkin, a graduate student at the University of Wisconsin-Madison and a former crew member during the 1970 field season, collected samples of sediment containing mollusc shells from a 5.4-meter deep column of alluvial sediments exposed in Kane Gulch and several other alluvial exposures (Salkin 1974, 1975).

James West, a graduate student at the University of California-Davis, made several visits to Cedar Mesa between 1972 and 1976 to collect sediment samples from modern, alluvial and archaeological contexts for the purpose of obtaining pollen samples (West 1978). The archaeological sampling was done in conjunction with the 1972-1973 Testing Program. Most of the archaeological samples analyzed by West were collected during excavations. And in 1973, Danny Brooks, a master’s candidate at Northern Arizona University, investigated a system of check dams associated with Pueblo III sites on Horse Flats, an area on Elk Ridge north of Cedar Mesa. Brooks tested the sediments behind several check dams, and may have made some surface collections from habitation sites in the vicinity (Brooks 1974). This research complemented CMP objectives by providing information about agricultural adaptations in an upland area north of Cedar Mesa about which little had previously been known (Lipe 2007).

Also in 1973, Larry Agenbroad, at that time a professor at Chadron State College in Nebraska, mapped alluvial deposits in a portion of Grand Gulch. On the basis of this work, Agenbroad (1975) proposed a chronology of alluvial deposition, down cutting and terrace formation. The fieldwork was supported with funds from the Cedar Mesa Project NSF grant, and Agenbroad’s field crew used the CMP field camp at Todie Spring as their base of operations. Lipe and Matson (1975) used Agenbroad’s data in a study that examined the relationship between areas of alluvium and the number and size of Pueblo II and Pueblo III sites in a 17.6 mile stretch of Grand Gulch.

Charlotte Benson, a doctoral candidate at the University of Washington, was partially supported by the CMP in 1975 to conduct a block survey of a portion of the Owl Creek drainage in the northeastern part of the CMP study area. Benson’s Owl Creek survey was designed to provide data on a specific large block located primarily on the mesa top. The Owl Creek survey thus provided a basis for characterizing multi-site dispersed communities, most if not all of which were spatially too large to fall within a single 400 meter square quadrat. These data were reported in a dissertation (Benson 1984) and an article (Benson 1985).

Without question, the lasting legacy of the Cedar Mesa Project has been the high quality of synthetic and interpretive research conducted over the past three decades, reported in dozens of masters’ theses, doctoral dissertations and peer-reviewed journal articles that, when taken collectively, have redefined how archaeologists understand prehistoric adaptations in the region (see discussions in Chapters 3 through 5). Among the more noteworthy student projects are those by Bloomer (1989), Camilli (1975, 1983), Dohm (1981), Haase (1983), Benson (1984), Aesen (1984), Bedell (2000), Brand (1994) Pollock (2001), Morton (2002), Schlanger (1980) and Mills (1989).
The BLM Projects. The Cedar Mesa Project was clearly academic in nature, but the resulting research also prompted the Bureau of Land Management (BLM) in 1974 to take a greater interest in the proactive management of the region in light of increased recreational use of the mesa generally. The subsequent BLM initiatives were conducted concurrently and in close cooperation with the academic efforts. In early 1974, the Museum of Northern Arizona received a contract from the BLM to map and make surface collections at designated rockshelter sites in upper Grand Gulch and lower Bullet Canyon. Donald Keller was the field director, and William D. Lipe was the principal investigator. Fieldwork was conducted in the late spring and early summer of 1974. The purpose of the project was to collect human remains, as well as scraps of basketry, organic remains and other artifacts, from the surface of the designated sites. Many of these items probably had been unearthed in the wave of digging by McLoyd, Graham, Richard Wetherill and others in the 1890s (Keller et al. 1974; Blackburn and Williamson 1997). Work involved mapping and surface clean-up of nine vandalized sites in hope of deterring additional vandalism (Keller et al. 1974).

BLM officials believed these materials should be collected because their presence on the site surfaces would prompt looters to engage in additional unauthorized digging at these sites. The BLM also sought to remove the human remains from public view. Additional goals of the project were to map and document looters' pits and to record site condition as a baseline for future site condition monitoring. The project, documented in a report by Keller et al. (1974), complemented information obtained during the Canyon Inventory and Collecting and the Tree-ring and Architecture sub-projects. Several of the sites documented in the Grand Gulch Cleanup Survey were revisited later in 1974 and were mapped in greater detail as part of the Tree-Ring and Architecture study. Of particular note, efforts were made to document and photograph the nature and extent of vandalism at identified sites. The collections and associated field notes are now curated at the Museum of Northern Arizona.

The “Cleanup Project” addressed only nine sites in Cedar Mesa, among them Turkey Pen Ruin (42Sa2714) and Perfect Kiva (42Sa5795), all of which were described as strongly associated with Mesa Verde Anasazi occupations during Pueblo II and Pueblo III times, based on ceramic analyses. The report offers good descriptions of recovered skeletal materials, the presence of burned human bone under conditions other than cremation, identification of sites initially excavated by Richard Wetherill, and recommendations for mitigation of impacts from public visitation (Keller et al. 1974).

In 1976, the BLM awarded a contract to the Museum of Northern Arizona to assess the archaeological resources of areas being considered for addition to the Grand Gulch Primitive Area. Lipe and later Richard Ahlstrom directed the field work, and Matson participated in a significant part of the fieldwork. Some of the proposed additions to the Grand Gulch Primitive Area had been sampled by earlier CMP surveys, and information from these surveys was provided to the BLM as part of the 1976 contract (Lipe et al. 1977). In addition, sampling surveys were conducted in two large areas not previously investigated in and around the drainages of Pine and Dripping Canyons, both of them western tributaries of Grand Gulch, and the drainages of Slickhorn and Point Lookout Canyons, both tributaries of the San Juan River.

For each of the two areas surveyed in 1976, a sample of randomly located 400-meter-square quadrats was systematically searched using parallel transects. Data from the quadrat surveys was used to estimate the total number and types of sites by period of time in the two drainage units. In addition, the entrenched canyon portions of both areas were surveyed, and all obvious sites were recorded. This was done in anticipation that recreational use of the proposed Primitive Area additions would be most intensive inside the canyons, and that BLM needed baseline data regarding sites present in those canyon systems.
The field coverage in 1976 was similar to the CMP prototype for random quadrat surveys, but somewhat less intensive for the canyon inventories. The level of documentation of sites, features and artifacts was much less intensive. No artifact collections were made, and sites were recorded on a two-page form with sketch maps. Most of the information gained by this sub-project on the distribution and frequencies of sites by time period and functional site type was incorporated in a monograph (Matson et al. 1990).

**Research: 1976 to Present**

Research was sporadic after 1976 when Lipe joined the faculty at Washington State University. A small reconnaissance was carried out in the spring of 1978 by Lipe and several graduate students from Washington State University to assess the possibilities for a larger survey and excavation project to be based in Comb Wash. Several east-west transects of the valley of Comb Wash were subsequently surveyed and several sites were recorded. No artifact collections were made. In 1984, Karen Dohm of Washington State University conducted excavations at 42Sa4248, a Basketmaker II and III site that had been recorded and tested as part of the CMP Testing Program in 1972-73 (Dohm 1981) that resulted in a doctoral dissertation (Dohm 1988).

Matson, funded through grants from the Social Sciences and Humanities Research Council of Canada, returned to Cedar Mesa in 1991 and 1992 under what had been dubbed Cedar Mesa Project II “to further explore the origins of the Anasazi tradition on Cedar Mesa” (Matson and Brand 1995:1). Limited excavations were undertaken at several Basketmaker II sites in the Hardscrabble Drainage that had initially been identified by the CMP Quadrat Survey that had seemed anomalous with regard to their lack of association with soils suitable for dry-farming. The goal was to determine whether these sites were “related to the earlier White Dog Phase Basketmaker II, the later Grand Gulch Phase Basketmaker II occupation, or to a previously unrecognized Late Archaic occupation” (Matson and Brand 1995). In addition, Matson tested site NR C9-5, a defensive site, to obtain dates and determine if it could be assigned to one of the Basketmaker II phases. As part of the 1991-1992 fieldwork, Karen Dohm conducted a block survey of an area in the North Road Drainage “to establish the extent of the Grand Gulch Phase habitation site aggregations and to determine if dispersed Basketmaker II villages existed” (Matson and Brandt 1995:2; see also Dohm 1995). Matson and Brandt (1995) suggested the Basketmaker II occupation of Cedar Mesa could likely be attributed to a migration of San Pedro Cochineal-like maize farmers who first cultivated the canyon bottoms through floodwater irrigation and later as dry farmers on the mesa top (1995:153). The results of these investigations are addressed in greater detail in Chapter 4.

In summary, the Cedar Mesa Project was an extensive regional survey focused on an 800-square-kilometer area ranging between 1700 meters (5600 feet) and 2070 meters (6800 feet) in elevation, with most of the vegetation being either pinyon and juniper or sagebrush flats. This area was divided into 20 drainages, five of which were sampled at a 7 percent rate by quadrats 400 meters to each side. A total of 76 quadrats were surveyed and 357 sites were identified (Lipe and Matson 1971b; Matson and Lipe 1975a, 1978; Matson et al. 1990). These were mapped and surface artifacts were collected within 1-meter-square provenience units. In addition to quadrat surveys, five drainage canyons were completely inventoried and 291 sites were documented. Of these, 115 of these sites were randomly selected for more extensive mapping and collection (Matson et al. 1990; Morton 2002). Test excavations were conducted at 12 sites, all but one (Turkey Pen, see Matson 1991 and Powers 1984) located within quadrats. Finally, the Tree-Ring Architectural Survey produced architectural maps and collections at 25 well preserved canyon sites (“Cliff Dwellings”) in the Grand Gulch area or in McLoyd’s canyon on the east site of the mesa (Bedell 2000; Bloomer 1989).

The project resulted in the collection of about 55,000 potsherds and 100,000 lithics
artifacts from 497 sites, all of which were documented by abundant notes, forms, photographs and maps. Some 130 sites located within the quadrats were classified as Basketmaker II sites, termed the Grand Gulch Phase, which was based on numerous tree-ring and radiocarbon assays with dates between A.D. 200 and 400 (Matson 1991; Matson et al. 1990; see also Dohm 1995, Matson 1994, Matson and Brand 1995). The mesa was depopulated after Basketmaker II times and then reoccupied in late Basketmaker III times (A.D. 650-725), termed the Mossbacks Phase. This phase was based on the identification of 49 sites within the quadrats.

After the Mossback Phase, the mesa was again abandoned (not a single Pueblo I site was found). In the A.D. 1000s the mesa was again occupied during what was called the Windgate Phase (A.D. 1060-1100) with a Mesa Verde ceramic tradition that may have overlapped with the Clay Hills Phase (A.D. 1100-1150) with a Kayenta ceramic tradition. Either a decrease in population or a short hiatus occurred, which was followed by the Woodenshoe Phase (A.D. 1165-1210) with Mesa Verde-style ceramics again dominating the collection. This was followed by the terminal Pueblo II-III period (A.D. 1210-1270), which includes the latest Cedar Mesa tree-ring date of 1268, marking the end of the Pueblo III period and the last major occupation of Cedar Mesa. The Pueblo II-III period is represented by 132 sites located within the quadrats.

Other University Projects

Although the vast majority of academic research in the Cedar Mesa area was being conducted through the Cedar Mesa Project, other university researchers were engaged in other unaffiliated projects. These efforts were short-term and produced only a few descriptive reports. Keller et al. (1974) mention that a brief survey of Kane Gulch, Step Canyon and Grand Gulch at Collins Spring Canyon were investigated by M.J. Harner of the University of California, Berkeley, in 1954 (citing Harner 1954), but this report was not located during this literature search. In 1967, Ray T. Matheny of Brigham Young University initiated investigations in the Dry Wash Canyon, Picket Fork Canyon and Tower Canyon areas (no report of this initial survey was identified). In 1968, Weber State College entered into a partnership with Brigham Young University, and the project area was expanded to include Milk Ranch Point and the mesas above the Texas Creek-Arch Canyon area.

The 1968 surveys, which were intended to be the initial phase of a long-term research project into settlement patterns in the area (Green 1969:iii), identified 821 sites and found an average site density of 45 sites per square mile (DeBloois 1975; DeBloois and Green 1978; Green 1969); Louthan (1977:1) indicated this survey was conducted in 1971. He also indicated the 1972 surveys were extended to Chippean Ridge where another 518 sites were documented (Louthan 1977; Matheny 1975). And in 1973 and 1974, surveys in the South Cottonwood and Dry Mesa areas identified 236 sites (Berger et al. 1976; Matheny and Gurr 1975). Most of these areas are outside the Greater Cedar Mesa area as defined in this overview.

These investigations were conducted in cooperation with the Forest Service, which was seeking to identify areas suitable for chaining of pinyon and juniper. One site in the Milk Ranch Point area was tested in 1971, and in 1974 four sites in the same area and four others in the Horse Flats area of Cottonwood Wash were tested as part of a National Science Foundation-funded student project (Louthan 1977:1; see also Louthan 1974 for descriptions of the excavated sites). Most of the areas investigated are just outside of the Greater Cedar Mesa area as defined in this overview, and consequently these efforts are only briefly reviewed.

Most of what is known of the BYU-Weber investigations, called the Elk Ridge Project, is found in three masters' theses (Dykman 1975; Hardy 1975; Louthan 1977). Hardy's descriptive report outlines a pattern of dispersed but interrelated cliff structures, mesa top villages and towers at Picket Fork Canyon (1975:180). These features
were interpreted as evidence of Mesa Verde Anasazi occupations, primarily during Pueblo II times with sparse evidence of Pueblo I and Pueblo III occupations; there was little or no evidence of influence from other regions (Hardy 1975:189-190). Louthan’s thesis addressed sites in the Chippean Ridge area where sites were predominantly habitations attributed to Pueblo I occupations, with a lesser early Pueblo II manifestation (Louthan 1977); this area is also outside the project area considered here.

In the late 1990s, Jonathan Till, a masters’ candidate at the University of Colorado, also initiated investigations in the Comb Ridge area to document the nature and distribution of Chacoan roads and associated sites (Till 1991, 2001). Seven previously recorded sites and 30 unrecorded sites were documented which had a temporal range from late Basketmaker to Pueblo III times. These sites appear to be related to trails or transportation corridors that would have connected groups living in the Cedar Mesa area to those living in Butler Wash and other areas to the east.

In addition, Winston Hurst, Jonathan Till and Catherine Cameron of the University of Colorado have been conducting investigations of Chacoan-like great houses in southeastern Utah, in particular the Bluff and Comb Wash areas. Relevant to the study area, the Comb Wash complex occupies a prominent location opposite the Comb Ridge drainage, is surrounded by a dispersed community of small sites and features an extensive network of prehistoric roads. The site dates to the mid- to late Pueblo III period, and unlike Chacoan great houses, the kivas are more representative of Mesa Verdean kivas, and towers were located around an adjacent spring, again a pattern more indicative of Mesa Verdean influence (Cameron 2009; see also Hurst et al. 2004). These data are discussed in greater detail in Chapter 5.

**Stabilization and Assessment Projects**

BLM interest in the cultural resources of the Cedar Mesa area dates to at least the mid 1960s when BLM personnel began photographing sites in the area, particularly in Grand Gulch. In 1965, Gordon N. Keller of Utah State University initiated a large-scale stabilization effort in Grand Gulch (in Donald Keller et al. 1974:28), apparently using Portland cement, repositioning beams to stabilize walls and rigging a pulley device to transport materials from the canyon rim. Un-used bags of cement were left behind where they were observed during the course of the Cedar Mesa Project many years later (William Lipe, personal communication 2009).

In response to increased recreational use of the Greater Cedar Mesa area and the consequent damage to cultural resources, the BLM and U.S. Forest Service (USFS) in the 1980s initiated a series of baseline surveys, data recovery and site stabilization initiatives. Unlike the earlier federal efforts that dovetailed with the Cedar Mesa Project, these efforts were contracted to private entities, including the Division of Conservation Archaeology (DCA), with Margaret Powers as principal investigator, and Nickens & Associates, with Paul Nickens as the principal investigator. Although these projects contributed no significant insights to human adaptations in the region, they offer detailed site descriptions and perspectives on the nature and extent of site degradation and vandalism.

The first major data recovery effort was initiated in 1980 when DCA was contracted to mitigate the damage from the 1979 vandalism of Turkey Pen Ruin (42Sa3714). Vandals working at night had excavated dozens of pits into the dry middens searching for artifacts of commercial value and discarding unwanted materials on the site surface where they were then vulnerable to surface collection. DCA mapped all features and looters’ pits (Figure 2.14), screened the back-dirt piles and refilled the looters’ pits. Intact strata were recovered from each looters’ pit and pollen and macro-botanical samples were obtained (Powers 1984).

The investigations revealed even when substantial portions of a site have been looted that valuable scientific information (e.g., pollen, microrefuse) can be recovered from back-dirt piles and remaining intact deposits. An estimated 120 cubic meters of fill had been disturbed by looters,
who used narrow shovels to dig small holes to locate deposits of a certain consistency, then dug around and undercut the deposits to extract items. The depths of the pits exceeded 1.5 meters in some instances. The vandals did not use screens, and small artifacts like figurines, bone awls and stone tools were found scattered about (Powers 1984:121-122).

In 1984, the BLM initiated efforts to construct a walkway through Junction Ruin (42Sa5106) and to stabilize walls at Kiva G, all to ameliorate the cumulative effect of uncontrolled pedestrian traffic at the site. Limited excavations were conducted in advance of ground-disturbance, and ceramics with a temporal range of A.D. 1000 to 1300 were identified, as well as corn cobs, cordage and other artifacts. These artifacts were not in original context, having been disturbed by pedestrian traffic through the site midden (Matlock 1985). In 1985, the BLM contracted with Nickens & Associates to assess the stabilization needs at nine sites in the Grand Gulch Primitive Area, all of which were well known to the public and were receiving extensive visitation. Among these were Turkey Pen Ruin (42Sa3714), Bannister House (42Sa3659), Split Level Ruin (42Sa5118), Two-Story House (42Sa3128), Perfect Kiva (42Sa5795), Green Mask Ruin (42Sa3711) and Junction Ruin (42Sa5106). The report contains detailed site descriptions and site condition assessments that are rare in earlier reports for the area (Metzger et al. 1986).

Concurrent with the Grand Gulch assessments, Nickens & Associates in 1985 also conducted detailed site condition and stabilization assessments at eight sites on USFS lands at the northern edge of the Greater Cedar Mesa in the Arch Canyon area (generally). Among the sites described was Lewis Lodge (42Sa256) (Metzger et al. 1985). Based on these assessments, stabilization of selected sites was initiated in 1986 when 22 structures were stabilized (Eininger et al. 1987; Metzger et al. 1987). Most of these sites are at the northern edge of or outside the study area considered here.

Another project warrants mention here, although it was not part of a government-sponsored site assessment. In 2006, the Colorado Plateau Archaeological Alliance analyzed the impacts of vehicular and pedestrian traffic in Arch Canyon on the northeast periphery of the study area. CPAA revisited nine previously recorded sites in the lower and middle Arch Canyon corridor to assess current site condition, including an examination of surface evidence of intentional vandalism, graffiti, ORV damage, illegal collecting, improper modern camping, site modification, littering and any other recreation impacts evident on the site surface. Archaeological sites were also analyzed based on their visibility, accessibility and potential for adverse effects. During the course of identifying previously recorded sites, 14 additional sites were identified and documented during a non-intensive examination of a roughly 1-kilometer-long section of the canyon (Spangler 2006).

Although the surveys were not systematic, data suggested a potential site density of roughly 10 prehistoric sites per kilometer in the bottom of Arch Canyon, and that sites would be found on both sides of the canyon in relative proximity to the canyon floodplain. Based on evidence observed at these sites, it was concluded that (1) most but not all sites identified were located on cliff ledges or in sheltered areas above the floodplain that were not directly affected by wheeled vehicles, (2) off-road vehicle travel may be damaging potential middens at the bottom of slopes and floodplain areas that were likely the focus of prehistoric agricultural activities, (3) most sites visible from the existing route have suffered significant vandalism, site degradation and illegal surface collecting from canyon visitors, although there is no way to determine when these activities occurred or who initiated them, (4) sites not visible from the route exhibited less evidence of adverse impacts from visitation, although these sites are being visited, and (5) there is an extremely high potential for unidentified sites along the main route that are directly accessible to ORVs (Spangler 2006).
Cultural Resource Management Projects

Passage and subsequent implementation of a variety of cultural and environmental protection laws in the 1960s and 1970s prompted federal land managers to actively pursue cultural resource management strategies that resulted in large numbers of archaeological mitigation projects. That policy initially prompted universities to create separate entities to accommodate contract archaeological projects resulting from those federal mandates. By the late 1970s, universities could no longer meet the demand for archaeological clearances in advance of development, resulting in a proliferation of private contract archaeological firms (Hardesty et al. 1986). Much of the archaeological research conducted on Cedar Mesa since 1980 was the result of contracts between various archaeological research companies and the federal government or private entities seeking approval for developments on public lands (herein referred to as cultural resource management, or CRM investigations).

Whether labeled cultural resource management, salvage archaeology, public archaeology, contract archaeology or conservation archaeology, compliance with federal regulations by private archaeological companies has resulted in 194 archaeological reports related to Cedar Mesa. While these projects have contributed to the site data on file with the Utah SHPO, most of those reports lacked theoretical orientation and have not contributed significantly to a broader understanding of regional cultural manifestations. Rarely has there been total compliance with federal mandates regarding the identification, mitigation or preservation of cultural resources. Traditionally, cultural resources have been identified through inventories of limited spatial areas impacted by development. And while the cumulative database has been augmented by the documentation of hundreds of sites, this process has rarely been accompanied by regional research strategies designed to recover maximum archaeological data (Janetski and Talbot 1998). Cedar Mesa-related projects are not discussed here, but are tabulated and referenced in Appendix B at the
end of this report, with the recognition that cum-
mulative data have the potential to contribute to
an understanding of regional chronology, demog-
raphy and environmental variables that may have
influenced human adaptations in the region.

**Other Research Projects**

In addition to the CRM-type of projects, other research-oriented projects have been under-
taken, largely under the umbrella of the BLM’s
Section 110 mandate to identify, evaluate and
nominate resources under its jurisdiction or con-
trol. Two of the most notable include a rock art in-
ventory undertaken by Sally Cole, and a concerted
effort by a small cadre of volunteers seeking to
identify the final locations of artifacts that were
removed from the region by the early museum
collection expeditions of the late nineteenth and
early twentieth centuries.

The Utah BLM-Earthwatch Project (pop-
ularly referred to as the “Utah Canyons Rock Art
Project”) was conducted between 1993 and 2001
to collect baseline archaeological data in wilder-
ness and remote areas of Southeastern Utah.
Using volunteers from Earthwatch Institute (the
primary grantor) and a professional staff, large
sections of Kane Gulch, Grand Gulch and Bullet
Canyon on Cedar Mesa were subjected to com-
prehensive survey. Additional areas in Slickhorn
Canyon and Point Lookout canyons were investi-
gated, as was the San Juan River bench. The proj-
ject resulted in detailed maps, as well as detailed
architectural and artifact drawings. A number of
sites initially documented in the 1950s to 1970s
were reevaluated during the project, which was di-
rected by Sally Cole. The BLM sponsored the re-
search and contributed necessary logistical
support and radiocarbon dating of alcove surface
finds and wood charcoal from an eroding hearth
(Sally Cole, personal communication 2009).

More than 200 sites were documented in
the general area. The project was designed to
record sites and collect information about sites
under increasing pressure from recreation, and
where it was known that a great number of ex-
posed artifacts (particularly pottery) had been re-
moved and architecture and middens were being
impacted. Thus, areas surveyed included the main
trails and tributaries of Grand Gulch, which in-
volved backpacking one month each season.
Baseline data collection and refining and
testing stylistic criteria for Basketmaker rock art
were the initial goals of the project, although re-
searchers eventually developed an interest in plas-
ter murals as the project progressed (Sally Cole,
personal communication 2009).

The Wetherill-Grand Gulch Research
Project involved "Reverse Archaeology," in which
professional photographer Bruce Hucko, and four
avocationalists (Julie Johnson, Fred Blackburn,
Ann Phillips and Ann Hayes) spent thousands of
volunteer hours researching sites within Grand
Gulch and visiting museums throughout the
United States, piecing together information to lo-
cate the collections which had been excavated and
taken from southeastern Utah before 1900. This
effort produced an archive of all accumulated doc-
uments that is now housed at the Edge of the
Cedars State Park in Blanding, Utah (Blackburn
and Williamson 1997). The exhibit, *Landscape
Remembers: Reverse Archeology in Canyon
Country*, was opened in 1996 at the Utah Museum
of Natural History, and included artifacts “redis-
covered” by this project group as well as informa-
tion on their methodology and research. The
project also resulted in a 1990 Anasazi Basket-
maker symposium that produced a monograph of
selected papers on the research efforts and current
understandings of the Basketmaker II period in
Cedar Mesa to that time (Atkins 1993). The sub-
sequent popular publication *Cowboys and Cave
Dwellers* by Fred Blackburn and Ray Williamson
(1997) thoroughly articulated the historical expe-
ditions and subsequent discoveries since the pro-
ject’s conclusion. This remains an ongoing
project, although on a much smaller scale.

Another interesting avenue of research
concerning “Great Features” of southeastern Utah
is also ongoing. In 1988, archaeologist Winston
Hurst chartered a plane to see if a prehistoric road
that had been described in South Cottonwood
Wash was still visible. The discovery that seg-
mants of this road were still visible spawned the
Prehistoric Roads Project of Southeastern Utah (Hurst and Till 2002; Severance 1999; Hurst et al. 1993; see also Till 1999, 2001), and also kicked off the search for Great Features such as "great kivas," "great houses," and associated community features. To date, at least six great house sites have been identified in the Comb Wash and Cottonwood Wash region, as well as a number of possible great kivas and 160 kilometers (100 miles) of prehistoric roads or road segments in the region generally (Hurst and Till 2002). This effort has benefited greatly from the research of Owen Severance, who has contributed important new insights into settlement patterns and cultural dynamics in the Cottonwood Canyon, Comb Wash and Elk Ridge areas (Severance 1999, 2003, 2004, 2005, 2006, 2008). Severance has identified three great kivas in the heart of Cedar Mesa (these are not yet documented, but they are mentioned in Hurst and Till 2002).

**General Observations**

Clearly, the data collected during the course of the Cedar Mesa Project have made invaluable contributions towards an understanding of prehistoric adaptations throughout time and across space in the Greater Cedar Mesa area. The high quality of the masters' theses and dissertations is not only commendable, but perhaps unprecedented in Utah archaeology. At the time of the Cedar Mesa Project fieldwork, it was anticipated that the collections it produced would be returned to Utah for final curation at the Edge of the Cedars Museum in Blanding, Utah. Because of the large volume of materials and records involved, and of the existing space limitations at the Edge of the Cedars, it was decided by the Utah State Office of the Bureau of Land Management that the Museum of Anthropology at Washington State University should continue to be the repository for these materials. In 1999, the Museum of Anthropology received funds to inventory the Cedar Mesa Project records and collections and to assess their condition (Lipe and Matson 2007; Hemphill et al. 1999).

Subsequently, Washington State University (WSU) and the Utah State Office of the BLM entered into a cooperative agreement to rehabilitate the collections and records in order to bring them up to current federal curation standards. Attempts to obtain funding for this work through the Save America's Treasures Program were not successful, and the Utah State Office of the BLM has funded the effort out of its cultural resources budget. As a matching contribution, WSU has provided facilities for the rehabilitation work, as well as the time of Museum of Anthropology Director Mary Collins and Professor Emeritus William Lipe (Lipe and Matson 2007).

The Cedar Mesa Collections Rehabilitation Project started in 2000 and is currently ongoing. The rehabilitation work includes entering catalogs of site data into a computer database, checking collections against the catalog records, copying paper records onto acid-free paper, labeling and filing all records, duplicating color slides and compiling an archive of project-related correspondence, reports and publications. The small number of human remains and possible funerary items included in the collections were identified and inventoried in compliance with NAGPRA (Lipe and Matson 2007). This worthwhile effort will contribute enormously to the creation of a single database for the Greater Cedar Mesa area, which in turn will facilitate future research.
Chapter 3

Hunting and Gathering in the Greater Cedar Mesa Area from 9000 to 1000 B.C.

Introduction

The prehistory of the American Southwest is commonly organized into different periods, and while terminology and temporal ranges differ between researchers and from area to area, the basic periods relevant to this overview are: (1) Paleoindian, with an emphasis on hunting large fauna during late Pleistocene times and prior to the onset of hunting and gathering strategies adapted to fully xeric conditions, (2) Archaic, which is characterized by the hunting of smaller Holocene mammals, the gathering of a diversity of desert plants, and the emergence of agriculture in some areas as a supplement to foraging, (3) Formative, which is characterized by increased dependence on cultigens with a continued reliance on wild resources, and (4) Late Prehistoric when hunting and gathering strategies again predominated. The Formative is most commonly associated with Ancestral Puebloan (or Anasazi) populations, whereas the Late Prehistoric is generally associated with ancestral Navajos, Paiutes and Utes. And while Puebloan temporal-cultural sequences continue through historic times in some areas of the Southwest, these are poorly represented in the Cedar Mesa area.

Following is a brief summary of the archaeological evidence of prehistoric groups that inhabited the Greater Cedar Mesa area prior to the advent of agricultural lifeways, perhaps as early as 1000 B.C. (see Chapter 4). For the purposes of this chapter, this period of time encompassed human adaptations predominantly oriented toward the procurement of locally available flora and/or fauna, in contrast to subsequent lifeways focused on food production. As discussed below, this time frame has been organized into a variety of periods, phases and complexes defined in specific areas of the Colorado Plateau. These organizational schemes are summarized in greater detail elsewhere (Berry and Berry 1986; Bond et al. 1992; Lipe and Pitblado 1999; Nickens 1982; Woodbury 1979; Irwin-Williams 1979; Jennings 1978; Spangler 2001; Simms 2008), and are addressed only briefly here.

Although the Paleoindian and Archaic evidence from the study area is scant, these periods of time are briefly discussed within a regional context that may offer avenues for future research. This discussion is particularly relevant to this overview in that it addresses the fundamental question in Southwestern archaeology of whether or not there is cultural continuity through time (e.g., did Archaic hunting and gathering evolve out of a big-game hunting Paleoindian tradition, or does it represent a displacement of Paleoindian groups by foragers better adapted to desert environments). Later in the Archaic sequence, the question of continuity is relevant to the appearance of agriculture and by extension the origins of the Ancestral Puebloan farmers. Researchers debate whether agriculture was an in situ development from an Archaic base (Kidder 1924; Irwin-Williams 1973, 1979), or was the region punctuated by periods of occupation, abandonment and reoccupation by immigrants from the south with new technologies and different lifeways (Berry and Berry 1986; see also Matson 1991 for a consideration of the regional data relevant to both hypotheses).

Paleoindian

Determining when the earliest humans arrived on the northern Colorado Plateau remains a topic of considerable fascination among scholars and the public. Until relatively recently, most archaeologists denied the presence of early man on the Colorado Plateau, citing the paucity of Pleistocene megafauna that could have been exploited by Paleoindian hunters. As late as the 1960s, Jennings argued that “probably because of aridity and
a dearth of the big game animals, the classic big-game hunters of the Plains ... are not found west of the Rockies" (1966:89). Since that time, however, archaeologists and paleontologists have documented not only a significant catalog of extinct Pleistocene fauna in the region, but the presence of distinctive Paleoindian artifacts typically associated with the hunting of extinct and modern fauna present during terminal Ice Age times (Agenbroad 1990a; Frison 1991; Grayson 1993; see also Graf and Schmitt 2007 for a Great Basin perspective).

The presence of early hunters on the Colorado Plateau is now generally accepted. But beyond agreement that humans were present in the region by about 10,000 B.C., there is little agreement among scholars on chronological sequences, definitions, geographic distinctions, settlement patterns, subsistence strategies or the technological implications of different artifact assemblages. Scholars cannot even agree as to whether the Paleoindian and Early Archaic manifestations are one and the same, or whether they represent distinct adaptations to different environmental variables. Willig and Aikens (1988) have rejected the term Paleoindian in favor of “Pre-Archaic” to distinguish what they perceived to be subtle differences in subsistence patterns between groups who hunted large migratory fauna in the Southwest and Great Plains, and coexistent Archaic peoples of the Great Basin who practiced a generalized hunting and gathering subsistence strategy. Other researchers have used the term “Paleoarchaic” to emphasize that while tool kits were different, human adaptations were similar to those in subsequent Archaic times (Graf and Schmitt 2007; Haynes 2007).

Evidence of early man in western North America near the end of the Pleistocene Epoch, or last “Ice Age,” has recently been documented as early as 14,000 years ago in the Pacific Northwest (Gilbert et al. 2008), whereas the earliest evidence in the Southwest and Great Basin has been reported from sites dating from about 11,000 to 12,000 years ago, usually in contexts related to the hunting of large mammals. A hunting strategy focused largely on large fauna persisted for several millennia in certain areas of the American West, perhaps as recent as 8,000 years ago on the High Plains where environments were more conducive to large herds of bison and other mammals (Frison 1991).

A more generalized Archaic hunting and gathering strategy, however, is clearly evident in the archaeological record by about 10,000 years ago, as evidenced by stratified deposits at Danger Cave in the eastern Great Basin (Jennings 1957, Madsen and Rowe 1988), Joe’s Valley Alcove in northeastern Utah (Barlow and Metcalfe 1993) and Cowboy and Joe Walter caves in the Canyonlands area (Jennings 1980), all to the north of the study area. Similarly, Archaic deposits have been dated to about 10,000 years ago at Dust Devil Cave in the Glen Canyon area (Ambler 1996) and from the Kaibab Plateau (Shroedl 1988), located to the west of Cedar Mesa. Collectively, these data suggest that broad-based hunting and gathering was present in southern Utah and northern Arizona at a time that might have been concurrent with the last vestiges of the big game hunters or was itself part of a big-game-hunting strategy that was evolving and adapting to Holocene environments.

Evidence of Paleoindian occupation and exploitation of the Colorado Plateau is generally rare (Copeland and Fike 1988; Schroedl 1977b, 1991), particularly when compared to the dozens of Paleoindian sites documented on the northwestern Plains and the comparative abundance of early Archaic sites now reported throughout the Great Basin and Colorado Plateau. Any attempt to reconstruct Paleoindian lifeways, therefore, requires the discussion of archaeological evidence from much broader geographic contexts. For more comprehensive reviews of Paleoindian data from Utah, see Copeland and Fike (1988), Madsen et al. (1976) and Schroedl (1977b, 1991). For a review of Paleoindian complexes from the Southwest, see Bond et al. (1992), Irwin-Williams (1979), Irwin-Williams and Haynes (1970), Davis (1989) and Lipe and Pitblado (1999); and from the Great Basin see Grayson (1993), Willig et al. (1988) and Graf and Schmitt (2007).
Most traditional cultural-ecological models of Paleoindian lifeways have emphasized the role of big-game hunting to the near exclusion of smaller or more abundant flora and fauna. As a general characterization, “Paleoindians were hunters and gatherers, exercising highly mobile strategies and manufacturing sophisticated hunting tools and a diversity of items appropriate for butchering game and processing hides, wood and bone” (Cordell 1984:142). Because most Paleoindian sites feature items found in hunting tool kits, it is assumed that Paleoindians were highly mobile, following and hunting “big game” such as mammoths, camels, bison, and horses (but see Beck and Jones 1997 and references therein, and Lipe and Pitblado 1999).

Most scholars now agree that Paleoindians probably exploited a broad environmental niche that included now-extinct mammals, but that adaptive strategies were probably similar to those in the subsequent Archaic period in that a broad range of plant and animal resources were exploited (Copeland and Fike 1988; Haynes 2007; Willig and Aikens 1988). Little is known about Paleoindian social, religious or political behavior, although it is assumed Paleoindians were organized at a band level. Using archaeological evidence and ethnographic analogy, Jennings (1978) and Frison (1991) speculated that Clovis peoples hunted individually or in small groups. During subsequent Folsom times, hunting expeditions were more organized, involving traps and communal efforts. Later Paleoindian hunters organized even larger communal hunts.

The earliest well-documented site representing this period in Utah is Danger Cave, located near Wendover (Jennings 1957; see also Rhode et al. 2005), where dates obtained from hearths show human occupation in the cave at approximately 10,300 years ago, or well within the range of Paleoindian temporal sequences. Although potential Paleoindian artifacts were recovered from the lowest stratum, these were subsequently lost. Most evidence at Danger Cave, as well as at other early Great Basin sites, is more indicative of Archaic-like human exploitation of marsh environments that once thrived around terminal Pleistocene lakes (Beck and Jones 1997; Graf and Schmitt 2007; Kelly 2001; Currey and James 1982; Rhode et al. 2005). A similar adaptation has not been proposed for the Colorado Plateau, which is characterized by deep canyons and high plateaus rather than lakes. In this region, Paleoindian evidence is commonly associated with river riparian areas such as the Colorado River, San Juan River and Green River drainages.

Archaeological sites assigned to the Paleoindian typically include isolated artifacts or artifact scatters with no associated cultural deposits, kill and butchering sites, and small open campsites. Kill sites include evidence of animal skeletal remains and tools, including points of the various complexes that were utilized in the killing and butchering processes. The numbers of animals represented at kill sites ranges from one to as many as 200 animals. Kill sites are typically found near the banks of former lakes or streams, or at the base of cliffs where animals were stampeded to their deaths.

Campsites frequently occur on ridges or dunes, and the remains include broken, split, and/or charred food bones; hearths; flint knapping debris; and a wide range of stone tools that include both fluted and non-fluted points, several varieties of scrapers, and utilized flakes. Both campsites and kill sites appear to have been located close to water and in areas with good vantage points for observing game. That Paleoindian peoples have been consistently labeled big-game hunters is due in large part to the archaeological bias toward recognizable kill and butchering sites that have yielded abundant evidence of hunting technologies and meat processing, and to the paucity of stratified deposits that would shed light on other aspects of Paleoindian lifeways.

Paleoindian complexes are distinguished primarily on the basis of distinctive projectile points. Sites containing remains of large Pleistocene mammals are sometimes associated with fluted points (Clovis and Folsom), non-fluted points (Black Rock Concave base and Great Basin Concave base variants), and large stemmed points of the Great Basin/Western-Stemmed and Windust
varieties (Beck and Jones 1997). Projectile points commonly attributed to Paleoindian occupations have been found at sites throughout southeastern Utah (Spangler 2001; Bond et al. 1992; Copeland and Fike 1988; Nickens 1982), although all of the Paleoindian points reported from southeastern Utah were defined in contexts far removed from the study area. There is more ample evidence from dated contexts in Nevada and throughout the Colorado Plateau (Beck and Jones 1997; Stiger 2001).

The Paleoindian period of time in the Southwest is traditionally divided into three sequential complexes each defined on the basis of changes in projectile point types and differences in the animals that were available for exploitation as the Pleistocene environment changed from cooler, wetter regimes to warmer, drier modern conditions (cf. Jennings 1974; Schroedl 1977b). Although temporal overlapping occurs, it is generally possible to place the complexes into a chronological order beginning with the Llano (or Clovis) Complex, followed by the Folsom Complex, and culminating with the Plano Complex (see Figure 3.1 and Figure 3.2). All three complexes are represented in southeastern Utah, although such evidence is widely dispersed and no clear patterns of human behavior have been identified in or near the study area. Only one Paleoindian site has been documented within the study area, and one other site is located immediately adjacent to the study area (discussed below).

Paleoindian assemblages have been documented throughout the Four Corners area, but as yet they have not been documented in stratified cultural deposits that have produced radiocarbon dates. Paleoindian materials are often found in multi-component contexts (likely the result of curation by later groups), or as isolated artifacts. Lipe and Pitblado (1999) have noted that fluted points in general are extremely rare in the region, hypothesizing that this is the result of a widespread, but limited utilization of the region by early Paleoindian hunters (1999: 101). They observed a slight increase during the late Paleoindian (Plano), with 14 occurrences of Angostura and nine Great Basin Stemmed points in southwestern Colorado. Some Great Basin Stemmed varieties (Figure 3.3) are identical morphologically to Jay points of the Oshara Tradition in the San Juan Basin, an Early Archaic manifestation in the region (Lipe and Pitblado 1999). They see the sparse record of Paleoindian utilization of the Four Corners region as suggesting an infrequent use of the area, probably on a seasonal basis.

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Figure 3.1: Regional Paleoindian temporal sequences. Modified from Spangler (2001).
Figure 3.1: Projected points and cumulative C-14 years B.C. (x1000)

Figure 3.2: Southwestern Paleoindian temporal sequences and corresponding point types. Modified from Agenbroad (1990a).

Figure 3.3: Representative examples of Great Basin Stemmed points common in the Four Corners area. Modified from Byer et al. 2008.

The Llano Complex

The earliest of the three complexes in southeastern Utah, the Llano Complex is characterized by the manufacture and use of the Clovis point, a distinctive fluted, lanceolate point averaging 8 to 15 centimeters in length (Figure 3.4). Throughout the High Plains and Southwest, such points have been found in association with now-extinct Pleistocene fauna, in particular mammoth (*Mammuthus sp.*) (Figure 3.5). As a result of several radiocarbon determinations, it is traditionally assumed that the Llano Complex can be placed between 11,500 and 11,000 B.P. (see Frison 1991 for a summary of these data).

Clovis kill sites and campsites were generally located at or near water sources, suggesting that prey were ambushed at or near these sources. Late Pleistocene mammals may have been retreating to water sources due to warming climates and dropping groundwater tables that restricted the availability of water. Detailed stratigraphic studies at the Lehner Ranch and Murray Springs sites in Arizona and the Blackwater Draw Site in New Mexico suggested that these Pleistocene mammals were not abundant during Clovis times and were possibly on the verge of extinction before they were targeted by Clovis hunters (Agenbroad 1990a:19). Although it is widely assumed that Clovis peoples were specialized big-game hunters, Grayson cautions that the mere fact that Clovis peoples were capable of harvesting large mammals does not mean that big game hunting provided a critical part of their diet or that mam-
mammoth hunting was even an important part of their lifeway. The “apparent importance of mammoths to Clovis people may result instead from the very biased way in which our sample of Clovis sites has accumulated” (1993:71).

Seven sites with Clovis points have been reported in or near southeastern Utah, five of which consisted only of isolated points or point fragments. In the Clearwater Canyon area of the Orange Cliffs, a fluted point was identified as a “Clovis fluting mistake rather than Folsom” (summarized in Spangler 2001). A Clovis point was discovered in Oak Creek Canyon, San Juan County (Lindsay 1976); a Clovis point was noted just south of the Utah-Arizona state line in Navajo County (Agenbroad 1967); and a Clovis point was found along Bullhorn Wash near Lisbon Valley in northeastern San Juan County (Black and Copeland 1981). And a known but undocumented site located in the Whirlwind Gulch area immediately west of the study area has produced two complete Clovis points, other Clovis point fragments, and an unspecified number of Clovis-like end scrapers. All are now in private collections (Bill Davis and Greg Nunn, personal communication 2008). Additionally, a single fluted biface base fragment was found at 42Sa24179 in Natural Bridges National Monument, but this point was associated with a slab-lined hearth feature more consistent with an Archaic or Basketmaker occupation. This artifact exhibits ground lateral margins and collateral flaking consistent with Clovis technology. It appears to be unfinished, having broken sometime during the fluting process (Irwin 2001).

Directly applicable to a discussion of Cedar Mesa is the Lime Ridge Clovis Site (42Sa16857), located in the southeast portion of the study area on a high ridge overlooking the San Juan River, roughly 4 kilometers northwest of the confluence of Comb Wash and the San Juan River. Some 294 artifacts were recovered, including one lanceolate biface fragment, two Clovis points and nine end scrapers. The two Clovis point base fragments exhibited lateral edge grinding and fluted surfaces. This site is thought to represent a hunting camp overlooking a riparian corridor likely used by large prey as they moved from an upland foraging zone to a riverine environment below (Davis 1989).
Late Pleistocene fauna may also be depicted in rock art near the current study area. Hauck reported two rock art panels (42 Ka 1840 and 42 Ka 1843) in lower Escalante Canyon that he believed could be representations of mammoths (Figure 3.6). Both panels “have been well weathered but are still fairly well discernible. In each case, the tusks, knob on the top of the head, and tail are well defined and identifiable” (1979:320). These images are similar in execution to two other “mammoth” representations in the Moab and Indian Creek areas, both north of the study area. All four of these sites are associated with the Colorado River or a tributary drainage with perennial water.

Research in southeastern Utah over the past two decades has convincingly demonstrated that late Pleistocene mammals were indeed present in the Colorado River drainage at a time when humans could have been in the region. In the Glen Canyon area, mammoth boluses (preserved dung balls) from Bechan Cave (dated between 11,600 and 13,400 B.P.) indicated the presence of xeric upland vegetation and lower riparian mesic vegetation (Agenbroad et al. 1989). The abundance of aquatic vegetation in the dung suggested that large fauna may have concentrated along streams and rivers in an otherwise arid landscape (Bond et al. 1992).

Also in the Glen Canyon area, investigations at Grobot Grotto, Mammoth Alcove, Hoopers Hollow and BF Alcove revealed considerable Pleistocene animal dung, including mammoth, extinct mountain goat, marmot, camel (Figure 3.7), horse (Figure 3.8) and bison (Agenbroad and Mead 1990b:59-67). And in south-central Utah, dung of mammoth, bison, horse, camel and sloth (Figure 3.9) was observed at Cowboy Cave (Jennings 1980). No unequivocal evidence of human activity in direct association with Pleistocene mammals was noted at any of these alcoves, although one bison bone at Cowboy Cave exhibited faint traces of polish “as if its broken end had been used as a scraper or as a polishing device against some soft material” (Jennings 1980:14-15).

Researchers have concluded southern Utah was, in Pleistocene times, a sagebrush-steppe with a riparian community near the streams. This botanical community is virtually the same as today’s nearby uplands of the Henry Mountains and the Aquarius Plateau at elevations ±1200 m (±4000 feet) higher. The upward migration (increased elevation) of plant communities can be roughly correlated with warming and sea-
sonal precipitation changes near the cave during the past 11,000 years (Agenbroad and Mead 1990a:56). Researchers placed the extinction of Pleistocene fauna in this area at about 11,000 years ago (Agenbroad and Mead 1990b:69) and within the range of the first humans in the Southwest.

Packrat studies at Fishmouth Cave, a large alcove located roughly 25 kilometers (15.5 miles) north of the Lime Ridge Clovis site, yielded middens dating from 12,770 to 9700 B.P. These deposits reflect cooler summer temperatures and increased precipitation during the Pleistocene-Holocene transition that would have supported riparian vegetation in some areas. This vegetation may have supported populations of large mammals such as mammoths and bison. The concentration of animals along these riparian areas could have attracted hunters to the area (Betancourt and Biggar 1985; Davis 1989). Of particular relevance to this information, a mammoth femur was collected by a local cowboy in the 1940s in Butler Wash just upstream from Fishmouth Cave (Bond et al. 1992).

Folsom Complex

Folsom sites elsewhere in the West typically date to about 11,000- 9,000 B.P., and are identified on the basis of a smaller, fluted point (Figure 3.10). The flutes are typically longer and deeper than Clovis specimens, often running almost to the tip of the point. Folsom materials include burins, end scrapers, bifacially prepared cores, denticulates, gravers, bifacial knives and bone and antler tools. Since the Folsom projectile point seems to be a smaller, more stylized version of the Clovis point, it might reflect adaptation to smaller, fleeter prey (Agenbroad 1990a:22; see also Frison 1991 and Irwin-Williams and Haynes 1970).

Animal remains commonly found in association with Folsom points include now-extinct bison (*Bison antiquus*) and many modern species. It is assumed that the shift from hunting the larger Pleistocene mammals (e.g., mammoths) to bison (Figure 3.11) reflected not only diminished numbers of mammoths, but changing environments from high-grass plains characteristic of the Pleistocene to a shorter-grass prairie of Holocene times that favored bison and other smaller ungulates.
With few exceptions, large fauna found in Clovis contexts had become rare, if not extinct, during Folsom times. Besides bison, Folsom hunters exploited modern species of antelope, canids and jackrabbit (Copeland and Fike 1988:6; Grayson 1993). Like Clovis points, Folsom points have been found in greater concentrations on the Colorado Plateau than in the Great Basin (Schroedl 1991). In both Plains and Southwestern contexts, evidence from Folsom kill sites and campsites suggests a greater, but not exclusive, dependence on bison hunting within more-geographically restricted areas (Frison 1991).

In southeastern Utah, Folsom points occur in about the same frequency as Clovis points (six sites). A fluted point fragment was identified at 42Ga3034 in the Orange Cliffs area that was interpreted as an unfinished Folsom point constructed of non-local materials; and a possible Folsom point was recovered at a campsite (42Ga2489) with slab-lined hearths, also in the Orange Cliffs area. Site records indicate a Folsom point was recovered from 42Ga312 in the southern Henry Basin and 42Ga899 in the upper Escalante River area (summarized in Spangler 2001; see also Copeland and Fike 1988; Davis 1989). On the Dark Canyon Plateau to the northwest of the present study area, Sharrock and Keane (1962) described a fragmentary Folsom point from Sweet Alice Springs. Also, a possible Folsom point was discovered on Elk Ridge near Milk Ranch Point (Irwin 2001). No other description was provided.

Like earlier Clovis times, Folsom hunting strategies may have been focused on faunal resources tethered to a greater or lesser degree to river corridors or nearby springs. This is clearly evident at two major Folsom sites near the Green River roughly 160 kilometers (100 miles) north of Cedar Mesa. The Montgomery Site, located on a terrace above the river, yielded 188 tools, including two Folsom point fragments, spurred transverse end scrapers, borers or gravers and numerous flakes with bifacial retouching with distinctive Folsom attributes. “The large amount ofdebitage, stone tools and weaponry implies a relatively large concentration of several families, possibly a band, who engaged in tool production and maintenance, faunal procurement and processing” (Davis 1985:12). The location of the site in proximity to the Green River may have been indicative of large mammals concentrating along riparian corridors in an otherwise increasingly arid landscape in terminal Pleistocene times (Bond et al. 1992; Davis 1985).

The nearby Dawson Site is a large, dense lithic scatter located in sandy dune deposits around a now-desiccated spring and playa. The assemblage consists of numerous Paleoindian projectile points, bifacial tools and debitage. More than 200 surface artifacts were collected, including the largest Paleoindian point assemblage yet documented in Utah. Point types represented include two Cody Complex points, 14 Folsom points and preforms, six Clovis fluted points and preforms, two Midland points, three lanceolate points, nine Great Basin Stemmed points, and a single Elko Series dart point (Smith et al. 2007). Limited testing in 2008 failed to locate subsurface cultural deposits, although researchers speculate that the area was repeatedly occupied as a campsite where stone tool maintenance occurred (Byers et al. 2008).

**Plano Complex**

The third and terminal Paleoindian period was the Plano Complex, which has been dated in Plains contexts to the period 9,000 to 7,000 years ago. This complex is identified by a number of projectile point types which have considerable
variation in form and geographic distribution (Figure 3.12). Plano points are generally lanceolate in shape, are not fluted, and exhibit fine pressure-flaking. Typically, Plano points and other tools are discovered with early postglacial fauna, such as modern bison or antelope. The temporal sequence for Plano points, typically defined by excavations at kill sites on the Great Plains, often overlaps the temporal sequences for the Early Archaic Period as traditionally defined in the Great Basin and Colorado Plateau. The Plano Complex is traditionally interpreted as a persistence of big game hunting strategies of earlier times but adapted to Holocene environments (see Frison 1991).

Researchers have noted that evidence of Plano peoples is virtually nonexistent in many areas of the Southwest, perhaps indicating abandonment of entire regions. Some have suggested that “in marginal areas the human population became increasingly concentrated around the principal remaining resources, leaving large areas subject to only marginal or temporary occupation” (Irwin-Williams and Haynes 1970:67). It is certainly possible that Plano hunters withdrew to other areas such as the northwestern Plains where large faunal resources, in particular bison, were more abundant. It is also possible that large fauna on the Colorado Plateau were always limited, and human populations had shifted adaptive strategies toward smaller fauna and plant resources by at least 9,000 years ago, if not a millennium earlier (Jennings 1978, 1980).

Evidence of Plano hunters in southeastern Utah is somewhat more common with at least 12 sites in southeastern Utah yielding diagnostic points. A point from 42Ga3185 in the Orange Cliffs area was described as similar to points from the James Allen and Hell Gap sites. A fragment of an isolated jasper projectile point recovered in the southern Henry Basin was suggestive of a late Paleoindian form with shoulders (e.g., Hell Gap points). And the shape and chipping technique of one point from 42Ga94 in the Escalante River drainage was deemed “within the range of Plainview,” although other chipped-stone and groundstone artifacts at the site were not considered to be of similar antiquity. In the Orange Cliffs area, 42Ga3201 yielded a Lake Mojave-like point, although it also was recovered in a context with features believed to date considerably later. A terminal Paleoindian point was recovered in the Orange Cliffs area at 42Ga3156 that was described as a large lanceolate point exhibiting an oblique pressure flaking technique that was similar to Frederick-Lusk points dated to about 9000 to 8000 B.P. on the Great Plains (see Spangler 2001 for citations).

Figure 3.12: Representative examples of Paleoindian points from southern Utah. Modified from Spangler (2001).
Somewhat closer to the study area, a Plano point was found near Monticello to the northeast of Cedar Mesa (Reed 1996). Hicks (1975:44) reported three Plano points from the Hovenweep National Monument area. His tentative classifications of the Hovenweep points included fragments of a possible Scottsbluff I or Eden point, a possible Plainview point, and a possible Agate Basin or Angostura point, as well as a complete Gypsum point (Archaic). Adjacent to the study area, a large non-fluted lanceolate point was also recovered in the Butler Wash area in the 1980s and is currently accessioned at the Edge of the Cedar Museum in Blanding (Figure 3.13); this point has not been analyzed.

Summary

Although data from the study area specifically is limited to a single site, evidence from southeastern Utah indicates that the region was exploited by sparse and dispersed populations of Paleoindian hunters during Llano, Folsom and Plano times. Like other portions of southern Utah, the Greater Cedar Mesa area, in particular areas adjacent to the San Juan River, could have served as a vital resource base during late Pleistocene times. It is possible that late Pleistocene animals were tethered to a greater or lesser degree to the riparian resources found along the San Juan River, and evidence of human exploitation of these resources will be found in association with the riparian corridor.

If large fauna survived in the Colorado River drainage during terminal Pleistocene times (cf. Agenbroad and Mead 1990a, 1990b), relic populations of these animals might have eventually retreated to higher elevations as local climates began to transition toward modern Holocene conditions. If this model is valid for the Colorado Plateau generally, there should be evidence humans were exploiting these animals in the higher refuge environments. Evidence that certain large fauna retreated to higher elevations has indeed been reported from the Wasatch Plateau in central Utah, where late Paleoindian point types (Medicine Lodge Creek points) were recovered near a high-elevation mammoth site dated to between 11,500 and 9,500 years ago (Gillette and Madsen 1992, 1993).

Another hypothesis has been offered by Frison (1991), who suggested that two distinctive Paleoindian subsistence strategies had emerged by 10,000 years ago. One was oriented towards open plains and part-time bison hunting, and the other was focused on resources in foothill and mountain slope environments. The foothill subsistence strategy was defined as more Archaic in that it featured both hunting and gathering (1991:67). If this foothill pattern is relevant to other areas of the West, including the plateaus of the Southwest, then evidence of late Paleoindian hunters in the higher-elevation environments may be indistinguishable from an Early Archaic pattern of hunting and gathering evident by about 10,000 years ago.

Although Paleoindian groups are thought to have oriented their subsistence patterns toward the larger, migratory fauna, recent research suggests at least partial dependence on smaller animal species and edible floral species available in a variety of environmental settings occupied by these groups (Lipe and Pitblado 1999; Beck and Jones 1997). Unequivocal evidence of this is currently lacking, and it is difficult to identify in archaeological contexts due to problems of poor preservation of macrofloral evidence at open sites and the high mobility of the Paleoindians that undoubtedly masks the overall
importance of these food items in the Paleoindian economy.

Paleoindian land-use patterns in the Cedar Mesa area cannot be hypothesized based on the limited evidence reported to date. And it is possible the Paleoindian presence here was never significant. As summarized by Schroedl (1992:6), "as fluted point complexes gave way to Plano complexes on the High Plains and the greater Southwest, Paleoindian subsistence patterns on the Colorado Plateau seem to have swiftly shifted to an Archaic mode with the corresponding artifact assemblage. Outside of a few scattered Plano points in the region at the higher elevations, there is no evidence that Plano complex cultures played a significant role in the prehistory of the area." Geib expanded on that concept, arguing that the region had a "low-level Paleoindian occupation" until about 9,000 years ago, after which "Archaic hunter-gatherers soon resettled the abandoned rugged canyon landscape" (1996a:28). Contemporaneous Paleoindian hunters "simply moved on rather than alter their lifestyle, leaving open a vast chunk of territory for populations already employing a generalist subsistence strategy -- foragers spreading out of the eastern Great Basin" (1996a:29).

Although it cannot be stated with certainty when the last Paleoindian hunters were found in southeastern Utah, current evidence suggests that an Archaic lifeway characterized by an expanded diet-breadth and a wider flexibility in resource-oriented subsistence patterns, was evident in the Four Corners area by at least 10,000 B.P. and that evidence of Early Archaic hunters and gatherers is ubiquitous by 8,000 B.P. (see Spangler 2001 for a summary of the relevant radiocarbon data). The earliest Archaic hunters and gatherers may have coexisted with Plano hunters, as evidenced by morphological similarities between Great Basin Stemmed points and Jay points of the Oshara Tradition, or the last of the Plano hunters may have simply adapted to the desert Southwest environments by becoming more reliant on hunting small game and gathering more predictable plant foods.

The Archaic

As discussed above, the earliest evidence of hunting and gathering in southeastern Utah dates to about 10,000 years ago, or the beginning of the Holocene when climates and vegetation regimes were assuming modern conditions. By 8,000 years ago, there is abundant evidence of Archaic hunting and gathering, most of it derived from deposits in alcoves, caves and rockshelters. Hunting and gathering remained the predominant subsistence strategy, although with periods of greater and lesser intensity, until 2,000 years ago when foraging was replaced by agriculture as the predominant subsistence strategy. Based on a growing corpus of radiocarbon dates, there is no convincing evidence in southern Utah of long cultural hiatuses during the Archaic (Figure 3.14; see also Chapter 4).

The transition from Pleistocene to Holocene environmental conditions was marked by the disappearance of large fauna at the end of the Pleistocene, the appearance of vegetation communities adapted to widespread xeric conditions and the human exploitation of a wider range of plant and animal resources (Cassells 1997). This dramatic shift can be at least partially explained by the change in environmental conditions. According to Beck and Jones (1997), conditions after 8000 B.P. were considerably dryer than those of the preceding four thousand years. This drying trend corresponds to an increase in the archaeological record of groundstone implements (manos and metates, in particular), as well as a greater frequency of birds, fish and small mammal bones that reflect a broader diet and a greater reliance on resources that have lower return rates (Beck and Jones 1997; Cassells 1997).

It is generally accepted that Archaic populations practiced a highly mobile hunter-gatherer lifeway, following the seasonal availability of plant and animal foods for subsistence. They probably traveled in small groups and were able to cover large amounts of territory in a relatively short amount of time (Cassells 1997; Grayson 1993). It is possible that Archaic groups utilized
Figure 3.14: Radiocarbon date frequency curve for the Colorado River drainage west of Cedar Mesa demonstrating an absence of extended hiatuses. Modified from Spangler (2001).

caves at a higher rate relative to open sites, although these data may be biased in that sheltered localities offer better preservation of cultural remains (Cassells 1997; Madsen et al. 1976).

**Theoretical and Environmental Context**

The Archaic period in the American West is traditionally characterized as a period of suprafamilial, mobile bands of about 25 individuals who seasonally exploited a wide spectrum of plant and animal species in different environmental niches. Archaic cultures are generally seen as sharing broadly similar hunting and gathering lifeways, but with distinct regional adaptations to local environmental conditions (Jennings 1978; Schroedl 1976). In concept, the Archaic is defined more in terms of hunter-gatherer lifeways than by variations in material culture. In practice, this period of time has been described more in terms of changes in basketry (Adovasio 1970a, 1970b), sandals (Ambler 1996), figurines (Coulam and Schroedl 1996) and projectile points (Holmer 1978, 1986).

Traditional definitions of Archaic hunter-gatherers have emphasized the “broad spectrum” of resources being exploited. And although many different plant and animal species may have been opportunistically exploited by Archaic hunter-gatherers, data from a growing number of sites on the Colorado Plateau, eastern Great Basin and northwestern Plains suggest a more restricted subsistence strategy where settlement patterns and organizational responses were structured around intense procurement of primary resources and opportunistic exploitation of lesser-ranked resources.

Modern hunter-gatherer theory in the western United States is unquestionably rooted in the pioneering research of Julian H. Steward (1938, 1940), a cultural ecologist whose research into Great Basin Shoshoneans marked the first significant attempt to apply ethnographic obser-
vations to interpretations of the prehistoric record. Steward recognized a consistent pattern throughout the Great Basin where populations were sparse, dispersed and highly mobile. Subsistence was generally unspecialized, revolving around intensive exploitation of available plant and animal species. There was little social organization beyond the nuclear family, territories were neither recognized nor defended, and economic cooperation among groups larger than the family was infrequent (Bettinger 1978:27; Steward 1938, 1940, 1955).

Like many earlier researchers, Steward's initial descriptions of Shoshonean hunter-gatherers (1938, 1940) were clearly influenced by environmental determinism in which different environments were seen as influencing (or constraining) the nature of technological adaptations, which in turn influenced other aspects of culture (Willey and Sabloff 1980:151). Researchers have observed that in his later writings, Steward became an advocate of cultural evolution, becoming "increasingly less interested in the effect of environment and technology on hunter-gatherer adaptation" and ignoring adaptive variability "in order to make them fit the mold of an evolutionary level of sociocultural integration" (Bettinger 1991:45).

Steward's research provided the theoretical framework for Jesse D. Jennings' classic Desert Culture or Desert Archaic concept (Jennings 1956, 1957; Jennings and Norbeck 1955), in which Archaic peoples of the entire western United States were described as seasonal hunters and gatherers who employed common adaptive strategies to exploit a variety of desert ecosystems. Persuaded that Great Basin desert environments presented an insurmountable obstacle to evolutionary progress, Jennings maintained that a generalized hunter-gatherer adaptation persisted from about 10,000 years ago to the ethnographic present (see Bettinger 1991:46).

The Desert Archaic adaptive strategy was characterized by hunting, trapping and snaring of birds, insects, deer, antelope, mountain sheep, rabbits and other small animals, and the collecting of grasses, seeds, bulbs, nuts, roots, berries and other exploitable plants. Among the traits Jennings assigned to the Desert Culture were sparse populations and small sociopolitical groups; settlement locations in caves and overhangs; bark or grass beds; mobile seasonal gathering; and intensive but non-specialized exploitation of food resources. Jennings also described basketry, cordage, netting, matting, fur cloth, tumplines as carrying devices, sandals, atlatl darts and a variety of chipped-stone artifacts, flat milling stones with cobble manos, specialized stone tools, digging sticks, fire drills, wooden clubs, horn-shaft wrenches, tubular pipes, *Olivella* shells and domesticated canines (Jennings 1956:70, 1957:280-281, 1960, 1966, 1978).

The Desert Culture concept has been often criticized for underemphasizing the role of climatic fluctuations and differences in regional environments (Baumhoff and Heizer 1965; Davis 1966; Heizer 1956). Irwin-Williams (1967, 1973, 1979), while acknowledging cultural continuity throughout the Archaic, argued that Jennings' catholic Desert Culture that subsumed the entire American West failed to recognize important differences between Archaic groups adapted to Great Basin environments and those of the Southwest (1967:445). Aside from typological differences in artifacts between the two regions, the only major difference between Irwin-Williams' Oshara Tradition and Jennings' Desert Culture was the presence of domesticated plants perhaps as early as 2000 B.C. in some areas of the Southwest that would have restricted seasonal movement and encouraged sedentism. Jennings (1974, 1978) and others (Aikens 1970; O'Connell 1975) have argued that adaptive diversity to regional environments is entirely consistent with the Desert Culture concept.

Generally, it can be stated that hunting and gathering of a wide variety of economic plants and animals was practiced throughout the Southwest, and that these strategies were similar but not identical to hunter-gatherer adaptations elsewhere in the Southwest. As summarized by Berry and Berry (1986:320), hunters and gatherers throughout the Archaic "saw only minor shifts in resource availability and, in response, made minor adjustments in exploitative range. In
the process, they sometimes encountered new classes of resources that required modifications in extractive technology or a reorientation of relative resource dependency. None of these constituted major evolutionary developments."

**Archaic Environments.** As discussed in Chapter 1, paleoenvironmental reconstructions relevant to the Archaic period have demonstrated a wide range of climatic diversity across the West, with only general patterns evident across broad geographic areas. In the Southwest specifically, beginning about 8000 B.C., climates were cooler and perhaps wetter than today, but warmer and drier than the preceding Pleistocene. Through time, temperatures warmed, and there was a reduction in effective moisture compared to earlier times as modern desert biotic communities became established. Climatic warming resulted in increased seasonality, and a strengthened monsoonal flow yielded moist conditions across the Southwest (Beiswenger 1991; Carrara et al. 1991; Whitlock and Bartlein 1993). Packrat midden evidence suggests the increase in subtropical moisture continued from 8000 and 4000 B.C. (Betancourt 1990; see also Coats et al. 2008). The monsoonal weather pattern is supported by pollen and macrofloral data that suggest a high timberline and warm temperatures until 4000 B.C. (Carrara et al. 1991). These conditions may have fostered the spread of pinyon pine northward into the northern Great Basin at this time (Madsen and Rhode 1990).

After about 4000 B.C. the paleoenvironmental record reflects considerable regional variability, and in some areas the evidence is contradictory. In the Black Mesa area, the Tsegi alluvium (3800 B.C. to A.D. 1450) was interpreted as having formed under relatively warm, moist conditions (Karlstrom 1988), whereas in the San Juan drainage, sand dune activity reflected dry conditions that continued from 4000 and 500 B.C. (Hall 1990). Pollen evidence from elsewhere on the Colorado Plateau indicates cooler temperatures and winter precipitation patterns dominated from 1700 to 1300 B.C., producing an expansion of woodlands. Between 1000 and 900 B.C., cool and dry conditions prevailed, followed by a shift to summer moisture and warmer temperature regimes that persisted from 900 B.C. to about A.D. 1 (Newman 1993a, 1993b; Petersen 1988). This contrasts with high-elevation pollen and plant macrofossil data from the Four Corners area that indicate a period of maximum warmth between 2600 and 100 B.C. (Carrara et al. 1991).

In the Four Corners generally, paleoclimatic reconstructions suggest warmer temperatures that correlate to stronger monsoonal moisture in the region during Middle Archaic times. This pattern would favor the growth of grasses and woody annuals that provided an important part of warm-season subsistence for Middle Archaic groups. The effects of the summer monsoon weaken from southeast to northwest, being less reliable in southeastern Utah than in northwestern New Mexico. It is possible that this was even more pronounced during middle Holocene times. The warming trend at this time may have also made higher elevation resources more attractive to Archaic groups, as suggested by Reed and Metcalf (1999) for northwestern Colorado. A lowering of the upper tree-line to near its present location around 1500 B.C. is consistent with the shift of archaeological sites toward lower elevations around 2000 B.C. (Lipe and Pitblado 1999).

These data offer little insight into Archaic climates in the Cedar Mesa area specifically. It is probable that conditions after about 10,000 years ago were initially wetter and cooler than today, gradually becoming warmer but remaining moist due to monsoonal weather patterns that persisted through the next 4,000 years. From 4000 B.C. to A.D. 1, conditions may have varied considerably with cycles of warming and cooling, periods of greater effective moisture and less effective moisture, and shifts between winter-dominant and summer-dominant precipitation patterns. A more precise resolution of the Archaic paleoenvironmental record is not possible at this time due to the rarity of studies conducted in or near the study area that address this period of time. It can only be stated, based on packrat midden evidence at Fisheye Cave in Butler Wash, that modern floral and climatic conditions were evident during
middle and late Holocene times (Betancourt and Biggar 1985).

**Temporal Frameworks.** As originally proposed by Jennings, the Desert Culture or Desert Archaic was applicable to most of the western United States, including the Colorado Plateau, where subsistence strategies and settlement patterns remained relatively constant throughout many millennia, even to historic times in some areas. As traditionally applied by archaeologists, the term “Archaic” is used to denote hunter-gatherer adaptations prior to the introduction of cultigens (about 2,000 years ago in the study area). In fact, distinctions between traditionally defined Early Archaic, Middle Archaic and Late Archaic periods and the multitude of proposed phases and complexes are based largely upon shifting preferences in projectile point types rather than distinctive changes to long-held hunter-gatherer lifeways.

The appearance of Archaic lifeways was marked by the appearance of new projectile point types, perhaps reflecting the development of the atlatl in response to a need to pursue smaller and faster game (Holmer 1986:96-97). Beyond general consensus as to the basic nature of Archaic hunters and gatherers in the region there is frustratingly little agreement as to how the corpus of archaeological data should be temporally organized. Various temporal schemes for the Archaic are summarized in Figure 3.15.

Jennings (1978) recognized no Archaic substages, instead defining an Archaic Stage from about 10,000 to 1,600 years ago. Madsen (1982) recognized subtle differences in the archaeological record of the eastern Great Basin, defining an Early Archaic period from about 6500 to 3500 B.C., a Middle Archaic period from about 3500 to 1600 B.C., and a Late Archaic period from about 1600 B.C. to A.D. 1. The Early Archaic Period was characterized by a probable population expansion within a restricted area where subsistence was related almost exclusively to lake-edge resources. The Middle Archaic Period was characterized by the combined pressure of population expansion and diminishing lake margin resources that prompted a subsistence adaptation consisting of “a migratory shift from site to site, from one ecosystem to another, as resources became available in differing areas” (1982:215). It could be argued the Middle Archaic population expansion and resource stress in the eastern Great Basin prompted hunter-gatherer groups to expand into the rugged canyons of the Colorado Plateau.

Irwin-Williams (1967, 1973, 1979) proposed a Picosa Culture regional variant for the Greater Southwest, and included the Cedar Mesa area within her Northern Sector. Irwin-Williams (1973) later proposed an Oshara Tradition that included the sequential Jay Phase (5500-4800 B.C.), Bajada Phase (4800-3200 B.C.), San Jose Phase (3200-1800 B.C.), Armijo Phase (1800-800 B.C.) and En Medio Phase (800 B.C.-A.D. 400). According to Irwin-Williams (1979, 1973), the Jay Phase represents occupation of the Four Corners area by groups from the San Dieguito Complex to the west. These earliest Archaic groups filled the void left by the eastern retreat of the big-game hunting Paleoindian groups during the Pleistocene-Holocene transition. Jay Phase groups may have had ancestral roots in earlier Paleoindian traditions.

The Jay and Bajada phase sites were thought to reflect occupation by small bands of nomadic hunter-gatherers who repeatedly occupied certain favorable localities in an unstructured, continuing seasonal round. The San Jose phase witnessed a significant population increase during a period of increased effective moisture and concomitant amelioration of restrictions on local resource bases (Irwin-Williams 1979). The Armijo phase witnessed the introduction of cultigens, primarily maize, from Mexico, which resulted in the production of seasonal food surpluses and population aggregations on a small scale. The En Medio phase is roughly equivalent to the Basketmaker II period as defined in the San Juan River drainage, and marks the emergence of the fully horticultural-based Puebloan groups of the Four Corners area, likely in response to population pressure and shrinking foraging territories (Bond et al. 1992).
Researchers, however, have generally failed to find convincing correlates to Irwin-Williams' phase sequence in southeastern Utah or anywhere north of the Colorado River (Geib 1996a). Oshara point types are not common anywhere in Utah, but some have been found at a few sites in the Four Corners area. As mentioned earlier in this chapter, Jay Phase points (Figure 3.16) are morphologically similar to Lake Mojave and Silver Lake points, and may imply utilization of the area by people of the Great Basin/Western-Stemmed Tradition dating from 8000 B.C. to 6000 B.C. Near the study area, a single Jay point was found during the reconnaissance surveys in Natural Bridges (Irwin 2001).

More persistent in the archaeological literature of the Southwest is the Cochise Culture model, created to describe a continuum of Southwestern Archaic adaptations between late Pleistocene hunters and food-producing groups two or more millennia ago (Sayles 1983; Sayles and Antevs 1941; Whalen 1971). Researchers subsequently divided the Cochise into an early Sulphur Spring stage, a middle Chiricahua stage and a late San Pedro stage – all of which implied continuity. In a critical reanalysis of the model, Berry and Berry (1986) argued that data defining the Sulphur Spring and Chiricahua stages were misinterpreted or fictive, and that the more supportable San Pedro stage was unrelated to either of the earlier stages. The data used to develop the Cochise Culture model were defined from investigations in southern Arizona and New Mexico far removed from the study area considered here.

Other organizational schemes have been developed for the region generally, including the Rio Grande Complex of northern New Mexico (Renaud 1942), the San Jose Complex of northwestern New Mexico (Agogino and Hester 1956), the Moab Complex in eastern Utah (Hunt and Tanner 1960), the Desha Complex in the Navajo Mountain and Glen Canyon area (Lindsay et al. 1968) and the Aneth Complex in extreme southeastern Utah (Mohr and Sample 1959). North of the Colorado River, Schroedl (1976, 1992) defined a Northern Colorado Plateau Archaic complex to which he assigned four phases (later modified into periods). The modified sequence was based on a wealth of northern Colorado Plateau radiocarbon dates that contradicted “the idea that the Colorado Plateau was periodically abandoned and later reoccupied. Demographic continuity is implied, al-

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**Figure 3.15: Regional temporal schemes for the Archaic. Modified from Spangler (2001).**
though population undoubtedly fluctuated. Cultural continuity throughout the demographic fluctuations is still an open question" (Schroedl 1992:8).

Just west of the study area, Geib (1996a) has proposed a seven-period temporal sequence for the Archaic in the Glen Canyon and surrounding areas. Geib defined an Initial Archaic period from 8030 to 6840 B.C. (calibrated ranges are used in this discussion) that was characterized by a "settling in" of sparse populations utilizing Pinto Series, Elko Corner-notched and perhaps Sand Dune Side-notched points, open-twined and warp-faced sandals and perhaps clay figurings. An Early Archaic period, assigned a temporal range of 6840 to ~260 B.C., was characterized by increased populations, reoccupations of favored locales and perhaps reduced mobility. Material culture traits included Elko Corner-notched and Side-notched, Pinto and Sand Dune Side-notched points (Figure 3.17). Open-twined sandals were replaced by plain-weave sandals (Geib 1996a:38; see also Coulam and Schroedl 1996).

Geib then recognized an Early-Middle Transition period from 5260 to 4440 B.C. that was characterized by declining populations and a change in settlement patterns reflecting greater residential mobility. Sites previously occupied (e.g., Cowboy Cave, Joe Walters Cave, Sand Dune Cave and Dust Devil Cave) were abandoned. Early Archaic projectile points were replaced by distinctive side-notched types, including Northern, Sudden, Rocker and Hawken points (Figure 3.18). Plain-weave sandals continued to be used (1996a:37). Geib defined a Middle Archaic period from about 4440 to 2980 B.C., arguing this period was characterized by a drastic population reduction coinciding with Antevs' (1955) hypothesized Altithermal drought interval where conditions were significantly warmer and drier. The Middle Archaic material culture record was marked by the continuation of Sudden and Hawken Side-notched points and a continuation of plain-weave sandals (Geib 1996a:37).
A Middle-Late Transition Period was defined from about 2980 to 2200 B.C. This period was characterized by population increases that may have corresponded to climatic amelioration and expansion of pinyon into their current geographical range. Earlier side-notched point types were replaced by San Rafael Side-notched and McKean lanceolate points (Figure 3.19). Plain-weave sandals continued to be utilized and split-twig figurines appeared in the archaeological record (Figure 3.20).

Geib also defined a Late Archaic period from 2200 to 1045 B.C. that was characterized by the greatest population densities of the Archaic. Material culture traits included Gypsum, Elko eared and McKean lanceolate points (Figure 3.21), split-twig figurines and plain-weave sandals (1996a:37).

The sequences proposed by Schroedl (1992) and Geib (1996a) are based on a wealth of Archaic data from sites from the Glen Canyon and northern Colorado Plateau area, primarily derived from large rockshelters and alcoves. A similar distribution of Archaic sites in sheltered riverine settings and upland base camps has not yet been documented in the Cedar Mesa area, although such sites likely existed. As noted by Hurst (1992), such sites would be expected to occur in riverine areas susceptible to destruction by floods,
or in shelters where they could have been obliterated or obscured by later, more sedentary occupations. It is possible that more abundant evidence of Archaic exploitation of the region was located below the Basketmaker II occupations of major caves and rockshelters in the region, and that this evidence was destroyed during waves of artifact collecting in the late nineteenth century.

**Southeastern Utah Archaic**

Kearns (1990) has proposed a regional expression of the Oshara Tradition specific to the Four Corners area that parallels the San Juan Basin Archaic of northwestern New Mexico. These expressions are informal constructs that were neither rigorously defined, differentiated or bounded (Bond et al. 1992), but were meant to serve as points for discussion and comparison. Kearns suggested that Archaic populations in the Four Corners area probably followed a strategy similar to that suggested for the San Juan Basin, with foraging camps in the lowlands during the warm season and cold weather upland base camps. He noted a clear distinction in resource procurement and utilization between these two types of camps based on the presence or absence of groundstone implements. The warm season, lowland camps where groundstone is present represent foraging camps of small bands, focusing on the procurement of seed foods; the upland camps where little or no groundstone is present represent seasonally distinct campsites geared toward the acquisition of fauna and non-hard-seed producing floral resources (Kearns 1990).

Kearns noted the occurrence of slab-lined storage features in southeastern Utah Archaic sites and considered these to be distinctive features of the Four Corners Archaic. Lacking significant artifact assemblages, he suggests these sites represent locales where seed resources were cached and retrieved for on-site consumption. He further suggested that these caches were established in locations of seasonal resource abundance and utilized as buffers against seasonal periods of resource scarcity (Kearns 1990). This data, however, is derived entirely from surface survey, and the contemporaneity of the slab-lined features and Archaic artifact scatters was uncertain (Bond et al. 1992).

In general, the Archaic archaeological record in and adjacent to the Cedar Mesa study area is minimal at best, a pattern repeated in southwestern Colorado, where Lipe and Pitblado (1999) described an Archaic record that is much sparser and less understood than that of adjacent regions. In that region, Archaic sites tended to be more common in low-elevation, sandy grassland environments and poorly represented in pinyon-juniper uplands. In the Greater Cedar Mesa area, no definitive patterns have emerged. Only four Archaic projectile points and one possible point were found during the course of the entire Cedar Mesa Project (Matson et al. 1990: 23), and these were found in association with much later sites and probably re-
reflect collection by subsequent groups rather than any original context. These sites were located on or in association with the pinyon-juniper mesa top.

When the entire study area is considered, only 28 sites, or 1.2 percent of the total sites in the database, were assigned an Archaic affiliation (Table 3.1), and even these small totals may be overstated. A closer review of the site data reveals that temporally diagnostic Archaic projectile points were observed at only seven sites, and these were identified as to type at only three sites. An Archaic affiliation was assigned to two sites based on the presence of hard-pan cists, at one site based on the presence of a basin metate and at two sites based on rock art (one rock art site also featured Gypsum and Elko Corner-notched points). At 17 sites, an Archaic affiliation was assigned without any diagnostic artifacts or features, making these determinations highly questionable.

Only one Archaic site featured associated Archaic-age cultural deposits. At Old Man Cave (42Sa21153), a BLM ranger had collected an open-twined sandal characteristic of Archaic sandals made between 6,600 and 8,300 years ago in the Glen Canyon region (cf. Geib 1996a). A sandal fragment from Old Man Cave subsequently returned a radiocarbon date of 7,440 ±100 B.P. (B-40116), suggesting the cave on the northeast edge of Cedar Mesa indeed contained Archaic deposits. Later examination of the cave (Geib and Davidson

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1994) revealed extensive looting, but with surface evidence of a Basketmaker II occupation (basketry and cists).

Test excavations into deposits exposed by looters produced five additional Archaic-age radiocarbon dates and two Basketmaker II radiocarbon dates, all from well defined strata. The six Archaic radiocarbon dates constitute the only chronometric data reported from the Cedar Mesa study area relevant to the Archaic (Table 3.2). These data suggest an intense and repetitive Archaic occupation about 8,000 years ago, and that harvesting and processing grass seeds were the major economic activities. Burned bone around hearth features indicated some hunting also occurred. Intense Archaic utilization of the cave continued for about 1,000 years, after which cultural activity waned, as evidenced by thinner layers of cultural debris and their interspersion with layers of natural deposition that continued intermittently over the next thousand years. There was no utilization of the cave between about 6,000 years ago and 1,800 years ago, implying a lack of occupational continuity throughout the Archaic (Geib and Davidson 1994:200-201).

The Old Man Cave investigations are perhaps most significant in that they demonstrate a clear potential for Archaic hunting and gathering evidence at similar sites elsewhere on Cedar Mesa. There also remains the possibility that Archaic adaptations may have been focused on areas of the Cedar Mesa Plateau that were not subjected to previous investigations, and that earlier research designed to identify agricultural adaptations on the mesa top may have been ill-suited to identifying Archaic forager sites. This potential was reified during the recent documentation of an expansive sand dune encampment on the lower slopes of the mesa just above Comb Ridge where Archaic dart points (Figure 3.22) were observed at 42Sa28033, a site with evidence of repeated occupation over an extended period of time (Spangler and Yentsch 2009a).

Perhaps relevant to the Late Archaic in the Cedar Mesa region (and the appearance of the split-twig figurine complex elsewhere in the region) is the appearance in the Colorado River and San Juan River drainages of a distinctive rock art style referred to as the Glen Canyon Linear Style. Although there is some question about the antiquity of the images, Schaafsma (1980:72-75) argues that San Juan Basketmaker rock art images are sometimes superimposed over Glen Canyon Linear figures, and therefore the Glen Canyon images are of greater antiquity. Turner (1963) has argued the style dates from 6000 to 2000 B.C., although Cole (2009) assigns a more conservative range of 3000 to 400 B.C. This style is common in the San Juan drainage and is found in the Cedar Mesa study area (Figure 23), as well as at nearby Sand Island and Butler Wash.

The Glen Canyon Linear Style is characterized by deeply dinted, rectangular outline forms that are sometimes filled with horizontal or verti-

**Table 3.2**

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<thead>
<tr>
<th>Radiocarbon Age</th>
<th>2 sigma calibration</th>
<th>Lab No.</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>7790 ±80 BP</td>
<td>6994-6426 B.C.</td>
<td>B-47007</td>
<td>Charcoal/ash lens</td>
</tr>
<tr>
<td>7560 ±90 BP</td>
<td>6538-6181 B.C.</td>
<td>B-47742</td>
<td>Grass chaff</td>
</tr>
<tr>
<td>7440 ±100 BP</td>
<td>6454-6026 B.C.</td>
<td>B-40116</td>
<td>Open-twined sandal</td>
</tr>
<tr>
<td>6730 ±70 BP</td>
<td>5699-5449 B.C.</td>
<td>B-47743</td>
<td>Charcoal/ash lens</td>
</tr>
<tr>
<td>6120 ±70 BP</td>
<td>5227-4846 B.C.</td>
<td>B-48141</td>
<td>Charcoal/hearth</td>
</tr>
<tr>
<td>5890 ±70 BP</td>
<td>4930-4577 B.C.</td>
<td>B-47008</td>
<td>Rodent feces</td>
</tr>
</tbody>
</table>

Source: Geib and Davidson 1994.
cal cross-hatching. Zoomorphic figures include deer, bighorn sheep and humans with disproportionately large bodies and minor extremities. Other common figures include long wavy lines with knobs at the end to resemble heads, animal tracks, lines of dots, rakes, ladders, connected circles, grids and mazes (Turner 1963). As discussed by Cole (2009:46), "anthropomorphs and animals are highly stylized and repetitive in nature. They are frequently displayed in orderly rows across sections of cliffs or boulders, and figures with masks and headdresses are presumed to have had socio-religious significance. Locations along major rivers and streams of the plateau make clear the intent to communicate and reinforce these ideas and related practices."

Another late Archaic rock art style found in the Greater Cedar Mesa is the Chihuahuan Polychrome Abstract Style (Schaafsma 1980).
This style is evident at the Green Mask Site at Panels 2 and 3 high on the upper wall and ceiling (Figure 3.24), where the paintings “are bright and well preserved despite their proposed antiquity” (Cole 1993:199). This style is believed to be associated with hunters and gatherers throughout the Southwest, Great Basin and Great Plains, and may be part of the same regional rock art tradition (Schaafsma 1980).

Of note, the Barrier Canyon Style, also believed to be Late Archaic in age, is found in relative abundance along the Colorado River in the Glen Canyon and Canyonlands regions, extending north along the Green River drainage as far as the Uinta Basin. This style, however, is “rare or missing” in the San Juan River drainage (Cole 2009:60). By comparison, Glen Canyon Style sites are more common in the Colorado River and San Juan River drainages, but are also found throughout Utah as far north as the Uinta Basin (Schaafsma 1971:66-67).

Summary

The distribution of Archaic sites across the Cedar Mesa landscape offers no clear pattern (see Appendix A: Map 2), and any hypothesis of Archaic lifeways specific to the Cedar Mesa area is not possible at this time due to the rarity of excavated sites with Archaic deposits, the small number of sites with temporally diagnostic artifacts (only one sandal and a handful of Archaic projectile points have so far been reported), and the near-absence of any problem-oriented research specific to the Archaic period. Hence, any discussion of the Archaic in the study area must incorporate discussions from distant areas that may or may not be applicable to Cedar Mesa, of which Geib’s (1996a) discussion of Archaic adaptations in the nearby Glen Canyon area appears to be most relevant.

The limited Paleoindian and Archaic data from the study area constitutes a major data gap
in that, with a couple of exceptions (Davis 1989; Geib and Davidson 1994), no problem-oriented research has been conducted into this period of time. It is certain that Paleoindian hunters and Archaic hunters and gatherers were present in the region, but the current database sheds little light on whether these occupations were sporadic and infrequent, or whether the absence of evidence for a more robust pre-agricultural adaptation is actually a reflection of the dearth of research into human adaptations during this period of time. As such, several possibilities must be considered:

- Archaic occupations were once evident in the archaeological record of the region, but this evidence was obliterated during subsequent occupation of same alcoves and rockshelters during Basketmaker and Pueblo times.

- Such evidence was present, but excavations conducted during the late 1800s failed to recognize subtle differences between aceramic Basketmaker II occupations and earlier aceramic occupations of the same shelter.

- Paleoindian and Archaic land-use patterns were substantially different than later agricultural groups, and therefore earlier special-use sites (campsites, lithic production and procurement sites) are actually located in environmental niches that have not yet been investigated.

- The Paleoindian and Archaic utilization of the Cedar Mesa landscape was never substantial, and any such evidence reflects occupation by occasional hunters and foragers, none of whom remained in the study area for any length of time.
Chapter 4

The Advent of Agriculture: Basketmakers in the Cedar Mesa Area
B.C. 1000 to 750 A.D.

Introduction

As discussed in Chapter 2, the concept of cultural antecedents to the ubiquitous cliff dwellers of the Southwest emerged in the wake of Richard Wetherill’s observations while excavating in the large alcoves of Butler Wash and Cedar Mesa in the 1890s. In a February 4, 1894 letter to B. Talbot Hyde, Wetherill articulated a difference between “cliff dwellers” and “cave dwellers.” And for the first time he suggested the name “Basket People,” although he deferred to Hyde, writing “you should have the honor at least of naming these, since it is your expedition” (Wetherill 1894:2). In the more than 100 years since that time, researchers have persistently employed the term “Basketmaker” to describe certain pre-ceramic and early ceramic-using peoples of the Southwest who preceded the Puebloan agriculturalists. Although definitions, theoretical frameworks and temporal schemes have undergone periodic revision, the term has proved remarkably resilient and is used here to describe the earliest agricultural adaptations in the Greater Cedar Mesa area.

Formal definition of a Basketmaker cultural stage was the result of the 1927 Pecos Conference, a gathering of preeminent Southwestern archaeologists to discuss fundamental problems and “lay the foundation for a unified system of nomenclature” (Kidder 1927:489). The resulting chronological classification, based largely on architectural and ceramic differences, was “developmental and not strictly chronological. Despite the fact that ordering of periods has chronological implications, developments were not expected to be synchronous throughout the Southwest, nor were all developmental stages expected to be represented in every area” (Cordell 1984:56). The Pecos Classification scheme nonetheless established a relative chronological framework employed not only by Southwestern archaeologists, but by those then working on the so-called “northern periphery” (Gillin 1938, 1941; Morss 1931; Wormington 1955). The continued application of Pecos Classification nomenclature in the archaeological literature is testimony to the influence of Kidder’s cultural classification scheme, which remains relatively intact.

The Pecos Classification specified three periods of Basketmaker development in the Southwest (Kidder 1927; see also Table 4.1): (1) Basketmaker I, a postulated, but then-unproven pre-agricultural stage now encompassed within various Archaic periods; (2) Basketmaker II, typified by the absence of pottery, the utilization of the atlatl, the proliferation of a remarkable basketry technology, the lack of cranial deformation, and the presence of horticulture; and (3) Basketmaker III, characterized by the appearance of pit-houses or slab houses in small hamlets; ceramics without painting, scoring, incising or appliqué; and a continued lack of cranial deformation.

The list of defining traits assigned to each period has undergone considerable revision and augmentation since 1927 (see Table 4.2), and numerous changes to the Pecos Classification nomenclature have been proposed, often with good theoretical justification. As noted by Hurst (1992), the Pecos nomenclature “is somewhat silly and untidy” given the term “Basketmaker I” is no longer employed. He and others in the Southwest have suggested the more neutral terms “Early Basketmaker,” which is consistent with Basketmaker II and has a temporal range of 1000/500 B.C. to A.D. 400, and Late Basketmaker, which is consistent with Basket-
<table>
<thead>
<tr>
<th>Dates</th>
<th>Periods</th>
<th>Distinctive Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.D. 1350–1600</td>
<td>Pueblo IV</td>
<td>Large plaza-oriented pueblos in Rio Grande and Western Pueblo areas; low kiva to room ratio; kachina cult widespread; corrugated replaced by plain utility types; B/W pottery declines relative to red, orange or yellow types.</td>
</tr>
<tr>
<td>A.D. 1150–1350</td>
<td>Pueblo III</td>
<td>Large pueblos and/or “revisionist great houses” in some areas, dispersed pattern in others; high kiva to room ratios; cliff dwellings; towers; triwalls; corrugated gray and elaborate B/W pottery, plus red or orange pottery in some areas; abandonment of the Four Corners by 1300.</td>
</tr>
<tr>
<td>A.D. 900–1150</td>
<td>Pueblo II</td>
<td>Chacoan florescence; “Great Houses”, great kivas, roads, etc. in many but not all regions; strong differences between Great Houses and surrounding “unit pueblos” composed of a kiva and small surface masonry roomblock; corrugated gray and elaborate B/W pottery, plus decorated red or orange types in some areas.</td>
</tr>
<tr>
<td>A.D. 750–900</td>
<td>Pueblo I</td>
<td>Large villages in some areas; unit pueblos of “proto-kiva” plus surface roomblock of jael or crude masonry; great kivas; plain and neckbanded gray pottery with low frequencies of B/W and decorated red ware.</td>
</tr>
<tr>
<td>A.D. 500–750</td>
<td>Basketmaker III</td>
<td>Habitation is deep pithouse plus surface storage pits, cista, or rooms; dispersed settlement with occasional small villages and occasional great kivas; plain gray pottery, small frequencies of B/W pottery; bow and arrow replaces atlatl; beans added to cultigens.</td>
</tr>
<tr>
<td>A.D. 50–500</td>
<td>Basketmaker II (late)</td>
<td>Habitation is shallow pithouse plus storage pits or cista; dispersed settlement with small low density villages in some areas; campsites important as well (?); no pottery; atlatl and dart; corn and squash but no beans; upland dry-farming in addition to floodplain farming.</td>
</tr>
<tr>
<td>A.D. 50–B.C. 1500</td>
<td>Basketmaker II (early)</td>
<td>Long-term seasonal (?) use of caves for camping, storage, burial, rock art; San Juan Anthropomorphic style pictographs and petroglyphs; camp and limited activity sites in open; no pottery; atlatl and dart; corn and squash but no beans; cultivation primarily floodplain or runoff based (?).</td>
</tr>
<tr>
<td>B.C. 6500–1500</td>
<td>Archaic</td>
<td>Subsistence based on wild foods; high mobility; low population density; shelters and open sites; atlatl and dart; no pottery.</td>
</tr>
</tbody>
</table>


Basketmaker II (1000 B.C. to A.D. 400)

The definition of the Basketmaker II cultural concept has undergone considerable evolution over the past three decades (e.g., Berry 1982; Gumerman and Dean 1989; Janetski 1993; Matson 1991, 2006b). Hurst (1992) has loosely defined this period in southeastern Utah as commencing with the widespread adoption of substantial structures for surplus food crops and ending with the introduction of ceramics, and that
Table 4.2: Material culture, environmental and social changes from Basketmaker II to Basketmaker III times. Source: Robins and Hays-Gilpin (2000).

this period is marked by the transition from mobile Archaic hunting and gathering to largely sedentary lifeways focused around households (1992:41). Smiley has succinctly defined Basketmakers as “peoples of the northern Southwest, organized in small groups, cultivating Mexican-derived domesticated plants, using dry caves and rockshelters as storage facilities and marking their stewardship of such facilities by placing their dead within them in comparatively rich funerary context” (1985:10). Matson has cautioned that the mere presence of domesticated foods is not enough to label early evidence as Basketmaker II, but that there should be other corroborating evidence (2006b:158).

The variability in the archaeological record from one region to another throughout the Southwest has prompted researchers to suggest regional variants, such as the En Medio Phase of the Oshara Tradition in the San Juan Basin (Irwin-Williams 1973), the Los Pinos Phase in northern New Mexico and southern Colorado (Eddy 1966), the White Dog Phase in the lower San Juan River area (Colton 1939, Lipe 1967, 1970), the Lolomai Phase in the Black Mesa area (Gumerman 1984; Powell 1983; Smiley 1993) and the Grand Gulch Phase in the Cedar Mesa (Matson et al. 1990), each with different spatial and temporal connotations.
In some respects, a perception persists that the alcoves and rockshelters of Cedar Mesa were the heartland of the Basketmaker II expression in the Southwest. As noted by Hurst, this is probably a misleading perception perpetuated by the abundant material culture recovered from these alcoves, caves and rockshelters during the 1890s.

The Basketmaker people do seem to have utilized those caves much more intensively than any of their predecessors had, thus leaving us a wealth of preserved material unmatched by any other archaeological culture with the possible exception of their cliff dwelling Pueblo III period descendants. In contrast to Archaic periods, the Basketmaker people leap forth from their dry caves fully dressed (by Basketmaker standards), coiffured [sic], painted and equipped with a wonderful array of skillfully made baskets, bags, tanned hides, feather and fur robes, and tools of all sorts [Hurst 1992:42].

Most of the caves, alcoves and rockshelters of the Cedar Mesa area had been plundered by 1900 and long before archaeologists had the opportunity to study the remains in proper spatial and stratigraphic context. Consequently, the earliest detailed descriptions of the archaeological remains of the Basketmaker culture were derived not from sites on Cedar Mesa, but rather in northern Arizona where there was an abundance of lesser-disturbed alcove and cave sites (Guernsey 1931; Guernsey and Kidder 1921; Kidder and Guernsey 1919), and in southwestern Utah (Nusbaum 1922). These investigations provided the foundation for the traditional concept that Basketmaker II peoples were farmers and foragers who constructed bell-shaped and slab-lined storage cists in caves and rockshelters, were highly mobile in search of wild food resources, utilized atlatls with side-notched dart points, and constructed remarkable basketry (Figure 4.1) but had no pottery in the traditional sense. A temporal range of about A.D. 1 to 500 was posed at that time.

Much of what is known today about the Basketmaker II period is derived from research over the past four decades at sites in the Cedar Mesa and Glen Canyon areas of Utah and in the Black Mesa area of northern Arizona. The origins of the current theoretical context for Basketmaker II adaptations can be found in the University of Utah investigations resulting from the Glen Canyon Project (Lipe 1970; Sharrock et al. 1963), wherein Lipe (1970:93-104) described a sparse Basketmaker presence in the Castle Wash and Moqui Canyon areas just to the west of Cedar Mesa. This was characterized by a brief occupation in the A.D. 200s by a small, isolated band. A small cluster of open habitations in upper Castle Wash were interpreted as evidence of a cool-sea-

Figure 4.1: Representative example of Basketmaker baskets recovered from dry caves in the Four Corners region. Modified from Guernsey and Kidder (1921).
son residential base from which upland hunting and gathering were organized. Several lower-elevation alcove sites in Moqui Canyon were presumed to have been warm-season habitations, with storage sites located some distance from the habitations. Hunting and gathering camps with diverse artifact assemblages reflected domestic activities, sometimes by more than a single family.

The origins of Basketmaker II agricultural lifeways is typically discussed within the context of three hypothesized models. Irwin-Williams’ Oshara tradition model suggested that the interval between 2500 and 300 B.C. was characterized by greater effective moisture than the present, with the exception of a drought at about 500 B.C. If Archaic populations expanded in response to increased carrying capacity of local environments, then a drought could have prompted some groups to intensify agricultural production and implement storage strategies, thus initiating a transition to Basketmaker lifeways now recognized in the archaeological record (Irwin-Williams 1973; see also Wills 1988).

In contrast to models suggesting an in situ development of agriculture by resident Archaic populations, other researchers have advanced that climatic changes resulted in large-scale migrations leading to depopulation of some areas and aggregation in others, and that the origins of the Basketmaker II manifestation on the Colorado Plateau could be found in the San Pedro Cochise culture of southern Arizona (Berry 1982; Berry and Berry 1986; Morris and Burgh 1954; see also Irwin-Williams 1967 and Matson 1999, 2003).

Matson (1991), drawing from his research on Cedar Mesa, has also posed an “evolutionary model of maize horticulture” independent of in situ and migration scenarios, suggesting the introduction of agriculture across the Southwest was related to a series of three climate-linked stages: (1) floodwater farming in the southern deserts by 850 B.C., (2) floodwater farming of low-lying areas of the Colorado Plateau by 500 B.C. and (3) dry farming of the Colorado Plateau mesas, including Cedar Mesa, by about A.D. 200. As each new farming strategy appeared, it was first as an adjunct to an earlier form and later became the dominant form, but with the earlier forms not entirely disappearing (see Kohler 1992:620). Hence, by A.D. 200, a diversity of farming strategies was present, each resulting in a different settlement pattern and each characterized by pithouse residences.

**Maize Agriculture**

Inherent in all three models are assumptions that food production emerged as a predominant lifeway, and that agriculture resulted in profound changes to human behavior that distinguishes this period of time from earlier forager lifeways. These changes, invariably labeled Basketmaker II, are abundantly evident in the archaeological record of Cedar Mesa and elsewhere in the Southwest. Although early models suggested Basketmaker II groups were primarily hunters and gatherers who supplemented their diet with maize (Amsden 1949), more recent research, much of it resulting from Cedar Mesa data, has demonstrated these groups were obtaining “nearly all of their protein-forming carbon from C4 species (cereals)” at a rate 40 to 60 percent greater than during Archaic times, which “no doubt results from the introduction of maize into local diets” (Chisholm and Matson 1994:251; see also Matson and Chisholm 1991). Coprolite analysis (Aasen 1984; see also Lepofsky 1986) and stable carbon isotope analysis of bone samples (Matson and Chisholm 1991) also demonstrated a substantial reliance on maize that was equal to that of later Puebloan peoples in the same area.

These conclusions are supported by an analysis of lithic tools at Cedar Mesa sites revealed that the ratio of expedient stone tools to formal stone tools remained unchanged from Basketmaker II through Pueblo III times and that “the similarity in technological organization through time supports the notion that a shift to a more sedentary settlement strategy had already occurred prior to the Basketmaker II” and that “Basketmaker II people were adaptationally and organizationally similar to later Puebloans” (Nelson 1994:287, see also 1995).

There is growing evidence that the spread of agriculture was relatively rapid across
significant distances (Matson 1991; Smiley et al. 1986; Smiley 1993, 1994; Wills et al. 1989), and that it occurred much earlier than previously hypothesized. Research in the Fence Lake area of New Mexico has now firmly established the presence of maize in that region by about 2000 B.C. (Huber and Van West 2005). These data support the radiocarbon dates reported earlier from sites in the Marsh Pass area of northern Arizona (Smiley 1993, 1994), as well as radiocarbon dates reported decades ago that at the time seemed anomalous.

For example, Willey and Phillips (1958:128) had long argued that evidence from Bat Cave in west-central New Mexico demonstrates maize horticulture was “well advanced by 2000-3000 B.C.” Haury (1962) and Martin and Schoenwetter (1960) argued that evidence from Bat, Tularosa and Cordova Caves all supported the contention that maize horticulture began about 2000 to 1000 B.C. At Cienega Creek Site in southeastern Arizona, maize pollen was recovered from deposits dating to 2000 B.C. (Martin and Plog 1973:277). Thomas (1976:455) placed the advent of primitive maize horticulture as early as 3000 B.C., with squash and beans being cultivated by at least 1000 B.C. In his overview of the antiquity of maize, Geib (1996c:54) argued the “picture now emerging is one of widespread and relatively early (ca. 1200 B.C.) use of domesticates across much of the Southwest” (1996c:54; for overviews of relevant early maize data see also Huckell et al. 2002; Matson 1991; Smiley 1994; and Wills 1988, 1995).

Evidence of maize agriculture at such an early date has not yet been reported from the Cedar Mesa region, although there is potential such evidence could be found. In the Butler Wash area just east of Cedar Mesa, maize from Six-Toe Shelter produced a radiocarbon date of about 550 B.C. and squash from Boomerang Shelter returned a radiocarbon date of 180 B.C. (Charles and Cole 2006). The earliest maize radiocarbon date within the study area is about 90 B.C. at Turkey Pen Cave (Matson 1988). As evidence grows that early agriculturalists were present in the region for many centuries prior to 90 B.C., "whether the lower temporal boundary for Basketmaker II (in the Cedar Mesa area) should be extended back to 1700 or 2000 B.C. is a good question. It may be more sensible to confine Basketmaker II to the last few hundred years B.C. and the first 500 years A.D." (William Lipe, personal communication 2009).

How and when agriculture appeared in the Cedar Mesa area has significant implications for group mobility and sedentism, population dynamics and community structure. Traditionally, the transition to a sedentary or semi-sedentary lifeway has been described as resulting from increased dependence on agriculture (Murdock 1969; Wills and Huckell 1994). As described by Whalen,

*Increasing use of cultivated plants could be expected to impose new activity patterns on society. Larger residential groups are useful in increasingly labor-intensive agricultural situations. Larger communities can more successfully assert and maintain rights to resources, so that concentration of occupation in a limited zone could provide strong pressure for nucleation and largerscale organization of population. This, in turn, increases reliance on food production as the only viable means of supporting large, dense populations on a long-term basis [1981:89].*

The appearance of agriculture in the Cedar Mesa region and its effects on population demographics offer intriguing avenues for future research, including an examination of hypotheses that Basketmaker II groups were migrating from the San Juan River drainage as far north as the Uinta Basin by about A.D. 200 (Talbot and Richens 1996). Researchers on the northern Colorado Plateau frequently look to the Cedar Mesa region as a possible source for early agricultural technologies found north of the Colorado River,
but they are generally reluctant to attribute early maize radiocarbon dates to evidence of an outright colonization by Basketmaker II farmers. Coltrain (1994, 1996), however, has argued that successful maize cultivation precluded highly mobile foraging strategy characteristic of Desert Archaic foragers, and as such early maize horticulture was not a slow in situ development, but rather an introduction of a new lifeway into the northern Colorado Plateau by Basketmaker II peoples (1994:147-148).

Cedar Mesa Perspectives

Research by William Lipe, R.G. Matson and others over the past four decades in the Greater Cedar Mesa area has significantly altered current understandings of Basketmaker II adaptations in the region generally and on the mesa specifically. Evidence now suggests that human adaptations from about 1000 B.C. through A.D. 400 were characterized by contemporaneous utilization of alcoves in canyon settings and single pithouses on the mesa top (Matson 1991; Matson et al. 1990), and that the most conspicuous Basketmaker II evidence could be assigned to a period from A.D. 200 to 400, or the Grand Gulch Phase. This period of time was characterized by the construction of shallow pithouses with long, slab-lined entryways that were loosely clustered on the mesa top, usually in the pinyon-juniper forests in upland areas and near deep topsoil. Campsites and limited activity sites were more widely dispersed and were considered to be resource procurement and special activity sites, whereas campsites with groundstone tools were interpreted as evidence of rice grass procurement locations (Matson et al. 1990).

Inherent in the Grand Gulch Phase temporal construct is the recognition that “older” Basketmaker II deposits are also present in the alcoves and rockshelters of Cedar Mesa and nearby Butler Wash. No phase sequences have been proposed for these earlier alcove occupations, although it is assumed they date from about 2,000 to 3,000 years ago, based on a small number of radiocarbon dates from Turkey Pen Cave and Old Man Cave on Cedar Mesa (Geib and Davidson 1996; Matson and Chisholm 1991) and other sites in nearby Butler Wash (Androy 2003). These older alcove manifestations are commonly referred to in the literature as the “White Dog rockshelter variant” or the “White Dog Cave culture of the Western Basketmakers” (cf. Matson 2006b:156-157) or simply as “White Dog,” a name derived from a prominent Basketmaker II cave of that name in the Marsh Pass area of northern Arizona.

Matson (2006b) has recently questioned the validity of traditional assumptions that “White Dog” peoples occupied rockshelters and alcoves while engaged in the floodwater farming of the canyon bottoms, and that later Grand Gulch Phase peoples constructed pithouses on the mesa top where they were largely dependent on dry farming. Matson has also questioned whether early Basketmaker II materials are even Basketmaker at all, arguing that “early Basketmaker II-like material does not, at this time, show evidence of agricultural dependency or of villages, yet has various elements, such as the use of maize which do foreshadow the Basketmaker II” (2006b:159). In that context, the now-discarded term Basketmaker I or “Preformative” would be more appropriate (2006b:158-160).

These BM I manifestations may be (or may include) episodes of maize use during particularly good times on the Colorado Plateau, and may be followed by other times where maize was not grown. And these good times may have included short-lived occupations of the Colorado Plateau by San Pedro Cochise groups (or other external groups), who, when conditions changed, abandoned the plateau [2006b:160].

As discussed by Matson et al. (1990: Vol. 5), Basketmaker research in the Cedar Mesa region was initiated in the 1960s and 1970s with certain assumptions that sites would be located in the canyons where relatively small areas would have been farmed and maize plots would have
been concentrated in those locations with optimal moisture where plants could mature without significant tending. The initial hypothesis (Lipe and Matson 1971b:135-136) was that canyon bottom farming would have exhibited a variety of strategies, including planting near springs and seeps, on floodplains with high water tables, and perhaps diversion of runoff to maize plots from summer monsoons.

Related to this first hypothesis was the notion that except for the growing season, most of the Basketmaker II peoples’ time would be spent on the mesa top. Specifically, the second hypothesis suggests that multi-use, long term “base camp” or “habitation” sites will be located in canyon rim areas to provide access to both the canyon bottom and mesa top environments. Since pinyon nuts ripen later than maize and would have been an important resource, a move to the mesa top during the fall would be appropriate. From fall to spring, continued access to the canyon bottom would be desirable for water and for use of stored food, as well as to facilitate seasonal transitions [Matson et al. 1990 Vol. 5:4].

A third hypothesis was that mesa top activities would be located in pinyon-juniper woodlands with the most productive assemblage of wild food resources, fiber and fuel, and not necessarily in areas of deep, arable soils. It was also assumed that Basketmaker II sites would be located in natural shelters, based on the abundance of artifacts removed from such locations in the 1890s (Matson et al. 1990). Subsequent research, however, identified a settlement pattern indicative of much greater reliance on dry farming of the mesa top (Matson 1991; Matson et al. 1990). Floodwater farming was deemed practical at only one locality on the mesa top (Dos Tanques-Dos Fuentes).

Nonetheless, “The concentration of the Cedar Mesa BMII on the mesa top where rainfall dry-farming was the only option does not mean that the canyons, where flood-water farming could be practiced, were abandoned” (Matson 2006b:155). See Table 4.3 at the end of this chapter for relevant chronometric data used in this discussion.

**Basketmaker II Pithouses.** The initial perception that Basketmaker II groups were mobile foragers who incorporated maize farming into their hunting and gathering lifestyle, and that they only constructed large cists to store maize for subsequent retrieval, was perpetuated by a near absence of evidence at that time for Basketmaker II pithouses indicative of greater sedentism. This perception was altered somewhat in the 1940s and 1950s through investigations in the Durango area (Morris and Burgh 1954; see also Fuller 1988; Reed and Kainer 1978). By the 1970s and 1980s, the presence of Basketmaker II houses was no longer disputed, due to cumulative research conducted in the Navajo Reservoir area (Irwin-Williams 1973), in the Moab area (Richens and Talbot 1989), Black Mesa (Powell 1983; Smiley 1984), the Rainbow Plateau area (Geib and Spurr 2000, 2002) and the Cedar Mesa and nearby Castle Wash areas (Dohm 1994; Lipe 1970; Matson et al. 1990; Sharrock et al. 1963; see also Pollock 2001).

As summarized by Whalen, early pithouse sites in the Southwest “are invariably small, scattered, nearly identical residences, which probably accommodated nuclear families ... [and] consisted of small scattered, nearly identical residential units, and the level of structural repetition both within and between communities appears to have been very high” (1981:86). This organization is commonly attributed to tribal-level societies. Citing ethnographic evidence, Gilman (1987) has argued that pithouses were used in cold seasons, usually winter months; that groups utilizing pithouses were engaged in at least a minimal biseasonal settlement pattern; and that these groups relied on stored food while the pit structure was inhabited (1987:541). Kohler (1992) and Matson (1988) have suggested that the location of the primary Basketmaker residence was in response to the location of the principal farming...
strategy, and that “maize was already such a substantial portion of the diet that the welfare of the maturing plants in the area in which the principal strategy was prosecuted could not be left to chance, but had to be monitored closely” (Kohler 1992:620).

The earliest utilization of pit houses in the Cedar Mesa area has not been well defined. Berry (1982:59) has argued that ephemeral pit houses were utilized in the area prior to the more substantial pit houses that are characteristic of the Grand Gulch Phase (A.D. 200-400). These exhibited poorly defined floor areas with minimal evidence of cists, deflectors, entryways or superstructures. They were circular to oval in shape and 4 to 5 meters in diameter. Within the study area, the only chronometric data reported from a suspected early Cedar Mesa-area pit house was reported from Zero Plaza in the Comb Wash area, where charcoal from a fire pit returned a radiocarbon date of 2050 ±120 B.P (RL-240) (Berry 1982:59; see also Hall 1973). Berry (1982) also cites supporting radiocarbon data from similar structures in the Castle Wash area to the west of Cedar Mesa and in the Black Mesa region to the southwest that suggests such pit houses could have been utilized as much as two centuries earlier than the classic Basketmaker II pit houses.

More substantial and defined pit houses are well documented on Cedar Mesa (Figure 4.2), all of which date to the Grand Gulch Phase. Three pit houses excavated in 1969 and 1970 during the course of the Cedar Mesa project all featured slab-lined entryways, possibly “wing” walls on either side of the entry and a central hearth with a deflector stone between the hearth and entry. The pit houses ranged from 6 to 7 meters in diameter (Matson et al. 1990 Vol. 5:5-21). Less-extensive excavations were later conducted at two other Basketmaker II sites (Dohm 1985; Lipe 1978a), and the same general pattern was evident, although a bell-shaped pit was present at one site, and both houses could have been up to 8 meters in diameter (Figure 4.3). Testing of two additional sites in the Johns Canyon area revealed the same pattern, although the pit houses were smaller, only 5 to 6 meters in diameter. When the excavated pit house sites are considered collectively, additional patterns emerge, including the construction of slab-lined storage cists between a wing wall and south wall of the pit house, outside square and circular hearths and cists typically located to the north of the pit houses, and middens with considerable burned sandstone and limestone, presumably detritus from heating stones used to boil foods (Matson et al. 1990 Vol. 5:22-23; see also Pollock 2001).

A defining signature of the Basketmaker II pit houses on Cedar Mesa was the presence of limestone. Limestone is not found in proximity to any of these sites, and the logical assumption was that these materials were brought to the residences for a specific purpose, probably as cooking stones. Because limestone is absent at or extremely rare at later sites, the presence of burned limestone in conjunction with the absence of pottery emerged as a signature wherein a Basketmaker II temporal affinity could be assigned to sites identified during surveys. At least 122 sites identified during the course of the project had separable and definable

Figure 4.2: Representative example of Basketmaker II-style pit houses reported in the Four Corners region. Modified from Brody (1990).
Basketmaker II components, of which 88 had associated limestone. Of the 34 remaining sites, other artifacts were observed at 21 sites that allowed an assignment to the Basketmaker II period. The remaining 13 sites were considered Basketmaker II, even though they were small lithic and flake-tool scatters without diagnostic artifacts (Matson et al. 1990 Vol. 5:25). Pithouses were identified at 23 sites, usually occurring as a single pithouse with one or two hearths, one or two cists and a midden area. Only two of the sites had two pithouses (1990 Vol. 5:26).

The florescence of Basketmaker II pithouses on the mesa tops is a defining characteristic of the Grand Gulch Phase, which was assigned a temporal range of A.D. 200 to 400. This range was supported by a series of five radiocarbon dates from three Basketmaker II pithouse sites, one of which was rejected as aberrant and inconsistent with two other dates from the same site. All five dates range from A.D. 200 to 400, with an average of A.D. 308 ±42. If only the four good dates are used, the average is A.D. 241 ±39 (Matson et al. 1990 Vol. 5:34). These data are supported by 26 tree-ring dates from four features at three different sites in Grand Gulch; all of the tree-ring dates are after A.D. 250 and before A.D. 350 (1990: Vol. 5:35; see also Aasen 1984 for radiocarbon dates from Turkey Pen Cave).

Although most Basketmaker II sites feature a single pithouse, Dohm (1994), drawing from Cedar Mesa Project data, has argued that pithouses are often found in “clustered neighborhoods” or “hamlets” of 14 to 20 pithouses in relative proximity to one another, a pattern that is more characteristic of aggregated settlements as opposed to isolated residences. These clusters lack integrative structures, but are identical in that they feature a dwelling with storage to the northwest or northeast, and that the spatial patterning evident at individual residential sites was dictated at least in part by those of adjacent residential sites (1994:272). This evidence suggests a much greater level of social complexity and community organization than are implied by traditional models of isolated, individual households, and that this aggregation foreshadowed later Basketmaker III to Pueblo III occupations in the region (Chisholm and Matson 1994; Dohm 1994; Matson 1991).

**Basketmaker II Storage**. Similar to residential architecture, storage facilities have traditionally been interpreted as evidence of concomitance to agriculture. This assumption is reinforced by the fact few storage facilities have produced radiocarbon or tree-ring dates consistent with Archaic occupations. As summarized by
Hurst (1992:43), the appearance of storage cists, often elaborately constructed slab-lined subterranean structures located in alcoves (Figure 4.4), is considered a hallmark of the Basketmaker II period. The assumption that such storage structures resulted exclusively from Basketmaker II occupations has been called into question in light of surveys in the Aneth area of southeastern Utah that documented slab-lined cists in association with San Jose Phase and Jay Phase artifacts that are characteristic of the Archaic (Kearns 1990).

The timing and nature of the appearance of storage structures bears directly on the timing and nature of the transition from a foraging to a farming economy. There are also inherent assumptions that storage strategies were employed to sustain populations through non-growing seasons, and that the size, nature and distribution of these structures would reflect increased or decreased mobility.

Under conditions of less winter sedentism and low stored food bulk, storage facilities may be smaller, less formal and so less obvious archaeologically than under conditions of increased winter sedentism and greater stored food bulk. This continuum of storage facility variation may appear in Southwestern pit structure sites with some sites being a product of less winter sedentism and so have smaller, less obvious storage facilities. Other pit structure sites used under conditions of increasing population, more subsistence intensification and so longer winter sedentism should have larger, more standardized and more archaeologically obvious storage facilities (Gilman 1987:553-554).

Archaeologists have long recognized that storage facilities take many forms, including pits, rooms, pots and baskets, and indeed variability in the types and sizes of Basketmaker II storage facilities is well documented (Guernsey 1931; Guernsey and Kidder 1921; Kidder and Guernsey 1919; Nusbaum 1922; see also Figure 4.5). Few researchers, however, have offered explanations as to why certain storage strategies were employed, how these may have differed in time and space, and the implications of storage strategies on site distribution, seasonal mobility, organizational hierarchy and population demographics.

The utilization of storage facilities has significant implications for settlement patterns and subsistence strategies. Smiley (1993:247) argued that sites with storage facilities implied a planned reuse of a location as opposed to a one-time use and abandonment. The presence of storage facilities... provides a solid indication of a surplus-based economy, so different from the usual hunter-gatherer pattern... Hunter-gatherer populations depend on natural productivity to supply their needs. They determine only how much effort they are
willing to expend in harvesting a particular resource. Farming populations have an entirely different strategy in that they determine, within their technological limits, where, when and how much of the given types of resources will be available. They decide not only future resource availability in terms of the time of harvest, but also in terms of a supply for the most distant future through storage [1993:248].

In this context, the large slab-lined storage cists located in the alcoves, caves and rockshelters of Cedar Mesa are likely storage facilities for agricultural products consumed during non-growing seasons, and it can be assumed that residential sites are located in close enough proximity that food resources could be effectively protected. The significant number of these storage facilities, reported mostly in the journals of the late nineteenth century expeditions, suggests that agricultural production was largely a successful endeavor, producing surpluses that mandated effective storage for later consumption. The size of the structures is such that the amount of stored food could have accommodated relatively large populations for significant periods of time (see also Guernsey 1931; Guernsey and Kidder 1921; Kidder and Guernsey 1919; Nusbaum 1922). At least two distinct storage strategies are evident in the Cedar Mesa area during Basketmaker II times. One involved storage cists in large, easily accessible rockshelters or alcoves where there is minimal evidence of residential activities (as described in the journals and papers of John Wetherill and others in the 1890s) and the other involved storage cists or pits usually located 8 to 10 meters north of a pithouse (Dohm 1988). The former strategy suggests caching of stored resources by a non-resident population where there appears to be minimal threat of human predation, and the latter strategy suggests storage in a setting where food resources could be protected by a resident population from human predation. Unfortu-

Mortuary Practices. Mortuary practices have long played a central role in the study of social, cultural, chronological, ethnic and racial issues (Chapman and Randsborg 1981). Archaeological studies have likewise used mortuary practices and burial attributes as a mechanism for interpreting cultural change and variability (Alekshin 1983; Bartel 1982; Binford 1971;
O’Shea 1981, 1984; Tainter 1978). Binford has argued “both the number and specific forms of the dimensions of the social persona commonly recognized in mortuary ritual vary significantly with the organizational complexity of the society as measured by different forms of subsistence practice” (1971:6). The dimensions of the social persona that are recognizable in mortuary practices are typically age, sex, social position, social affiliation and location of death.

Increased social complexity is implied by the rich funerary contexts associated with Basketmaker II burials reported from the Cedar Mesa area, primarily those recovered in the 1890s. These burials are typically attributed to band- or tribal-level of social organization. The burials of band- and tribal-level societies commonly denote only age and gender differences, economic roles and personal achievement, whereas more complex ranked societies also mark social positions, social affiliations, rank and status (Mowrer 2006:261; see also Binford 1971).

In her analysis of 138 Basketmaker II burials from Utah, a large percentage recovered from sites in the Cedar Mesa area, Mowrer (2006) found the Utah sample to be comparable to those from other regions in the Southwest in that funerary practices reflected primarily age differentiation. Hunting tools, as well as rare or exotic items, were only associated with adult burials, whereas textiles were associated with infants (60 percent) far more than subadults (7 percent) and adults (12 percent). She concluded that burial items were indeed indicative of band- and tribal-level societies, and that these items suggested economic roles, achieved status and ritual activities during life. Funerary objects associated with infants were more indicative of body preparation and grief (2006:275-276).

As discussed by Hurst (1992:44-45), an examination of early archaeological records can provide insight into Basketmaker II lifeways, although any material culture is inherently suspect due to the absence of original context or stratigraphic association. It is not always clear from the early reports which items were actually associated with interred individuals and those that may have been deposited in proximity to the burials before or after the burial event. The catalog of funerary items, however, appears to include elaborate woven baskets with intricate colored designs (Figure 4.6), skin bags, wooden trays, digging sticks, atlatls and dart points, leather and feather clothing, ceremonial implements, bone tubes and beads, and pouches with food items (see Guernsey 1931; Guernsey and Kidder 1921; Kidder and Guernsey 1919; Nusbaum 1922).

Figure 4.6: Representative example of Basketmaker II weaving patterns evident at sites in the Four Corners area. Modified from Guernsey and Kidder (1921).

Early researchers noted a consistency to Basketmaker II burial practices. As summarized by Guernsey and Kidder from their excavations in northern Arizona,

*The bodies of adults were always wrapped in fur-string*
blankets and at the loins of most females were small string aprons. The limbs were flexed to occupy the least possible space and occasionally held in that position by cords. The bundles thus prepared were encased in large woven bags, which were cut down one side for greater ease in drawing on, and then stitched together again with yucca leaves. Babies were sometimes placed in bags, but were more commonly buried on their cradles with their blankets, umbilical pads and “diapers” of bast in place as in life. No fixed manner of orienting the remains was adhered to, this detail having been decided, apparently, by the manner in which the body best accommodated itself to the shape and size of the cist. Mortuary offerings were numerous and varied and seem fairly representative of the food, implements, weapons and ornaments of daily life together with some objects of a ceremonial nature. The standard gift to the dead was basketry; tray baskets were practically always inverted over the heads of adults, often over children; large panniers also served as covers; and smaller baskets, empty or filled with trinkets, were generously piled into the graves [1921:22].

It is assumed that a similar burial pattern was evident at the many alcove sites investigated in the Cedar Mesa area in the 1890s. This assumption is supported by investigations at Old Man Cave (Geib and Davidson 1994) where Basketmaker II burials were recovered from at least two slab-lined cists, along with fragments of baskets and rabbit-skin blankets. One feature returned a radiocarbon date of 1790 ±90 B.P. and one returned a date of 1870 ±70 B.P., both of which are consistent with Grand Gulch Phase occupations documented on the mesa top (Matson et al. 1990).

Evidence suggests that each cist usually contained more than one burial and in most instances two to four individuals were interred together (cf. Guernsey and Kidder 1921). Occasionally, the number of interred individuals at some sites is much greater, indicating single-event burials of large numbers of people who had suffered violent deaths and repeated use of the same burial site over an extended period without evidence of violence. For example, Basketmaker II “ossuaries” or “cemeteries” have been documented in the Kanab area where as many as 36 individuals were represented at three burial sites in relatively close proximity, some with bones placed in anatomically incorrect positions, and some of which were partially coated with a reddish paint or stain. All of the burials were indicative of formal burials inside constructed cists used only for interments. There was no evidence of violence (Edgar 1994).

Among the most studied of the Cedar Mesa burial sites of probable Basketmaker II affinity is Cave 7 (Hurst and Turner 1993; LeBlanc 1999; Turner and Turner 1999), where the Hyde Exploring Expedition of 1893-94 recovered the remains of more than 90 individuals, most of whom exhibited evidence of trauma. Turner’s reexamination of 61 of the individuals revealed a demographic profile skewed towards males, at least three incidents of post-mortem scalping of males, and one incident where the skin and flesh had been removed. The evidence suggested that trophies were taken from certain individuals and that some women and children may have been taken as captives (Hurst and Turner 1993:168-169).

Other Basketmaker II burials in the Cedar Mesa area (and elsewhere the Southwest) have produced evidence of persistent or periodic violence. Richard Wetherill’s Cave 11 (Green Mask Cave) yielded female remains that exhibited perimortem and postmortem fracturing of the cranium and arm and leg bones (Turner and Turner 1999:397). Cole (1993) has argued the Green
Mask pictograph for which the site is named depicts a flayed and painted Basketmaker face and head. Wetherill also reported burials of severed body parts, including one individual who had been cut in half at the waist and then stitched back together (McNitt 1957). Morris (1939:19) reported “undeniable evidence of a prehistoric massacre” at the Canyon del Muerto site in northern Arizona, and Kidder and Guernsey (1919) reported a head scalp from the Marsh Pass area where the skin had been flayed from the skull and then stitched shut at the mouth and eyes; the scalp was then attached to a handle to create an artifact that appears identical to both painted and pecked images found in the rock art of the Cedar Mesa area (Cole 1990; Hurst and Pachek 1989). Guernsey and Kidder (1921:55) described and illustrated one such individual who may have been scalped (Figure 4.7).

Figure 4.7: Possible evidence of scalping at a Basketmaker II site in northern Arizona. Modified from Guernsey and Kidder (1921).

**Basketmaker II Rock Art**

Also relevant to this discussion is the prevalence of a distinct rock art tradition that may be related to Basketmaker II manifestations in the Cedar Mesa. As discussed by Cole (1993:195; see also Cole 2009), rock art is one complementary component of the archaeological record that, when integrated into the whole, has the ability to help explain the past. Comparisons with material culture provide evidence for determining age, meaning and function that can be supported by physical, aesthetic and ethnographic data. As such, rock art has the potential to shed light on the distribution, function and meaning of associated material culture. Others have argued that rock art iconography can shed light on ownership of key resources (Robbins 1997), social boundaries (Geib 1996b) and manifestations of prestige and competition (Hayden 1998; Robins 2002).

At least two temporally overlapping and related rock art styles have been defined for the Greater Cedar Mesa area, the iconic San Juan Anthropomorphic Style (Figure 4.8), which is temporally exclusive to the Basketmaker II period, and the more generally classified Basketmaker II-III style (Figure 4.9), which has stylistic traits that persist after Basketmaker II times. As defined by Schaafsma (1980:109-120) the San Juan Anthropomorphic Style depicts broad-shouldered figures with rectangular or trapezoidal torsos with elaborate ornamentation and decoration. The more generalized Basketmaker II-III style also features broad-shouldered anthropomorphs with a variety of triangular, trapezoidal or rectangular torsos, often without the elaboration of the San Juan anthropomorphic style. Other images common to Basketmaker II rock art include representations of masks (Figure 4.10), faces, scalps, flute or whistle players, processional figures, copulating couples, bighorn sheep, bears, canines, snakes and birds (Cole 2009:120; see also Charles and Cole 2006). Common to the Cedar Mesa region are humans associated with wands or standards, seed-beaters, snares, crooks, atlatls and darts, and possible baskets, bags or pouches (Charles and Cole 2006:192).

A particularly common motif that appears in Basketmaker II times and is found in abundance in the Cedar Mesa area is the duck-like image (Figure 4.11). The rock art images have correlates to wooden effigy sticks or wands reported from Arch Canyon within the study area (Spangler 2006) and White Dog Cave in northern Arizona (Guernsey and Kidder 1921; see also Figure 4.12). The Arch Canyon site (42Sa26,872) is intriguing in that the duck effigy stick was found in association with duck rock art imagery and other modified sticks or wands. As discussed by Schaafsma (1980), duck imagery is widely associated with shamanism
and rituals in Mexico and the American Southwest. In the Puebloan world, gods may assume the form of a duck, and ducks serve as “messengers of rain clouds of the four sacred directions, as seed bearers and as messengers of the gods,” as well as symbols of supernatural healing (1980:134).

Perhaps the most well known of the San Juan Anthropomorphic Style sites within the study area is the Green Mask Site (42Sa3711), an alcove with Pueblo II-III architecture overlying an earlier Basketmaker II occupation defined by slab-lined storage pits. The presence of Chihuahuan Polychrome rock art panels at this site indicates an even earlier Archaic occupation. San
Juan Anthropomorphic Style images are evident at Panels I, 4, 5, 6 and 7 where there are more than 200 Basketmaker anthropomorphs, quadrupeds, hand and finger prints, snakes and geometric shapes (Figure 4.13). Cole (1993, 2009) has argued that the rock art here, based on the symbolism and spatial distribution, represents events surrounding birth, death, burials and everyday occurrences such as food procurement and storage, and perhaps ceremonies where the images served to communicate appropriate symbolism during and after events. In the Cedar Mesa area generally, most Basketmaker II imagery “can be characterized as public communication – it is openly displayed on alcove walls, cliffs and boulders at and near water sources, habitations and storage and burial sites” (Charles and Cole 2006:194).

Robins and Hays-Gilpin (2000) have argued that Basketmaker II rock art was focused around shamanistic rituals that emphasized the power and prestige of individuals, primarily men, but the iconography was not typically gender specific. Robins (1997) examined the spatial distribution of San Juan Anthropomorphic Style sites throughout the region, and noted that without exception, the larger panels of life-sized anthropomorphic figures in open settings correlated with areas suitable for floodplain or sub-irrigation agriculture. A similar relationship was observed in...
Grand Gulch (Hyder 1997). Hence, “The association of the large San Juan Anthropomorphic panels with the White Dog Phase and areas of apparent high agricultural productivity have important implications for social as well as economic uses of maize in emergent agricultural societies” (Robins and Hays-Gilpin 2000:235). By Grand Gulch Phase times, the imagery, while holding to the San Juan Anthropomorphic Style, changed to reflect spatial homogeneity, references to puberty rites, and images of rebirth and emergence that reflect “new forms of ritual that allowed men to create ritual-based crosscutting relationships facilitating mobility between different natal communities and maintaining networks of social ties” (2000:247).

Robins (2002) later argued that the ritualistic violence evident at cave sites in the Cedar Mesa area is depicted in the Basketmaker II rock art iconography of the region, and that it is associated with expressions of social power, especially when prominently displayed in association with productive agricultural lands. These expressions are reflected in the artistic skill used to make the images and in the depiction of ceremonial clothing, hair ornamentation and other paraphernalia that correspond to Basketmaker II mortuary evidence, including ritual scalping. He argued that rock art marked claims to productive resources, and that the “appropriation of surplus crops for social purposes by individuals in positions of power, in the social context of feasting, may underlie one of the more successful (i.e. long-lived) adaptations of agricultural technology in the Four Corners region” (2002:396).

**Basketmaker III: A.D. 450 to 750**

Traditionally, the distinction between Basketmaker II and Basketmaker III is based on the development of a grayware ceramic tradition. Basketmaker III potsherds are readily identifiable at pithouse sites throughout the Southwest, and hence are convenient temporal markers whereby sites can be assigned to this particular period of time. As initially defined during the Pecos Conference (Kidder 1927), this cultural stage was characterized by residential sites with pithouses but no contiguous or substantial surface structures; the widespread use of domesticated crops such as corn and beans; the presence of new tech-
nologies such as plain pottery and the bow and arrow; and a population that did not practice cranial deformation. As summarized by Wilshusen (1999a), the fact that so many preeminent Southwestern researchers, including Earl Morris, Frank Roberts, Paul Martin and J. O. Brew, redirected their attention towards Basketmaker III and Pueblo I sites immediately after 1927, emphasizes how little was known of this period of time.

Considerably more is known today. In the Southwest generally, Basketmaker III is considered the first period in which there is widespread evidence of occupation throughout the Four Corners area. These sites are generally dispersed, single pithouses that were probably oriented around nuclear families, although there is evidence of population aggregation in some areas. Residential structures were typically deep, circular pithouses that were more substantial than in earlier times (Figure 4.14). As many as 20 pithouses occur at some Basketmaker III villages, although hamlets of three or four residential structures are more common. There is evidence in some areas for community-level structures in the form of great kivas. Trough metates and rectangular one- and two-hand manos began to replace groundstone tools of earlier groups, and the bow and arrow began to replace the atlatl as the preferred hunting implement. It has also been argued that Basketmaker III peoples were more dependent on cultivated resources than were their predecessors, with the introduction of protein-rich beans having profound effects. All of these changes, considered antecedent to the ubiquitous Puebloan occupations that followed, have significant implications for changes in human behavior through time (discussed hereafter).

There are also qualitative differences that delineate Basketmaker III from earlier and later periods, and archaeologists have expended considerable energy towards fine-scale resolution of what is and is not Basketmaker III (see Table 4.2 above). As summarized by Hurst (1992), the period begins with the appearance of grayware pottery about A.D. 450 and ends about A.D. 750 with the appearance of Abajo red-on-orange pottery and the appearance of rectangular surface storage rooms. Pithouses during the first two centuries of the Basketmaker III period, while more substantial, are similar in layout to earlier pithouses; by the early A.D. 600s, the addition of an antechamber to the south or east of the main chamber “is almost an ubiquitous feature” (Hurst 1992). Also common are floor ridges extending from the fire pit to the walls, four primary interior roof support posts, and interior storage bins. Pithouses are typically circular or oval in shape, ranging from 0.5 to 1.5 meters in depth, and they become rectangular with rounded corners later in the period (1992:47-48). When more than one pithouse are

Figure 4.14: Typical Basketmaker III-style pithouse common in the Four Corners region. Modified from Jennings (1978).
present, they are typically contiguous in that they share a common wall.

In some cases, there is greater site organization with the addition of formal work areas, ramadas, storage structures and perhaps kivas (Figure 4.15). Pithouses are deeper and more spacious, and feature earthen-covered wooden roofs supported by four posts and crossbeams, or are dome-shaped. These pithouses typically feature storage bins, benches and a central fire pit. Entry was made through a hole in the roof or lateral side entrance. Agricultural fields were located near villages, and check dams may have been utilized to control water flow. Beans were added to the diet by about A.D. 600 (perhaps earlier), and turkeys may have been domesticated about this time. Cotton also came into use near the end of this period. Baskets, textiles and sandals continued to be manufactured, but with greater elaboration. Turquoise and ocean shells offer evidence of widespread trade (Brody 1990:72-74).

A number of important excavations in the Four Corners region have focused on sites that were largely Basketmaker III (see Wilshusen 1999 for an overview). In southwestern Colorado, research spanning almost seven decades (Morris 1939; O'Bryan 1950; Lancaster and Watson 1954; Wheat 1955; Rohn 1975; Birkedal 1976; Gooding 1980; Breternitz 1986; Brisbin 1984; Brisbin and Varien 1986; Morris 1991) has refined archaeologists' understanding of Basketmaker III chronology and technological change, which has spurred more thinking about settlement patterns and social changes (Fetterman and Honeycutt 1987; Fuller 1988; Kane 1986; Morris 1991). In southwestern Colorado alone, roughly 2,000 sites with Basketmaker III components have been recorded (Wilshusen 1999a). An abundance of Basketmaker III sites have also been excavated or documented in the San Juan Basin (Altschul et al. 2000; Elson 1981; Hildebrant 1989; McEnany 1985; Morris 1980; Popelish and Fehr 1983; Warner and Elson 1982), and in the Black Mesa region (Linford 1982; Gumerman and Dean 1989; Powell 1983; Powell and Gumerman 1987).

The majority of the excavated Basketmaker III sites in the region are habitations that date between about A.D. 590-720 (Wilshusen 1999a). Architectural variation in pit structures and their surrounding facilities is fairly straightforward and has been researched for some time (Bullard 1962; Morris 1991; Wilshusen 1988). Although it is difficult to make precise chronological assignments based on pithouse construction styles and associated features, it is possible to distinguish early from late pithouses. There is considerable variety in Basketmaker III settlements, with examples ranging from very small structures (e.g., seasonally used field houses) to hamlets with up

Figure 4.15: Artist's reconstruction of typical Basketmaker III site layout. Modified from Wilshusen (2006).
to six and possibly nine pithouses. The vast majority of sites are one- or two-household habitations, a pattern that appears to remain unchanged through the Basketmaker III period. As a consequence, settlement patterning does not appear to be particularly chronologically sensitive for distinguishing early and late settlements.

Basketmaker III investigations in southeastern Utah have been limited in number. Investigations at the Luna Leyenda Site near the town of Bluff revealed seven Basketmaker III pithouses and associated features, and 18 burials in the highway right-of-way alone. Based on radiocarbon data and shifts in ceramic tempering preferences from sand to andesite, Neily (1982:249) argued the initial occupation of the site occurred in the early A.D. 500s by Kayenta-oriented populations, and during the A.D. 600s this population was displaced or infiltrated by Mesa Verde-influenced immigrants. Hurst (1985:88) has argued the shift in tempering preferences was widespread across the Mesa Verde Anasazi region, and it may reflect culture change rather than population movement. Neily’s investigations also demonstrated long-distance acquisition of exotic materials, including *Olivella, Glycimeras* and *Conus* shells from the Pacific Coast, and azurite from the LaSal Mountains (1982:520). The burials at Luna Leyenda constitute the largest collection of Basketmaker III skeletal remains yet documented in Utah. Other Basketmaker III sites have been investigated near the town of Montezuma Creek; one featured a substantial pithouse, associated cist and a ramada area, and the other featured a similar pithouse and associated cists (summarized in Hurst 1992:52).

Collectively, regional research has demonstrated that occupations by pithouse-dwelling, maize-farming groups was widespread across the greater Southwest, creating a perception of population expansion during this period of time in some areas. This may be an illusion perpetuated by the fact that Basketmaker III sites with grayware pottery are more easily identifiable than Basketmaker II sites without pottery. As summarized by Hurst (1992:49), “early Basketmaker habitations are notorious ephemeral and subtle in their surface manifestations, and easily masked by even a minor late Basketmaker component” (1992:49).

**Cedar Mesa Basketmaker III**

Almost all of what is known about Basketmaker III manifestations in the Greater Cedar Mesa area resulted from the Cedar Mesa Project investigations on the mesa top. Matson et al. (1990) have suggested the Basketmaker II presence (Grand Gulch Phase) ended about A.D. 400. This period was followed by a hiatus of 250 years or more before the area was again reoccupied by Basketmaker III farmers. This resurgence, labeled the Mossbacks Phase, began in the late A.D. 600s and continued into the early A.D. 700s. “Thus there is an apparent gap of some 250 or more years between the two occupations and a duration of less than 100 years for the Mossbacks Phase” (Matson et al. 1990 Vol. 6:2).

The Cedar Mesa Project surveys identified 52 sites that were definitely or probably Basketmaker III, a determination made primarily on the presence of Chapin or Lino Gray potterysherds (the total was winnowed during the analysis to 48 sites). Four of these sites produced 44 tree-ring dates from seven features, all of which indicated occupations in the late A.D. 600s and perhaps early A.D. 700s (Matson et al. 1990 Vol. 6:13). By comparison, two salvaged sites at Natural Bridges National Monument produced six tree-ring dates between about A.D. 565 and 645 (Schroeder 1965); four components along U-95 in the Comb Wash area produced four dates from three sites that ranged from about A.D. 575 to A.D. 625 (Dalley 1973; Wilson 1974); and one site in Butler Wash yielded a single date of A.D. 625 (Nickens 1977). Because all of the dated samples from these comparative sites were missing an unknown number outside rings, Matson et al. (1990) argued they under-represented the actual age of the features, and that these sites are likely consistent with the Mossbacks Phase dating from about A.D. 650 to the early A.D. 700s (see Table 4.3 at the end of this chapter).
The assignment of sites to the Mossbacks Phase was based largely on the presence of certain ceramics, primarily Chapin or Lino Gray rim sherds, and/or Chapin Black-on-white or Lino Black-on-gray painted sherds (Figure 4.16). In most instances, Basketmaker III diagnostics were mixed with later Pueblo II-III ceramics, but because the later assemblages are temporally distinct from the Basketmaker III ceramics, an occupation during the Mossbacks Phase was assigned with some confidence (Matson et al. 1990 Vol. 6:5). Researchers noted an absence of limestone at Mossbacks sites, and a shift to larger pithouses. Because of the absence of a Basketmaker III presence in the Red Rock Plateau area to the west of Cedar Mesa (cf. Lipe 1967), it was suggested that Mossbacks sites on Cedar Mesa constituted the western edge of the Basketmaker III expression so prevalent in the Mesa Verde region. “The fact that our initial dates are slightly later than those found elsewhere may be due to this position on the periphery, an area which may have been occupied only after more central locations were filled up” (Matson et al. 1990 Vol. 6:6).

Test excavations at four Mossbacks sites revealed pithouses consistent with Basketmaker III pithouses elsewhere in the region. Pithouses featured a main chamber that was rectangular with rounded corners (sub-rectangular) or round with a smaller and often shallower antechamber to the south or southeast. Unlike earlier times, most sites (31) featured multiple components indicative of later occupations, whereas only 18 sites featured a single Basketmaker III component. Most evidence for Mossback sites was documented on the mesa top where they reflected settlement patterns and momentary population sizes generally similar to those of earlier Basketmaker II manifestations in the region. These were focused predominantly on maize dry farming of the mesa tops. Of 291 sites identified in canyon drainages, only 15 had Basketmaker III components, and 14 of those were ephemeral in nature (Matson et al. 1990 Vol. 6:5).

**Bow and Arrow Technology.** A fundamental truism that has defined the Basketmaker period of time for much of the past century is that Basketmaker II peoples used the atlatl with its accompanying dart points while Basketmaker III peoples used the bow and arrow (see Kidder 1927). Indeed, considerable energy has been expended describing elongated and convex-sided corner-notched and side-notched with expanding stems as “classic” Basketmaker II diagnostics (Figure 4.17). Hurst (1992:46) has noted that the uniqueness of the Basketmaker dart points is illu-

![Figure 4.16: Chapin Black-on-white ceramics characteristic of Basketmaker III times. Source: Crow Canyon Archaeological Center Laboratory Manual (Ortman et al. 2005).](image)
sory when the theoretical orientation of those making the identification is considered: Archaeologists working south of the Colorado River readily assign such points to Basketmaker peoples, whereas those working north of the Colorado River are likely to classify the same ones as Elko

Figure 4.17: Typical Basketmaker atlatl dart points. Modified from Guernsey and Kidder (1921).

Series points characteristic of Archaic hunting and gathering. A detailed examination of point types and debates over typology are beyond the scope of this overview (see Hurst 1992 for a good summary of the debate).

For the purposes of this discussion, the implications of a radical change from the atlatl (Figure 4.18) to the bow and arrow are addressed. The incorporation of bow and arrow technology into Basketmaker III lifeways marked a radical shift in hunting strategies and an improvement in the efficiency of food procurement. As summarized by Frison, arrow points could be manufactured from easily obtained quarry materials and were easier to make than atlatl darts. Arrow shafts were also easier to manufacture than atlatl shafts. In addition to added convenience, the bow has a longer range, the greater velocity of arrows allows greater penetration of prey, hunters can reduce body movement and thereby facilitate greater stealth, and proficiency is more quickly attained than with atlatls (1991:211-212). Arrow points were considerably thinner and smaller than dart points and would have been more fragile and less serviceable as cutting tools. The continued use of atlatl darts after the introduction of the bow and arrow, therefore, may have been a function of dart points serving as both projectile points and hafted knives, thereby reducing the tool kit necessary for hunting trips (Weder 1980:104).

Unlike horticulture, which appears to have spread northward into Utah from the San Juan River drainage and Kayenta regions, bow and arrow technology appears to have come from the Great Basin, spreading into the Colorado Plateau from the west and north. The appearance of bow and arrow technology north of the Colorado River likely occurred six or seven centuries prior to its appearance in the Cedar Mesa region south of the Colorado River during Basketmaker III times. North of the Cedar Mesa area, the bow and arrow is associated with the ubiquitous Rosegate Series points (cf. Thomas 1981) and is traditionally viewed as concurrent with the emergence of the Fremont culture, although this technology likely preceded the florescence of agriculture north of the Colorado River.

Evidence of earlier bow-and-arrow technology south of the Colorado River is extremely

Figure 4.18: Atlatl throwing sticks. Modified from Charles (2006).
tenuous. As summarized by Geib, "the many cave excavations within the Kayenta region have uncovered no evidence of Basketmaker II bow use but abundant and varied evidence of atlatl use -- dart points and preforms, dart foreshafts and mainshafts, foreshafts with dart points, atlatls and atlatl weights" (1996c:65). In fact, atlatl technology is considered a hallmark of Basketmaker II occupations throughout the region (cf., Guernsey and Kidder 1921; Kidder and Guernsey 1919; Lindsay et al. 1968; Lockett and Hargrave 1953; Matson 1991; Matson et al. 1990; Schilz 1979; Smiley 1993). Collectively, the data support the "long-held conclusion that the bow was a Basketmaker III addition across a broad region south and east of Glen Canyon, being adopted sometime after about A.D. 500" (Geib 1996c:65).

There is limited evidence that some Basketmaker II populations had access to bow-and-arrow technology or had contact with those who did. Arrow points have been found in Basketmaker II contexts in the Rainbow Plateau and Shonto Plateau areas (Geib 1996c:66). And at Canyon del Muerto, a classic Basketmaker II site in the Kayenta region, an arrow shaft was imbedded in one of the victims (Morris 1925:291-292).

Some researchers (Bungart and Geib 1987; Geib and Bungart 1989) have argued the Colorado River would have formed a physiographic boundary between proto-Fremont groups north of the river and Basketmaker peoples to the south, and that the time lag for diffusion of bow and arrow technology to the Anasazi could be attributed to competitive relations between different ethnic groups. "If Basketmaker II represents an influx of horticultural populations who spread across the Colorado Plateau filling in agricultural niches, then the bow might have been the competitive advantage that allowed local Proto-Fremont populations to maintain occupancy of their traditional territories" (Geib and Bungart 1989:4). By A.D. 500 or 600 (Basketmaker III times), the Colorado River was no longer an effective boundary that prevented the transfer of bow and arrow technology to groups living south of the river, or to the transfer of ceramic technologies to those living north of the river, as evidenced by the pan-regional adoption of grayware ceramic traditions about A.D. 600. This perhaps indicates at least some socioeconomic intercourse between Fremont and Anasazi groups living north and south of the river during Basketmaker III times. In fact, the similarity between Basketmaker III occupations south of the river and Fremont adaptations north of the river has been repeatedly noted by Fremont scholars over the past 75 years (see Spangler 2001, 2002 for detailed overviews of these data).

Ceramic Technologies. Throughout the region, the apparent increase in sedentism appears to be associated with increased dependence on domesticated food resources. This dependence, which included reliance on maize, beans and squash, precipitated a greater need to store food resources. Reed has observed that "With an earlier commitment to corn and bean agriculture and sedentary living than previously thought, the earlier production and use of durable ceramic containers are logical accompaniments, one of many technological changes necessary to meet the storage and processing needs of an agricultural, sedentary people" (2000:8). Gumerman and Gell-Mann (1993:19) have argued the cultivation of beans beginning in the early A.D. 500s required containers more durable than tarred or pitch-lined baskets used to cook previously. Because beans require nearly constant tending this food staple was "perhaps the final crop that made sedentism fully necessary" (Reed 2000:8).

As summarized by Reed et al. (2000:203-220), the origins of ceramic production on the northern Colorado Plateau is generally viewed as an indication of increased dependence on agriculture.

The inception of ceramic vessel production in the Southwest may have been primarily a functional innovation. On the Colorado Plateau, it appears that the first pottery occurred as a full-blown technology that was slowly adopted by individual households as the need for sturdy storage and cooking pots increased. The spread and adoption of this technology ap-
pear to have originated from the south in conjunction with sedentary adaptations associated with dependence on agriculture [2000:216].

If bean horticulture was an integral component in a shift to more sedentary lifeways, as evidenced by the appearance of ceramics, it should also be noted that very few Basketmaker III sites have yielded beans. It cannot be stated whether the paucity of evidence for bean agriculture is a function of poor preservation, or whether beans constituted such a minor part of the diet that they are poorly represented in the cultural deposits. It remains a truism in the greater Southwest, one that is rarely challenged, that the triad of corn, beans and squash constituted a significant portion of the prehistoric diet during Basketmaker III times and after.

Traditional views associate the advent of ceramics on the northern Colorado Plateau with a migration of individuals from the Mogollon highlands. Subsequent differences in ceramics were attributable to the development of distinct traditions with local characteristics dictated by the availability of certain materials used in the production. Recent studies in northern Arizona, however, have demonstrated the existence of a contemporaneous Anasazi brownware ceramic tradition dated to about A.D. 200 to 500 (Basketmaker II to early Basketmaker III times) that exhibited many of the same characteristics of the Mogollon ceramics. Specifically, the brownware vessels exhibited little evidence of added tempers. During the A.D. 500s, Anasazi potters began experimenting with local resources and finishing techniques, adding temper, slipping surfaces, painting designs and using different clays (Reed et al. 2000:203).

It is likely that during the late Basketmaker II and early Basketmaker III periods, families making and using pottery may have lived next to people who did not adopt pottery technology. Still, the widespread distribution of brownware pottery technology indicates that by A.D. 200, agricultural developments in most regions of the Southwest had reached a threshold where pottery vessels became important. Local conditions may have contributed to the initial acceptance or rejection of pottery technology [2000:218].

Evidence of a pre-grayware ceramic tradition on Cedar Mesa has not been addressed in the modern literature. Such evidence may have been observed at Basketmaker II sites in the Grand Gulch area in the 1890s. Guernsey and Kidder (1921), in a discussion of a clay pottery sample recovered from a Basketmaker II context in northern Arizona, made a passing reference to “Mr. John Wetherill, to whom it was shown, said it recalled the pottery found in Basketmaker caves of Grand Gulch. This, according to McLloyd and Graham’s description as quoted by Pepper, was a very crude, unglazed ware, some of the bowls showing the imprint of the baskets in which they were formed” (1921:31-32).

The adoption of ceramic technology between A.D. 200 and 500, and the shift to a grayware technology by A.D. 500 or 600, is generally viewed as a response to changing subsistence patterns reflected in the need for more diverse and durable containers for cooking and storage. The cooking of beans, for example, requires a vessel capable of withstanding two to three hours of boiling. The earliest ceramics (brownware) were apparently designed for expedient production. Construction techniques were simple, and shapes were restricted to a few vessel forms, primarily seed jars, straight-necked jars and bowls. Decoration was rare, tempering for long-term durability was absent and the construction techniques would not have required specialized knowledge of ceramic properties. This would have accommodated lifeways characterized by seasonal sedentism and mobility (Reed et al. 2000:218).

In contrast, the later grayware ceramics may be indicative of greater sedentism. The grayware vessels featured a variety of tempers de-
signed to improve vessel durability, and a variety of vessel shapes and sizes were constructed. Greater time was expended preparing materials, forming and decorating vessels, and controlling the firing atmosphere. As described by Mills (1989), an investment in durable ceramics is further evidence that groups that once relied on mobility to ameliorate vagaries in the distribution of resources began to become more sedentary in response to more reliable technologies for food production and processing. Evidence of year-round occupation of agricultural sites by the A.D. 500s and early A.D. 600s “supports a shift to household sedentism through which mobility for resource exploitation would have been achieved by task groups” (Reed et al. 2000:219).

**Social Structure.** The traditional view of Basketmaker III sociopolitical structure was that dispersed households organized at the familial or supra-familial level and focused around one or two pithouses assumed to have accommodated nuclear families. Indeed, a pattern of one or two pithouses is evident in the Cedar Mesa area during the Mossbacks Phase (Matson et al. 1990). Julian Steward (1936, 1955) was perhaps the first to address Basketmaker social organization, arguing that local lineages defined the basic Basketmaker social unit, and that growth occurred through the establishment of new lineages that moved into new areas in relative proximity to the parent lineage. The emergence of small hamlets about A.D. 600 was seen as an amalgamation of related lineages, but the basic pattern remained intact.

A growing corpus of data from the greater Southwest suggest considerably greater social complexity during Basketmaker III times, including large villages, large storage facilities and great kivas or over-sized pithouses arranged around plazas (Reed 2000:13). This pattern is more typical of Pueblo I times, but one characterized by an absence of competition for scarce resources, band-level social organization, social differentiation, specialized decision-making, greater access to non-local trade goods, more evidence of subsistence intensification and the emergence of local leaders (Birkedal 1976; Chenault and Motsinger 2000; Damp and Kotyk 2000; Lightfoot and Feinman 1982).

The function of large subterranean structures that appeared during Basketmaker III times at several sites in the Southwest has evoked considerable debate. Some researchers have argued that such large structures were great kivas or communal structures antecedent to the great kivas of Pueblo I to Pueblo III times (Burton 1993; Gilpin and Benallie 2000; Altschul and Huber 2000; Reed 2000), while others maintain there is no clear connection between the Basketmaker III structures and later kivas (Wills and Windes 1989). As summarized by Reed (2000), the various competing arguments are not exclusive of one another, and it is unlikely that all Basketmaker groups experienced the social changes accompanying sedentism and increased agricultural dependence at the same time or in the same way. Rather, “flexible organization was probably the rule ... and we should expect to find different levels of social, political and ritual organization in different areas” (2000:15).

Basketmaker III villages or hamlets have not yet been documented in the Cedar Mesa area although there remains a potential that such sites will be discovered. Hamlets of at least nine or 10 pithouses have been documented at 42Sa6757 and 42Sa8889/8895 in the White Mesa area (Davis 1985) and at Site 13 (Brew 1946; Davis 1985) at Alkali Ridge, both east of the study area. As discussed above, a Basketmaker III hamlet, the Leyenda Site near the town of Bluff, consisted of at least seven Basketmaker III pithouses and associated features, and 18 burials (Neily 1982:249). While many view Basketmaker III villages as rare or anomalous, Altschul and Huber (2000:145) have argued they are “not unusual and, indeed, may be fairly common over much of the Colorado Plateau.”

The implications of changing social organization in response to population aggregation into hamlets or villages, even if only in select locations, are substantial, although interpretations of the relevant data may be somewhat speculative. As summarized by Gilpin and Benallie (2000:172-173), the increased dependence on domestic foods and increased sedentism evident at Basketmaker III sites was concomitant with an in-
creased division of labor according to gender, matrilineal control of farmland, matrilocal residences, a need for communal ritual to integrate increasingly permanent hamlets and farmsteads that could not persist independently, the development of kivas as the focal point of ritual and ceremony that were controlled by men, and by the emergence of site hierarchy, centralization and unequal concentrations of surplus.

**Rock Art.** Robins and Hays-Gilpin (2000:247) also see evidence of increased social complexity in the rock art of the Basketmaker III period, which is substantially different than earlier times. The static, heroic nature of the earlier San Juan Anthropomorphic Style (Basketmaker II) gave way to more narrative expressions of rituals and myths, characterized by depictions of male potency and processions that are presumed to be narratives of ceremonies and rituals linking communities (Figure 4.19). Robins and hays-Gilpin argued that rock art and portable artifacts became increasingly diverse during Basketmaker III times, reflecting gender and age role differentiation, intra-community competition for prestige and control of resources, and intercommunity rituals, alliances and conflict. Their data were derived from sites from throughout the San Juan River drainage, including sites on Cedar Mesa and in contiguous areas.

As summarized by Cole (2009:173-174), Basketmaker III (and Pueblo I) rock art is often located in direct association with earlier rock art sites and the imagery may represent events recounted in oral traditions to connect the past to the present. Cole sees considerable continuity between Basketmaker II and Basketmaker III expressions, including the persistence of broad-shouldered triangular anthropomorphs, processions of backpacker anthropomorphs, flute players, linear and dot motifs, handprints and footprints, and animals such as bighorn sheep, bears, canines and felines. The differences from earlier expressions include less embellishment of anthropomorphic figures (Figure 4.20) and greater variety of such figures, including elongated rectangular figures with hair whorls and one-horn headdresses, figures with oval bodies and heads, and lizard-like forms with rec-
Basketmaker III rock art sites depicting processions of individuals are well documented in the Cedar Mesa area, especially along Comb Ridge where they are associated with east-to-west “crossover” localities along the nearly vertical escarpment. These figures are animated and range from abstract linear forms to realistic and embellished figures. Some of the figures are wearing backpacks, some are attached to objects such as crooks, “pendant circles” and lines, and some have distinctive bird headdresses and hairstyles. Cole and others have argued these sites are indicative of group travel and are reflective of social markers that include age and social status, and that such depictions may symbolize travel by dispersed small groups to a centralized great kiva or community center (Cole 2009:176; Manning 1992; Robins and Hays-Gilpin 2000; see also Wilshusen 2006).

Summary

As discussed above, the remarkable Basketmaker II manifestations in the Greater Cedar Mesa area constitutes the first significant occupation of the study area. This expression includes both ephemeral and substantial pithouse residences, abundant and large storage cists in alcoves and rockshelters, which were also used as burial chambers where the dead were interred in comparatively rich funerary contexts, a distinctive rock art tradition and sophisticated basketry.

Maize-growing farmers may have been present in the area by 1000 B.C. (or earlier), but this is not yet supported by radiocarbon data. The earliest residents – whether labeled “White Dog,” Basketmaker I or Preformative (cf. Matson 2006) – had certainly begun to occupy rockshelters and alcoves in the Cedar Mesa area in first few centuries B.C., although they may not have been as dependent on agriculture as those who came later. Cultivation of maize and squash certainly occurred, probably facilitated by floodwater farming of the canyon bottoms, and, in at least one instance, floodwater farming on the mesa top (Matson 1994).

By A.D. 200, farming strategies had evolved to include dry farming of the mesa tops, although floodwater farming of the canyon bottoms continued. Dry farming, however, assumed para-
mount importance, as evidenced by a proliferation of pithouses in close proximity to maize fields on the mesa top. Called the Grand Gulch Phase, this period of time featured as much dependency on cultivated foods as that of later Basketmaker III to Pueblo III times. The increased dependency on cultigens, compared to earlier times, may have resulted in increased sedentism and social complexity, as well as the emergence of rituals to integrate dispersed communities. A Basketmaker II occupation of Cedar Mesa is supported by at least 25 radiocarbon dates and 28 tree-ring dates from sites within the study area (see Table 4.3). By A.D. 400, Cedar Mesa had been abandoned.

The Cedar Mesa area was not again reoccupied until the arrival of Basketmaker III farmers some 250 years later. This resurgence, labeled the Mossbacks Phase, began in the late A.D. 600s and continued into the early A.D. 700s, or a period of less than 100 years. The spatial patterning evident at Basketmaker III sites indicates they exploited farmlands on the mesa tops much in the same manner as their Grand Gulch Phase predecessors, although their pithouses were larger and more substantial. This period of time was characterized by the appearance of new technologies, in particular the bow and arrow which increased hunting efficiency, and grayware ceramics, itself indicative of the introduction of domesticated beans into the diet of Southwestern farmers and the need for durable containers to boil beans for extended periods.

Although evidence is currently lacking from the Cedar Mesa area, Basketmaker III manifestations elsewhere in the Four Corners region suggest this period was characterized by increasing social complexity that included population aggregations into villages, the emergence of great kivas for community rituals and perhaps greater social hierarchy. The Cedar Mesa area appears to have been on the western edge of Basketmaker III developments in southwestern Colorado. How the Cedar Mesa communities may have been integrated into this larger manifestation is not known, although rock art attributed to this period could symbolize travel by dispersed small groups to a centralized community center. A brief Basketmaker III occupation is supported by at least three radiocarbon dates and 44 tree-ring dates (see Table 4.3).

Table 4.3: Basketmaker II-III chronometric data from the Greater Cedar Mesa study area

<table>
<thead>
<tr>
<th>Lab No.</th>
<th>C-14 Age BP</th>
<th>2 Sigma</th>
<th>Period</th>
<th>Material</th>
<th>Provenience</th>
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<td>BMIII</td>
<td>pinyon</td>
<td>Feature H</td>
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<td>BMIII</td>
<td>pinyon</td>
<td>Feature K</td>
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</tr>
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<td>AD 510p - 636 +vv</td>
<td>BMIII</td>
<td>pinyon</td>
<td>Feature K</td>
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<td>Dead Dog (42Sa5115): Sally Cole, personal communication 2009</td>
<td>B-120371</td>
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<tr>
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<td>BMII</td>
<td>cordage</td>
<td>alcove</td>
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<td>1790 ±50</td>
<td>AD 92-381 AD</td>
<td>BMII</td>
<td>plant</td>
<td>alcove</td>
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<td>BC 193-124 AD</td>
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<td>2 Sigma Period</td>
<td>Material Provenience</td>
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<td>AD 25-428 AD</td>
<td>BMII juniper bark burial pit</td>
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Table 4.3: Basketmaker II-III chronometric data from the Greater Cedar Mesa study area (cont.)

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Veras Site (42Sa3650): Pollock 2001, Berry 1982

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WJ-2-3: Matson et al. 1991

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WJ-12-6: Matson et al. 1991, Matson 1991

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Zero Plaza (42Sa2135): Dalley 1973

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All radiocarbon dates recalibrated as per CALIB REV5.0.2 (Stuiver et al. 2004) for consistency.

Symbols: P = pith ring present, FP = the inside ring is far from the pith, V = although outside rings are missing, it is estimated the outside ring date is within a few years, VV = there is no way of estimating how far the last ring is from the true outside, B = bark present on the outside ring
* = one or more rings may be missing near the end of the ring series, but their presence or absence could not be determined
++ = multiple rings missing from the outside and the specimen could not be accurately dated
Introduction

Researchers have long struggled with descriptive definitions that delineate changes in human adaptations between A.D. 750 and 1300, or that period of time when Southwestern populations shifted from primarily pithouse occupations to above-ground pueblos. Traditional definitions of the Pueblo period of time have defined three sequential periods of Pueblo I, Pueblo II and Pueblo III with an implied progression from simple to complex through time (see Kidder 1927). More recent research has emphasized the tremendous variability in adaptive strategies, settlement and land-use patterns, and site structure through all three periods. Some discussions offer no distinctions between the Pueblo I period and early Pueblo II times, and others consider the late Pueblo II and Pueblo III periods to be coequal. Still others have resorted to more inclusive and temporally overlapping terms like “Developmental Pueblo Period” to describe the shift to surface masonry pueblos that occurred between A.D. 700 and 1100, and “Classic Pueblo” to describe population aggregations from A.D. 1000 to 1300 (Brody 1990). Collectively, this period of time can be characterized as a time of enhanced social, political and economic complexity among some populations, but not all groups.

In general, the entire period of time encompassed by Pueblo I, Pueblo II and Pueblo III can be characterized by a pan-regional pattern of population aggregations, dispersal, abandonment and, in some cases, reoccupation, but with dissimilarities in the timing and nature of these events from region to region. With few if any exceptions, the defining traits of the Pueblo period of time were rooted in earlier Basketmaker expressions.

Despite the material evidence for greatly increased complexity of religious, political, economic and social systems, many of which were analogous to those of the historic pueblos, there are surprisingly few entirely original innovations. Water management systems were more sophisticated, but for the most part elaborated on earlier Anasazi methods, and, while pottery and many other arts and manufactures burgeoned, these were mainly refinements and variations upon older themes and technologies. Similarly, the elaborate calendrical and ritual concerns evidenced by solstice markers and Great Kivas had much older prototypes. Virtually all the technological and intellectual aspects of Classic Pueblo culture appear to have had their origins in earlier ... practices [Brody 1990:110].

For the purposes of this overview, the traditional Pecos Classification nomenclature is retained, but with modified temporal ranges suggested by Wilshusen (1999b), Lipe and Varien (1999a, 1999b) and Hurst (1992). The Pueblo I period encompasses that period of time from A.D. 750 to 900 when some populations aggregated into large villages; the Pueblo II period ranges from A.D. 900 to 1150 with the rise of Chacoan centers that extended their influence to a large portion of the Greater Southwest, as well as the dispersal of some populations into small farmsteads or rancherias on mesa tops; and the Pueblo III pe-
period from A.D. 1150 to 1300 when some populations aggregated into relatively large communities, canyons and cliffs were exploited to a greater degree, and climatic deterioration led to abandonment of much of the Southwest at the end of the period (see Table 5.1). The Greater Cedar Mesa area may not have been continuously occupied through the Pueblo I-III period of time, but this chronological framework provides a broader context to facilitate a discussion of relevant Cedar Mesa data. Due to the voluminous nature of the archaeological literature related to this period of time, only those reports most relevant to the study area are cited here.

**Pueblo I: A.D. 750 to 900**

As discussed in Chapter 4, many of the defining traits of the Pueblo I period of time were actually present during late Basketmaker III times. These included population aggregations into villages or hamlets, some of which featured defensive stockades, and the use of exceptionally large pithouses or kivas (Figure 5.1). The transition from Basketmaker III to Pueblo I is defined archaeologically by rapid demographic and organizational change throughout the Four Corners region (see Varien et al. 1996; Wilshusen 1999b, 2006; Wilshusen and Ortman 1999), albeit with considerable regional variation on the timing and importance of these changes. There was a continued preference for subterranean circular structures (pithouses and/or kivas), but with the addition of contiguous above-ground storage units of true masonry that were joined together through accretion into blocks of rooms. Plain-gray pottery predominated (Mancos Gray, Moccasin Gray, Kana-a Gray), but vessel necks were decorated with a band of corrugations. Painted pottery appeared in the form of black-on-white types such as Piedra Black-on-white, Kana-a Black-on-white; red-on-orange types such as Abajo Red-on-orange; and black-on-red types such as Bluff Black-on-red, Deadman Black-on-red, Abajo Polychrome (Figure 5.2). Reliance on agriculture may have increased as evidenced by terracing, irrigation and field grids.

The distribution of known Pueblo I sites across the Four Corners area suggests a shift from middle-mesa locations utilized during Basketmaker III times to more upland settings above 6,000 feet elevation and into major drainages. A pronounced clustering of Pueblo I sites at higher elevations and along major drainages has been interpreted as responses to episodic droughts that rendered the lower and middle-elevation mesa tops unsuitable for runoff irrigation farming. These higher elevations, while featuring greater effective moisture, would have been susceptible to shorter growing seasons, with killing frosts later in the spring and earlier in the fall (cf. Euler et al. 1979; Kane 1986, 1989; Petersen 1988; see also Matson et al. 1990). Plog (1979) has argued this period was the first to reflect political and economic alliances that linked diverse Anasazi populations throughout much of the Colorado Plateau. As summarized by Brody (1990), the need for large and secure storage spaces, for mutual aid during lengthy periods of drought, and for cooperative labor forces encouraged development of ever larger communities and of alliances among neighboring groups.

<table>
<thead>
<tr>
<th>Northern San Juan</th>
<th>Population Dynamics and Settlement Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD 750-920</td>
<td>Large, short-lived villages; development of San Juan Pattern after AD 880; abrupt population decline in southwest Colorado and population increases in southeastern Utah</td>
</tr>
<tr>
<td>AD 920-1050/1075</td>
<td>After AD 950, slow population increase in southwest Colorado, low population in southeastern Utah</td>
</tr>
<tr>
<td>AD 1050/1075-1150</td>
<td>Marked population increase and construction of great houses</td>
</tr>
<tr>
<td>AD 1150-1200</td>
<td>Population decline and population disruption in southwest Colorado and southeast Utah; hiatus in great house use? After AD 1180, population increase to peak likely in early 1200s; small sites cluster and great houses still used; new regional center at Aztec?</td>
</tr>
<tr>
<td>AD 1225-1275/1300</td>
<td>Large aggregated sites cluster at canyon heads; variety of associated architecture; evidence of lack of social integration at large communities? After AD 1280, population begins rapid decline as entire region is abandoned</td>
</tr>
<tr>
<td>AD 1275/1300-1600</td>
<td>Region abandoned</td>
</tr>
</tbody>
</table>

Table 5.1: Comparison of population dynamics and settlement patterns from north to south. Modified from Cameron (2009:312).
The Pueblo I period has been the focus of scholarly research since almost the beginning of formal archaeological inquiry in the Southwest. In about 1913, Earl Morris (1919) excavated a number of Pueblo I sites, recognizing a transitional site type between earlier Basketmaker sites and the later cliff dwellings. This “transitional” period was addressed by scholars at the first Pecos Conference (Kidder 1927), where an identifiable stage of cultural development—Pueblo I—was defined on the basis of various material culture and architectural traits. In general, it was a period when cranial deformation was practiced, culinary vessels featured coiling or banding around the necks, and blocks of surface masonry rooms were associated with pit structures. As summarized by Wilshusen (1999:196), the Pecos Conference served to rectify the “muddle of various terms” used to denote the transitional period, and led directly to a renewed interest in the Pueblo I period of time among prominent researchers in the region (e.g., Martin 1938, 1939; E.H. Morris 1939; E.A. Morris 1959; Roberts 1929). Among these were J.O. Brew’s landmark excavations at Alkali Ridge, east of the Cedar Mesa study area (Brew 1946).

Early Pueblo I research was focused largely on defining how long the transitional period lasted, examining changes in lifeways that delineated this period from earlier and later periods, and understanding how these changes were related to large sites such as those in Chaco Canyon (Wilshusen 1999b). Researchers began to recognize a wide diversity of house types, pottery types and site layouts that varied from area to area, although there was little success in explaining how these changes occurred. By the 1950s, a variety of local development sequences had been developed (Brew 1946; O’Bryan 1950; Rohn 1977), and subsequent advances in tree-ring dating (Dean 1988b) and ceramic seriation (Breternitz et al. 1974) led to more refined local chronologies. As summarized by Wilshusen (1999b:197), “while there was progress in documenting and dating change at the local level, there was still limited success in explaining why change occurred regionally.”

Critical re-examination of the Pueblo I period resulted through several large-scale salvage projects in the 1970s in southwestern Colorado, northern New Mexico and northeastern Arizona. As summarized in Wilshusen (1999b), researchers examined a 30-room pueblo constructed in the middle to late A.D. 800s in Ute Canyon in southwest Colorado, recognizing that increasing population and multi-generational use could have resulted in increased use of surface rooms for a wider range of activities than just storage or seasonal use. Also represented was a shift to new architectural forms (e.g., kivas). In the Black Mesa area, research at a 39-room pueblo occupied in the A.D. 800s addressed the functional qualities of pit structures and pueblos, with pit structures interpreted as evidence for bi-seasonal residential shifts while pueblos represented more stable and intensive occupations in which groups did not make dramatic seasonal moves (Gilman 1987; see also discussion in Chapter 4).

In the Chaco Canyon area, researchers documented a large number of small Pueblo I unit pueblos, as well as the presence of three early
Chaco great houses with 15 to 35 rooms constructed in the late A.D. 800s and early A.D. 900s (Hayes 1981; Windes and Forde 1992, 1996). And in southwestern Colorado, the Dolores Archaeological Project investigated more than 50 Pueblo I sites, at least 22 of which were village sites with as many as 100 rooms, all dated to the mid to late A.D. 800s (Breternitz et al. 1986). Subsequent research (Kane 1989; Wilshusen 1989; Wilshusen and Ortman 1999) recognized organizational differences evident in Pueblo I site structure that may have corresponded to abandonment of the Pueblo I villages in the A.D. 880s. Collectively, these projects have defined the modern theoretical context for discussions of the Pueblo I period in the Four Corners region, although none of them occurred near the Cedar Mesa study area.

Southeastern Utah

The Pueblo I period in southeastern Utah has not experienced the same level of critical re-evaluation as seen in other areas of the Southwest. In fact, the period of time from about A.D. 750 to 900 is poorly represented in the Greater Cedar Mesa study area (see Appendix A: Map 4), where it remains defined largely on the basis of changes in artifacts and architecture with their inherent implications for changes in community organization. In southeastern Utah generally, several aggregated Pueblo I communities have been identified, all of which stand in decided contrast to the dispersed and smaller settlements of Basketmaker III times (and to subsequent Pueblo II period settlements). Pueblo I sites here typically include an unusually large pit structure or kiva that was likely the focus of communal and ceremonial activities that integrated the community through mitigation of conflict, competition and resource shortfalls during episodic droughts (see Hurst 1992:53 for a summary).

Lipe (1967, 1970), noting the absence of Basketmaker III and Pueblo I sites in the Red Rock Plateau west of Cedar Mesa, suggested that
Cedar Mesa might constitute the western frontier of an extensive Basketmaker III manifestation centered in southwestern Colorado (see also Matson et al. 1990 Vol. 6:6). More equivocal is whether Cedar Mesa was a western frontier during Pueblo I times. The Cedar Mesa Project quadrat surveys recorded no sites assignable to the Pueblo I or early Pueblo II periods (Matson 1990 Vol. 6:5), even though Pueblo I sites were known to exist in Comb Wash and other drainages to the east outside the survey quadrats (Haase 1983).

In southeastern Utah, Pueblo I population aggregation has been documented at Alkali Ridge east of Blanding (Brew 1946), upper South Cottonwood Wash (DeBloois 1975; Louthan 1977), the Twin Rocks Site near Bluff (Davis et al. 1990), Monument Village in Montezuma Canyon (Miller 1974; Patterson 1975) and in several areas around Aneth (Hurst 1992:55). As discussed by Hurst (1992:54), a significant number of Pueblo I sites have been identified in southeastern Utah, some with overlying Pueblo III occupations, but these are as yet undocumented. Unrecorded sites include substantial aggregations at McElmo Creek, Montezuma Creek, Recapture Wash, Butler Wash and Comb Wash (only the latter is within the study area considered here). Some of these sites are located in defensive positions, including a fortified site on a prominence at the confluence of Yellowjacket and McElmo creeks about 11 miles northeast of Aneth. The site consists of slab-lined rooms, depressions and bedrock water catchments on a narrow point bounded on two sites by sheer cliff walls (Hurst 1992; see also Fewkes 1919; Gunckel 1892a, 1892b, 1892c; Morley and Kidder 1917).

As discussed by Hurst (1992), ceramic preferences during Pueblo I times in southeastern Utah were clearly distinct from earlier or later times. Regional distinctions in decorative styles had become well established, particularly between the Mesa Verde and Kayenta areas, as typified by the “clear divergence” of Piedra, White Mesa and Kana’a black-on-white from the generic Lino style of the previous period, “a stylistic regionalization presumably reflecting decreased interaction and possible boundary crystallization among geographically separated groups” (1992:52; see also Table 5.2). Perhaps related to this development was the emergence of a technologically sophisticated San Juan Red Ware tradition among the western Mesa Verde Anasazi. This tradition, which appeared suddenly and without precedent,

<table>
<thead>
<tr>
<th>Period</th>
<th>Gray Tradition</th>
<th>White Tradition</th>
<th>Red Tradition</th>
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<tbody>
<tr>
<td></td>
<td>Mesa Verde</td>
<td>Kayenta</td>
<td>Mesa Verde</td>
</tr>
<tr>
<td>P III</td>
<td>Mesa Verde</td>
<td>Kiet Siel Gray</td>
<td>Mesa Verde</td>
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<tr>
<td></td>
<td>Corrugated</td>
<td>Moenkopi</td>
<td>McElmo b/w</td>
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<tr>
<td></td>
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<td>Corrugated</td>
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<td>PII</td>
<td>Mancos</td>
<td>Tusayan</td>
<td>Mancos b/w</td>
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<tr>
<td></td>
<td>Corrugated</td>
<td>Corrugated</td>
<td>Cortez b/w</td>
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<tr>
<td>PI</td>
<td>Mancos Gray</td>
<td>Kana-a Gray</td>
<td>Piedra b/w</td>
</tr>
<tr>
<td></td>
<td>Moccasin Gray</td>
<td></td>
<td>Kana-a b/w</td>
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<tr>
<td>BMIII</td>
<td>Chapin Gray</td>
<td>Lino Gray</td>
<td>Chapin b/w</td>
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<td>Lino b/g</td>
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<td></td>
<td></td>
<td></td>
<td>Abajo r/o</td>
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</tbody>
</table>

Abbreviations: b/w is black-on-white, b/r is black-on-red, b/o is black-on-orange, r/o is red-on orange, b/r is black-on-red, b/g is black-on-gray.

Table 5.2: Comparison of relevant ceramic types by region of influence. Modified from Nickens (1979:108).
emerged in late Basketmaker times and persisted for roughly three centuries until it was replaced by Tsegi Orange Ware with its origins in the Kayenta region.

**Greater Cedar Mesa**

Compared to the prevalence of Basketmaker III sites on Cedar Mesa, Pueblo I sites are remarkably rare, and researchers have argued that most are located on the northern and eastern periphery of the study area (Dalley 1973; Haase 1983; Matson et al. 1990; Severance 2003; Wilson 1974). High densities of Pueblo I sites have been reported at higher elevations in the Milk Ranch Point area (DeBloois 1975), and some have been reported along the eastern edge of Cedar Mesa overlooking Comb Wash (Haase 1983). Severance (1999, 2003) reported a Pueblo I road – the earliest yet documented in southeastern Utah – and seven great kiva depressions with Pueblo I ceramics, but it is unclear if these sites are located in or simply near the Cedar Mesa study area (Hurst and Till [2002:21] have argued that none of the Utah great houses or roads date prior to late Pueblo II times).

Severance also noted that Pueblo I ceramics found in the Cedar Mesa area at this time are dominated by White Mesa Black-on-white, indicating influence from or immigration of people from the Kayenta area. In contrast, sites in drainages to the east of Cedar Mesa feature Piedra Black-on-white, indicating influence from the Mesa Verde region (Severance 2003:199; see also Severance 2004). This implies that Comb Ridge may have been a boundary between Kayenta-influenced groups to the west and Mesa Verde-influenced groups to the east. As part of this overview, site forms on file with the Utah SHPO and BLM were examined to determine ceramic types identified at sites in the Cedar Mesa area and thereby ascertain the region of influence (Kayenta or Mesa Verde). These data indicate that ceramics at almost all Pueblo I sites in the study area were identified as Mesa Verde types (Figure 5.3), a finding inconsistent with data reported by Severance (2003). The accuracy of this determination is admittedly predicated on the ability of archaeologists to make accurate identifications during field surveys.

The substantial decrease in the level of intensity of Cedar Mesa occupations during Pueblo I times, as noted by Cedar Mesa Project surveys (Matson et al. 1990), and the corresponding increases in site density in upper elevation areas around Milk Point Ranch (DeBloois 1975) and Chippean Ridge (Louthan 1977), both located north of the study area considered here, could reflect a population shift to higher elevations between about 6,200 and 8,200 feet elevation. This may have been a response to drought conditions that made lower elevations unsuitable for dry farming. At Chippean Ridge, Pueblo I sites are more represented (232 sites, or 34.3 percent) than any other period of time (Louthan 1977). What is not clear from the available data is whether these higher-elevation occupations represent population aggregation, as is common elsewhere in the Four Corners, or a continuation of the dispersed family farming pattern of Basketmaker III times.

The issue of population aggregation, if it occurred in or near the study area, may have been a defensive response to increased competition precipitated by drought. As discussed by LeBlanc (1999), Pueblo I population aggregation may have occurred in response to an intensification of warfare, in which case spatial buffers would have emerged between groups that had aggregated for mutual protection (see also Orcutt et al. 1990; Wilshusen 1986). LeBlanc (1999) suggested a major "empty zone" emerged to separate Pueblo

![Figure 5.3: Ratio of Cedar Mesa sites with Pueblo I ceramics exhibiting Mesa Verdean versus Kayenta influences.](image-url)
I populations living in the Mesa Verde area from those in the Kayenta region. Whether Cedar Mesa was part of the major empty zone between Mesa Verde and Kayenta populations or whether it constituted the western edge of the Mesa Verde Pueblo I expression cannot be stated at this time.

**Summary.** Although definitive statements about Pueblo I occupations in the study area cannot be offered, Wilshusen’s (1999b) excellent synthesis of the regional data offers perspectives that may be applicable to the Cedar Mesa area. He suggests the Pueblo I period represents a classic example of Formative societies organized around villages, and that “the rapid emergence of these villages, their short use lives, and the probable migration of thousands of people across the region are all aspects of Pueblo I change in the northern Southwest” (1999b:237). Major changes occurred in the very late A.D. 800s and early 900s as settlement locations shifted from north to south, agricultural settings changed from upland dry farming of mesa tops to lower elevation drainage settings with less rainfall and poor soil quality, and settlement patterns shifted from large, tightly interconnected villages to dispersed communities of single-residence hamlets (Figure 5.4; see also Wilshusen 2006 for a popular summary of this transition).

The population aggregation evident during Pueblo I times undoubtedly has implications for dramatic changes to community organization and the florescence of rituals to facilitate conflict resolution and socioeconomic relationships as evidenced by hierarchically organized ritual systems with unusually large pit structures, as well as alternative systems focused on large kivas and numerous smaller pithouses (Wilshusen 1999b).

Dramatic changes in ritual or ceremonial practices, however, are not evident in the suspected Pueblo I rock art of the region, which is generally characterized as a continuation of Basketmaker III styles and iconography. In fact, Cole (2009:173-179) sees no distinction between Basketmaker III and Pueblo I rock art in the region, discussing both periods coequally. Broad-shouldered anthropomorphs are less embellished than in earlier times, procession panels are common and reflect narrative qualities, and the catalog of images includes backpackers, flute players, spirals, geometric designs, hand and paw prints, and lizard-like forms. The Procession Panel on Comb Ridge may be the best example of Basketmaker III-Pueblo I rock art in the study area (Figure 5.5).

**Pueblo II: A.D. 900-1150**

As discussed above, evidence from late Pueblo I sites in the Dolores River drainage in southwestern Colorado suggests a dispersal of populations away from large Pueblo I villages in the late A.D. 800s (Wilshusen 1999b). A similar dispersal in the Alkali Ridge and Montezuma Canyon areas of southeastern Utah probably occurred, although the nature and timing of these changes is uncertain. Hurst and Till (2002) have noted many of the Pueblo I sites show substantial occupation well into the A.D. 900s. It can be stated with greater certainty that sites in southeastern Utah after about A.D. 900 are dispersed and relatively small. Habitation sites range from isolated rooms or room blocks through variations on the fundamental room block-kiva unit pueblo and multiple-unit pueblo (Figure 5.6), sometimes loosely aggregated into villages. And in some areas, massive, formally planned edifices...
were constructed that were smaller than but similar to structures found at distant Chaco Canyon. As summarized by Hurst (1992), “such variability defies simple summary definition. Perhaps the Pueblo II is best conceptualized as the interval separating the Pueblo I and Pueblo III periods, both of which lend themselves to more straightforward definition” (1992:56).

For the purposes of this overview, the Pueblo II period is assigned a temporal range of A.D. 900 to 1150 (as per Lipe and Varien 1999a). According to the original Pecos Classification (Kidder 1927:490), the Pueblo II was a stage of cultural development marked by widespread geographic extension of small villages and the manufacture of corrugated cooking vessels, often with great elaboration. As discussed by Lipe and Varien (1999), the Pueblo II period was initially viewed as part of a progressive continuum that culminated in the large communities of the Pueblo III period. This linear progression from simple to complex was reinforced by Roberts' (1935a, 1935b, 1937) architectural studies in the region through which the “unit-type pueblo” (often referred to as a Prudden Unit) with aggregated surface masonry structures and associated kiva became the typical site “type” for this period (Figure 5.7). Only after the emergence of tree-ring dating was it demonstrated that small unit pueblos were contemporaneous with large structures at Chaco Canyon, thereby encouraging the replacement of gradualist approaches to culture change with interpretive models that recognized the complexity of human adaptations during this period of time (Lipe and Varien 1999a:242).

Archaeological investigations at Pueblo II sites in the Southwest, whether through surveys, testing or excavations, are myriad, and only those most relevant to the Greater Cedar Mesa area are addressed here (but see Lipe and Varien [1999a] for a superb overview of regional data). Generally, the Pueblo II period can be characterized by moderate climates, expansion of settlements into areas that had previously been unsettled, increased populations and decreased evidence of conflict. Although paleoclimatic reconstructions are sometimes contradictory, the early Pueblo II is generally characterized by high climatic variability with a general trend toward increased effective precipitation, aggrading arroyos and higher water tables. In contrast, the late Pueblo II period ap-

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Figure 5.5: Procession Panel at Comb Wash is considered to be typical of Basketmaker III-Pueblo I rock art. Photo courtesy of Sally Cole.

Figure 5.6: Artist's depiction of a typical Pueblo II-period farmstead. Adapted from Nickens (1979).
Midden enweep (Eddy et al. 1984) and Cedar Mesa (Matson et al. 1990).

The apparent population increase during Pueblo II times was accompanied by the appearance of (or elaboration on) a variety of water and soil conservation features (Brooks 1974; Davis et al. 1986; Plog and Garrett 1972; Rohn 1977), including arroyo check dams (trincheras), linear borders, reservoirs and irrigation ditches (Schroeder 1968; Vivian 1970, 1974; Winter 1976a, 1976b). Winter (1983) also found widespread use of floodwater farming in drainage bottoms without any remaining evidence of durable conservation features, although earthen ditches and dikes may have eroded to be unrecognizable. Such conservation features are seen as attempts to increase the carrying capacity of the land in response to population pressure in core areas and subsequent dispersal on small farming groups into marginal environments.

The dispersed nature of settlement patterns during Pueblo II times has traditionally been interpreted as reflecting a time of relative peace and prosperity in the Anasazi world (Eddy et al. 1984:39), although this view has been challenged by evidence of homicide and cannibalism (Turner and Turner 1999; see also Baker 1990 for relevant southeastern Utah data) and possibly defensive stockades at sites in Colorado (Kuckelman 1988:428-430). LeBlanc (1999:154-156) observed that some Chacoan sites were located on high points that were well situated for defense, but that the vast majority of sites in Pueblo II times, "both large and small, were usually situated in low places near water, farmland or similar resources. High, defensive localities were rarely used. Communities almost always were to some degree spread out; there were no defensive walls or palisades, nor were room blocks arranged in a defendable perimeter" (1999:156).

The Pueblo II period has also been divided by some researchers into an early Pueblo II from A.D. 900 to 1050, and a later period from A.D. 1050 to 1150 (cf. Stuart and Gauthier 1981; Lipe 1967, 1971).

Figure 5.7: Typical site layout during Pueblo II times, commonly referred to as a "Prudden Unit" pueblo. Modified from Prudden (1903).
and Lekson 1990; Lipe and Varien 1999a). Early Pueblo II sites are rare in the study area, whereas late Pueblo II sites are ubiquitous (Matson et al. 1990). Population dispersal at the end of Pueblo I times is supported by Severance’s (2003) ceramic analysis at Pueblo I sites that found dramatic reductions in the frequency of early Pueblo II pottery compared to earlier Pueblo I times.

In the region generally, early Pueblo II habitation sites consist of one or two unit-type pueblos that include a kiva, a small number of associated surface rooms of jacal or masonry construction, an occasional small pit structure used as a food processing room, and a trash midden. These unit pueblos are typically dispersed, and they occur in isolation or are loosely clustered, although small aggregations have been observed. Great kivas are present at some sites and probably served as central features for communities (Lipe and Varien 1999a:244). From about A.D. 1000 to 1050, communities began to exhibit greater clustering of habitations, which may also have been larger in size (1999a:256). It is assumed that a similar community pattern is evident in the Cedar Mesa area, although the limitations of the database preclude any further discussion. This assumption is supported by Severance (2003), who observed five great kiva depressions, four with associated prehistoric roads, attributable to this period of time.

**Late Pueblo II**

A late Pueblo II presence (A.D. 1050 to 1150), which has been well documented in the Cedar Mesa area and throughout southeastern Utah, is characterized generally by a proliferation of small habitations with the traditional room block and associated kiva (Figure 5.8), the appearance of great houses that were the central focus of community activities, and the aggregation of some populations into villages. Community centers were more visible, either through the presence of a great kiva, a great house, an aggregation of residential structures or some combination of all of these features (Lipe and Varien 1999a:256). The unit-type pueblo characteristic of earlier times continues to be the dominant site type, although multi-unit pueblos become more common. Upland dry farming was the preferred agricultural strategy, but a variety of strategies are evident, sometimes within the same community (1999a:257). The increase in the site density and expansion into areas previously unoccupied is seen both as an actual population increase (Euler 1988:222-224) and to some extent a dispersal of large Pueblo I communities into smaller single-unit or multi-unit pueblos reflecting isolated settlements and community clusters (Eddy et al. 1984:38).

The late Pueblo II period is typically described within the context of the “Chaco phenomenon” in northwestern New Mexico, characterized by the construction of massive structures and possibly population aggregations. As summarized by Lipe and Varien (1999a:258), the major episodes of great house construction at Chaco Canyon began about A.D. 1040 and reached a peak between A.D. 1080 and 1100, after which construction declined in the early A.D. 1100s. The center of the Chacoan system may have shifted north to the Animas River area where construction at great houses, begun about A.D. 1080, accelerated after

![Figure 5.8: View of the now-stabilized kiva at the head of Mule Canyon, northern Cedar Mesa. The room block is located just out of view.](image)
A.D. 1100 and continued through 1130 (McKenna and Toll 1992). Collectively, these data suggest the Chacoan phenomenon flourished between about A.D. 1040 and 1130, or most of the late Pueblo II period considered here.

The rise of the Chacoan system and its role in integrating distant Pueblo II communities has been the subject of considerable debate over the years. On one hand, Cordell (1984) argued that most of the Southwest was not incorporated into a hierarchy centered on Chaco Canyon, but rather a pattern of local development continued. She suggested that population density increased in many areas, soil- and water-control features were constructed, some villages became quite large, and regionally distinct ceramic styles developed (1984:283). On the other hand, the subsequent identification of numerous great houses with Chacoan-like features, great kivas and road networks throughout the Four Corners area in the past two decades suggested instead that the Chacoan sphere of influence, characterized by large architectural features denoting substantial status differentiation, was actually ten times broader than originally believed (Lekson 2006; Lekson et al. 1988), and that it may have extended into the Cedar Mesa area (Hurst and Till 2002).

A comprehensive review of the voluminous written record of the Chaco phenomenon is beyond the scope of this overview. It can be stated, however, that most models recognize the likelihood of some level of socioeconomic interactions between the elite of different communities, with Chaco Canyon being instrumental in the development and spread of the organizational principles that underlay the concepts of great houses and roads (Sebastian 1983) and the inherent implications on interregional exchange (Varien et al. 1996). As summarized by Hurst (1992), “whatever the nature of the so-called Chaco system, we can be sure that some kind of extensive system was in operation in the Four Corners area during the tenth and eleventh centuries, that the central Chaco was heavily if not centrally involved in it, and that it figured importantly in the world of the Anasazi” (1992:63).

Whether the Pueblo II is discussed within the framework of a Chaco alliance (Plog 1983) or Chaco phenomenon (Irwin-Williams 1972; Vivian 1990), this period is marked by the appearance of large, architecturally distinct structures. Chacoan great houses are typically multi-storied cellular room blocks with enclosed kivas, and most often there are associated larger kivas, referred to as great kivas. All feature sophisticated construction incorporating tabular sandstone and chinking with small stones, minimal mortar and core-and-veneer wall construction (Lekson 1984). This expression is best known in the San Juan Basin of New Mexico, with nine great houses in Chaco Canyon and dozens more throughout northern New Mexico, particularly in the Animas River area (Kincaid 1983; Lekson et al. 1988; Marshall et al. 1982; Powers et al. 1983; see Vivian and Hilpert 2002 and Noble 2004 for popular summaries).

In a controversial tome, Man Corn: Cannibalism and Violence in the American Southwest, Turner and Turner (1999) postulated that the Chaco phenomenon represents the emergence of a political elite, perhaps stimulated by Toltec immigrants, that used public violence, mutilation and cannibalism as a political mechanism to control local populations, and that Chacoan hegemony subsequently spread to distant regions in Utah, Arizona and Colorado. Evidence of extreme violence is indisputable (see Baker 1990; Bullock, 1991, 1992; Billman et al. 2000; Kuckelman et al. 1999; White 1992), although Lipe and Varien (1999a) have convincingly questioned the Turners' conclusion of Chacoan state-sponsored terror as a means of political control, pointing out that most cases of extreme violence post-date the period of Chacoan great house construction, some by more than 100 years.

As discussed by Lipe and Varien (1999a), cases of extreme violence occur at or about the time of the onset of a profound drought in the mid A.D. 1100s, and “rather than being products of the expansion of terrorist social control by a powerful and ruthless elite, these particular cases seem more likely to be associated with the breakdown of what political institutions the Chaco system had to offer and/or with the failure of crops due to a
widespread drought” (1999a:286). Hence, the cannibalism, if it indeed occurred, could represent the settling of old feuds, famine, breakdown of social control, inter-community warfare, mortuary treatments or the killing of suspected witches (Bullock 1998).

Southeastern Utah. Chacoan-like great houses have been documented as far north as Lowry Ruin and in the Montezuma Valley area, both in Colorado (Powers et al. 1983), and as far west as the Hopi Reservation in Arizona (Gilpin 1989). In Utah, great houses have been observed in South Cottonwood Wash (Hurst 1992), upper Montezuma Canyon (Matheny 1962), the Montezuma Creek and Aneth areas (Harden et al. 1986); near the Bluff town cemetery, Cottonwood Wash, Natural Bridges, Arch Canyon and Cedar Mesa (Hurst 2000; Hurst and Till 2002; see also Hurst 1992, citing personal communications). An undocumented great kiva and road segment was recently identified near the Bullet Canyon trailhead on top of Cedar Mesa (Jonathan Till, personal communication 2009). The Utah great houses and great kiva sites typically feature remnants of prehistoric roads, often associated with circular, C-shaped or bracket-shaped structures (Hurst et al. 1990). Few of the Utah great house sites exhibit the classic Chacoan tabular sandstone construction evident in the San Juan Basin, but rather a more generalized Mesa Verdean construction style with stone blocks and irregular chinking (Hurst and Till 2002); many Utah sites do not have exposed masonry and have yet to be examined, mapped or documented to assess their construction style (Hurst and Till 2002; Hurst 1992). Some of the great houses may, in fact, not be “great houses” in the Chacoan architectural model, but rather very large houses (see Cameron and Duff 2008 and Lipe 2006).

Possibly associated with road features are “avanzadas,” or “odd structural complexes” on promenances with commanding views. Till (2001) identified two such structures on Comb Ridge, one (42Sa24298) a highly defensible complex of structures on a high sandstone knob where the only approach is blocked by defensive walls, and the other (42Sa23772) building rubble arrayed across a crevasse at the top of a knob overlooking an herrerada and road. Till also identified burned features that may represent “signal fire” locations. None of the great features in the Cedar Mesa area have produced direct dates. Based on the cross-dating of surface ceramics, Hurst and Till (2002) have argued that all such features date to late Pueblo II and Pueblo III times, although more exact resolution of the temporal sequence was hampered by evidence of use, re-use and remodeling of great structures and monumental construction.
houses through time. None of the southeastern Utah great features date after about A.D. 1250.

The relationship of the Utah “great features” to those described elsewhere in the Four Corners region or to the Chaco core area cannot be determined. As summarized by Hurst and Till,

*It is clear that Utah witnessed widespread development of great features in a generalized, less spectacular version of the generalized Chacoan pattern, by late Bonito times. It is less clear whether this pattern was introduced late into the area from the southeast, or had its roots in earlier local developments, as it did in the Chaco region (Windes and Ford 1992). The latter seems likely. While the Chacoan version of the great house system was clearly elaborated and developed far beyond its Utah analogues, we are not yet prepared to suggest whether Utah’s great features appeared earlier or later, or simultaneously with, or developed in emulation of, those in the Chaco region [2002:27].*

By the middle A.D. 1100s, the Chaco Canyon great houses and many of the outlying communities in the San Juan Basin had been abandoned (or at least new construction and maintenance had ceased), perhaps reflecting a collapse of the system they represented. Population increases have been documented at that time in upland areas (Lipe and Lekson 1990), perhaps reflecting migration of Chacoan populations (Stuart and Gauthier 1981). Other areas of the Southwest such as the Defiance Plateau and Black Mesa (Euler 1988) saw population declines in upland areas and corresponding increases in the lower drainages. In the Cedar Mesa area, a withdrawal of Kayenta Anasazi populations and resurgence of Mesa Verdean influences was observed (Matson et al. 1990). The collapse of the Chacoan communities, whether it was an alliance, phenomenon or system, and the subsequent shift of populations about A.D. 1150 approximate the end of the Pueblo II period of time.

**Greater Cedar Mesa.** Researchers have long recognized regional variations in Pueblo II expressions throughout the region (e.g., Mesa Verde, Chaco, Kayenta), based largely on differences in ceramic assemblages and architectural styles (Figure 5.9). This is relevant to Cedar Mesa where the northern expansion of the Kayenta Anasazi during Pueblo II times met with a western expansion of the Mesa Verde Anasazi in the Cedar Mesa area, with Comb Ridge becoming a distinct boundary between the two traditions (Hurst 1992;
see also Haase 1983; Matson et al. 1990). This marked a fundamental shift from the Mesa Verde-influenced ceramics of earlier Basketmaker III and Pueblo I occupations to influence or migration from the Kayenta region during Pueblo II times. This perception is reified by the perception that many architectural sites on Cedar Mesa exhibit architecture more characteristic of the Kayenta Anasazi (William Davis, personal communication 2008; Winston Hurst, personal communication 2008), and by the appearance of the Tsegi Orange Ware tradition with roots in the Kayenta region (Figure 5.10).

Collectively, the survey data from the Greater Cedar Mesa area reflect the general Southwestern trend toward dispersed, smaller settlements during late Pueblo II times, but with a rarity of population aggregations evident in some regions (e.g., Mesa Verde). The Cedar Mesa pattern of small structure size consistent with a proliferation of nuclear-family or extended-family farmsteads is repeated throughout the Colorado and San Juan river drainages at this time. Late Pueblo II and Pueblo III sites are typically oriented towards the mesa tops with aeolian deposits suitable for dry farming (Camilli 1975:111; see also Camilli 1983). Residences were typically located in close proximity to agricultural fields with little evidence the canyon drainages were occupied.

Based on survey data from 1971 through 1976, Haase (1983) noted that occupation of Cedar Mesa was intense from late Pueblo II through Pueblo III times, a sharp contrast to Pueblo I and early Pueblo II times when the mesa itself was unoccupied. During all periods, habitation sites are small compared to other areas of the Southwest (Haase 1983:1-2). He determined that elevation could have been the most important factor determining Puebloan settlement systems, which were influenced by the availability of precipitation, arable land and fuel. He observed an increase in complexity and density of settlements at higher elevations (1983:116; see also Matson et al. 1990: Vol. 12). The data also demonstrate that each habitation site was associated with numerous field sites designed to minimize loss of agricultural products (1983:118).

Matson et al. (1990: Vol. 11), using statistical data from the quadrat surveys, have argued that successful dry farming (reliance on rainfall) on Cedar Mesa could only take place at higher elevations (e.g., the pinyon-juniper zone) and only in those locations with deep soils. The majority of habitation sites identified in that study were located between about 6,300 and 6,700 feet elevation and almost all were located above 6,000 feet elevation. All habitation sites with the greatest number of structures were located above 6,400 feet elevation. There was also a direct correlation between habitation sites and dense stands of pinyon-juniper, itself an indication of soil depth, and southern exposures.

Based on tree-ring dates and ceramic seriation, Haase (1983), following on Matson and Lipe (1977; see also Matson et al. 1990), suggested a phase sequence for late Pueblo II occupations of Cedar Mesa (Figure 5.11). He proposed a Windgate Phase beginning at about A.D. 1060 when small groups of farmers occupied the mesa top. This was characterized by dispersed farmsteads with a predominance of Mancos Black-on-
white ceramics with smaller amounts of Cortez and Mesa Verde Black-on-white varieties, suggesting close affiliation with the Anasazi of the Mesa Verde region (Figure 5.12). He does not explicitly state when this phase ended, although a chart (1983:30) imprecisely indicates it terminated about A.D. 1100. Haase proposed that Windgate farmers were the first in 400 years to test the agricultural potential of Cedar Mesa, and “they were pioneers settling a virgin landscape” (1983:104).

The Windgate Phase was followed by a Clay Hill Phase that “appears to have been part of a general movement of Kayenta peoples or traits into southern Utah during the early 1100s” (Haase 1983:32). This phase is characterized by a ceramic assemblage dominated by Sosi and Dogoszhi Black-on-white varieties typical of the Kayenta ceramic tradition. Cedar Mesa was then abandoned about A.D. 1150 (1983:33).

Abandonment at about A.D. 1150 is supported by ceramic evidence. Matson et al. (1990 Vol. 7:42) noted overlapping ceramic traditions between the Windgate and Clay Hill phases, but little evidence the Clay Hill ceramic sequence overlapped with the subsequent Woodenshoe Phase. Bedell (2000), citing tree-ring evidence, has argued that rather than occupation followed by abandonment and then re-occupation, there were continuous but fluctuating levels of occupation of the study area from about A.D. 1110 through A.D. 1270, but with two periods of intense occupation, one during late Pueblo II times and one during Pueblo III times (2000:302). One period of construction occurred in the A.D. 1120s to A.D. 1140s, corresponding closely with the proposed Clay Hills Phase.

Based on the spatial distribution of storage and residential features, Bedell (2000) also suggested that the construction of domestic structures, agricultural production and distribution of resources were organized at the household level rather than a community level (2000:315), and that limited aggregation of households and inter-household cooperation and decision-making occurred as a defense mechanism during times of environmental stress (2000:318-319). This study built upon earlier observations by Matson et al. (1990) that approached the question of settlement patterns from two perspectives: (1) The late Pueblo II/Pueblo III sites on Cedar Mesa are “rancherias,” or isolated farming communities of one or two families living on site all of most of the year, or (2) these sites represent field houses occupied during the summer months by portions of a much larger population center to the east, perhaps in upper Comb Wash or Cottonwood Wash. In this regard, the data were mixed. The larger (and best preserved) canyon sites, constructed during Pueblo III times, “could not be seasonal field sites,” whereas “except for the canyon sites and a few of the larger mesa-top sites, one could argue that the rest of the sites do not have physical characteristics of large size or architectural features, such as definite kivas, that clearly indicate that they are winter habitations rather than field houses” (Matson et al. 1990 Vol.11:109).
Radical shifts in ceramic preferences evident during the Clay Hills Phase are commonly attributed to actual movement of populations into and out of a given area, and indeed the ceramic evidence from Cedar Mesa has been used to suggest movements of Mesa Verde Anasazi and Kayenta Anasazi through time (see Matson et al. 1990:Vol. 7 for a detailed discussion of Cedar Mesa ceramics by area of influence). Any interpretation of Cedar Mesa habitations as summer field houses is based on the assumption that winter home bases were located nearby to the east or northeast, and that seasonal residents of the mesa brought their Mesa Verde-influenced pottery with them. However, this presents a perplexing problem during Clay Hill Phase times when the local ceramics were of the Kayenta tradition. If the presence of Kayenta pottery means occupation by Kayenta farmers, and no potential Kayenta winter home base is located nearby, then these sites could not have been seasonal field houses (Matson et al. 1990 Vol. 11:110). Matson and Lipe (1977:55) caution that other explanations are possible, and that Kayenta ceramics in an area where Mesa Verde ceramics had previously dominated could reflect the acquisition of spouses from the Kayenta area, extensive trade or other mechanisms that did not involve actual movement of people. Matson et
al. (1990 Vol. 12:38), while retaining these possibilities, argue such scenarios are unlikely, and the probable source of Clay Hills Phase ceramics are Kayenta cultural groups living on Cedar Mesa.

In summary, the Greater Cedar Mesa area was occupied by small groups of dispersed farmers, primarily nuclear families or extended families, during relatively short periods of time. Population aggregation into small villages or hamlets was extremely rare. As succinctly summarized by Matson et al. (1990 Vol. 11:107), “There is no doubt that Cedar Mesa was not a locus of intense Pueblooid occupation.... Compared to areas in Upper Comb Wash or in Cottonwood Wash to the east, Cedar Mesa lacks large sites. Mesa-top sites with masonry rooms in the dozens, to say nothing of the hundreds, are completely or almost totally lacking.” It can also be stated the Cedar Mesa phenomenon was not unique, but was duplicated on other mesas throughout the Southwest during Pueblo II times. The beginning of a Pueblo III period in the Cedar Mesa area, beginning about A.D. 1150, is marked not so much by radical changes in land-use patterns as by subtle shifts in settlement patterns that may have been a response to deteriorating climates and consequent social stress. (Late Pueblo II rock art manifestations, which are traditionally discussed within a Pueblo II-III context, are addressed hereafter.)

**Pueblo III: A.D. 1150 to 1300**

In the Southwest generally, the Pueblo III period of time from A.D. 1150 to 1300 is characterized by the sociopolitical ramifications of the decline of major Chacoan centers in the San Juan Basin. These included the development of large aggregated settlements in areas peripheral to the San Juan Basin, a retraction of the overall area occupied by the Pueblo II farmers, changes in community patterns from clusters of dispersed settlements with occasional aggregates to the ubiquitous use of large, plaza-oriented villages, new configurations for exchange of information and materials, and by the end of the period the emergence of the Kachina cult and kiva complex resembling historic patterns (Lipe and Lekson 1990; Lipe and Varien 1999b).

Concurrent with these developments, the period is also characterized by abandonment of some areas and population shifts to others, a decrease in the number of sites but an increase in the size of sites, widespread intensification of water and soil conservation strategies that had appeared during Pueblo II times, the florescence of distinct architectural and ceramic complexes by which the Mesa Verde Anasazi and Kayenta Anasazi are best known, and the widespread occupation of defensible locations and locations with dependable water sources during the decades preceding abandonment (Lipe and Lekson 1990; Lipe and Varien 1999b). These traits, best recognized among the public by the visually spectacular cliff ruins at places like Mesa Verde and Betatakin, are rooted in the developments described above for the Pueblo II period. In some areas, including southeastern Utah, elements of the earlier Chacoan architecture and cultural landscape persisted well into the A.D. 1200s through “transitional” great houses and “revisionist” great kivas, and through the continued use of roads (Hurst and Till 2002).

These defining traits have expanded upon the original Pecos Classification definition (Kidder 1927) for the Pueblo III period, initially described as a period characterized by the appearance of large communities, artistic elaboration and specialization of various functions. Because of the large and visually impressive architecture associated with Pueblo III sites in the Four Corners region, this period of time has been the focus of substantial research from the beginning of archaeological inquiry in the Southwest more than 100 years ago. A review of the voluminous archaeological literature related to this period is beyond the scope of this overview (see Lipe and Varien 1999b for a superb overview of Pueblo III period research).

As discussed above, the end of the Pueblo II period (A.D. 1150) was marked by dramatic population declines in large geographic areas across the Southwest, including much of southwestern Utah and northwestern Arizona (see Spangler 2001 for an overview), the San Juan Basin (Stuart and Gauthier 1981), Defiance Plateau (McDonald 1976, Morris 1983), Black
Mesa (Powell 1983) and portions of the Montezuma Valley (Eddy et al. 1984). Other areas experienced concurrent population increases, including the Long House Valley (Dean et al. 1978), Canyon de Chelly (McDonald 1976, Morris 1983) and the Mesa Verde heartland in the McElmo and Montezuma Creek drainages (Lipe and Lekson 1990; Lipe and Varien 1999b). Even in these core areas where populations appear to have increased, there is evidence in early Pueblo III times that the dispersed farmsteads in the hinterlands were abandoned in favor of fewer, larger settlements consisting of large blocks of contiguous rooms or multi-unit pueblos. Later in the period, there is a noticeable shift toward cliff dwellings and canyon rim tower-habitations directly associated with dependable water (Eddy et al. 1984; Lipe and Lekson 1990, Lipe and Varien 1999b; Varien et al. 1996).

This latter shift is generally thought to represent a defensive response during late Pueblo III times, as evidenced by settlements and towers on rock prominences, inaccessible mesas, escarpments and precarious cliff ledges throughout the Four Corners region (Figure 5.13). Access to many of the sites is “particularly inconvenient, and defensible locations may have served exclusively as defensive citadels for use only during crises, rather than as full-time habitations (Hurst 1992:68).

LeBlanc (1999) and Haas and Creamer (1993) have argued that the entire Southwest was “engulfed” in warfare in late Pueblo III times, beginning about A.D. 1250, when vast areas were abandoned, massacres occurred and populations shifted into defensive postures, all coinciding with the onset of climatic deterioration. Architectural “cliff” sites are especially common in the Greater Cedar Mesa area (Figure 5.14), although these are much smaller than elsewhere in the region and many appear to have been focused on the defense of food resources rather than human defense (discussed hereafter).

This defensive response coincided with a sharp distinction between the Kayenta and Mesa Verde Anasazi, as evidenced by a divergence of ceramics and architectural styles. As summarized by Hurst (1992), during Pueblo II times, Mesa Verde and Kayenta potters were producing similar ceramics and trading them extensively with one another. By Late Pueblo III times, the two areas were producing unmistakably distinct black-on-white, “the most distinct in their history (Kayenta Black-on-white, Mesa Verde Black-on-white, Kayenta Polychrome), and virtually none was passing between them” (1992:69).

**Southeastern Utah**

To what extent Pueblo III occupations in southeastern Utah reflected the broader patterns observed elsewhere in the region cannot be stated at this time, due to the rarity of problem-oriented research at such sites, although it is assumed that general patterns observed in the Mesa Verde heartland are evident here. At Nancy Patterson Village in Montezuma Creek Canyon, Wilde and Thompson (1988) observed that early Pueblo III site structure indicated an open posture possibly related to a commitment to interaction at the household, com-
munity and regional levels. Middle and late Pueblo III evidence suggested a contraction of household space limited to defined interior areas of the pueblo, “giving the impression of a group of closed, withdrawn households, forming a poorly integrated community that was abandoned near the end of the thirteenth century” (1988:2).

By late Pueblo III times, settlement patterns throughout southeastern Utah had shifted as groups moved closer to permanent water sources at the heads of canyon, and in limited cases to residences on cliff ledges. Surveys in southeastern Utah have identified the Cajon Ruin tower complex at the head of Allen Canyon, a Pueblo III great house in Montezuma Creek and a series of defensible sites along the terraces of south bank of the San Juan River, as well as ubiquitous small unit pueblos, isolated stone towers and rimrock/boulder structures (see Hurst 1992 for a review of these data, most of which is unreported).

As discussed above in greater detail, the great houses, great kivas, roads and associated features evident in southeastern Utah persisted well into Pueblo III times, and indeed these may have been defining characteristics of the Pueblo III period in southeastern Utah (Hurst and Till 2002; Severance 1999, 2003, 2004). In some instances, earlier great houses were remodeled or rebuilt during Pueblo III times, obscuring or obliterating remnants of the earlier construction. As discussed by Hurst and Till (2002), there may have been an intraregional shift as well. The Pueblo II great house at Arch Canyon may have been replaced as a integrative community center by the Pueblo III great house at the mouth of Comb Wash. At Comb Wash, the great house is associated with a community of scattered Pueblo II sites, as well as a number of possible great kiva depressions in proximity to the great house. Elsewhere, Hurst and Till observed that Pueblo III canyon rim sites are in close proximity to earlier great houses (2002:25).

Road networks probably emerged during Pueblo II times, but these had become well developed by Pueblo III times, extending as far west as Cedar Mesa. At least some of the roads appear to connect great houses across broad regions, “forming a clear network involving at least six great house sites in the Cottonwood-Comb Wash region” (Hurst and Till 2002:26). This period was also characterized by the appearance of large masonry towers at the heads of canyons, usually above reliable water sources, that may have functioned as forts or symbols of ownership of the water sources (Severance 2003:29). Towers are common in the Greater Cedar Mesa area.

Generally, the social complexity resulting from population aggregation evident in the Mesa Verde and Kayenta core areas is not replicated in southeastern Utah. Hurst cautions that most southeastern Utah sites with Chaco-esque features, such as great houses, great kivas and roads, are multi-component sites indicative of strong Pueblo III occupations, “and it is still unclear whether their Chaco-esque features first ap-
peared during Pueblo III or earlier. It is certain that some of the roads and related features were in use during Pueblo III, as evidenced by the exclusive presence of Mesa Verde Whiteware ceramics” (Hurst 1992:67). This is certainly evident at the Bluff great house, which was remodeled during the A.D. 1200s (Cameron 2009).

**Cedar Mesa**

Much of what is known about the Pueblo III period of time in the Cedar Mesa area comes from research conducted during the course of the Cedar Mesa Project and through ongoing research into “great features” in the area. Haase (1983; see also Severance 2003) has argued that a retraction of Kayenta Anasazi from the region about A.D. 1150 was followed by a movement of Mesa Verde Anasazi into the region about A.D. 1165, as evidenced by the dominance of Mesa Verde Black-on-white and McElmo Black-on-white ceramics. This resurgence of Mesa Verde influence was labeled the Woodenshoe Phase with a temporal range of about A.D. 1165 to 1200. This was followed by a Red House Phase from A.D. 1200 to 1270, after which the area was abandoned. The distinction between the two phases is poorly delineated, and Haase (1983:33) suggests both phases “may represent a single ca. 100-year-long occupation by the same cultural group, with ceramic changes between the two phases occurring when certain ceramic types became popular and others fell into disfavor.” Bedell’s (2000) tree-ring analysis demonstrated a period of intense construction from the A.D. 1230s through A.D. 1250s.

Matson et al. (1990) have observed some differences in settlement patterns from Pueblo II to late Pueblo III times. During the earlier Mossbacks and Windgate phases (Basketmaker III and Pueblo II, respectively), habitation sites were focused around fields at higher-elevation areas with deep soils, primarily pinyon-juniper forests suitable to rainfall-supported agriculture. Land-use patterns were virtually identical. By late Pueblo III times (Redhouse Phase), habitation sites are more closely associated with known water sources, which are more readily available in canyon settings at lower elevations (1990 Vol.11:120).

These canyon sites are characterized by an abundance of storage facilities (Figure 5.15) and in some cases kivas, while there is a corresponding rarity of habitation rooms. Defensive features are common, but when defensive features protect only part of a site, they are oriented towards protection of the stored resources rather than protection of people. As discussed by Matson et al. (1990 Vol. 11:121), protection of stored food resources is associated with internecine warfare, and if a group is being raided by another with a similar way of life, the raids will occur only during the seasons having no important subsistence activities, or more simply put, farmers would need to get in their own crops before it would be economical to raid others. “The corresponding lack of defended habitation areas indicates that territorial, or even between cultural group warfare was not occurring” (Matson et al. 1990 Vol. 11:121), whereas the rarity of canyon habitations suggested that cliff settings were used primarily for storage and ceremonial purposes, and that most of the population lived on nearby mesa tops (1990 Vol. 12:39).

Benson (1984) has argued that land-use patterns shifted through time from sedentary set-
settlements early in the Pueblo sequence to transitory occupations after A.D. 1200 when there was a proliferation of field houses, a pattern of dispersed temporary use and movement that could have been a response to fluctuating climates and depletion of soil quality (1984:97-98). Site distribution patterns reflected a northeast to southwest moisture gradient where the pinyon, juniper and sagebrush parks of the higher northeast portion were more suitable to agriculture, and the black brush-dominated southwest portion was occupied only during wetter regimes and then only ephemerally. Population shifts (occupation, abandonment and reoccupation) reflected human responses to climatic changes along this moisture gradient (1984:30).

Morton's (2002) analysis of Pueblo III settlement patterns noted that Cedar Mesa sites are generally smaller than those in the Mesa Verde region, and with one possible exception there are no clusters of small habitation sites near Chacoan-like great houses. No general trend toward population aggregation was observed on Cedar Mesa during early Pueblo III times (A.D. 1165-1210). Rather sites are dispersed with a moderate shift from the mesa tops toward canyon occupations. The latter part of the Pueblo III period (A.D. 1210 to 1300) was characterized by a continuation of dispersed small habitations and a greater increase in canyon residential locations, with only one site (Moon House) considered large (Figure 5.16). This stands in sharp contrast to the Mesa Verde region where there is evidence of increased aggregation, larger dwellings and larger communities (Morton 2002:115-117; see also Lipe and Ortman 2000). Morton argued that dispersed mesa top occupations were prevalent throughout the Puebloan occupation of Cedar Mesa, and that this pattern continued during late Pueblo III times, although they are found at lower elevations, perhaps reflecting locations closer to canyon environments and canyon water sources. The density of sites in canyon environments is greater at this time, but “there are probably more Red House sites in total on the mesas that within the canyons.” He also suggested the increased number of canyon sites in Pueblo III times, concurrent with mesa-top occupations, may reflect overall increased populations.

Figure 5.16: Eastern portion of Moon House complex, perhaps the largest of the PIll cliff sites in the Cedar Mesa area. Photo courtesy of Bruce Hucko.
due to migration of families from the central Mesa Verde region (2002:118).

The abandonment of Cedar Mesa about A.D. 1270 may have been driven by a combination of human (anthropogenic) and environmental factors. Matson et al. (1990: Vol. 12) make a case for periodic abandonment precipitated, in part, by unsustainable agricultural practices and population growth that exceeded the carrying capacity of available farm land. Throughout most of the Basketmaker III and Pueblo II-III periods, farming was focused on mesa areas with dense pinyon-juniper forests indicative of deep, nutrient-rich soils. Farming of the forest lands would have required clearing of the trees, something easily accomplished by burning individual trees, which itself would add nutrients to the soils. Agricultural production would have been high in the first few years after clearing, and the agricultural plots would have had a projected lifespan of about 10 years until the nutrients were depleted. Based on population estimates and the amount of land needed to support that population, virtually all pinyon-juniper forestlands suitable for agriculture would have been utilized, and “the Anasazi may well have run out of productive woodland for agriculture” (1990 Vol. 12:45). This could have resulted in abandonment of the mesa for up to 400 years at a time before the pinyon-juniper forests could have regenerated.

Climatic variability may also have played a factor in abandonment of the mesa. The Basketmaker III and Pueblo II-III occupations occurred during the latter portions of favorable climatic episodes of abundant spring or winter precipitation and abundant summer monsoons. These occupations terminated with the onset of unfavorable climatic episodes with either reduced spring-winter or summer precipitation. Climatic deterioration at about A.D. 1250 may have resulted in the movement of some populations closer to canyons with predictable water sources, but these areas were less than optimal for dry farming. This may have been a “last gasp” strategy to survive on Cedar Mesa, one that ultimately failed. “Simply put, when conditions were favorable for rainfall agriculture Cedar Mesa was intensely occupied, when it was not the mesa was abandoned” (Matson et al 1990 Vol. 12:52).

**Rock Art.** As discussed by Cole (2009), Pueblo II-III rock art is ubiquitous throughout the Great Cedar Mesa area, where it exhibited a continued evolution of earlier styles, preferred locations for artistic expressions, and perhaps increased complexity in the purpose for the images. Rock art occurs near and in direct association with great houses and canyon cliff houses throughout the study area, and

*Familiar subjects are elaborated and new subjects are introduced, as evidenced by pottery. Enduring subjects include lizard-like anthropomorphs (the bodies are more varied and include rectangular, bulbous and stick-figure forms); realistic human forms (seemingly more common and varied in appearance); copulating couples and birthing scenes; horn-like and antennae-like headdresses; figures wearing hair whorls and earrings; flute players with and without humped backs; processions; stamped handprints and petroglyphs of hand and foot motifs; centipedes and other insect-like forms; animals (deer or elk, bighorn, pronghorn, bears and snakes) and birds of many kinds; animal and bird tracks; spirals; steps or terraces; T-shapes that resemble T-shaped doorways; swastikas; and a variety of other geometric motifs and designs [2009:191-192].*

Many representational elements observed in the rock art have correlates in the material culture record. For example, the zigzag lines, steps and other geometric designs (Figure 5.17) are similar to geometric designs found on ceramics dated to this period, and the T shapes are similar to the entryways to Mesa Verdean-
Figure 5.17: Geometric designs appear with greater frequency in Pueblo II-III rock art in the Cedar Mesa area. Adapted from Cole (2009).

Figure 5.18: T-shaped doorway is a shape that appears in Pueblo II-III rock art in the region. Photo courtesy of Andrew Yentsch.

Figure 5.19: Remnants of the “turkey pen” at Turkey Pen Cave. Photo courtesy of Andrew Yentsch.

Style habitation structures dated to this period (Figure 5.18). The depiction of turkeys reflects the importance of these domesticated animals to local populations, which is supported by cultural deposits at Turkey Pen Cave, where a turkey pen enclosure remains partially intact (Figure 5.19).

Generally, the Pueblo II-III rock art of the Cedar Mesa region features panels that are crowded with smaller, less rigid images that lack the heroic nature of earlier styles, although Schaafsma (1980:135) argues the rock art of this period exhibited a new standard of excellence that “followed with unbroken continuity in the tradition established earlier.” New elements, all with parallels in older styles, appeared, including figures holding small round and rectangular shields, defensive poses, individuals armed with bows and arrows, knives and spears, and battle scenes. Cole believes these images reflect the increasing social unrest evident during late Pueblo II-III times, noting that these images are often displayed on cliff walls near or inside enclosed rooms (2009:194). In many instances, images have been painted on the plastered interior walls of cliff structures, particularly during Pueblo III times, as evidenced by sites such as Moon House (Figure 5.20). This suggests the role of art images had shifted from grand depictions meant to be seen, understood and per-
haps respected by non-local groups (e.g. Basketmaker rock art) to more private expressions meant to be viewed by those participating in certain ceremonies or social events as a mechanism for maintaining clan identity during periods of increased population aggregation and social complexity (Schaafsma 1980: 135).

Summary

The research conducted over the past four decades in the Greater Cedar Mesa area collectively demonstrate a sparse Pueblo I presence and a dramatic increase in the number of small architectural features during Pueblo II and Pueblo III times. In general, it can be stated that the Pueblo II and Pueblo III occupation of Cedar Mesa exceeded anything that occurred prior or since, and that area exhibited occupation, abandonment and re-occupation by small family units dispersed widely over the landscape. The patterns evident in the San Juan Basin and Mesa Verde areas are not obvious in the Cedar Mesa area, which may have been at the western edge of the Mesa Verde Anasazi and/or the eastern edge of the Kayenta Anasazi, with alternative influences from both regions. Evidence of social stratification is limited to a few great houses and great kivas (or very large houses and very large kivas) in the area, which may have served to integrate the dispersed farmsteads and hamlets into a broader social network involving distant communities.

Whether Cedar Mesa was enveloped within a broader “Chaco phenomenon” or was a unique local manifestation remains a subject of considerable debate and ongoing research (see Cameron 2009). As discussed by Hurst and Till (2002: 7), “Variability and individuality appear to be the norm, with little evidence of conformity to a strict template. Individuality is so evident that it may have been consciously strived for.” Some structural characteristics common in Colorado and New Mexico, such as massive great houses with hundreds of rooms, are conspicuously absent in southeastern Utah. Other defining Chacoan characteristics, such as true core-and-veneer construction, have been documented only at a handful of sites. Hence, there are “broad similarities in settlement and organizational behaviors shared across this area,” but evidence of integration into a broader Chacoan world “has been maddeningly elusive” (Hurst and Till 2002: 7-8).

The social complexity evident during Pueblo II times continued during Pueblo III times with the continued use of great houses and road networks, but with shifts in settlement patterns to locations closer to water sources, often at the heads of canyons. This shift resulted in an abun-
dance of cliff dwellings, towers and ubiquitous granaries attributed to this period of time. Such evidence is conspicuous throughout the study area, and the preserved nature of the architecture has resulted in worldwide acclaim, drawing tens of thousands of visitors every year who marvel at the Pueblo III remains found here. The Pueblo III period of time, however, represents a very small fraction of the human history of the Greater Cedar Mesa area, perhaps a last-gasp attempt to remain here in the midst of deteriorating climates and consequent social instability. While the Pueblo III expression here is indeed significant, it nonetheless represents a waning of the more-substantial Pueblo II florescence that marked the zenith of human occupation of Cedar Mesa. The final abandonment of Cedar Mesa was underway by about A.D. 1275, if not earlier, and by A.D. 1300 the entire area had been depopulated.

Throughout the Pueblo I, Pueblo II and Pueblo III periods of time, the Cedar Mesa region appears to have been on the frontier, either on the eastern periphery of events occurring in the Kayenta region or on the western boundary of Anasazi developments in the Mesa Verde area. As evidenced by the architecture and material culture traits, influences from both regions are conspicuous throughout the Greater Cedar Mesa area, although the source of this influence shifted through time. These shifts could represent an actual displacement of existing populations by immigrants or the integration of existing populations into different regional expressions recognized today as the Mesa Verde Anasazi and the Kayenta Anasazi.

Regardless of the source of influence, land-use and settlement patterns across the mesa remained remarkable stable through time. Human residency in the Greater Cedar Mesa area can be characterized by a proliferation of small family farms reliant largely but not exclusively on dry farming of the mesa top. And while there is some evidence of increased social, technological and architectural complexity, there is minimal evidence of large-scale population aggregation that is common elsewhere in the region at the same time. In general, the Cedar Mesa area appears to have participated in the broader regional pattern of initial occupations, population expansion, dispersal, abandonment and, in some cases, reoccupation.
Chapter 6

Numas, Athapaskans and Euroamericans: Late Prehistoric and Historic Adaptations from A.D. 1300 to 1950

Introduction

The period of time after the Puebloan abandonment through Euroamerican settlement is commonly referred to as the Late Prehistoric Period (also referred to as the Protohistoric Period), dated in the region generally from roughly A.D. 1300, or the end of the Pueblo III Period, to the Spanish exploration into and settlement of southern Arizona and New Mexico in the A.D. 1500s, and somewhat later in other areas to the north. Euroamericans arrived in the Cedar Mesa region in the 1870s, finding scattered Utes, Southern Paiutes and Navajos living in the area—indigenous peoples who had already been influenced by at least two centuries of socioeconomic intercourse with the Spanish, Mexicans and other acculturated tribes in the Greater Southwest. The level of Euroamerican influence on indigenous groups varies by location, with those living in more remote regions such as Navajo Mountain retaining traditional lifeways to a greater degree. Hence, the terminal date for the Late Prehistoric varies by region and the researcher attempting to organize the temporal data. For the purposes of this discussion, the Late Prehistoric is defined as that period of time from prior to written records relevant to Cedar Mesa specifically, or from about A.D. 1300 to 1875 when the first government surveyors assigned to the Hayden Expedition ventured into Comb Wash (see Chapter 2).

Although the Late Prehistoric period of time is poorly understood and even less well documented archaeologically, a wealth of scholarly materials can be used to infer Late Prehistoric lifeways. These data are largely the result of landmark research by Robert S. McPherson, whose interviews with indigenous tribal elders, along with his seminal historic research over nearly two decades, provide the foundation for the overview presented here (McPherson 1995, 2001a, 2001b, 2009; see also Aton and McPherson 2000, Powell 1983, Topping 1997). In particular, Comb Ridge and Its People: The Ethnohistory of a Rock (McPherson 2009) offers indigenous perspectives specific to the Cedar Mesa study area considered here and should be consulted for a more detailed discussion of the importance of this landscape to modern groups in the region.

The Historic Period in the Greater Cedar Mesa area begins with the arrival of government explorers in the region in the mid 1870s, although the rich and colorful history of the region is more commonly associated with the arrival of Mormon pioneers in 1880 following an arduous overland trek through Glen Canyon and Cedar Mesa and eventually to Bluff (McPherson 1995; Powell 1983; Topping 1997). The Euroamerican history of the region is addressed in considerable detail in A History of San Juan County: In the Palm of Time (McPherson 1995), which should be consulted for a more thorough discussion. Detailed Euroamerican histories specific to the Greater Cedar Mesa area are scant, but see Aton and McPherson (2000) for a history of the San Juan River and McPherson (2009) for a brief consideration of Euroamerican perspectives of Comb Ridge (this publication offers a more detailed discussion of aboriginal use of the landscape during historic times).

There are three aboriginal traditions that warrant consideration in this chapter: (1) individuals or small groups who visited the region from Puebloan villages to the south following the abandonment of the region (referred to in archaeological contexts as Pueblo IV); (2) the Numa, also referred to as Shoshoneans, who are believed to
have arrived in the Southwest from the north and west via a homeland in southern California, whose descendants today are the Ute and Southern Paiute; and (3) Athapaskan groups believed to have arrived in the region from the north either by way of the Rocky Mountains or the Great Plains, whose descendants today are the Navajo and Apache. Each group was present in the region at the time of Euroamerican settlement in the late nineteenth century, and each continues to inhabit delimited portions of the American Southwest.

Distinguishing between the Late Prehistoric period and earlier occupations is warranted on the basis of changes in the dominant lifeway. Agriculture had been abandoned as the primary economic strategy by about A.D. 1300, and aboriginal lifeways after that time were characterized by hunting and gathering more reminiscent of Archaic adaptations. Archaeological sites on the northern Colorado Plateau that have produced radiocarbon dates after A.D. 1300 occasionally yielded crude brownware potsherds and small arrow points invariably labeled as Desert Side-notched and Cottonwood triangular that stand in decided contrast to ceramics and projectile points produced during the Formative Period. These distinctive cultural markers are rare in the archaeological record of southeastern Utah, but they are commonly observed at Southern Paiute and Ute sites elsewhere in Utah (Spangler 2001, 2002).

The disappearance of sedentary, agricultural lifeways by about A.D. 1300 in the Greater Cedar Mesa area appears to have been considerably more abrupt than is evident in areas in southwestern Utah, where masonry residential structures may have continued into the early A.D. 1300s. Throughout the region, sites yielding post-A.D. 1300 radiocarbon and tree-ring data, although rare, are typically associated with ephemeral occupations indicative of temporary hunting and gathering activities (see Spangler 2001 for an overview of the southern Utah data).

Given that detailed syntheses relevant to the Late Prehistoric and Historic periods are readily available, data relevant to the Greater Cedar Mesa area are only briefly summarized here. Also, in light of the archaeological data that can overlap the Late Prehistoric and Historic periods of time, this discussion addresses the archaeological data relevant to each group that inhabited the region, each of which is discussed chronologically from A.D. 1300 through the modern era.

**Puebloan Tradition**

Permanent settlement of the Greater Cedar Mesa region by Puebloan farmers cannot be demonstrated archaeologically after their abandonment of the region in the late thirteenth century (Pueblo III). There is some evidence to suggest that Puebloan groups made occasional visits into the area of southeastern Utah, based on modern Puebloan oral tradition, the presence of occasional Pueblo IV ceramic sherds and a continuity of rock art styles in the region generally. Collectively, these data suggest that small groups from various Pueblo villages to the south occasionally returned to selected locations north of the San Juan River, probably as part of ceremonial pilgrimages to ancestral homelands.

Archaeological evidence of a Pueblo IV presence in the Greater Cedar Mesa area is limited to six sites where Jeddito Black-on-yellow ceramic sherds were found, all in contexts mixed with earlier Pueblo III components. Jeddito Black-on-yellow and Hopi Corrugated sherds are also known from the LaSal Mountains vicinity, Dark Canyon, Cottonwood Wash and Comb Ridge east of the study area considered here. Jemez Black-on-white sherds have also been reported from Montezuma Canyon to the east (Hurst 1992).

Whether these artifacts are the product of occasional or scheduled visitation to a specific location for ceremonial purposes, or whether they were incidental occurrences during visits for other reasons such as hunting and collecting is unknown. Local residents have reported periodic visitation to the canyons northwest of Bluff by Hopi elders for ceremonial purposes (William Davis, personal communication 2008). It is also possible the limited archaeological evidence could be the result of other groups (Navajo or Ute) acquiring and carrying Puebloan ceramics into the
region. Whatever the case, the post abandonment Pueblo IV archaeological record is extremely ephemeral, suggesting a very limited use of the Greater Cedar Mesa area prior to the settlement of the region by Euroamericans. No ethnohistoric accounts of Puebloan peoples relevant to Cedar Mesa were identified during the course of preparing this overview.

**Numic Tradition**

The arrival of hunter-gatherers speaking Numic languages (Numic is a variant of the Uto-Aztecan language family) in the eastern Great Basin and northern portions of the American Southwest has traditionally been placed at about A.D. 1000 and somewhat later in northeastern Utah, southern Idaho and western Wyoming (Butler 1981, 1983; Frison 1991; Lamb 1958; Steward 1940; Wright 1978). As such, there may have been a slight temporal overlap between the Formative groups living north of the Colorado River and Numic-speaking immigrants, collectively referred to as Shoshoneans, who spread eastward into Colorado and south into the Four Corners region. In fact, the arrival of Numic-speaking groups has been offered as a driving factor in the abandonment of the area by the Puebloan groups (Ambler and Sutton 1986, 1989; see also Spangler 2001, 2002 and references therein for an overview of this debate). However, archaeological confirmation in this respect is lacking, and no overlap has been demonstrated in the Four Corners region where the earliest chronometric evidence of Numic occupation in the Four Corners indicates an arrival just after A.D. 1600 (Dean 1969; see also McPherson 2009:58).

Until recently, there was general consensus that Numic-speaking peoples arrived in their historic territories relatively recently and that historic distribution of these peoples was the result of widespread expansion of Numic-speaking populations from homelands in the southwestern Great Basin (Madsen and Rhode 1994:3; see also Figure 6.1). Currently, there little agreement as to when a migration of Numic-speakers occurred, how it occurred, why it occurred, the relationship of Numic-speaking populations to preexisting populations in the eastern Great Basin and Colorado Plateau, how settlement patterns and subsistence strategies differed from pre-Numic populations, and whether or not a Numic expansion actually occurred (see Across the West: Human Population Movement and the Expansion of the Numu, edited by David B. Madsen and David Rhode [1994] for a vigorous discussion of various and often competing hypotheses).

The chronometric evidence reported from the region generally suggests the presence of widely dispersed populations of hunter-gatherers, a pattern consistent with that described by Kelly (1964) for historic Southern Paiute occupations in the adjacent region to the west. In southwestern Utah, a Numu presence has been documented at about A.D. 1300 or shortly thereafter (see Spangler 2001 for an overview of the chronometric data). The presence of Numic-speaking groups in the Cedar Mesa area cannot be demonstrated at or near the time of abandonment by Puebloan farmers at about A.D. 1300, and hence it is currently accepted the Numu arrived in this area sometime
after the abandonment, perhaps as much as three centuries later. If they were indeed present in the Cedar Mesa area earlier than A.D. 1600, they may have been so few and so dispersed as to be archaeologically unrecognizable.

**Ethnographic Observations**

The observations and ethnographic work of Franciscan friars Dominguez and Escalante in 1776 (Warner 1976), John Wesley Powell in the 1870s (Fowler and Fowler 1971) and Julian Steward and Isabelle Kelly in the first half of the twentieth century (Steward 1938; Kelly 1964) described the inhabitants of the Great Basin and northern Colorado Plateau as practicing a largely hunting and gathering existence, whereas contemporaneous sedentary groups on the southern Colorado Plateau practiced agriculture. It can be inferred from these ethnographies that the Southern Paiute and Ute were organized in small kin-based bands, who lived in brush covered wickiup-like domiciles (Figure 6.2) and followed an annual cycle of exploiting wild plant and animal resources (Stewart 1942; Kelly and Fowler 1986; Callaway et al. 1986). Subsistence strategies varied between (and even among) the groups occupying this region, conditioned by a myriad of complex factors that include the relative abundance of wild plants and animals, the proximity to individual procurement areas (resource patches) and the availability of water (Kelly and Fowler 1986).

Much of the ethnohistoric literature has focused upon their mobile hunting and gathering lifeway for subsistence (Steward 1938; Stewart 1942; Kelly and Fowler 1986; Callaway et al. 1986) that resulted from a lifeway much like that of the Archaic. The only diagnostic differences distinguishing the Late Prehistoric-Historic Period from the Archaic were the continued use of the bow and arrow, as evidenced by distinctive projectile points commonly referred to as Desert Side-notched points. The Numa artifact assemblage is different from that of the Formative in that the brownware ceramic tradition is markedly different from earlier pottery, and their basketry features a different weaving style than was evident in earlier periods.

Like other Late Prehistoric and early historic groups that occupied the arid lands of the Great Basin and Colorado Plateau, the Numa were organized in small, highly mobile groups. Research by Stewart (1942) among the Southern Paiute in Nevada has shown that the nuclear family was the center of all sociopolitical organization (see also Kelly and Fowler 1986). No tradition existed among the Southern Paiute to identify themselves with the specific bands to which they were assigned by ethnographers, and therefore the band identities used in the scholarly literature are probably artificial constructs created by researchers to geographically organize the data (Kelly 1964; Kelly and Fowler 1986).

Small game (jackrabbits, cottontails, and rodents) was more important than large game to most Numic-speaking groups, although deer, bison, mountain sheep, elk, antelope and bear are repre-
sent in both the ethnographic and archaeological records. Larvae, crickets and grasshoppers also provided important, albeit temporary, food resources (Kelly and Fowler 1986). Pinyon nuts were of great importance all over much of the Great Basin and Colorado Plateau, and a variety of berries, roots, nuts, seeds, and greens were also exploited (Stewart 1942; Kelly and Fowler 1986; Callaway et al. 1986). The subsistence economies of the early historic inhabitants of the region often brought derisive and derogatory descriptions from Euroamerican chroniclers in the region. Terms such as “wretched,” “impoverished” and “digger” were used to describe Numic-speaking inhabitants of the region (Euler 1966; Kelly and Fowler 1986; Callaway et al. 1986).

Cedar Mesa Numic

Numic-speaking peoples occupied major portions of Utah, Colorado, New Mexico and Arizona at the time of historic contact (Figure 6.3), and two groups speaking variants of the Numic language group have been reported in the region surrounding the Greater Cedar Mesa area, the Southern Ute and Southern Paiute. There were few, if any, recognized distinctions between the two groups, either by Euroamerican chroniclers or among the Numic living in the region. Southeastern Utah constituted the easternmost extension of the Southern Paiute in the form of the San Juan Band (Figure 6.4), and the westernmost expression of the Southern Ute, the Weeminuche Band. McPherson (2009:58) argues the material culture of the two groups was indistinguishable, there was significant intermarriage, and there is confusion in the historic record between the two groups. As such, both groups in southeastern Utah are commonly referred to as Utes.

Numic-speaking groups tended to utilize existing structures, and they left few cultural markers upon leaving an area. Consequently, there are few diagnostic markers such as the distinctive pottery, projectile points or domiciles that offer

Figure 6.3: Modern distribution of Numic-speaking peoples in western North America. Adapted from Madsen and Rhode (1994).
proof of Ute occupation in the Cedar Mesa area or the larger San Juan region of Utah and Colorado (McPherson and Yazzie 2000). In fact, only three sites in the SHPO database were ascribed to Ute occupations. Two sites featured Ute rock art elements (42Sa5271 and 42Sa7106) and one was a possible Ute wickiup at 42Sa17413 (Figure 6.5). Rock art sites attributed to historic Utes are common throughout the study area, but are poorly represented in the SHPO database (Figure 6.6).

It should also be mentioned that Ute oral histories suggest that Ute and Navajo families lived together at Allen Canyon during a military campaign against the Navajos in the mid-1800s, referred to as the “Fearing Time.” McPherson’s informants indicated that “All of them [Utes] hunted on Blue Mountain and the Bears Ears, shared the same camps with Navajos, traded buckskins for Navajo rugs, spoke both languages, and built hogans and shade homes similar to those of
the Navajo" (McPherson 2009:87). Hence, the Ute archaeological record during the historic period likely reflects mixed assemblages, as well as architecture similar to Navajo structures.

The White Mesa Utes consider the Elk Ridge area on the northern periphery of the study area to lie within the ancient heartland of the Ute people. This area was so important to them that they persistently defied all relocation efforts and were finally allotted land in Hammond Canyon, Whiskers Draw, Cottonwood Wash and Allen Canyon (Yazzie 1990). Other landscape features and significant places of traditional use within the present study area include the San Juan River and Comb Ridge. Historically, Mancos Jim Mesa and Spanish Mossback Mesas were used as fortress locations by the Utes in times of conflict (McPherson 2009; McPherson and Yazzie 2000). The Bear Dance, a spring ceremony symbolizing nature's awakening, was historically performed at Bears Ears, and later in Bluff, Montezuma Canyon and Allen Canyon. It is now performed only in the fall at White Mesa (McPherson 2009; McPherson and Yazzie 2000).

The Southern Paiute traditionally occupied and utilized a territory that extended across...
southern Utah and Nevada, northern Arizona and along the western side of the Colorado River into California. The San Juan Paiutes utilized resources along the San Juan River on the southern periphery of the study area, and their range included a portion of Navajo Mountain referred to as the “Paiute Strip” (Bunte and Franklin 1987; Kelly 1964; Kelly and Fowler 1986; McPherson and Yazzie 2000). The wealth of ethnographic literature on the Paiutes living in western Utah, Nevada and northern Arizona stands in sharp contrast to the paucity of ethnographic studies specific to the San Juan Paiutes (but see Bunte and Franklin 1987).

The Bureau of Land Management (BLM) asserts there are no known places of religious or traditional importance to the Paiute people within the study area (BLM 2007), although the Paiute Tribe of Utah has indicated an interest in the traditional plants of the San Juan River region. The BLM planning documents are inconsistent with the limited ethnohistoric record. As summarized by McPherson, the wanderings of the Utes and Paiutes in this area were centered on a “Spiritual Cross,” the crux of which is the junction of the San Juan River and Comb Ridge, or the southeast corner of the study area considered here. This area represents the “center of both temporal and spiritual migrations of the People” and a place “where all nations will come together” (2009:21).

From a more functional perspective, the Comb Ridge area, called “Slick Rock Mound,” afforded access to springs, the sunlight reflecting off the slickrock provided ideal winter camping conditions, it was a favorite place to gather Indian rice grass and herbal teas, and it was a favorite source for willows and sumac used to weave baskets for traditional wedding ceremonies. Informants indicated the traditional Navajo Wedding Basket, used by both Navajos and Utes, was inspired by the broken skyline of Comb Ridge (McPherson 2009:21-22).

Although the Mormon settlers in the region claimed that it was better to feed than to fight the natives, most still viewed the Indians as too different to integrate into their society. It was therefore common practice to maintain social distance between the whites and the native populations through both attitudes and public policy (Kelly and Fowler 1986). As early as 1865, Utah Superintendent of Indian Affairs O.H. Irish suggested the removal of the Southern Paiutes to the Uintah Reservation in northeastern Utah (Tom and Holt 2000: Kelly and Fowler 1986). In 1872 President Ulysses S. Grant created the Moapa Reservation north of Las Vegas Nevada for all of the Southern Paiute of Arizona, Nevada, California, and Southern Utah. By 1875, very few Southern Paiutes had actually relocated there. The Kaibab Reservation was established in 1907 around Mocasain Spring southwest of Kanab, Utah. It was originally 20,000 acres in size, but was expanded in 1913 and again in 1917 to approximately
120,413 acres (Kelly and Fowler 1986). The Koosharem Reservation east of Richfield Utah was established in 1928 (Tom and Holt 2000).

A similar dispossession was experienced by the Southern Ute in the Four Corners region. The Weeminuche band traditionally ranged from the Dolores River in southwestern Colorado in the east, to the Colorado River in the north and west, and to the San Juan River in the south. Beginning about A.D. 1650, this band had been raiding portions of New Mexico, stealing horses from the Spanish and later raiding Pueblo, Navajo and Paiute villages to supply a flourishing slave trade. They had become widely dispersed throughout southwestern Colorado and southeastern Utah by the mid-nineteenth century (McPherson 2009; McPherson and Yazzie 2000).

Presently, the Southern Ute occupy portions of White Mesa and the Ute Mountain area of southwestern Colorado where reservations were first established in 1882 and expanded in 1897. Relevant to the Greater Cedar Mesa area, the Allen Canyon Paiute settlement, located roughly 40 kilometers (25 miles) east of the study area, was established in the early 1900s and was inhabited by both San Juan Band Paiutes and Weeminuche Band Southern Utes (McPherson and Yazzie 2000). By the 1950s, along with occupants of the Westwater community, the residents of Allen Canyon relocated 17.5 kilometers south of Blanding to White Mesa where today they are known as the White Mesa Utes. No temporal sequences have been proposed for the Utes and Paiutes of southeastern Utah.

**Athapaskan Tradition**

Scholars have traditionally placed the arrival of the Navajo, or more accurately the Dine, in the American Southwest, along with their linguistic relatives the Apache, during the mid-to-late A.D. 1500s, although more recent evidence from the Farmington, New Mexico, area suggests they were present in the region perhaps as early as A.D. 1300 and certainly by A.D. 1400 (Reed and Horn 1990; see also Cassells 1997; Towner 1996, 2003). Kluckhohn and Leighton (1962:33) proposed that the ancestors of these Athapaskan speaking groups may have entered the northern Southwest as early as A.D. 1000, playing a role in the Ancestral Puebloan abandonment of the Four Corners region. Schlesier (1994) and others have argued that Fremont farmer-foragers from the northern Colorado Plateau migrated southeast from Utah across the Rocky Mountains into the Southern Plains where they became the Apache encountered by Spanish explorers (1994:334-335).

The first Spanish settlers in New Mexico in the 1600s described various Apachean groups as semi-sedentary horticulturalists who also hunted in the mountains north of Santa Fe, practicing a lifeway remarkably similar to the prehistoric Fremont of Utah. Citing early Spanish documents, Thomas (1935:110-132) observed that Athapaskan groups "cultivated crops of grain, maize, frijoles and pumpkins," and "crops of maize, watermelons, pumpkins and kidney beans, and an abundance of buffalo hides, plums and tamales."

The traditional lands of the Navajo covered an area bounded by Blanca Peak, Mount Taylor, the San Francisco Peaks and the La Plata Mountains (Maryboy and Begay 2000). Today they occupy a reservation roughly 25,000 square miles in size that covers parts of southeastern Utah, northeastern Arizona and northwestern New Mexico (Figure 6.7). The northern boundary of the Navajo Reservation is the San Juan River, which corresponds with the southern boundary of the study area considered here.

**Navajo Origins**

The Navajo, referred to as Southern Athapaskans, have been a subject of anthropological research for more than 100 years (see Matson and Magne 2007; Towner 1996, 2003 and references therein), although archaeological inquiry has been sporadic. History, oral tradition, linguistic evidence and ethnographic data suggest an origin for Southern Athapaskans in west-central Canada (Figure 6.8), the point from which they began a southward migration incited by famine and/or a growing population about 1,000 years ago.
Researchers have suggested Southern Athapaskans migrated south, following herds of bison across the plains and arriving in the Southwest as bison-hunting nomads (Gunnerson 1979).

Upon departing from their northern homeland, they relied generally on hunting-fishing-gathering subsistence economy. They utilized sinew-backed bows and single-piece arrows tipped with side-notched projectile points; constructed conical-shaped dwellings of the forked-pole type (although variation occurred according to local circumstances and available materials); created flat and twined, coiled basketry; used dogs as beasts of burden; and organized into loose bands (Brugge 1983). It is possible that these groups came into contact with remnant populations of Fremont and Ancestral Puebloans around A.D. 1300 (Aikens 1972), but it is not known whether or not they had any influence on the abandonment of those respective cultures (Brugge 1983; Aikens 1972; Jett 1964).

Numerous hypotheses for the entry of Athapaskan-speaking people into the Southwest have been proposed, from a course through the Great Basin (Steward 1936:62), to a High Plains route through eastern Colorado and New Mexico (Keur 1941:74), to an intermountain migration into the Southwest (Huscher and Huscher 1942; Schlesier 1994). While it remains a matter of contention among scholars, recent research in the Dinetah and La Plata District suggests that

Figure 6.7: Location of modern Navajo Reservation with major settlements. The study area is north of Kayenta (unshaded area). Figure source: OVC.edu.
the Navajo entered the Southwest via a northern, intermountain route long before the Pueblo Revolt of 1680. This supports Navajo oral tradition that suggests an origin through the Rocky Mountains (see Towner 2003 for a review of the relevant data).

Most hypotheses suggest the Navajo and Apache entered the Southwest around A.D. 1500, that they were strongly influenced by contact with their Pueblo neighbors, that they only expanded out from their homeland (Dinetah) in north-central New Mexico in the second half of the eighteenth century in response to drought and pressure from Ute raids, and that Navajo subsistence and settlement practices have shifted with each change in environmental setting (Towner 1996, 2003). Some adoption of Puebloan traits may have taken place slightly before and during the Pueblo Revolt in the late 1600s that resulted in a large number of Pueblo refugees living among the Navajo. How much influence these refugees had on Navajo culture remains a matter of debate (Towner 2003; Brugge 1996).

Temporal Schemes

Navajo archaeological studies have been conducted in northeastern Arizona and northwestern New Mexico, resulting in a number of period and phase designations (see Towner 1996 and references therein). The applicability of these sequences to southeastern Utah has yet to be determined. However, a brief summary of this information is offered to provide general background for the Navajo history of the region.

In a review of the historical and archaeological data for the Navajo of northwestern New Mexico and northeastern Arizona, Hester (1962) proposed a cultural sequence extending from roughly A.D. 1500 to the present. This sequence follows two chronological lines for the Eastern Navajo and Western Navajo, respectively. For the Eastern branch, Hester (1962) begins with a hypothetical period that he calls the “Pre-Southwestern Navajo” that is poorly defined due to a lack of archaeological data. This period covers entry of the Navajo into the Southwest. As these groups were small and highly mobile, following a hunting and gathering subsistence cycle, they left little behind in the way of diagnostic markers that would differentiate themselves from other highly mobile groups.

The period from A.D. 1500 to 1696 was labeled as the Dinetah Phase, defined by the presence of maize, bean and squash horticulture, along with the introduction of Dinetah Grayware Utility ceramics. The forked-pole hogan (Figure 6.9) was the primary residential structure at the time of initial contact with the Spanish (Hester
1962). The Gobernador Phase, which ran from roughly A.D. 1696 to 1770, was characterized primarily by stone-masonry constructed hogans and the emergence of weaving. European trade goods and animal husbandry (horses and sheep) took on a vital role in Navajo culture. Pueblo trade wares and Gobernador Polychrome ceramics dominated those assemblages where ceramics are present (Hester 1962).

During the Cabezon Phase from A.D. 1770 to 1800, hogans were characterized by stone-walls and log cribbing, although forked-pole hogans continued to be used. Navajo Polychrome ceramics emerge as another dominant pottery type during this period. Hester also noted extensive contact between the Eastern Navajo and Spaniards during this time, as well as with their Pueblo neighbors (Hester 1962). The Reservation Phase began in A.D. 1800, continuing to the present. The cribbed-log hogan was the dominant house type (Figure 6.10), and sheep corrals were commonly associated with domiciles. Bottle glass and tin cans are represented in abundance at most sites (Hester 1962).

For those groups residing in Arizona, Hester (1962) defined a sequence with two distinct phases. The first is the DeChelley Phase, which begins with the distinctively Navajo traits of the forked-pole and cribbed-log hogan styles, as well as the presence of Navajo Polychrome,
Navajo Grayware Utility and Pinyon Utility ceramic types. There was little contact between the Navajo and the Spanish occupants of the region at this time, nor with their Pueblo neighbors. This phase is basically the western equivalent of the Cabezon Phase in the east, spanning the period from A.D. 1770 to 1800 (Hester 1962). Immediately following is the Reservation Period that begins around A.D. 1800 and continues to the present day.

Hester’s work prompted a re-evaluation by James (1976), although James’ data were specific to the Canyon DeChelley area of northeastern Arizona. This sequence may have more applicability to Navajo studies in southeastern Utah, not only due the proximity to the study area, but because it focuses more on the later time periods that are glossed over in Hester’s treatment.

James (1976) begins with the Del Muerto Phase (A.D. 1750 to 1800), which marks the initial Navajo settlement of northeastern Arizona and is characterized by distinctively Navajo artifact and structural assemblages. Corbelled-log hogans were the dominant structure type, although forked-stick hogans are also well represented in the archaeological record of the region. Stone masonry hogan types also emerged during this period. Some Gobernador Polychrome and Pueblo trade ceramics were present, but they were not as dominant as Pinyon utility wares or Navajo painted varieties. Small pueblo-like structures, as well as sites located in what appear to be refugia or defensive locations, were fairly common. The selection of these locations was likely attributable to pressure and raiding by their Ute neighbors to the north and east. Agricultural crops and European animals were introduced to the Western Navajo during this period, which was also a time of fairly wide-spread contact between the Navajo and their Puebloan neighbors.
Following is the DeChelley Phase from A.D. 1800 to 1863. This phase is marked by the continued dominance of corbelled-log, forked-pole and stone-masonry constructed hogans. Sites continue to be found in defensive locations due to the persistence of Ute and Euroamerican pressures. In fact, the U.S. military, at a time when military resources had been diverted to Civil War campaigns in the East, engaged the Utes as military surrogates to raid the Navajos. As summarized by McPherson (2009), broken treaties and misunderstanding led in the late 1850s to open warfare between the Navajos and Puebloan tribes, as well as with the Utes. The Utes were their most feared enemies who “were particularly effective in aggressively ferreting out, killing and capturing” the Navajos (2009:82).

This period is referred to as the “Fearing Time” when hundreds of Navajo families fled into the canyons of northeastern Arizona and southeastern Utah. There is a general decrease in ceramic artifacts found in ash dumps at the sites of this period, although Navajo painted, plain gray utility and Pinyon Utility wares are still fairly common. There is also a virtual disappearance of Pueblo painted ceramic varieties during this time. From A.D. 1863 to 1867, the U.S. government had relocated most Western Navajos to Fort Sumner. This period has been termed the “Fort Sumner Hiatus” by James (1976), a time when Navajos were under constant Ute and Anglo threats, resulting in large-scale surrender of the Navajo to the federal troops and removal of 8,000 captured Navajos to Fort Sumner on the Pecos River. The “Long Walk” continues to hold tremendous historical significance to the Navajo people (Maryboy and Begay 2000; McPherson 1992, 2009).

The Western Navajos returned to their homeland in 1867, beginning what James (1976) called the Tsaile Phase, which persisted until A.D. 1900. This period can be characterized as a time of reduced pressure from both their Ute neighbors and the federal government. Forked-pole hogans were still common, but cribbed-log hogans and other varieties emerged that were constructed in less conspicuous locations. European-type wagons begin to be used by the Western Navajo during this time, although Anglo trade goods were extremely rare. Navajo Gray and Pinyon Utility, as well as Navajo Painted ceramic varieties were common. By the time of the first Euroamerican settlements in eastern Utah in 1880, local Navajo and some Ute/Paiute families had livestock (horses, sheep and goats) and ranged them throughout the region, including the Elk Ridge-Blue Mountain uplands (Correll 1971).

For the period from roughly A.D. 1900 to 1946, James (1976) proposed the “Wheatfields Phase.” All varieties of hogans are constructed during this time with no one type dominating over others. Although the use of wagons was common, there is little in the way of European goods represented in the archaeological record. An extremely limited number of native tools is found. James’ Chinle Phase began in A.D. 1946 and extended to 1965. This period saw the construction of all varieties of hogans and the introduction of a small number of framed houses. Automobiles become quite common, as do many Anglo-derived innovations such as plastic and foil wrappers, zip codes on labels, and the abundance of glass items (James 1976). From A.D. 1965 to the present, James (1976) proposed the Window Rock Phase. Most occupants of the region today live in framed houses with all varieties of hogans constructed next to or near these structures. Along with the increased use of plastic and foil packaging and dated labels, aluminum and glass containers are common.

Cedar Mesa Navajos

Unequivocal archaeological remains of early Athapaskan origin are lacking north of the San Juan River. One site in Natural Bridges National Monument northwest of the study area was assigned a Navajo classification. This site (42Sa6966) consists of two dry-laid stone walls and a small rectangular slab-lined hearth. The walls resemble Navajo sheep pens found in isolated canyons of the Navajo reservation south of the study area (Hobler and Hobler 1978: 35). The oldest Navajo date derived from a site near the study area is A.D. 1620 from a structure in White Canyon, although this date is questionable. Other tree-ring dates show evidence of Navajo use of
areas to the north of the San Juan River in the A.D. 1600s, in particular areas around Grand Gulch, Bears Ears, White Canyon and Monticello (Maryboy and Begay 2000).

There is considerable evidence of Navajo utilization of the study area during historic times. Specific to the Greater Cedar Mesa area, Prudden (1897) mentioned passing Ute and Navajo camps and corn fields during his work in the Grand Gulch area. The Hoblers also mentioned two other possible Navajo sites near Grand Flat, consisting of simple conical log-and-brush shelters, a sweat lodge, heating stones and ash. They argued these sites illustrate a long-standing pattern of intermittent use of the area, possibly extending back to the late thirteenth century (Hobler et al. 1978:35).

Eighteen sites of Navajo affiliation have been documented to date in the Greater Cedar Mesa area. Day (1964) tested a Navajo camp as part of the University of Utah’s Glen Canyon Project. This camp consisted of two forked-stick hogans, a cribbed-log hogan, and a small forked-stick sweat lodge located on the northern portion of Cedar Mesa just south of the head of White Canyon. This site produced seven tree-ring dates ranging from A.D. 1869 to 1879. Other sites include seven forked-pole hogans (Figure 6.11), three cribbed-log hogans, one stone masonry hogan, three corrals, one lamb pen, one game trap, two game racks, four brush wind breaks, two sweat houses (Figure 6.12), and two trails. Seven of these sites have been tree-ring dated, ranging in age from A.D. 1715-1940. Forty-two additional tree-ring dates from 10 sites within and adjacent to the study area (Natural Bridges, Bears Ears, White Canyon, Cottonwood Wash, Comb Wash and Grand Gulch) were obtained in the 1950s as part of the Navajo Land Claim Project (Stokes and Smiley 1963; see also Table 6.1). This was the largest single project ever undertaken to identify and document the extent and duration of the Navajo occupation of the southwest, primarily to support Navajo claims to areas not included in their reservation (Towner and Dean 1996; Stokes

Figure 6.11: View of hogan at 42Sa10997 within the Cedar Mesa study area. Photo courtesy of the Antiquities Section, Utah Division of State History.
Figure 6.12: Navajo sweat lodge at 42Sa10989 in the Cedar Mesa study area. Photo courtesy of Antiquities Section, Utah Division of State History.

and Smiley 1968, 1963). Collectively, these dates reveal a span from A.D. 1620 to 1950, with most dates in the 1800s, but none with cutting dates between 1863 to 1867 (Stokes and Smiley 1963).

This suggests that while Navajo utilization of the region could have occurred as early as A.D. 1620, it becomes more conspicuous in the archaeological record after A.D. 1700 (Correll 1971; Brugge 1983, 1996; Towner 1996, 2003), and that it may actually have appeared in the late 1700s (Hurst 1992; Towner 1996; but see Maryboy and Begay 2000). It has yet to be demonstrated whether or not Apachean groups ever entered southeastern Utah.

The Greater Cedar Mesa area continues to have significance to modern Navajos, who view the area as a traditional landscape where they return for hunting, gathering traditional plants and wood-cutting (BLM 2007). Certain geologic features in the region, especially Comb Ridge and Bears Ears, continue to have mythico-religious significance to the Navajo (see McPherson 1995, 2009; McPherson and Yazzie 2000; Maryboy and Begay 2000). They also ascribe cultural significance to Navajo Mountain and Abajo Mountains. Navajo elders refer to Comb Ridge as the backbone of the earth (McPherson 2009:19), while Comb Wash is called Mountain Sheep's Testicles, a reference to an incident in the 1860s when Navajo hunters camped at the mouth of Arch Canyon were bickering over who had the rights to the coveted organs (2009:28). Most Navajo place names in the Cedar Mesa area are derived from incidents that occurred at a specific place, and the prevalence of certain plants and animals (McPherson 2009).

The Cedar Mesa landscape also has tremendous religious significance to the Navajo.

*The land bounded on the south by the San Juan River, on the north by Elk Ridge and the Bears Ears, on the west by*
Table 6.1: Tree-ring dates from the Greater Cedar Mesa area attributed to Navajo occupations.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Sample No.</th>
<th>Area</th>
<th>Specimen</th>
<th>Date, A.D.</th>
<th>Inside</th>
<th>Outside</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBR-34</td>
<td>NLC-430</td>
<td>Natural Bridges</td>
<td>Loose log</td>
<td>1181 p</td>
<td>1843 v</td>
<td>1843 v +G Navajo Land Claim, dated by LTRR</td>
<td></td>
</tr>
<tr>
<td>NBR-35</td>
<td>NLC-431</td>
<td>Natural Bridges</td>
<td>Loose log</td>
<td>1169 p</td>
<td>1828 v</td>
<td>1828 v +G Navajo Land Claim, dated by LTRR</td>
<td></td>
</tr>
</tbody>
</table>

The symbols used with the inside date:

- year: the pith ring is present.
- p: the pith ring is present, but the cutumum of the inside ring indicates that it is near the pith.
- r: the pith ring is present, but because of the difficult nature of the ring series near the center of the specimen, an exact date cannot be assigned to it. The date is obtained by counting back from the earliest dated ring.

The symbols used with the outside date:

- B: back is present on the specimen.
- G: heartwood galleas are present on the surface of the specimen.
- C: characteristic surface patina and smoothness is present. This patina develops on specimens stripped of bark, as these specimens usually have bark removed and subsequently deteriorated or fell off.
- I: the outermost ring is continuous around the full circumference of the specimen. This symbol may be used for full cross-sections.
- E: the outermost ring is present, but the outermost ring is continuous around the available circumference.
- N: no evidence of outermost ring; the specimen was cut from the trunk or branches of the tree. The date is within a very few years of a cutting date.
- +: a subjective judgment. Although there is no direct evidence of the true outside of the specimen, the date is within a very few years of a cutting date.
- ++: no way of estimating how far the last ring is from the tree outside. A subjective judgment. Although there is no direct evidence of the true outside of the specimen, the date is within a very few years of a cutting date.
- G, L, and L: indicate cutting dates in order of decreasing confidence, where ++ > + > G = L. The symbols G, L, and L may be used in any combination with each other or with other symbols except G and G. The symbols + and ++ may be used with any combination of the other symbols.

Bannaneras, Byran, Jeffrey S. Dean, and William J. Robinson
1969
Tree-ring Dates from Utah's Southern Ute Area, Laboratory of Tree-Ring Research, The University of Arizona, Tucson.
Navajo Blanket and Lime Ridge, and on the east by Bluff, holds tremendous meaning for the Navajo people. Snakes, lightning, arrowheads, wind, bears, Puebloan sites, witchcraft and the river are not unconnected physical entities but powerful religious and philosophical things that lead directly to sacred teachings. Power, prayers and protection are their theme [McPherson 2009:80].

Archaeological research at Navajo sites thus far has been limited to site documentation and sporadic dating (Brugge 1966; Stokes and Smiley 1963; Winston Hurst, personal communication 2008; see also Towner 1996). To date, the earliest known Navajo site in San Juan County is found in White Canyon where a hogan west of the Bears Ears dated to A.D. 1620, although this structure also produced dates in the 1700s (Stokes and Smiley 1963) and may be an example of older wood used in later structures. Most other chronometric data suggest a Navajo presence in the area no earlier than the A.D. 1700s.

At the present time, Navajo studies in southeastern Utah are in their infancy. As such, it is unknown whether or not James' temporal schemes proposed for northern Arizona are applicable to the archaeological record of the study area. However, the near-constant state of warfare occurring in northeastern Arizona, particularly after A.D. 1800, had direct ramifications on Navajo utilization of southeastern Utah, including the Cedar Mesa area, as families sought refuge from Ute raiders acting as surrogates for the U.S. military. As discussed above, some Utes living in southeastern Utah appear to have embraced the refugees, even living together at Allen Canyon (McPherson 2009).

Quoting a Navajo informant, McPherson (2009:83) indicated a number of Navajo families sought refuge in the Comb Ridge and Bears Ears areas, but "there were no permanent homes because there were Utes raiding in this country in those days so we were afraid to stay in one place too long.” McPherson suggests that relations between the Navajo refugees and Utah Utes were generally peaceful, and that it was Colorado Utes living to the east who were raiding the Navajos in southeastern Utah. He also noted that Navajos were already living in Comb Wash and elsewhere prior to the conflict that led to their dispossession in Arizona, and that the Navajos in southeastern Utah had a long history of trade, cooperation and coexistence with the Paiutes and Utes (2009:84).

**Euroamericans**

As stated above, the advent of the historic period in southeastern Utah generally and the Greater Cedar Mesa area specifically began with the arrival of Euroamerican explorers, most notably the Hayden Expedition in 1875. The arrival of Mormon pioneers in 1879-1880 demarcates the first Anglo attempt to establish a permanent settlement on the banks of the San Juan River southeast of the study area considered here. The history of the region has been thoroughly addressed in a number of publications (see McPherson 2009, 1995, 1994a, 1994b, 1992; McPherson and Yazzie 2000; Miller 1966; Powell 1983; Topping 1994) and is only briefly summarized here.

The first exploration of the general region by non-indigenous Euroamericans occurred in 1776 when an expedition of Franciscan friars Francisco Atanasio Dominguez and Silvestre Velez de Escalante attempted to find passage from New Mexico to Spanish missions in California (Warner 1976). The group never reached California, but they did become the first verifiable expedition of non-Indians to visit Utah. They bypassed Cedar Mesa on the going and return trips, although the San Juan River and adjoining areas are illustrated on their map (Figure 6.13). As discussed above, the Escalante journal (Warner 1976) offered the first Euroamerican accounts of Southern Paiute groups in southern Utah prior to the arrival of Mormon settlers (see discussion above).

It is likely that Spanish, Mexican, French and American explorers, trappers, traders, prospectors and soldiers passed
through the Greater Cedar Mesa area from time to time. McPherson (2009:22) illustrates a rock art panel in Comb Wash that appears to depict “a Hispanic lancer mounted on either a horse or mule” (Figure 6.14). He also noted that Bears Ears appear on early Spanish maps as Orejas (ears). It is also probable that cattlemen ventured into the area in the mid 1800s, certainly by the 1870s when a few small ranches were established along the upper San Juan River. The oldest inscription found in the study area is “Louis Clift 1870” in Comb Wash near Navajo Spring. However, permanent white settlement of San Juan County did not begin until 1880 when the main body of the famous Hole-in-the-Rock expedition arrived in what is today Bluff (McPherson 1992, 1995).

Figure 6.13: Reproduction of the Dominguez-Escalante Expedition map by Captain Bernardo de Miera y Pacheco relevant to southeastern Utah. The San Juan River is labeled Rio de Nabajoo. Illustration courtesy of the Utah State Historical Society.

Figure 6.14: Rock art depiction interpreted as a mounted Spaniard with a lance. Modified from McPherson (2009).
Hole-in-the-Rock Expedition

The relevant history of the expedition actually began in April 1879 when The Church of Jesus Christ of Latter-day Saints (LDS) issued a mission call to saints in Parowan and Cedar City to secure peaceful relations with indigenous groups and to open southeastern Utah to further colonization. An exploring party of 27 men, two women and eight children, loaded into 12 wagons, departed Parowan in southwestern Utah via a southern route through northern Arizona, arriving on the San Juan River on June 1, 1879. Over the next 17 days, they established Fort Montezuma and mapped the area between McElmo Creek on the east and Butler Wash on the west, apparently never reaching the study area considered here. Two of the expedition members remained behind, while the others returned to Parowan via a northern route through Moab and Green River (McPherson 2009:89).

The main party of about 250 men, women and children with 83 wagons and more than 1,000 head of livestock instead chose a largely unexplored route to the San Juan River that took them into central Utah to Escalante and then south towards the Colorado River. After two weeks of following the base of Fiftymile Mountain, the expedition led by Silas S. Smith arrived in late November at the seemingly impenetrable 1,200-foot-deep Colorado River gorge and the 1,000-meter-wide Colorado River below (see McPherson 1995, 2009; Miller 1959, 1966). The subsequent construction of a trail down the sheer cliff faces, the painstaking lowering of wagons, people and livestock, and the ferrying of families and livestock across the river is an epic tale in the annals of the American West (McPherson 2009:89).

Upon reaching the south bank of the Colorado River, the task of finding a route to the San Juan River fell to George Hobbs, George Sevy, George Morrell and Lemuel Redd, who promptly got lost in the maze of canyons. On Christmas Day 1879, the small party found itself still lost, out of food, enshrouded in a cloud bank and wading through snow. Hobbs, the only one of the four who had been to Fort Montezuma, climbed a knoll (now called Salvation Knoll) and spied Blue Mountain to the northeast and Comb Wash stretching to the southeast. The scouting party then proceeded south across Cedar Mesa to Road Canyon before returning to the main group (McPherson 2009:89-90).

The main expedition then proceeded east out of the Colorado River gorge towards the Bears Ears and then south across Cedar Mesa to Road Canyon, arriving in March 1880. They eventually reached the impenetrable Comb Ridge, then following it south to the San Juan River where a trail was then cut into the slickrock cliffs, known as San Juan Hill over a period of five or six days. During this time, William H. Hutchings and J. Smith carved their names into the sandstone at the base of the hill, along with the date of March 28, 1880 (McPherson 2009:91). On April 6, 1880, after roughly six months of back-breaking labor in harsh conditions, the missionaries reached the

Figure 6.15: Navajo Springs route through Comb Ridge. Photo courtesy of the Utah State Historical Society.
sandy bottomlands along the banks of the San Juan River where they established Bluff City (McPherson 1995; Miller 1959, 1966).

Of note, the route made famous for the hardship endured by the first pioneers was virtually obsolete upon the expedition’s arrival in Bluff. The new residents of Bluff retained their close social ties to Mormons living in Escalante and southwestern Utah, and occasionally some used the Hole-in-the-Rock Road for personal travel. However, supplies were more easily obtained from southwestern Colorado and northwestern New Mexico, and by 1883 an easier freight route was constructed north through Butler Wash that cut through Comb Ridge at Navajo Springs (McPherson 2009:92; see also Figure 6.15).

Mormon Settlement

The original Bluff fort and historic village of log homes was laid out with a church, school and cooperative store in the center, which were surrounded by agricultural fields and orchards. During a livestock boom from 1886 to 1905, Bluff’s original rough log cabins were replaced by substantial hand-hewn red sandstone houses in the Victorian Eclectic style, some quite large and elegant, and others built of wood-frame lumber (McPherson 1995). A number of these homes are now listed on the National Register of Historic Places.

Relevant to the Cedar Mesa study area, the mouth of Comb Wash, referred to locally as the Rincon, emerged as a natural choke point for Mormon cattlemen and Navajo herders moving livestock back and forth from summer range in the Elk Ridge area to areas south of the river for winter range. In 1883, William Hyde (Figure 6.16), who had in 1880 established a store and waterwheel at Fort Montezuma, in 1883 opened a trading post at the Rincon where he constructed a ferry and waterwheel. Massive rains in late 1883 and early 1884 washed away Hyde’s improvements, and he abandoned the site. In late 1884, Frank and Ernest Hyde and Joseph and Amasa Barton restarted the post under the name Hyde and Barton Trading Company, moving the new edifice to a ledge 12 feet above the floodplain. The brothers also ran sheep throughout the southern portion of the study area considered here. The post was abandoned shortly after an 1887 incident in which Amasa Barton was killed during a dispute with Navajos who had come to trade (McPherson 2009:97-98).

After a decade of fighting the marginality and unpredictability of agriculture on the San Juan floodplain, many settlers discovered that life was somewhat easier in the high country at the base of the Abajo Mountains. In March 1886, Francis A. Hammond, LDS stake president for southeastern Utah, sent an exploration party from Bluff to locate areas more amenable to agriculture in the higher elevations. The south and north forks of Montezuma Canyon provided real possibilities, yet the general region was already utilized by non-Mormon cattle companies such as the Kansas and New Mexico Cattle and Land Company and the L.C. (or Lacy Cattle Company) outfit, who had arrived in the area about 1880, as well as by Ute/Paiute and Navajo herders. One estimate placed the number of L.C cattle in the area at that time at 17,000 (McPherson 2009:100).
In an attempt to deter the non-Mormon cattle outfits, Hammond sent Mormon families from Bluff to lay claim to ideal locations by building ranches and making other improvements. Within the study area, Francis B. Hammond had an improved ranch in Comb Wash, and another man, a hermit known only as Posty, had a place at the mouth of Mule Canyon. The Whiskers Draw and North Fork areas, which were originally called “the Little Valleys,” located just south of Milk Ranch Point, were utilized by Mormon settlers from Bluff in the operation of an open-range dairy, and the area thus became known as “the Milk Ranch” (Hurst and Turner 1993:150-151). Although this area was never truly “settled,” a wooden corral and possibly a house were constructed in the vicinity in 1882 to validate Mormon claims to the area (A.R. Lyman n.d. (c):35). A log fence or corral was built across the mouth of a small box canyon in North Fork, enclosing an alcove where the Wetherills would make a Basketmaker discovery a decade later (see Chapter 2). The only known record of this feature is an incorrectly captioned photograph (it is labeled as “Butler Wash”) taken by T.M. Prudden during his work in the area in 1900 (Prudden 1903: Plate 29.2).

Although the Milk Ranch area was already used as range land by Utes, Paiutes and Navajos, Anglo cattleman, such as the brothers Al and Jim Scorup, soon crowded onto the range. Cattle grazing occurred in Tuwa Canyon as early as 1878 (McVickar and Eininger 2001; Hobler et al. 1978). By the middle 1890s, Mormon stockmen from Bluff had developed several trails onto Elk Ridge, had built fences and corrals in several locations, and had created a wagon road into the area from Bluff (A.R. Lyman n.d. (c):35, 69-70). Confrontations between the Mormon settlers, non-Mormon cattle outfits and Ute Indians, all of whom were attempting to control access to the area’s water, lasted for the better part of the next seven years. The ultimate losers in the conflicts were the Utes and Paiutes, who found themselves crowded off the open range (McPherson 2009:104-108).

In the spring of 1888, settlers began constructing a town that was known as both North Montezuma and Hammond until it took the name Monticello in honor of Thomas Jefferson’s estate. Twenty additional men from Moab, Bluff and Mancos were called on by Hammond to bolster the new settlement. Together they fenced 320 acres, established crude homes from wagon boxes and tents, and started the task of hauling wood from the mountains. Private homes and a meetinghouse arose from the sagebrush flats, while an irrigation ditch, built by the newly incorporated Blue Mountain Irrigation Company, snaked its way across the flats to water the crops (McPherson 1994b).

The town of Blanding was established in the early 1900s by Bluff residents seeking agricultural land away from the unpredictability of farming along the flood-prone San Juan River. Situated on White Mesa near the southern end of the Abajo Mountains (also referred to locally as the Blues), Utes and Navajos frequently camped in this area because of the water from local springs and seeps. Navajos called the location “Sagebrush” due to the ubiquitous sage in the area (McPherson 1994a, 1995).

The first Mormons to arrive here were Walter C. Lyman and his brother Joseph, who loaded a buckboard with supplies and left Bluff to investigate White Mesa’s potential (McPherson 1994a, 1995). Soon thereafter, more than a dozen families began laying the foundation for the town site. The LDS Church, however, soon called many of these men to serve missions, and the construction halted. By 1903 the missionaries had returned and completed their work of marking out a town site and constructing an irrigation canal from Johnson Creek. Albert R. Lyman, Walter’s nephew, had pitched his tent in the newly surveyed town by April 1905, and by July, five other families had begun to settle in (McPherson 1994a, 1995).

First known as Grayson, the town changed its name in 1914 when a wealthy easterner by the name of Thomas F. Bicknell offered a thousand-volume library to any Utah town that would adopt his name. Grayson vied with another rural town called Thurber for the prize, and the two towns split the books. Grayson assumed Bick-
nell's wife's maiden name of Blanding, while Thurber assumed the name Bicknell. The people of Blanding became disgruntled, however, when they found that many of the books they received were of poor quality (McPherson 1995 and references therein).

Between 1912 and 1916, Blanding received a population increase caused, in part, by political unrest in Mexico. Many Mormon families who had previously fled south of the border during the intense anti-polygamy persecution of the 1870s and 1880s abandoned their Mexican homes and moved back to the United States. Some found refuge in San Juan County. In January 1914, the town claimed a population of 500 people; five years later it had risen to 1,100 (McPherson 1994a, 1995).

Blanding received lasting notoriety for its role in 1923 in the "Posey War," billed by some as the last Native American uprising in the United States. It all began when two young Utes robbed a sheep camp, killed a calf and burned a bridge. Although they turned themselves in, they escaped from the sheriff after the trial. The local white population quickly mobilized, not only to capture the two fugitives, but also to capture Posey, a Paiute whose name had been either directly or indirectly linked to most negative incidents in the region (Figure 6.17). More accurately, the event was a last bid for freedom by desperate Utes and Paiutes living on the outskirts of Blanding who, because of increased hostility with the Anglo neighbors, began fleeing to the rough country of Navajo Mountain. Posey acted as a rear guard and was wounded in a skirmish near Comb Ridge. He watched as a large number of emigrants were rounded up and carted off to a barbed-wire compound in town. Posey died a month later (McPherson and Yazzie 2000; McPherson 1985, 1995), assuming a mythical status among Utes in the region after his death. This prompted local Anglos in 1923 to dig up Posey's body as proof that he was, in fact, still dead. Collectively, these events in the early twentieth century demarcated the final abandonment of the nomadic lifestyle of the Ute in the region as federal Indian policy and local political realities forced the Utes to accept individual land holdings (McPherson and Yazzie 2000).

**Economic Pursuits**

Although the economic interests of raising livestock and agriculture dominated the region throughout most of Anglo history, logging operations in what is now the Manti-LaSal National Forest began in the Elk Ridge area in the late 1940s (Wolfe and Irwin 2003). Mining has been part of the economy of San Juan County dating as far back as 1883 when prospectors Cass Hite, Scotty Ross, Indian Joe and Edward Randolph explored the Natural Bridges area (McVickar and Eininger 2001), and Walter Mendenhall extracted $5,000 in flour gold from sand bars 10 miles down river from the mouth of Comb Wash (McPherson 2009:133-134). As many as 150 miners were trying their luck on the San Juan River in the early 1890s (Figure 6.18), although the gold rush was
short-lived (McPherson 1999, 2009; see also Aton and McPherson 2000).

Oil and gas exploration around the turn of the twentieth century was productive, and wells are still operating along the San Juan River (but not within the study area considered here). The first oil well to be drilled in the region was at the mouth of Comb Wash, but this well came up dry. Later wells at Mexican Hat, started in 1904, were highly productive. The Mexican Hat oil boom led to exploration and the sinking of wells throughout the area between Comb Wash on the east and Slickhorn Canyon on the west (Figure 6.19). These wells were never highly productive, although many produced oil (McPherson 2009:136).

The uranium boom of the 1940s and early 1950s also brought large numbers of people into the area and saw the creation of a few large fortunes (Topping 1994). In fact, The Vanadium Corporation of America (VCA) selected Monticello as a site for a wartime vanadium processing mill. It employed 200 workers until it closed in 1946, reopening in 1949 as a converted vanadium and uranium processing plant. During the 1950s, the mill processed large amounts of ore taken from the canyons throughout southeastern Utah. The Atomic Energy Commission closed the plant permanently in 1960 (McPherson 1995). Remnants of uranium mines are found throughout southeastern Utah. More conspicuous are the thousands of miles of two-track roads created by uranium prospectors to reach the deposits.

It should be noted that the impacts from uranium mining, timber harvesting and other non-agricultural economic pursuits are minimal within the study area, and few have been formally documented. In fact, the vast majority of historic sites found within the study area remain undocumented. Only 21 sites in the SHPO database are attributed to Euroamerican utilization of the study area. These sites include historic inscriptions on the rock walls at earlier archaeological sites, cowboy camps, range fences and small homesteads or line cabins. The most significant historic feature in the Cedar Mesa area is the Hole-in-the-Rock Trail, which is listed on the National Register.

**Summary**

Although documented archaeological evidence of Late Prehistoric and Historic Period utilization of the Greater Cedar Mesa area is quite limited. The entire study area was utilized intermittently by Puebloan visitors from the south, Utes and Paiute hunter-gatherers, by Navajos who foraged but who also may have farmed, and by Euroamerican ranchers who grazed cattle and sheep from Valley of the Gods on the south to Elk Ridge on the north. Sporadic utilization of the study area may have begun a century or two after abandonment of Cedar Mesa by Puebloan farmers at about A.D. 1300 (see Hobler et al. 1978), although most evidence points to Navajo occupations sometime after about A.D. 1700 (no chronometric data have been reported from Ute-Paiute sites).
The overall paucity of archaeological data related to occupations from A.D. 1300 to 1600 may be due to a number of interrelated factors. These occupations may have been extremely transient, and the archaeological evidence is therefore quite ephemeral and offers minimal cultural diagnostics whereby such sites could be identified. Such occupations may indeed be present, but archaeologists working in the region have generally failed to recognize them. Or the region was never utilized to any significant extent until sometime after A.D. 1600. Based on the current database, the period of time after A.D. 1300 is greatly underrepresented in the archaeological record.

The early historic accounts and more recent oral histories offered by descendants of families who once lived in or near the Greater Cedar Mesa area suggest the study area was significant to Utes, Paiutes and Navajos prior to their displacement and acculturation by Euroamericans. Most of this evidence reported to date, however, is related to indigenous utilization of the study area after the mid 1850s, or the “Fearing Time” that resulted in widespread warfare and population displacement, as well as social fragmentation and coalescence of groups with different ethnic identities for mutual protection and economic cooperation. As such, the relevance of the ethnohistoric and historic record to an understanding of Late Prehistoric settlement and subsistence practices, as well as population and cultural dynamics and resultant adaptations to the arid American Southwest, remains equivocal.

Euroamerican utilization of the study area began in earnest shortly after the arrival of the famed Hole-in-the-Rock Expedition in Bluff in the spring of 1880. The Cedar Mesa area itself was peripheral to the Mormon settlement of the region, and as such there is minimal evidence of a Euroamerican presence there. Permanent settlement
is limited to one ranch in Comb Wash, one small farm at the mouth of Mule Canyon, a trading post and ferry operation at the Rincon at the mouth of Comb Wash, and a ranching operation in the Milk Ranch Point area on the extreme northern periphery of the study area. Mormon ranchers ranged their livestock from Valley of the Gods on the south to Elk Ridge on the north, as evidenced by a scattering of livestock fences, corrals and other improvements. The most important historic resources found in the study area are remnants of the Hole-in-the-Rock Trail, which retains tremendous significance to the descendants of the expedition, many of whom still live in the region.
Chapter 7

The SHPO Database: An Analysis of Cedar Mesa Site Data and Data Gaps With Recommendations for Future Management

Introduction

The discussion offered in the previous six chapters was based largely upon a synthesis of previous research conducted in the Greater Cedar Mesa area over the past century or more. The discussion in this chapter consists of an analysis of all documented sites currently on file with the Utah State Historic Preservation Office (SHPO) and the Monticello Field Office of the Bureau of Land Management (BLM), as well as miscellaneous data at Edge of the Cedars Museum in Blanding and on file with Abajo Archaeology in Bluff. These official records were supplemented by site data provided by Dr. William Lipe of Washington State University.

In total, site forms for 2,173 documented sites in the Greater Cedar Mesa area were examined during the course of this analysis (see Appendix A: Map 1). Reviewers Lipe and Laird Naylor (BLM) have indicated that significant numbers of documented sites and survey blocks are not reflected on Map 1. However, all sites and survey areas on file with the BLM and SHPO are represented here (hereafter referred to simply as the SHPO database). Deficiencies in the database are indicative of the absence of relevant site documentation on file at the appropriate state and federal agencies.

The documentation of archaeological sites using some sort of standard form has been common practice in Utah since the early 1950s when the University of Utah first initiated broad-ranging statewide surveys using forms created specifically for that project, which were then cataloged at the university. The level of documentation was superficial by today’s standards, but at the time it represented a quantum improvement over earlier practices. In the 1960s, federal agencies and other universities and museums developed an array of different site forms. These were then cataloged at different locations. Even though the Smithsonian trinomial site numbering system had been applied in Utah since the 1950s, some entities applied different numbering systems, creating confusion among data managers seeking a uniform clearinghouse for all Utah archaeological data.

The passage in 1966 of the National Historic Preservation Act created a mechanism for each state to designate a state historic preservation officer, a position that became the impetus for centralized data storage at the state level. In Utah and other western states, these officials repeatedly grappled with the bewildering array of different site forms, the scattered catalogs of site data and artifact collections at various federal agencies and universities, inconsistencies in the level of site documentation, and the confusing and sometimes contradictory regulations being issued by different federal agencies. In 1981, uniform statewide procedures were established (the Intermountain Antiquities Computer System, or IMACS) for the documentation of archaeological and historical sites; these procedures are now mandated in Utah and Nevada and portions of Idaho, Wyoming and California. Most of the site data relevant to the Greater Cedar Mesa area was compiled prior to IMACS, and therefore most site forms do not meet currently accepted standards for site documentation.

The SHPO database must therefore be considered within the following two contexts:

- Although it has been standard practice to submit site data to the state for decades, this was not always done, and there are likely hundreds of unidentified site forms with temporary numbers...
filed away and forgotten in the archives of federal agencies and research institutions. It should be noted that several dozen site forms completed during the course of the Cedar Mesa Project have not yet been submitted to the Utah SHPO (William Lipe, personal communication 2009), and forms for hundreds of sites identified during the recent Comb Wash Campground Surveys and Comb Wash Heritage Initiative are currently in preparation (Winston Hurst, personal communication 2009). Hence, the SHPO database considered here is actually a large representative sample (ca. 80 percent) of documented sites.

- Site forms completed prior to 1981 typically do not have the same level of detail as those completed after that time, thereby creating bias in the database. For example, a site form completed in 1970 may not have mentioned that site vandalism was evident at a particular site, creating a nil value in the database, whereas a later site form for the same site would have required an actual determination of whether or not vandalism was present. This problem is evident on most data fields in the SHPO database considered here. Given the potential for bias, our findings should be used cautiously and with qualifications.

Throughout 2008, researchers Jerry D. Spangler, Andrew T. Yentsch and Rachelle Green obtained copies of 2,173 site forms, examining each of them in detail for relevant data. Excel spreadsheets were developed whereby most data could be assigned to various fields with a value of 0 (not present) or 1 (present). Exact site location information was rarely indicated on the site forms, but maps on file with the SHPO had estimated site locations that allowed us to estimate UTM coordinates. Using GIS software, these coordinates were then plotted on 21 different U.S. Geological Survey 7.5 minute maps, which were then combined into a single map to provide a broad view of the entire study area (see Appendix A: Map 1). The database developed here includes the following data sets:

- Administrative Data: Smithsonian site number, temporary site number, other identifying site name, UTM easting, UTM northing, section, township, range, land ownership, year the site was recorded, individual who recorded the site, institution responsible for recording the site and state project number.
- Environmental Data: General site location (mesa, canyon, open and sheltered), specific site location (alcove, bench, knoll, ridge, arroyo, cliff, dune, canyon bottom and slope), associated canyon drainage (primary and secondary) and water source (type and distance), deposition and vegetation.
- Site Type: General descriptive (permanent or transient), pithouse simple (single pithouse), pithouse complex (multiple pithouses), structural simple (single structure), structural complex (multiple structures), rubble mound (unknown structural), storage, artifacts simple (single artifact class), artifacts complex (multiple artifact classes), rock art, and other. Sites were also examined within a site classification scheme developed by Winston Hurst (personal communication 2008) under descriptive and interpretive criteria.
- IMACS Site Criteria: Number of rooms, multi-room structures, single-room structures, kiva, tower, storage cist, granary, unspecified storage, walls/unknown, depression, rubble mound, rock alignment, hearth, midden, petroglyphs, pictographs and other.
- Temporal-Cultural Affiliation: Determinations of Paleoindian, Archaic, Basketmaker I, Basketmaker III, Pueblo I, Pueblo II, Pueblo III, Pueblo IV, Ute/Paiute, Navajo and Euroamerican cultural affiliation. This determination was usually based on the presence of temporally diagnostic artifacts.
- Ceramics General: Plain (grayware, white ware, orange ware, red ware), painted (black-on-white, black-on-red, black-on-orange, other, polychrome), manipulated (neck-banded, corrugated) and ceramics present but types not specified.
- Ceramics Specific: Ceramics identified on the site forms as to specific types were organized by time period and area of influence (Kayenta and Mesa Verde). Ceramic types were assigned values of 1 (present) or nil (not present); no attempt was made to evaluate by quantity.
- Artifacts: Ceramics plain, ceramics painted, ceramics manipulated, ceramics other, chipped-stone tools, groundstone tools, maize, charcoal, wood, other organics, other artifacts and comments.
- Impacts: Site condition (excellent, good, fair, poor, unknown), vandalism (severe, moderate,
minor, unspecified), roads (road cut through site, off-road vehicle impacts, meters to nearest road), erosion, grazing and National Register status (listed, significant or recommended eligible, insignificant or recommended ineligible, not specified).

- Curatorial Data: Entity holding the relevant data, location of site forms and notes (at research institution, state or BLM), photograph location (research institution, state or BLM, none taken, unspecified), artifacts collected (yes, no, unspecified), location of curated artifacts and comments/other.

It should be noted that totals for many of the above data fields were determined to be insufficient to demonstrate any general patterns or to allow interpretive discussions even in general terms. Consequently, not all data fields are addressed in this overview.

**Site Documentation**

The impetus for archaeological research in the Cedar Mesa area has clearly been driven by research objectives, with 53 percent of all documented sites having been recorded during the course of university- or museum-sponsored projects (Figure 7.1, see also Table 7.1). Also evident is the fact the BLM has traditionally deferred site identification and documentation to academic researchers, doing little until recent years to proactively identify, evaluate and nominate historic properties under its jurisdiction or control (see Section 110 of the National Historic Preservation Act). Some efforts were initiated under the stabilization analyses discussed in Chapter 2, and various BLM-initiated projects are now ongoing. Some 24 percent of sites in the current database have been documented through efforts of a federal agency. Most of these projects, however, were initiated in direct response to proposed activities on federal lands, and as such they are Section 106 compliance projects rather than proactive Section 110 efforts.

The data also demonstrate that the amount of research in recent decades has dropped sharply, from 427 documented sites in the 1980s to 207 sites in the 1990s to 103 sites so far this decade (Figure 7.2; see also Table 7.2). This decline probably reflects a waning academic interest in the Cedar Mesa area specifically, as well as the absence of large-scale undertakings that mandated extensive Section 106 compliance surveys. It should be mentioned that the database of documented sites is expected to increase by several hundred sites in the near future as BLM-fostered research in the Comb Wash area is completed and submitted. These projects are being completed through a variety of grants and direct financial assistance, including the ongoing Butler Wash and Comb Ridge surveys, the Utah Canyons Rock Art Project and the Great Features Project. The emergence of BLM-initiated public-private partner-

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**Table 7.1: Sites recorded by type of institution**

<table>
<thead>
<tr>
<th>Entity</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Agency (BLM/USFS/NPS):</td>
<td>515</td>
<td>23.70</td>
</tr>
<tr>
<td>Academic/Museum:</td>
<td>1171</td>
<td>53.89</td>
</tr>
<tr>
<td>Clearance (CRM):</td>
<td>360</td>
<td>16.57</td>
</tr>
<tr>
<td>State:</td>
<td>126</td>
<td>5.80</td>
</tr>
<tr>
<td>Unspecified:</td>
<td>1</td>
<td>0.05</td>
</tr>
</tbody>
</table>

---
Table 7.2: Number of sites recorded by decade.

<table>
<thead>
<tr>
<th>Year</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1890s</td>
<td>12</td>
<td>0.55</td>
</tr>
<tr>
<td>1920s</td>
<td>22</td>
<td>1.01</td>
</tr>
<tr>
<td>1950s</td>
<td>15</td>
<td>0.69</td>
</tr>
<tr>
<td>1960s</td>
<td>388</td>
<td>17.86</td>
</tr>
<tr>
<td>1970s</td>
<td>998</td>
<td>45.93</td>
</tr>
<tr>
<td>1980s</td>
<td>427</td>
<td>19.65</td>
</tr>
<tr>
<td>1990s</td>
<td>207</td>
<td>9.53</td>
</tr>
<tr>
<td>2000s</td>
<td>103</td>
<td>4.74</td>
</tr>
</tbody>
</table>

Inadequate Baseline Data

As discussed above, the quality of site documentation has improved considerably over the past two decades. Most sites in the Greater Cedar Mesa area, however, were documented prior to the implementation of IMACS, and the poor quality (by today’s standards) of most site forms on file with the BLM and SHPO precludes their use as proactive management tools for site monitoring, or for subsequent research. Most site forms provide minimal site information, usually only a couple sentences of descriptive text. In the case of the Cedar Mesa Project, more detailed information was collected, but in many instances it was not included on the site forms submitted to the state. Most site forms in the database compiled here contain little or no information about current site condition or the nature and source of adverse impacts that could be ameliorated through aggressive management.

Assessments of site condition are greatly facilitated by comparisons of photographs taken over time, which can illustrate the rate of site degradation. This approach was recently implemented in southeastern Utah by the Carnegie Museum, which in 2008 initiated a project to identify sites initially photographed by the Carnegie Museum Expeditions of 1945 to 1947 and to re-photograph the sites from the same perspectives.
This effort revealed that some sites appear virtually the same some six decades later, while other sites have been severely damaged (Figure 7.3). The Carnegie expeditions examined sites in the Armstrong Canyon, Natural Bridges and Butler Wash areas just outside the study area considered here.

Large collections of photographs of Cedar Mesa sites taken since the late 1800s are now archived at a number of museums and research facilities around the nation, and all would be an invaluable resource to land managers. In addition, later photographic collections (1950s to 1980s) are now being held at the University of Utah, Brigham Young University and Washington State University. Also of note, the BLM initiated a photo-documentation effort in the 1970s of many high-profile sites. These are currently cataloged at Edge of the Cedars Museum. Although large numbers of photographs were taken during the course of previous research, most site forms on file with the BLM and SHPO have no attached photographs. Of those site forms with photographs, most photos are of such poor quality as to render them useless for management purposes. Only 35 percent of the Cedar Mesa site forms on file with the state have any attached photographs, although photos were taken at a far greater percentage of sites. Photographs were not taken of 22 percent of sites, and photographs are not indicated on 14 percent of the sites. Photographs and negatives are being archived at various institutions (Figure 7.4).

Most of the Cedar Mesa Project (Washington State University) reports utilized only temporary field numbers, making it cumbersome to identify those sites through their permanent Smithsonian identifiers at the Utah SHPO. In the case of those sites with only temporary numbers, it makes it difficult for land managers, who rely almost entirely on SHPO data organized by permanent numbers, to determine the site location without accessing the actual field notes that are not readily available. The compilation of a catalog of all temporary numbers cross-referenced to all permanent numbers is included here in Appendix C.

Additionally, there are large numbers of high-profile sites known to archaeologists and the general public (some are even publicized on the Internet) that have never been formally documented. These sites include great houses, great kivas and major architectural sites such as towers, unit pueblos and cliff structures. The absence of baseline data related to these sites is undoubtedly rooted in the time-consuming process of fully documenting complex sites to current IMACS standards, as well as the absence of a long-term strategy whereby such sites can be documented.

This problem is particularly acute along the San Juan River, where fewer than a dozen sites have been formally documented, but where hun-
hundreds of sites exist. These sites are well known to the thousands of river-runners who float the San Juan River annually, and visitation to these sites is a primary reason behind the river trips. The BLM has noted a steady deterioration of site conditions in recent years, as well as the disappearance of artifacts, presumably removed by recreational visitors to those sites (Rick Borretti, personal communication 2009).

We therefore recommend:

- The official Cedar Mesa site records on file with the Utah SHPO and/or BLM should be augmented with more-detailed site data, much of which is archived at WSU. Given that most sites were not recorded on IMACS forms and the level of detail does not meet currently accepted standards, the BLM should initiate a long-term site-re-identification project wherein sites can be properly documented to acceptable standards and current site condition can be assessed (it is generally accepted that sites recorded prior to about 15 to 20 years ago should be re-documented).
- There are as many as 280 sites documented through the course of the Cedar Mesa Project (all without permanent site numbers) where the documentation has not been forwarded to the state, a process that has been delayed by a lack of funding (William Lipe, personal communication 2009). Given that the location of these sites is currently unknown to land managers, the submission of these forms is critical for the BLM to properly manage these sites in light of increasing visitation in the region. Financial assistance to WSU to accelerate the completion of the appropriate IMACS site forms would be an appropriate priority.
- The catalog offered in this overview correlating permanent and temporary site numbers (Appendix C) should be augmented and updated by the Utah SHPO as additional site forms are completed and submitted to the state. These updates should be made available to the SHPO and BLM to assist in proactive site management. Researchers should be encouraged to use Smithsonian numbers in all relevant reports and discussions to facilitate better communication among researchers and for consistency with the SHPO’s centralized IMACS database.
- The absence of baseline photo-documentation of Cedar Mesa sites is particularly disconcerting to the Utah SHPO and BLM’s Monticello Field Office. A cooperative state-federal effort to obtain complete collections of site photographs now being held at museums, research institutions and CRM firms would help to establish a centralized photographic database (correlated to permanent site numbers) that would greatly enhance BLM management efforts. Although obtaining a complete photographic catalog would require a significant financial commitment, digital technology and the utilization of public-private partnerships and qualified volunteers could ameliorate those costs. It should be noted the Utah Department of Community and Culture has recently entered into a partnership with the Peabody Museum at Harvard University to acquire digital copies of all Utah collections at that institution, some of which are relevant to southeastern Utah. Similar partnerships with other institutions would be a valuable contribution.
- Given the abundance of known but unrecorded sites, many of which are receiving significant public visitation, at least some level of baseline site documentation of these sites should be given the highest priority. At a minimum, this should include photo-documentation and the assignment of permanent Smithsonian numbers to assist in the management of those sites. This effort should include the compilation of a catalog of all sites identified on Internet web pages and in guide books and other publications, a prioritization of undocumented sites that warrant immediate base-
line documentation, and the development of long-term strategies to document these sites. This effort would be appropriate for public-private partnerships and/or qualified volunteers from the Utah Statewide Archaeological Society.

- Baseline site documentation should be initiated at commonly visited sites along the San Juan River. This area is particularly appropriate in that (1) the river corridor experiences high visitation by a restricted number of river-runners annually, most of whom come to the river corridor intending to visit specific sites, (2) access to the river corridor is controlled through permits which can facilitate contact with and education of visitors about proper etiquette, and (3) river users can be engaged in the protection of archaeological sites in remote areas where a consistent law enforcement presence is not feasible. This effort could be a prototype for efforts elsewhere in the Cedar Mesa area whereby visitation to archaeologically sensitive areas and/or sites could be managed by limiting the number of visitors allowed and by requiring administrative contact with all visitors prior to backcountry trips.

Inadequate Surveys

A review of the site and survey data reveals investigations in the Greater Cedar Mesa area have been fairly limited in scope. It is estimated that only 1 to 2 percent of the study area has been subjected to intensive surveys, and that vast areas of the mesa have never been investigated. In the absence of quantitative block survey data or random sample surveys for the entire study area, the expected number of historic properties within the project area cannot be established with a high degree of confidence, but can be conservatively estimated at more than 100,000 sites. This estimate is based in part on ongoing research in the Comb Wash area on the northeast periphery of the study area and in the Butler Wash area just east of Cedar Mesa. In these areas, block surveys have identified site densities of 80 to 90 sites per square mile (Winston Hurst, personal communication 2008).

It is emphasized that the SHPO database does not reflect all surveyed areas, although the omitted areas are not considered large enough to alter significantly the overall estimates that only 1 to 2 percent of the project area has been surveyed. Not represented in the database are the Cedar Mesa Project (CMP) quadrat survey areas (400-square-meter blocks), which were small randomly selected blocks scattered mostly across the central and western portions of the mesa. These important surveys (Matson et al. 1990) were never designed to cover large areas, but to obtain a statistically valid sample of site data through which predictive models could be developed related to the potential nature, density and distribution of sites across the mesa as a whole. There is no reason to question the validity of the sample, although it should be noted the CMP study area was considerably smaller than the Greater Cedar Mesa project area considered here. As such, sample-oriented surveys of major portions of the Greater Cedar Mesa area have never been attempted.

It appears that previous research has been focused to a large extent on the central and western portions of the mesa, with the upper Grand Gulch drainage being the focus of repeated investigations through time. Significantly less attention has been focused on the southern portion of the mesa, or on most areas east of highway U-261, in particular the mesa tops. Very few, if any, investigations have been conducted in several major drainages. As indicated in Appendix A: Map 1, areas with minimal or no survey data include:

- The entire southeast quadrant of the project area east of the highway, beginning at the south fork of Road Canyon on the north and extending to Comb Ridge on the east and to the San Juan River on the south. Areas with few or no identified sites (and by inference few or no formal investigations) include Valley of the Gods, Lime Creek, Lime Ridge, Snake Canyon, Barton Range Canyon and lower Road Canyon. Surveys of the mesa top in this area are extremely limited (surveys to date have been mostly Section 106 clearance surveys of narrow linear routes).
- Lower canyon areas above their confluences with the San Juan River. These areas include lower Johns Canyon, Slickhorn Canyon and lower
Grand Gulch. All three drainages are known to contain an abundance of impressive archaeological sites, which are well known to and visited frequently by river runners. Yet fewer than a dozen sites have been formally documented in this area, and no formal surveys have been conducted (some of these are lands administered by the National Park Service).

- The northwest tributaries of Grand Gulch. Although considerable survey work has been completed in the upper Grand Gulch area (where impacts from recreation are greatest), very few sites have been documented in Grand Gulch between the Bullet Canyon confluence on the east and Polly's Canyon confluence on the west. Only a few sites have been documented in Green House Canyon, Step Canyon and Dripping Canyon, all northern tributaries of Grand Gulch.

- Upland areas in the northwest quadrant of the project area. Although some survey work has been conducted adjacent to U-95, very few sites have been identified on the mesa north and west of Grand Gulch, and the amount of comprehensive survey work must be considered extremely small or nonexistent.

- Owl-Fish Creek. Although a small block survey was conducted in Owl Creek (Benson 1985), most of this major drainage has never been surveyed and only a few sites have been formally documented outside of the survey block. Likewise, Fish Creek, a major sister drainage of Owl Creek, appears never to have been surveyed (no survey reports were identified during the course of this overview), and only a handful of sites have been formally documented there. Both Owl and Fish Creeks receive intense visitation from backpackers (there are formally designated BLM trails here) and both are known to have abundant and aesthetically impressive archaeological sites extending from the canyon mouth to their headwaters, a distance of more than 20 kilometers.

- Mule Canyon. Several sites, including impressive masonry towers that attract public visitation, have been documented at the head of Mule Canyon, but only a few sites have been documented in the drainage below the towers. A short canyon by comparison to the Fish-Owl drainage, this canyon has nonetheless witnessed significant increases in visitation in recent years, although no surveys have been conducted to identify resources at potential risk.

- Arch Canyon. This archaeologically rich drainage is accessible by motorized vehicles and as a result receives significant day-use focused on visiting cultural sites. No formal surveys have ever been conducted here, but recent non-systematic surveys (Spangler 2006) identified an exceptionally dense concentration of sites along the canyon corridor that are vulnerable to recreation impacts.

- Eastern Cedar Mesa. Although mesa-top surveys have been conducted south of the Snow Flats Road above Road Canyon, this area comprises only a miniscule portion of the expansive mesa area east of the highway. In fact, the vast majority of the eastern mesa top has not been investigated and, with the exception of the Road Canyon area, only a few sites have been formally documented.

- Comb Wash. The Comb Wash drainage, which defines the entire eastern edge of the study area here, has been the focus of considerable scholarly attention in recent years, although most of these efforts have been directed at the northern portion (Winston Hurst, in prep), the southern portion (Cameron 2008) and on trails crossing Comb Ridge (Till 2001, Hurst and Till 2002). Major sites of all periods are known to exist along the entire length of the drainage. It is expected that Comb Wash has an extremely high density of sites, but the distribution of sites, particularly in the middle portion, remains largely unknown.

The paucity of survey data for most of the Greater Cedar Mesa area must be considered a major data gap that can only be ameliorated through formal inventories. Given the expansive area under consideration, comprehensive surveys of entire areas (Class III) would require a massive commitment of financial and personnel resources perhaps unprecedented in the history of Utah archaeology. Given that Class III surveys are unlikely due to fiscal limitations, a BLM commitment to long-term Class II sample surveys of these uninvestigated areas could contribute to a better understanding of the nature, density and distribution of sites on the mesa as a whole, as well as the nature and extent of recreation impacts. Such surveys would be an appropriate expression of the BLM's Section 110 mandates and
could help address many fundamental questions, such as:

- How were human adaptations in the lower elevations of Cedar Mesa (southern half) different from those in higher elevations (northern half), and are there spatial differences in land-use patterns (camps and lithic scatters versus residential sites)?
- How were lower canyon drainages exploited in prehistoric times, how did the San Juan River facilitate or constrain settlement along the river corridor, and how were settlement patterns there related to those on the mesa itself?
- Was utilization of the mesa tops relatively uniform from east to west, or were there environmental variables that made eastern areas unsuitable for habitation? Can the Class II quadrat survey results (Matson et al. 1990) accurately predict site type and site density across the entire study area or only the central mesa area?
- The elevation and topographic nature of the largely uninvestigated Owl-Fish Creek drainage is strikingly similar to that of upper Grand Gulch, where previous research has identified an exceptionally high density of sites. Are the nature, density and distribution of sites identical in both drainages and are the temporal patterns the same? What was the role of Comb Wash in prehistoric settlement patterns? Was it primarily a transportation corridor, or was it also a major locus for residential activities? Did these patterns change through time?
- Investigations of the upper Grand Gulch above Bullet Canyon identified a high density of sites. Are land-use patterns different in the poorly investigated middle and lower portions of this major canyon drainage? Are the same patterns duplicated in minor drainages?
- Could more geographically expansive Class II surveys shed better light on estimates of overall site density and the carrying capacity of the local environment? How many people lived here at any given time? Can spatial and temporal patterns be identified through surface surveys?

**Environmental Patterns**

All sites in the SHPO database were examined for their relationship to environmental variables (e.g., elevation, topographic location, distance to water). This effort was successful only in limited terms due to the near-absence of environmental data on many site forms and inconsistencies in how environmental data were recorded. For example, some field crews determined distance to water as distance to the nearest canyon drainage, even if the drainage has no permanent water. Others took care to note distance to the nearest seeps or springs. These inconsistencies precluded any fine-scale analysis of site location as it relates to specific environmental variables.

These data, however, offer broad perspectives on previous research in the area. There is a common perception that previous research in the Greater Cedar Mesa area was predominantly focused on the large and aesthetically pleasing Pueblo III architectural sites in canyon-cliff settings, or on rockshelters, alcoves and cave sites with a potential for cultural deposits. Roughly half of all recorded sites are located on mesa tops and half in canyon settings (Figure 7.5). When the entire study area is considered, the canyon environments represent a relatively small percentage of the mesa as a whole, suggesting a somewhat disproportionate focus on canyon environments, primarily in the upper Grand Gulch drainage and its tributaries.

A closer review of these data, however, reveals that previous investigations have addressed a multitude of environmental settings, and that sheltered sites (alcoves, sheltered cliff structures) constitute only 28 percent of documented sites; all others are in open settings (Figure 7.6). These data suggest that a wide range of topographic and environmental settings were considered during previous research projects. It should be noted that the poorly documented eastern and southern portions of the study area may feature different environmental variables than could have influenced the density and distribution of sites, although the influence of these environmental variables on human adaptations remains largely unknown at this time.

The limited number of surveys in the southern portion of the study area must be considered a major data gap. However, this data gap
must also be considered within the context of the Class II surveys conducted in the central and northern portions of Cedar Mesa, which found a north-to-south elevation gradient, with sites decreasing in density and complexity at lower elevations to the south, and increasing in density and complexity at higher elevations to the north (Matson et al. 1990). This perception is reified when documented sites in the SHPO database are examined by their elevation. The majority of documented sites are located above 6,000 feet elevation, and only a very small percentage of sites are located below 5,500 feet elevation (Figure 7.7). These data, therefore, could be interpreted in one of two ways: (1) prehistoric sites are increasingly rare in the lower elevations to the south, and even additional surveys are unlikely to identify high or even moderate site densities, or (2) previous surveys have disproportionately focused on middle to upper elevation areas where high site densities were expected, and that no definitive statements can be made about lower-elevation adaptations because this issue has not been adequately addressed.

These environmental considerations present intriguing avenues for future research:

- How is the lower Cedar Mesa environment different than middle or upper portions of the mesa, and which variables would have constrained or facilitated use of the lower mesa?
- If prehistoric farmers were responding to decreased effective moisture by shifting to higher-elevation settings where rainfall was greater, what was the amount of rainfall that made agriculture viable in the lower mesa? Was the amount of moisture substantially more in the upper mesa, or were there other more critical environmental factors that limited agricultural use of the lower mesa, such as soil quality, soil depth, sparse woodlands and slope?
- Was the lower mesa within the range of logistically based foraging by groups living in the middle and upper mesa, and if so, which wild floral and faunal resources could have been efficiently procured and when?
- Which environmental factors would have constrained or facilitated farming of the canyon bottoms in the lower mesa area? Is the viability of canyon-bottom farming different between those canyons draining the highlands above Cedar Mesa (e.g., Grand Gulch) and those originating lower on Cedar Mesa (e.g. Road Canyon)?
- As a major drainage for runoff from the Abajo Mountains, Comb Wash undoubtedly experienced substantial water flows during the spring months and during the summer monsoons. What mechanisms, if any, were employed to facilitate flood irrigation in those areas where the amount of water would seem difficult to control? Was water quantity a major factor that constrained agriculture, with smaller canyons with smaller catchments being more manageable than larger drainages with major catchment areas?

Although paleoenvironmental studies collectively demonstrate a fairly consistent regional
climatic pattern, very few studies have addressed changes in environmental conditions within the Greater Cedar Mesa area through time. Such changes, including those at the short-term seasonal, annual and decadal scale, can have substantial impact on human subsistence strategies, settlement and mobility patterns, as well as overall demographic patterns. These generalizations offer avenues for future research, among them:

- Varien et al. (2007) have demonstrated the potential of weaving together analyses of climatic variation, agricultural productivity and anthropogenic change to better explain the effects of climatic change on settlement dynamics, population trends and migrations, and crop yields. Although the Cedar Mesa area is smaller, with fewer (and smaller) sites and fewer tree-ring dates, it represents an ideal environment to test a more holistic approach toward explaining short-term and long-term changes in human behavior. Such an approach would require the compilation of a comprehensive tree-ring database, a more thorough examination of the occupation history of habitation sites and a broader reconsideration of the potential agricultural carrying capacity of the entire local environment. Much of these data were collected during the course of the Cedar Mesa Project.
- Multi-proxy paleoclimatic reconstructions (e.g. packrat midden, tree-ring and geomorphic studies) have not been the focus of significant research in the Cedar Mesa area. As such, the lack of fine-grained climatic information related to natural resources and agricultural productivity stands as an important gap in the current database. Although small-scale dating of archaeological structures has been performed, long-term dendrochronological reconstructions amenable to continuous climate signal exist only for Kane Spring, White Canyon and Milk Ranch Point (Dean and Bowden 1972b, 1972c; Dean and Robinson 1971).
- Existing dendro-climatological data for the study area suggest there were periods during Basketmaker II and Basketmaker III times when climatic conditions were conducive to agriculture, in some cases optimal for agriculture, but where phase sequences for Cedar Mesa (e.g., Haase 1983) suggest the mesa was abandoned. Why would an entire region be abandoned during climatic episodes suitable for agriculture? Does the absence of sites in early-middle Basketmaker III times represent a sampling bias? Were there other

Figure 7.7: Percentage of documented sites by elevation.
environmental or anthropogenic factors that con-
strained agriculture during optimal climates?

- The persistence of mesa-top agricultural adap-
tations during Pueblo III times appears to have oc-
curred during periods of extreme climatic
variability unfavorable for agriculture. How were
local micro-climates different on Cedar Mesa than
in the better-understood Mesa Verde region? Are
human responses to environmental uncertainty
identifiable in the archaeological record?

Culture History

Cultural affiliation is typically assigned to
sites identified during the course of surveys based
on the presence of certain temporally diagnostic
artifacts (e.g., ceramics, projectile points, maize
remains) or architectural features (e.g., pithouses,
masonry styles), as identified on the site surface
at the time the site is documented. Therefore, cul-
tural affiliation should be an objective process
based on surface evidence. In practice, this be-
comes a subjective process predicated upon the
ability of surveyors to make accurate identifica-
tions based on sometimes limited surface data at
hand and the experience of the individuals making
those determinations.

To assess general patterns through time,
all sites in the SHPO database were examined for
specific references to cultural or temporal affiliation,
with a value assigned for each period of
time indicated (v=1). Each site was then assigned
UTM coordinates and plotted using GIS software
to determine the relative spatial distribution of
such sites during each period of time discussed in
the previous chapters. No attempt was made to
correct, qualify or assign a weighted value to such
determinations based on perceived inaccuracies
in the identifications or the qualifications of the
field researchers to make such determinations.
Rather, temporal affinity indicated on the site
forms was taken at face value. An analysis of the
SHPO database reveals broad temporal patterns
that are generally consistent with proposed tem-
poral sequences for the region suggested by
Haase (1983) and Matson et al. (1990) (see Fig-
ure 7.8) with some evidence of increases and de-
creases in the intensity of occupations, but
without evidence of long-term abandonment, as
discussed below.

This section also discusses data gaps that
could be addressed through future research. Many
of the research questions articulated here are being
or will be addressed through the efforts Laboratory
of Archaeology at University of British Columbia,
Vancouver, and the Museum of Anthropology at
Washington State University. These research di-
rections are articulated in a successful grant pro-
posal to the Social Sciences and Humanities
Research Council of Canada (Matson 2007), and
they represent the next generation of scientific in-
quiry arising from the earlier efforts of the Cedar
Mesa Project (discussed in earlier chapters). These
relate primarily to the Basketmaker II and Pueblo
II-III periods of time (discussed below).

Paleoindian

Only one Paleoindian site (Lime Ridge
Clovis Site) is located within the project area, and
one other site is located just outside the project area
to the northwest. It is probable that archaeological
sites attributable to the Paleoindian time period will
be found in the study area, perhaps associated with
San Juan River terraces or major riparian corridors
leading to higher elevations (e.g., Comb Wash, But-
ler Wash), although such evidence is likely sparse.
The archaeological identification of such sites may
be difficult for a number of reasons. First, site as-
semblages may be biased by the removal of intact
or re-workable surface artifacts by prehistoric and
modem collectors. Second, the co-mingling of un-
derlying Paleoindian occupations and those of sub-
sequent groups inhibits interpretative analysis, as
is the case at the Nunn Paleo Site, as yet undocu-
mented, which contains mixed deposits with Paleo-
indian projectiles and fluted point fragments,
Archaic artifacts and Puebloan artifacts (Greg
Nunn and William Davis, personal communication
2008). And third, sedimentary aggradation since the
Pleistocene has possibly buried evidence of Pale-
oindian occupations, resulting in little or no surface
evidence of these occupations.

Research designed specifically to identify
and explain Paleoindian adaptations in an area
with a low potential for sites dating to this period of time is probably not warranted. Paleoindian sites are commonly reported by members of the public, and occasionally during the course of clearance surveys associated with development projects on public lands. As such, the discovery of Paleoindian sites often occurs more by happenstance rather than by design. Given the rarity of such sites (and significant public interest in such sites), future discoveries, whether by the public or through the course of formal archaeological surveys, warrant thorough documentation of surface evidence, and any ground disturbance activities should be accompanied by an appropriate problem-oriented research design. In light of these considerations:

- The Nunn Paleo Site constitutes perhaps the most important Paleoindian site in southeastern Utah. The site encompasses several thousand square meters and is widely known to San Juan County residents, who have collected surface artifacts from the site over many years. Given the importance of this site, and the fact it has never been formally documented, the BLM is strongly encouraged to initiate the documentation process, either in-house or through a cooperative agreement with an outside entity. The documentation should include at a minimum an inventory of relevant artifacts and recovery of exceptional Paleoindian artifacts deemed to be at imminent risk of removal.
- It appears the Lime Ridge Clovis Site is a Paleoindian camp perhaps oriented towards exploitation of large fauna tethered to a greater or lesser degree to the riparian resources along the San Juan River. In contrast, the Nunn Paleo Site is located in a more upland mesa area. This presents opportunities to address important questions relevant to the Cedar Mesa area. What can an examination of the spatial distribution of Paleoindian artifacts and environmental variables at both sites reveal about Paleoindian land-use patterns? Can evidence at both sites be used to test hypotheses (e.g., Geib 1996a) about migratory patterns of terminal Pleistocene fauna and human exploitation of these resources? Is there any evidence of broader-based
subsistence (e.g., small game, plant foods) during Paleoindian times, and how can this be recognized in light of mixed artifact assemblages?

**Archaic**

Only 26 total within the study area, or 1.2 percent of the total sites documented, were assigned an Archaic affiliation (Table 7.3). The distribution of these sites across the Cedar Mesa landscape reveals no clear spatial or temporal patterns (see Appendix A: Map 2). The visibility of Archaic sites in the Cedar Mesa area may be low for a number of reasons: (1) Archaic foragers rarely used Cedar Mesa and evidence of the Archaic will continue to be sparse; (2) Evidence of Archaic use was limited to alcoves and rockshelters where it has been obscured or obliterated by subsequent occupations; or (3) Previous surveys have failed to identify more ephemeral Archaic manifestations, or have incorrectly assumed that aceramic campsites and special use locales are attributable to later groups. Assumptions of temporal affinity (e.g., aceramic camps are interpreted as Basketmaker II special-use locales even if there is no diagnostic evidence to support that determination) are more prevalent among CRM research projects in the area. It is possible some of these sites are, in fact, evidence of hunting and gathering activities during Archaic times.

An Archaic presence in the Cedar Mesa area is probably greater than indicated by the database, but it cannot yet be demonstrated to have

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been substantial. Archaic occupations will likely be found along the San Juan River corridor (warm-weather habitations) and the pinyon-juniper foothills (cooler-weather habitations) that reflect seasonal movement between resource patches. This adaptation was probably similar to Archaic adaptations elsewhere in the Four Corners south of the Colorado River, although limitations of geographically broad cultural-historical models traditionally applied to the Archaic period of time are acknowledged. It is also recognized that Archaic manifestations in the study area reflect low-intensity occupations by mobile populations producing similar artifact types, and that these artifacts are similar to those being produced in adjacent regions (e.g., southern Colorado Plateau and Great Basin). Cultural continuity throughout the Archaic periods or phases, however, cannot be adequately demonstrated in the archaeological record.

Throughout the region, minimal changes in Archaic lifeways are evident until about 500 B.C. when the appearance of maize agriculture and storage facilities demarcates the beginning of the Basketmaker temporal sequences. Archaic temporal frameworks are largely based on shifts in projectile point preferences, but why point preferences changed through time and consequent implications for human behavior have not been adequately addressed. Shifts in other material culture traits (e.g., basketry, sandals and figurines) during the Archaic are also poor temporal indicators and only somewhat better spatial indicators. In effect, roughly 8,000 years of human prehistory in the Cedar Mesa area remains unknown and must be considered a major data gap at this time.

The paucity of Archaic data from the Greater Cedar Mesa area may be a reflection of a lack of problem-oriented research into hunters and gatherers in an area where most scholarly attention to date has been focused on agricultural lifeways. Research into more ephemeral Archaic adaptations should be encouraged to better understand land-use patterns in the millennia leading up to agricultural adaptations and the consequent implications for changes in mobility and sedentism through time. Such research could shed additional light on questions of whether the transition to agricultural lifeways was embraced by in situ populations of hunters and gatherers, whether farmers displaced in situ foragers by restricting foraging territories, or whether farmers and hunter-gatherers coexisted, practicing a spectrum of different lifeways that ranged from fully agricultural to full-time foragers (cf. Simms 1986b). Among the potential avenues for future research:

- A random sample of all previously recorded campsites without diagnostic artifacts or features, accompanied by limited testing and radiocarbon analyses, could be an appropriate research direction to establish which, if any, of these sites were utilized by Archaic groups, or whether they indeed represent occupations by later groups and that the Archaic presence here is minimal or nonexistent. This could also test the validity of common assumptions of cultural affinity for those sites without diagnostic artifacts.
- As demonstrated by Geib (1996a), alcoves in riverine environments have considerable potential to contain Archaic deposits that can shed new light on Archaic adaptations through time. Similar alcoves are likely located along the San Juan River corridor, although Archaic deposits could be obscured or obliterated by later, more sedentary occupations. A more intensive survey of the San Juan River corridor to identify alcoves with intact Archaic deposits would be an appropriate “first step” that could lead to other problem-oriented investigations into the Archaic period of time.
- Hogan (1994; see also Elyea and Hogan 1983) has proposed a serial foraging model for late Archaic times wherein the subsistence-settlement system was tethered to semi-sedentary home base settlements that were located in pinyon-juniper uplands. This is consistent with Vierra (1980), who argued for a seasonal shift to an upland logistical home base during the winter. The Greater Cedar Mesa area, with local environments ranging from lowlands along the San Juan River to forested uplands along Elk Ridge would appear ideally suited to test these hypotheses of seasonal movement between upland and lowland environments during Archaic times.
- Given the sometimes-contradictory paleoenvironmental reconstructions for the Early and Middle Holocene periods for different areas of the
Southwest, any inferences about climate change in the Cedar Mesa area are tenuous, at best. Any reconstruction of Archaic lifeways in this area is predicated on a better understanding of human responses to changes in local climates and the resulting changes in the density and distribution of locally available resources. As such, climatic reconstructions specific to the Cedar Mesa area should be afforded greater priority in any future research designs.

Matson and Brandt (1995) suggested the Basketmaker II occupation of Cedar Mesa could likely be attributed to a migration of San Pedro Cochise-like maize farmers from southern Arizona who first cultivated the canyon bottoms through floodwater irrigation and later as dry farmers on the mesa top (1995: 153). If a migration occurred, did it displace or assimilate existing Archaic populations, or did Cedar Mesa represent an area devoid of foragers that was ripe for unopposed colonization? How are San Pedro Cochise hunting and gathering strategies similar to or different from those of earlier Cedar Mesa hunter-gatherers? Can distinctive Archaic artifacts (as yet poorly represented in the Cedar Mesa area) offer evidence of earlier migrations of foragers that foreshadowed later migrations of agriculturalists?

**Basketmaker II**

For the purposes of this overview, all site forms were examined in detail for any determinations that sites were of a Basketmaker II affiliation. A review of the sites revealed 499 sites where a Basketmaker II determination was made, or 23.2 percent of all sites. This constitutes the second highest percentage of sites behind only the combined Pueblo II-III period, suggesting a relatively intense and unprecedented occupation of the mesa during Basketmaker II times. The Basketmaker II total compares to only 27 sites assigned to Paleoindian and Archaic times (1.3 percent) and 379 sites assigned to Basketmaker III times (17.6 percent). There is good reason to believe some Basketmaker II data are biased by unsupported field determination of temporal affinity. A review of the site forms found that in many cases, non-diagnostic lithic scatters and special use sites without ceramics were determined to be Basketmaker II sites, a theoretically untenable assumption given the absence of temporally diagnostic artifacts or features.

All Basketmaker II sites were assigned UTM coordinates and plotted using GIS software to determine the spatial distribution of such sites (see Appendix A: Map 3). As expected, a majority of Basketmaker II sites are located along or near upper Grand Gulch and its tributaries, although this density may be a function of where most Basketmaker II problem-oriented research was conducted. Intriguing is the scattering of roughly 50 Basketmaker II sites in the southwest quadrant of the study area, all at lower elevations presumably poorly suited for agriculture. Considered collectively, Basketmaker II sites are generally located inside canyon drainages or on the mesa tops near canyon drainages. With the exception of a cluster of Basketmaker II sites near the head of Road Canyon, such sites are rare in the eastern half of the study area. This scarcity is more likely due to the lack of systematic surveys in the eastern portion of the study area, and current site density and distribution patterns indicated on Appendix A: Map 3 are likely not representative of the Greater Cedar Mesa area as a whole. Given the high density of Basketmaker II sites near the head of Road Canyon, it is expected that large numbers of such sites will also be documented in the Fish Creek-Owl Creek drainage, both in the canyon corridor and on the mesa tops near the canyon rim. The overall scarcity of Basketmaker II data for the eastern mesa is considered here to be a major data gap for the Greater Cedar Mesa area.

The spatial distribution of documented Basketmaker II sites raises many questions that could be addressed through additional surveys:

- Previously documented sites indicate that lower mesa environments were utilized during Basketmaker II times, and that the settlement pattern of utilizing canyon corridors and the mesa top near the canyon rims is evident in both higher and lower settings. Does this suggest that effective moisture was adequate for agriculture across the entire mesa? Or do agricultural strategies differ between higher mesa settings with greater
moisture and lower elevations with less predictable rainfall?

- Can the same settlement pattern be demonstrated on the eastern side of the mesa in the Owl Creek, Fish Creek and Mule Canyon drainages? Is the Basketmaker II expression concentrated in the upper portions of these drainages, or does it extend to lower elevations, as appears to be the case in Grand Gulch?

- Is the near absence of Basketmaker II sites along Comb Wash a function of inadequate surveys, or were Basketmaker II agricultural practices poorly suited to Comb Wash?

- A small cluster of Basketmaker II sites was documented in highland settings east of Natural Bridges National Monument. Did these Basketmaker II groups attempt to farm at elevations above 7,000 feet, or were upland areas foraging territories to supplement maize agriculture? Can a more systematic survey of upland areas identify foraging practices during this period?

- Recent research has demonstrated that Basketmaker II populations were predominantly dependent on maize farming with its inherent implications for sedentism. What would be the optimal range for logistical foraging, and are uplands in the Elk Ridge-Bears Ears area within that range for Basketmaker II populations living in the southeast quadrant of the study area?

- Gilman (1986) has argued that pithouses should indicate winter occupations with, at a minimum, bi-seasonal mobility. Yet cumulative research has demonstrated pithouse-dwelling Basketmaker II peoples were primarily sedentary farmers dependent on maize. Can a bi-seasonal pattern of mobility be identified, and if so what was the spatial dynamics of this adaptation on Cedar Mesa? If not, what are the implications for traditional assumptions about farming and foraging? Are Basketmaker II pithouses winter residences or are they summer field houses reflecting a claim to arable land, or both?

Ongoing research in the region is addressing several important questions (Matson 2007), among them:

- Matson and others (Matson et al. 1990) have demonstrated that Basketmaker II peoples of the Greater Cedar Mesa area were committed maize agriculturalists, not modified hunters and gatherers (Aasen 1984; Chisholm and Matson 1994; Matson 1991; Matson and Chisholm 1986, 1991, 2007; Matson et al. 1990). That determination raises the question of how agriculture arrived in the Southwest. Irwin-Williams (1967) noted the similarity of the Western Basketmaker II (which includes Cedar Mesa) to the San Pedro Cochise. Berry (1982) and Berry and Berry (1986) expanded on this similarity to argue that the San Pedro Cochise migrated on to the Colorado Plateau from the southern Basin and Range, bringing their maize agriculture with them. Matson (1991, 2003, 2006b) demonstrated that Basketmaker II adaptations reflected two “ethnicities” with the Western Basketmaker having many links to the San Pedro Cochise. Bellwood (1997, 2001, 2005) suggested that this hypothetical migration originated in central Mexico and that these groups spoke a Uto-Aztecan language. To test the idea of genetic connections to central Mexico, Basketmaker II coprolites from well dated and stratified Cedar Mesa contexts will undergo mitochondrial DNA (mtDNA) analysis and the results compared against a large Southwestern and Mexican mtDNA database to better determine the origins of early farmers on the mesa.

- From about 100 B.C. to A.D. 500 A.D., one of the archaeological “signatures” of Grand Gulch phase sites is an abundance of limestone fragments in the middens at habitation sites (Matson et al. 1990), interpreted as the use of locally-available limestone for “stone-boiling” of maize-based dishes, presumably in tightly-woven baskets (Matson 1991). This would have represented a transition from previous food systems involving seasonally roasting or steaming freshly harvested maize to one more reliant on dried maize essential for year-around dependence on this crop. Ongoing studies involving collecting unaltered limestone, heating them and using them to boil whole ears, shelled kernels and corn meal. Suitability of this technique for cooking maize can be evaluated, and the limestone thus used can be compared to archaeological examples to see if characteristics match. If the study indicates the likelihood that stone-boiling was used prehistorically, it is possible to evaluate the nutritional effects of this
process, in particular whether it increases the metabolic availability of some proteins, especially the low levels of lysine found in maize that would have been important to sedentary groups lacking other plant proteins (i.e., beans).

- Increased evidence of conflict during Basketmaker II times elsewhere in the Southwest (Hurst and Turner 1993; LeBlanc 1999; Matson and Cole 2002) stands in contrast to data from Cedar Mesa where only one defensive site (Rock Island NR C9-5) is currently known (Matson 1994, Matson and Brand 1995). Questions remain as to whether the conflict was between Basketmaker II farmers and indigenous non-Basketmaker people, or among different Basketmaker II grounds increasingly in competition as the area filled up and the situation became circumscribed, or both. Ongoing studies include a complete analysis to determine whether the artifact assemblage differs from other contemporaneous habitation sites in the kinds of tools and/or lithic material. These analyses may indicate whether different activities are associated with the defendable location and whether access to lithic resources was constrained, perhaps as a result of conflict with neighboring groups.

**Basketmaker III**

The emergence of ceramic tradition among pithouse-dwelling maize farmers typically demarcates the beginning of the Basketmaker III period. This period of time is generally more recognizable during surface surveys due to the presence of distinctive grayware ceramics. For the purposes of this overview, all site forms were examined in detail for determinations of Basketmaker III affiliation. A review of the site forms revealed 379 sites where a Basketmaker III determination was made, or 17.6 percent of all sites. This compares to 499 sites assigned a Basketmaker II temporal affiliation. This could imply a somewhat reduced level of occupational intensity after Basketmaker II times, which is consistent with findings of the Cedar Mesa Project (Matson et al. 1990). The intensity of occupations may have decreased substantially after Basketmaker III times, as evidenced by the fact that only 151 sites (7.1 percent) have been assigned a Pueblo I temporal affiliation. Collectively, these data could be interpreted to suggest a major Basketmaker II occupation of the mesa, followed by periods of progressively less occupation until about A.D. 1000.

All sites in the SHPO database that had been assigned a Basketmaker III temporal affiliation were subsequently assigned UTM coordinates and plotted using GIS software to determine the spatial distribution of such sites (see Appendix A: Map 3). The distribution of Basketmaker III sites may be a function of where problem-oriented research has been conducted, and it may not be representative of the distribution of Basketmaker III sites on Cedar Mesa as a whole. With few exceptions, little research has been focused on Basketmaker III manifestations in the larger study area considered here, and density and distribution of Basketmaker III sites must be considered a major data gap.

As discussed in Chapter 4, Basketmaker III sites are more rare, but the pattern identified during the Cedar Mesa Project seems to reflect a shift to pithouse occupations in pinyon-juniper woodlands with deeper soils. Matson et al. (1990) considered this shift to be consistent with dry farming of the mesa tops. The appearance of storage cists adjacent to the pithouses reflected a shift from storage in canyon and alcove settings to onsite storage. And significant utilization of the canyon corridors was not evident at this time. The Basketmaker III pattern suggested by Matson et al. (1990) is not especially obvious in the SHPO database of sites assigned a Basketmaker III affiliation. Some sites are scattered across the mesa top, but the majority have been identified in the canyon drainages, primarily the upper and middle Grand Gulch area. In fact, the pattern evident in the SHPO database suggests a much greater percentage of Basketmaker III sites in the canyon drainages than during Basketmaker II times.

This spatial pattern raises important questions about current hypotheses related to the Basketmaker III period of time.

- Is the hypothesis that Basketmaker III families dry farmed on mesa tops based on an insufficient sample size that under represents concurrent adaptations in canyon environments?
• If storage shifted to on-site storage cists next to fields, how were the canyon corridors utilized during Basketmaker III times? Were multiple storage strategies in effect at this time that included on-site storage in addition to remote storage in alcoves and rockshelters? What are the implications of variable storage strategies on sedentism and social relationships? Were multiple agricultural strategies in effect to ameliorate the failure of one strategy?

• Is the Basketmaker III occupation narrowly restricted to the Grand Gulch drainage, or will it be identified in the environmentally similar Owl-Fish Creek drainage, as well? What environmental variables were conducive to Basketmaker III adaptations, and are optimal environmental conditions present elsewhere in the Greater Cedar Mesa area?

• Is the scarcity of Basketmaker III sites an accurate indication of a low-intensity occupation of the mesa generally, or did the random quadrats fail to identify population shifts into different environmental niches that remain uninvestigated?

• What can the dispersed nature of Basketmaker III sites reveal about community organization and how did this differ from earlier times? Is there any evidence of competition or conflict, and how does this relate to such evidence in Basketmaker II and Pueblo I times?

**Pueblo I**

Current hypotheses suggest an occupational hiatus for Cedar Mesa during Pueblo I times, with the possible exception of sites along the eastern margin of the mesa that remain largely uninvestigated (Matson et al. 1990; Haase 1983). Based on an examination of site forms indicating the presence of Pueblo I components and/or artifacts identified during surface surveys, there appears to be a reduction in the number of sites attributed to this period, although total abandonment of the mesa suggested by some researchers is not supported. According to the SHPO database, 151 sites in the Greater Cedar Mesa area have evidence of a Pueblo I presence (7.1 percent of the total), compared to 379 sites in Basketmaker III times (17.6 percent) and 795 sites in Pueblo II times (35.5 percent).

A review of site location information for the Greater Cedar Mesa area reveals no distinct patterns. Pueblo I sites, although fewer in number, are dispersed across the mesa tops, some are located in the Grand Gulch drainage and others are located along the base of Comb Wash. There is no clear indication that Pueblo I sites increase in density with increased elevation where there was an assumed increase in effective moisture, although such higher-elevation areas with intense Pueblo I occupations are located just outside the study area (see Chapter 5). The sparse and dispersed nature of these Cedar Mesa-area sites suggest Pueblo I occupations were less intense than those of earlier or later times, but that the Cedar Mesa canyons and mesa tops continued to be utilized (see Appendix A: Map 4).

The Pueblo I period of time has not been the focus of significant problem-oriented research in the Cedar Mesa area, and as such the Pueblo I period stands as a major gap in the current database. Pueblo I sites are known in the Comb Wash area, but most of these are undocumented (some are now being documented by Winston Hurst [in prep] through his ongoing research in Butler Wash and Comb Wash). As discussed in Chapter 5, various researchers have hypothesized that Cedar Mesa itself was not occupied during Pueblo I times, but rather Pueblo I occupations will be found along the eastern margin of the mesa overlooking Comb Wash and in higher elevation settings above 6,000 feet elevation. The quadrat surveys did not identify such sites in the sample areas above 6,000 feet (they have been found at much higher elevations to the northeast of the study area). The database compiled here identified no obvious trends related to elevation. As such, the Pueblo I period in the Greater Cedar Mesa area presents intriguing avenues for future inquiry.

• If the Pueblo I period represents a population shift to higher elevations, would this be clearly represented if the study area were to be expanded to include nearby Milk Ranch Point, Chippean Ridge and other areas above 7,000 feet elevation? At what elevation does the shift become conspicuous?

• Would additional Class II random samples of
other areas on Cedar Mesa reveal the current pattern of scattered Pueblo I sites across the mesa generally, or will there be clustering in optimal environmental niches? Which environmental variables influenced Pueblo I occupations?

- There are known Pueblo I sites along the Comb Wash drainage. Was this occupation likewise sparse or does these sites represent a clustering along major drainages? Is there evidence in the Greater Cedar Mesa area of population aggregation or defensive orientation as is the case at Pueblo I sites in Montezuma Canyon and Alkali Ridge to the east?

- Interpretations of the Pueblo I archaeological record for Cedar Mesa is hampered by the absence of excavations of Pueblo I sites in or near the study area. Such excavations could shed light on unresolved questions such as population aggregation, defensive responses precipitated by deteriorating climates, and shifting land-use patterns in response to climate change, and how those changes may be related to more robust Pueblo I adaptations elsewhere. Such research could also better explain continuity or discontinuity between the more prevalent Basketmaker III and Late Pueblo II occupations in the region.

- Excavations of Pueblo I sites could also identify construction beams that could contribute important insights into the timing of any population shifts, and to reconstructions of prehistoric climates that may have influenced population dynamics at this period of time.

**Pueblo II-III**

As discussed in Chapter 5, the Greater Cedar Mesa area experienced intense periods of occupation, perhaps separated by short periods of abandonment, from Pueblo II times through the final abandonment of the mesa about A.D. 1270. An intense occupation is supported by the SHPO database, although it does not allow for fine-scale resolution of the various phases that have been proposed. The database derived from site forms on file with the Utah SHPO is limited on numerous levels: (1) Temporal and cultural affiliation was typically assigned based on the presence of diagnostic ceramics, (2) Survey data rarely delineates between early and late Pueblo II ceramics, (3) Surveyors typically identified ceramics on any given site as both Pueblo II and Pueblo III ceramics, and (4) In many instances ceramics were identified only by period and not as to type that would facilitate an analysis of Kayenta or Mesa Verde influence. The accuracy of the remaining data is also predicated on accurate field identifications of ceramic types, a process that can require laboratory analysis or extensive knowledge of local ceramics (e.g., Matson et al. 1990; Severance 2003). Given those considerations, the database here should be used with caution.

Because site forms on file with the Utah SHPO and BLM do not distinguish between early and late Pueblo II, the database used in this overview does not facilitate any discussion of whether occupations on Cedar Mesa were less intensive earlier in the Pueblo II period, although it is assumed, based on the Cedar Mesa Project quadrat surveys (Matson et al. 1990), that early Pueblo II sites are generally rare and that most sites can be attributed to late Pueblo II times. It remains unknown if this is a sampling bias and whether sites attributed to this period of time are located in areas not considered by the quadrat surveys.

A dramatic increase in sites attributed to the Pueblo II period suggested by Matson et al. (1990) and Haase (1983) is supported by the SHPO database, with 795 sites (36.6 percent) having features attributed to this period (see Appendix A: Map 4). This compares to 151 sites with Pueblo I features (7.1 percent), but is virtually identical to the 771 sites (35.4 percent) with Pueblo III features. The similarity between the Pueblo II and Pueblo III numbers is likely attributed to the fact that site forms typically assign a "Pueblo II-III" affiliation with no distinction between the two. An examination of ceramic diagnostic by region of influence revealed that Mesa Verde-influenced ceramics are the predominant types during all periods and that these are far more common than Kayenta ceramics (Figure 7.9). The prevalence of Kayenta wares during a brief episode in Pueblo II-III times (Matson et al. 1990) appears to represent a minor component of the total artifact assemblage. This stands in contrast to personal observations by Winston Hurst,
William Davis, Owen Severance and other experts in the local archaeology that there is a predominance of Kayenta ceramics west of Comb Ridge. As such, the database here may indeed reflect the inability of some crews to accurately identify differences between Mesa Verde- and Kayenta-influenced ceramics during cursory field examinations.

The spatial distribution of Pueblo II-III sites reflects utilization of both mesa tops and canyon environments, with a somewhat greater preponderance of canyon sites in later times. These canyon sites are located in most major drainages and their tributaries, except in the southeastern quadrant of the study area where no significant surveys have been conducted. Given that canyon sites are often architectural sites, the greater percentage of documented canyon sites attributed to this period of time may be due to their high visibility. Even though large numbers of mesa top sites have been identified during the course of the Cedar Mesa Project and various other investigations, such sites appear under-represented in the overall sample of sites attributed to this period of time.

Ongoing research related to this period (Matson 2007) will offer new perspectives into the Pueblo II-III expression on Cedar Mesa:

- The Clay Hills phase on Cedar Mesa represents a brief intrusion of Kayenta-influenced ceramics, part of an expansion also seen farther west in the Glen Canyon area (Lipe 1970). Researchers will examine whether this represents an actual migration of people out of the Kayenta area and if so, if it coincides with the expansion of Chacoan influence in the very late A.D. 1000s or with sociopolitical disruptions attending its collapse after about A.D. 1130. The answers to these questions can shed new light on the interregional dynamics of the Chaco phenomenon. To determine whether the Clay Hills phase represents an actual Kayenta colonization of Cedar Mesa versus some type of intensified exchange, neutron activation analyses of the clays used in Kayenta-style potsherds will be conducted on samples from a Cedar Mesa midden and compared to Kayenta area clay types and sources. Production of Kayenta ceramics on Cedar Mesa would indicate an actual colonization.

- Great houses linked to the Chacoan socio-cultural system will be examined based on the presence of architectural and site-plan traits that reference the major great houses at the primary Chacoan centers (Chaco Canyon and the Aztec complex), and on site dates that fall within the brief period of Chacoan expansion to the north (Lipe 2006; Kantner and Mahoney 2000). These efforts will be focused on two sites that have tentatively been identified as Chaco-like, the great houses at the Et Al Site and the Severance Site (Kantner 2003). Both sites will be mapped to determine their layout and architectural traits, ceramics will be examined to identify their chronological placement, and samples from exposed construction timbers will be collected for tree-ring dating.

- Chaco great houses typically served as community centers for surrounding dispersed communities. Less than 1 kilometer from the Et Al Site is Bullet 12-1, one of the largest Cedar Mesa sites in terms of population, as evidenced by the presence of 15 hearths (Matson et al. 1990) but with very little architectural evidence and only a modest artifact assemblage dispersed over a large area. It is associated with the Windgate Phase about A.D. 1060-1120, or a time associated with Chacoan influence. B12-1 is unique among Cedar Mesa sites, and researchers question whether it is a very short duration site associated with the construction of the Et Al Site or if it was perhaps associated with sea-
sonal festivals carried out there. Most Chaco great houses are in areas of relatively dense occupation and temporary residences are not needed. Matson et al. (1990) estimated the Pueblo population of the sampled area was about 1,000, and some people would be living 15 kilometers or more away, perhaps requiring temporary habitations. If Bullet 12-1 people were involved in “feasting” (Dietler and Hayden 2001), more and larger bowls and less storage ceramics would be expected.

A possible reason for the precipitate decline in Chacoan influence in the mid-1100s is the occurrence of a major drought episode from about AD 1135 to 1180 (Benson et al. 2006; Lipe 2006; Meko et al. 2007). Because Cedar Mesa is agriculturally marginal relative to the central Mesa Verde region to the east, its population should have been especially sensitive to this drought. Hence, demonstrating a population decline or hiatus on Cedar Mesa in the mid-1100s would provide new evidence regarding the severity and geographic extent of the drought. Chronological re-evaluation of Cedar Mesa ceramics will help resolve this question, as will an evaluation of all Pueblo II-III tree-ring dates from southeastern Utah, many of them obtained after the Cedar Mesa Project chronology was established.

The depopulation of the Northern Southwest in the late A.D. 1200s is a classic problem in Southwestern prehistory (Kidder 1924; Lipe 1995). In the central Mesa Verde region, the A.D. 1200s saw a buildup of population; settlements shifted from mesa tops to canyons and canyon-rim locations; there was increased movement of people from small dispersed homesteads and hamlets into villages of 50 or more people; and there was a rapid final depopulation in the late A.D. 1270s and early 1280s (Varien et al. 1996, 2007; Varien 1999, 2002). It has been argued that depopulation began somewhat earlier in western areas such as Cedar Mesa than in the central Mesa Verde region (Lipe 1995; Glowacki 2006), and that populations in the western area, including Cedar Mesa, did not participate in the same settlement shifts evident in the more densely populated central Mesa Verde area (Varien et al. 1996). The proposed differences between the central and western Mesa Verde areas have substantial implications for understanding the dynamics of social and cultural interaction across the Northern San Juan area. For example, if most of the Cedar Mesa population continued to live in small settlements on the mesa top until the end of occupation, this would suggest that warfare was not an important factor in the west relative to the more populous areas farther east.

Ongoing studies include a reclassification of Mesa Verde tradition ceramics using both refined typologies and an analysis of time-sensitive attributes (Hegmon 1992). Chronological comparisons of pottery assemblages dating to the A.D. 1200s from sites on the mesa top versus sites located in the canyons will allow researchers to determine if the shift to canyon locations was as dramatic on Cedar Mesa as in the central Mesa Verde area to the east. Tree-ring dates from the region surrounding Cedar Mesa will also be assembled to obtain a tighter chronology for the timing of construction of sheltered “cliff dwellings” in the canyons of southeastern Utah. A refined chronology for the Woodenshoe and Red House phases should enable researchers to use existing site data to evaluate whether or not Cedar Mesa populations remained high or declined during the mid A.D. 1200s, whether the area was effectively depopulated by the mid A.D. 1260s (significantly before the central Mesa Verde area), and whether habitation site size increased or stayed constant during the 1200s.

It is anticipated that these ongoing studies will address many fundamental questions related to the Pueblo II-III period of time on Cedar Mesa. Other potential questions include:

Unlike the Mesa Verde region, settlement patterns in the Cedar Mesa region reflect a continuation of dispersed, small farming communities apparently organized at the family or suprafamilial level. Varien (1999) has offered models of Pueblo II and Pueblo III sedentism and mobility at the household, community and regional levels, based on presumptions of stable, long-lasting communities. These models may be appropriate mechanisms to examine the relative mobility of “frontier” households on the fringe of Mesa Verde or Kayenta influence, and how mobility and sedentism evidenced by small farming communities might have been integrated into the broader regional socioeconomic network of
larger communities evident elsewhere in the region in Pueblo II and Pueblo III times.

- Adler and Varien (1994) have proposed that Pueblo II and Pueblo III community organization involved a population more or less tethered to a community center with public architecture and a persistent residential population, although the overall population ranged from dispersed to aggregated. Cedar Mesa may be an appropriate study area to examine whether a loose network of dispersed households were also tethered to distant community centers. Such an approach could examine whether dispersed frontier farming communities were more mobile, or whether tethering is still evident but involved fewer and more dispersed community centers.

- Researchers have identified a late Pueblo III strategy of protecting stored food resources, but little evidence of protection of human populations. This stands in contrast to other areas of the Southwest where population aggregation and site location on cliff ledges and defensible prominences have been interpreted as evidence of warfare and violent competition (cf. LeBlanc 1999). This presents questions that warrant further investigation, including (1) Why were human populations in the Cedar Mesa area not fearful of their lives when human defense is a prominent theme elsewhere; (2) From whom were they protecting their food resources (neighboring groups or intruders from outside the area); (3) How does “raiding” of food supplies relate to intercommunity cooperation, alliances and mutual defense, and does raiding reflect a breakdown of traditional, kin-based alliances; and (4) Is the rarity of defensible habitation sites in the Cedar Mesa area based on an inadequate sample, or are such sites located in as yet un-surveyed areas?

- Elevation and effective moisture are assumed to have been critical factors in earlier settlement patterns. Yet Pueblo II-III sites are found over most of the Greater Cedar Mesa study area at all elevations with different levels of effective moisture. Is this indicative of exceptional climatic conditions for dry farming across the entire area, the introduction of new hybrids of drought-resistant maize, more effective water control features, or simply last-gasp attempts by an excessively large population that required expansion into those areas most marginal for agriculture? Sample surveys of the entire study areas might offer broader perspectives of human adaptations to variable landscapes at a time of climatic deterioration and when human populations might have grown to exceed the carrying capacity of an environment already marginal for agriculture.

**Late Prehistoric and Historic Periods**

As discussed in Chapter 6, the period of time after the Puebloan abandonment through Euroamerican settlement is commonly referred to as the Late Prehistoric Period, dated in the region generally from A.D. 1300 to the time of Spanish exploration into the area. In the Cedar Mesa region, Euroamericans arrived in the 1870s, finding scattered Utes, Southern Paiutes and Navajos living in the area. The delineation of a Late Prehistoric period distinct from earlier occupations is warranted on the basis of distinctive changes in the dominant lifeway. Agriculture had been abandoned as the primary economic strategy by at least A.D. 1300, and aboriginal lifeways after that time were characterized by hunting and gathering more reminiscent of Archaic adaptations. Most archaeological evidence from the Greater Cedar Mesa area is attributed to groups who arrived in the region after A.D. 1600, and therefore these sites could also be discussed within the context of early Historic Period adaptations.

Archaeologically, this period of time is poorly represented in the SHPO database developed here. Only three documented sites are attributed a Pueblo IV presence, three sites to a presence by Numic-speaking populations, 18 sites to Navajo occupations and 21 sites to a Euroamerican presence in the study area. Taken collectively, these sites represent only 2 percent of all documented sites in the area (see Appendix A: Map 5). Consequently, the entire period of time after A.D. 1300 must be considered a major data gap, at least archaeologically. The paucity of documented sites stands in contrast to the wealth of ethnohistoric and historic data relevant to the study area (see McPherson 2009 and citations therein). It should be noted that large numbers of sites attributed to this period of time (e.g., Navajo hogans, Eu-
roamerican livestock operations, inscriptions) are known but have never been documented.

Given the paucity of data relevant to this period of time, virtually every topic remains a valid avenue for future research, including the establishment of basic chronologies and an examination of settlement patterns, subsistence and changes in land-use patterns through time. Other basic questions that could be addressed include:

- Navajo archaeology is still in its infancy in the Greater Cedar Mesa area. Can the arrival of Navajos in the area in the A.D. 1600s be firmly established, or was their arrival actually a century or two later? Was it precipitated by events occurring elsewhere in the Southwest, and if so how does Cedar Mesa relate to Navajo culture history elsewhere in the region? Were the first Navajos in the area farmer-foragers, or was Cedar Mesa primarily a hunting and gathering territory? Was the Navajo tradition in the Cedar Mesa area similar to or different from contemporaneous adaptations in northern Arizona or northwestern New Mexico, and can the origins of the Cedar Mesa Navajo be determined in the archaeological record?

- When Numic-speaking populations arrived in the area has not been established, although it is assumed to have been long after the abandonment of agriculture by A.D. 1300. This stands in contrast to southwestern Utah where Numic-speaking populations may have co-existed with terminal Formative farmers. Is the source of Numic-speaking groups to be found among the Southern Utes to the east, or among the Southern Paiutes to the west? Can differences in material culture be identified in the archaeological record? How does the arrival of the Utes and Paiutes relate to the arrival, perhaps at about the same time, of the Navajos? Can ethnicity be identified in the archaeological record, or did a blending occur whereby Navajos and Num proposed in the archaeological record?

- How was the Cedar Mesa area viewed by the descendants of Pueblo III farmers who left the area about A.D. 1300? Was it important as an area for hunting and gathering, or was it primarily an area for pilgrimages to honor ancestors? The absence of ethnographic studies related to the Puebloan use of the study area and its relative importance to modern Puebloans remains among the most significant data gaps for the study area.

- Can the ethnohistoric record of the region provide clues as to Late Prehistoric settlement patterns and subsistence that can be verified by archaeological data? Or does this historic record reflect human adaptations already modified by centuries of Euroamerican contact? How did these adaptations change through time, and what were the environmental and socioeconomic factors behind these changes?

Site Types

As discussed throughout the previous chapters, the Greater Cedar Mesa area is home to tens of thousands of documented and undocumented sites, ranging from the ephemeral (e.g., non-diagnostic lithic scatters, stone alignments of unknown utility) to the complex (e.g., stone towers, pueblos, great houses). Determining exactly what types of sites are represented and how many of each type have been documented is a perplexing problem. A review of the site forms on file in the SHPO database reveals a bewildering array of classification schemes and differing criteria for assigning sites to particular site-type categories. Some researchers have applied a descriptive nomenclature that attempts to minimize subjective determinations, and others employ an interpretive approach that assigns function and cultural affiliation based on observable surface evidence. Further complicating any analysis are inconsistencies from one researcher to another as to what constitutes a particular site type. For example, some researchers label sites with a single architectural structure as special-use sites and others label the same sites as agricultural field houses, farmsteads or satellite residences.

Both the descriptive and interpretive approaches to classification of site types have advantages. Inconsistencies in how sites are classified on existing site forms minimizes, as well as the inadequate and incomplete data found on most existing site forms, makes any analysis based on site type difficult, at best. These inconsistencies have made it virtually impossible to develop
a meaningful regional database of site types using the existing IMACS database. It should be noted the IMACS form has been required in Utah since 1981, and it was intended to provide uniformity to classification schemes (IMACS 1992). While the form is ideally suited to document sites found in the Great Basin and northern Colorado Plateau, it is less functional as a database tool for Puebloan cultural manifestations south of the Colorado River.

Researcher Winston Hurst, a specialist in Cedar Mesa archaeology, has grappled with the "site type" problem in the San Juan County area for decades. In an effort to create greater uniformity in the local nomenclature, he has developed two different approaches, one that is predominantly descriptive and where inference of site function is kept to a minimum (Table 7.4), and the other that is interpretive with function assigned based on established criteria (Table 7.5). As summarized by Hurst (personal communication 2008), the descriptive model is more objective, whereas the interpretive model is more subjective and requires greater familiarity with the local archaeological resources.

In an effort to apply Hurst's classification systems, all readily available site forms in the SHPO database were examined and, when possible, they were then assigned to a site type under both the descriptive and interpretive schemes. When an individual site had features assignable to multiple site-type criteria, these sites were assigned to a particular category based on the ranking established by Hurst wherein site types listed higher on the tables can subsume site types listed lower on the list. For example, a habitation site can include artifact scatters, storage cists and rock art, but would be listed as a habitation site. In both schemes, not all sites were assignable to a particular site type. Furthermore, the methods we used to determine the primary site type, based on the information in the existing site form, may not be an accurate interpretation of the available data (e.g., some site forms indicate charcoal staining, but these may not have met the criterion of "house-sized" stain defined by Hurst).

Hurst's descriptive approach appears particularly good at delineating general site types such as "structural" and "artifact scatters." And most sites (95 percent) could be assigned to a descriptive category (Figure 7.10). Based on this approach, the most common sites found in the study area are architectural sites with no associated depression (28.4 percent), followed by artifact scatters (20 percent) and artifact scatters with minor features such as hearths (18 percent). As a whole, 40.8 percent of documented sites meet Hurst's criteria as "structural." The number of sites defined as multi-unit pueblos and single-unit pueblos was almost identical (78 and 77 sites, respectively, each with 3.6 percent of the total). The weakness in this approach appears to be the broad category of "architecture without depressions," which subsumes within the same type room blocks, towers, granaries and "unknown" structures.

Assigning sites to "site types" under Hurst's interpretive approach is far more subjective, and given the limited information available on many site forms, it is much more difficult to accomplish with a comfortable level of accuracy. Of the sites in the SHPO database, 12.6 percent could not be assigned to an interpretive site type (Figure 7.11), either because they did not conform to an established category or because there was not enough information on the site form. The most common sites are camps or processing sites (22.2 percent), followed by primary habitations (16.6 percent), satellite habitations (12.9 percent), storage facilities (12.6 percent) and chipping stations (11.3 percent). As a whole, 36 percent of all documented sites are habitations. The weakness of this model is the inherent bias of those making determinations as to what the site function was based on the limited data on hand.

In summary, it can be stated that about 40 to 50 percent of all sites documented to date are architectural sites with evidence of residential occupations and food storage, and about 35 to 40 percent of documented sites are special-use localities with artifact scatters and/or minor features such as hearths. The number of "other" sites, such as prehistoric roads, shrines, quarries and public architecture not associated with habitations is quite small.
<table>
<thead>
<tr>
<th>Descriptive Site Type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural: multi-unit pueblo</td>
<td>One or more evident room block(s) or structural rubble mound(s) with two or more associated structural depressions</td>
</tr>
<tr>
<td>Structural: single-unit pueblo</td>
<td>Single room block or structural rubble mound with one associated structural depression</td>
</tr>
<tr>
<td>Structural: architectural remains with no depression</td>
<td>Any evident structure of one or more rooms, or a room block of any size, with no evident associated structural depression (except room depression[s] in rubble)</td>
</tr>
<tr>
<td>Structural: multiple depressions or house-sized stains</td>
<td>Two or more evident depressions of pit structure size with no evident associated surface rooms or rubble mounds(except cists)</td>
</tr>
<tr>
<td>Structural: depression or house-sized stain</td>
<td>One evident pit structure-size depression with no associated surface rooms or rubble mounds (except cists)</td>
</tr>
<tr>
<td>Hogan(s) or wickiup(s)</td>
<td>Standing or collapsed wooden super-structural elements either teepee-like or cribbed, or 3+–m diameter earthen ring with associated features and/or artifacts</td>
</tr>
<tr>
<td>Sweat house</td>
<td>Either standing small, hogan-like structure with associated burned rock and/or exterior ash stain, or a 1- to 2-m diameter earthen ring with associated burned rock and exterior ash stain</td>
</tr>
<tr>
<td>Mine or quarry</td>
<td>Location with clear evidence of rock removal in the course of mineral extraction, with or without associated buildings, constructed dump chutes etc.</td>
</tr>
<tr>
<td>Cairn or rock pile</td>
<td>(not used--these features were recorded as Isolated Finds)</td>
</tr>
<tr>
<td>Rock or rubble alignment</td>
<td>Alignment or rocks or rubble not evidently part of a masonry structure or room-block, and not forming an enclosure</td>
</tr>
<tr>
<td>Rock or rubble enclosure</td>
<td>Alignment or rocks or rubble not evidently part of a masonry structure or room-block, forming an enclosure, including cases that utilize a natural rock or cliff as one side of the enclosure</td>
</tr>
<tr>
<td>Fence</td>
<td>Self explanatory. Includes any informal brush/slash barricade extending across the country, not forming a discrete enclosure like a corral</td>
</tr>
<tr>
<td>Corral/pen</td>
<td>Evident non-room enclosure of wood, rock and/or wire</td>
</tr>
<tr>
<td>Linear swale</td>
<td>Self explanatory. We do not include very small swales formed by stock, pack or game trails, unless they are part of a known or evident historic trail</td>
</tr>
<tr>
<td>Hand-and-toe holds or steps</td>
<td>Pecked steps</td>
</tr>
<tr>
<td>Rock art</td>
<td>Petroglyph[s] or pictograph[s]</td>
</tr>
<tr>
<td>Inscription(s)</td>
<td>Carved/scratched/drawn/painted names and/or dates or other text</td>
</tr>
<tr>
<td>Isolated artifact</td>
<td>Not used. This category would only be used for an isolated artifact of such extraordinary significance that its discovery location deserves documentation at a level higher than Isolated Find</td>
</tr>
<tr>
<td>Artifact scatter with minor features</td>
<td>Artifact scatter with ash stain(s) and/or FCR, no more substantial features</td>
</tr>
<tr>
<td>Artifact scatter</td>
<td>Artifacts only, no evidence of features</td>
</tr>
</tbody>
</table>
Table 7.5: Interpretive system for site types developed by Winston Hurst

<table>
<thead>
<tr>
<th>Interpretive Site Types</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary habitation</td>
<td>Evidence of household- or larger scale architecture with substantial midden deposits</td>
</tr>
<tr>
<td>Satellite habitation</td>
<td>Evidence of household-scale or sub-household-scale architecture with light midden deposits</td>
</tr>
<tr>
<td>Habitation with public architecture</td>
<td>Evidence of household- or larger-scale architecture with associated community-scale feature(s) such as an oversized pit structure, defined plaza, road swale(s) etc.</td>
</tr>
<tr>
<td>Isolated public architecture</td>
<td>Evidence of community-scale feature(s) such as an oversized pit structure, defined plaza, road swale(s), etc., with no evident associated domestic architecture</td>
</tr>
<tr>
<td>Camp or processing site</td>
<td>Artifact scatter with associated tools (e.g. ground stone) suggestive of food processing, and/or with associated thermal feature(s) but no more substantial architecture</td>
</tr>
<tr>
<td>Shrine/herradura</td>
<td>Evidence for ritual usage with no associated domestic features. Examples include unusual rock formations or &quot;earth openings&quot; (caves) etc., water sources and so forth with associated cairns, small enclosures, rock art etc. Also included are isolated rock rings, cairns or rock enclosures not associated with unusual natural features, but whose location or association suggests ritual usage in the absence of domestic occupation</td>
</tr>
<tr>
<td>Storage/cache</td>
<td>Small constructed feature either too small for normal habitation or lacking any evidence of domestic habitation, and with no evidence of ritual association, and not associated with a more inclusive category of site. Examples include masonry granaries, cists, and temporary rubble enclosures under trees or overhangs as commonly used by Navajos as temporary gear caches</td>
</tr>
<tr>
<td>Mine/quarry</td>
<td>See &quot;Descriptive Types&quot;</td>
</tr>
<tr>
<td>Kiln(s)</td>
<td>Rectangular, rock-lined enclosure ca. 1- to 1.5-m wide and variably long, with associated ash stain and FCR</td>
</tr>
<tr>
<td>Checkdam(s) and/or other water control</td>
<td>Typically, rock alignments that run perpendicular to the fall line of the slope or across a drainage channel, or evidence of masonry exposed in the sides of a drainage channel</td>
</tr>
<tr>
<td>Lithic material source</td>
<td>Geologic outcrop with associated debitage and waste material. This is generally applied to discrete geologic outcrops, not to such diffuse sources as secondary gravels or widely scattered lag deposits</td>
</tr>
<tr>
<td>Rock art</td>
<td>Petroglyphs or pictographs not associated with a more inclusive category of site</td>
</tr>
<tr>
<td>Road/trail</td>
<td>Linear swale, carved steps, rock/wood cribbing or other evidence of human traffic on a scale sufficient to leave a durable archaeological expression. These linear site types may pass contiguous through more discrete sites such as artifact scatters, habitations, etc.</td>
</tr>
<tr>
<td>Fence</td>
<td>Self-explanatory. These linear site types may pass contiguous to or through more discrete sites such as artifact scatters, habitations, etc.</td>
</tr>
<tr>
<td>Corral/pen</td>
<td>See &quot;Descriptive Types&quot;</td>
</tr>
<tr>
<td>Sweathouse</td>
<td>See &quot;Descriptive Types&quot;</td>
</tr>
<tr>
<td>Chipping Station</td>
<td>Lithic scatter without other artifact types or associated features, and not at a lithic material source</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
and is statistically insignificant. It should also be noted that both models are poorly suited to future studies of rock art in the region in that the number of sites with rock art are greatly underrepresented. Ninety sites were identified as rock art sites (4.2 percent), although several hundred sites have rock art components. The nature of Hurst’s ranking system is such that sites with rock art that also have architectural features, rubble mounds, enclosures and rock alignments are assigned to these latter categories rather than a rock art category.

An analysis of the relevant data using the IMACS database was not possible due to several factors, among them (1) only a small number of sites were recorded using the IMACS form, (2) not all IMACS site forms have been turned into the state for entry into the database, and (3) not all site forms on file with the state have been added to the statewide database. During the course of compiling the database used in this overview, sites were examined by general site type and characteristics, and these were plotted using GIS software (see Appendix A: Map 6). Upon reviewing the collected data, it was decided that Hurst’s approaches to site types was better suited to this discussion, and no attempt was made to sort relevant data by yet another organizational scheme.

Adverse Impacts

As discussed in Chapter 2, archaeological sites in the Greater Cedar Mesa area have been subjected to more than a century of official, unofficial and illegal excavation and removal of artifacts. Hundreds of alcove and cliff sites have been systematically looted, some of them (e.g., Turkey Pen Ruin) repeatedly, over the period of many decades. It is generally assumed that most major sites within the study area have been impacted to some degree by legal and illegal removal of cultural materials. As evidenced by the highly publicized 2009 federal indictments of more than 20 individuals accused of trafficking in Southwestern antiquities, there may be validity in the common perception that sites in the region continue to be
damaged by illegal looting and vandalism. In addition, sites throughout the study area have suffered from the cumulative effects of increased recreational use, road construction, a proliferation of off-road vehicles and generations of livestock grazing (BLM 2007).

Arriving at an accurate assessment of nature and extent of such activities on cultural resources is not possible given the limited information available. Information as to site condition and activities affecting site condition was not required prior to implementation of the IMACS site form in 1981. Most site forms completed prior to 1981 failed to make any mention of activities detrimental to the integrity of the sites. Furthermore, very few pre-IMACS site forms offer assessments of the National Register eligibility of the sites. For the purposes of this discussion, an “adverse impact” is defined as any activity initiated by humans in the modern era that degrades the National Register integrity of a specific site. These impacts include intentional de-
struction (e.g., looting and vandalism) and inadvertent damage (e.g., livestock grazing, off-road vehicle travel). Adverse impacts most relevant to this discussion are vandalism/looting and damage caused by off-road vehicles.

Site Condition and Eligibility

Assessing the current condition of all archaeological sites found within the study area is difficult due to several factors: (1) Evaluation of site conditions is a subjective determination that varies from one archaeologist to another; (2) Site conditions may have deteriorated since the site was initially documented; and (3) Not all site forms in the SHPO database indicate a site condition. Based on the criteria defined in the IMACS User’s Guide (1992), a site is in excellent condition if it is “virtually undisturbed,” a subjective determination that can include insignificant disturbance. A site is in good condition if 75 percent or more of the site is undisturbed, in fair condition if 50 to 75 percent of the site is undisturbed, and
poor if greater than 50 percent of the site has been disturbed. These criteria are open to considerable individual interpretation. For example, a site with a 1-by-1 meter granary destroyed by vandals but associated with a 100-square-meter artifact scatter could be described by one researcher as “poor” in that less than 50 percent remains of the primary feature, or it could be described by another as “good” in that the granary constitutes a very small percentage of the total site area.

An analysis of the SHPO database for site condition data found that 31.2 percent of all sites were in good condition, but only 5.2 percent were in excellent condition. This compares to 21.3 percent in fair condition and 15.7 in poor condition. Site forms for roughly one in four documented sites have no indication of the site condition at the time the site was recorded (Figure 7.12). Although these data should be used cautiously, it appears that roughly 37 percent of all sites are in good to excellent condition and 37 percent are in fair to poor condition, with the condition of the remainder of the sites unknown at this time. It should be noted that ongoing BLM monitoring of certain sites may have produced additional site condition data that were not added to the IMACS site form used in this analysis.

The site forms also contain little information on the National Register eligibility of the sites. Based on the information contained in the SHPO database, only 36.3 percent of sites were determined to be significant and/or eligible for listing on the National Register, and 10.2 percent were determined to be insignificant and not eligible (Figure 7.13). A cursory review of ineligible sites found that many are clearly eligible. These include room blocks, rock art sites and sites with buried cultural features. The database indicates that only five sites have been formally listed on the National Register of Historic Places, a total that is inconsistent with the SHPO National Register files. These files indicate that the Hole-in-the-Rock Trail was listed on August 9, 1982, and the Grand Gulch Archaeological District was established on June 6, 1982. This district contained 81 prehistoric sites at the time it was designated, including artifact scatters, temporary camps, special use areas, burial sites, rock art panels, granaries and cliff structures. Notable sites included in the district include Junction Ruin (42Sa5106), Turkey Pen Ruin (42Sa3714) and Split-Level Ruin (42Sa5118).

**Vandalism**

Problems in determining site condition are similar the difficulties encountered with the SHPO database as it relates to vandalism of archaeological sites (for the purposes of this discussion, vandalism is considered to be any intentional damage to or destruction of cultural resources). Very rarely
is the presence of vandalism indicated on the site form, and in those instances where it is mentioned it almost never includes a discussion of the nature or extent of the damage. Of the sites forms examined, 16.7 percent indicate the presence of vandalism, whereas 83.3 percent either exhibited no evidence of vandalism or the presence of vandalism was not indicated (Figure 7.14). The absence of baseline data on the nature and extent of vandalism at sites in the Greater Cedar Mesa area precludes any detailed discussion of the factors that may be relevant to patterns of vandalism in the study area. Rather, only general statements can be offered at this time that vandalism has been a serious problem in the past and that vandalism may be ongoing.

The nature and extent of vandalism throughout the Greater Cedar Mesa area is a topic that warrants more thorough investigation. Several researchers over the past 25 years have attempted, with varying degrees of success, to develop predictive models to illuminate which sites are most likely to be vandalized. Nickens et al. (1981), in a report entitled A Survey of Vandalism to Archaeological Resources in Southwestern Colorado, dealt exclusively with Ancestral Puebloan sites similar to those in the study area considered here. Their methods included a review of damaging activities, or what they referred to as “agents of cultural resource destruction,” an overview of cultural resource destruction within the project area, a compilation of known site data through the use of variables thought to be important to the problem, field checks to compare file data and interviews with known collectors to get first hand accounts of the most vulnerable sites.

Perhaps most important was the employment of easily discernable, site-related variables through the use of a standardized vandalism form. These variables included the age or cultural period of a site, general site type, distance to the nearest road, type of nearest road and the distance to the nearest town. Nickens et al. (1981) compiled data on 1032 sites, including 732 previously recorded sites and 300 sites they had recently recorded during a Class II survey. They also conducted field checks on 61 sites reported to be undamaged. They found that later-period sites with masonry architecture located more than 20 miles from the nearest town and within 100 meters of a dirt road were most likely to be vandalized. Interviews with known collectors supported their findings.

A similar study in southeastern Utah, entitled: Cultural Resource Investigations in Southwestern Utah to Aid in the Assessment of Archaeological Vandalism (Simms 1986a), examined archaeological sites in the Manti La Sal National Forest just north of the study area considered here. Interestingly, previous work in the area performed by Brigham Young University indicated that sites in the area were in “pristine” condition in the early 1970s (cited in Simms 1986a). As with the Nickens et al. (1981) study, Simms’ study dealt exclusively with Ancestral Puebloan sites. Simms developed a set of site-related variables or attributes that were designed to predict vandalism at certain sites. These variables included cultural affiliation of the site, number of rooms, presence or absence of other features such as kivas, storage structures, standing walls, rock alignments, rock art and middens, and whether the site was located in the open or in an alcove.

Simms (1986a) suggested that sites within view of a traveled road were often less damaged than more remote sites. However, site-specific access was a major factor. For example, remote sites that required a ladder or climbing gear for access were less damaged than those
closer to the road. Sites with easy access, or those less than 2 kilometers from an off-road vehicle trail or rough two-wheel drive road but out of view of that road, exhibited the most damage. Alcoves and rockshelters near roads had all been vandalized, and open sites near roads exhibited the most recent damage. In summary, Simms found that site accessibility, site visibility from the road and distance to the road were the primary predictors of site vandalism.

Kvamme (1990) conducted another study of vandalism, entitled San Juan County, Utah, Archaeological Vandalism: An Assessment of a Vandalism Model and Practice, that focused on archaeological sites around the town of Blanding and again dealt only with Ancestral Puebloan cultural material. His methods also included the use of a standardized vandalism form that employed a set of variables to predict damage. However, his model used only two major criteria: access and site type. Kvamme assigned numerical values to each component, with values assigned for air distance from the nearest town, driving distance from the nearest town, walking distance from a road and road type. Numerical values were also assigned to site type or “attractiveness.” Arguing that site type drives vandalism more than site accessibility, he gave the former values three times the weight as the latter. The sum of all values was considered to be an accurate measure of overall site vulnerability. Using a geographic information system, Kvamme (1990) included data from 13,000 sites, of which 100 were to be field checked. Unfortunately, this study was not completed (these data remain in storage at Weber State College). Even so, initial results found a strong correlation with their scoring system and vandalism noted on IMACS forms.

Another attempt to examine vandalism trends (Ahlstrom et al. 1992), entitled Pothunting in Central Arizona: The Perry Mesa Archaeological Site Vandalism Study, focused on the Tonto National Forest in central Arizona and dealt exclusively with Ancestral Puebloan sites. Similar to the previously described efforts, Ahlstrom et al. (1992) identified variables thought to be important, and they developed a vandalism form to standardize their data collection. The variables included site size, site density, site visibility, site accessibility, site location on the mesa, amount of vandalism already present, whether a person on site would be visible by someone off site, and six different types that included small, medium and large residential, defensive, communication and probable habitation.

Ahlstrom et al. (1992) found that the size of the mesa itself was a major contributing factor to vandalism. Most sites included in the study were located within 600 meters of a road and almost any point on the mesa can be reached in less than three hours. In other words, the mesa was deemed “small” in relation to both the density of its road networks and to the time necessary to traverse it. In addition, they suggested that access to a particular site was not as much of a contributing factor as was site type. This suggested that sites that are “uninteresting” to pothunters may be disregarded despite easy access. Larger, more complex sites (e.g., those with greater than 100 rooms) were more likely to be damaged than smaller sites (e.g., those with 1 to 9 rooms).

Several recent studies in eastern Utah also demonstrated a direct relationship between vehicle access and frequency of vandalized sites. More than 30 different variables were defined, among them vertical and horizontal distance from a road, the visibility of the site or site location from a road, difficulty of access, accessibility of the site to off-road vehicles, distance from the site to a locality of extended modern occupation (e.g., well pads and homesteads), site types and the extent of vandalism in relation to the above factors. The definitions of “agents of cultural resource destruction” offered by Nickens et al. (1981) were used. In the Range Creek study area, all sites within 200 meters of an existing route were more likely to have been vandalized, as were any sites visible from a vehicle route regardless of distance (Spangler et al. 2006). Other studies in the Moab area (Spangler and Yentsch 2009a) and in the Arch Canyon area on the northeastern edge of the study area considered here (Spangler 2006) demonstrated that vehicular access and visibility of the site or site location are strongly correlated with the frequency of vandalism. These findings sug-
gest that those who intentionally damage archaeological sites arrive in the general vicinity via motorized vehicle, although they sometimes have to then travel cross-country on foot. Almost all of the vandalized sites investigated in these three studies are located within 200 meters of an existing trail or there were motorized vehicle tracks leading to within 200 meters of them.

Collectively, the different approaches used to predict site vandalism offer potential for future research in the study area:

- Are architectural sites located within 100 meters of an existing road more vulnerable to vandalism than are sites located a greater distance from a road, as suggested by Nickens et al. (1981), or is visibility from an existing road a greater factor, as suggested by Spangler et al. (2006)? Or are sites not visible from a road at greater risk due to the fact looters have less risk of being observed, as suggested by Simms (1986a)?
- Is site type a greater factor in determining which sites are vulnerable to vandalism, or is it more a function of site size, as suggested by Ahlstrom et al. (1992)? What types of sites are at risk?
- Is vandalism limited to highly visible sites on cliff ledges and canyon environments, or is it also a factor at open sites on the mesa tops? Are the types of vandalism different from one setting to another?
- Is vandalism ongoing and how can this be measured in the archaeological record? Is the vandalism more commonly systematic looting by experienced pothunters or incidental disturbance resulting from other activities?
- What is the spatial relationship of the existing road and trail network to vandalized sites, and can the relationship between vehicular access and vandalism be measured?
- Has vandalism affected the National Register-eligibility of these sites, or do vandalized sites retain significant qualities that may still make them eligible under various criteria?

These questions cannot be adequately addressed through the existing SHPO database due to the absence of relevant vandalism data on existing site forms. Given that the study area considered here represents an ideal sampling universe for a study of vandalism (e.g., high elevation to low elevation sites, sites with easy and difficult access, sites with significant visitation and those without), it is strongly recommended that a vandalism study be designed specifically for the Cedar Mesa area. This study could be implemented concurrently with a more comprehensive study of all adverse impacts in the region (e.g., recreation). The relationship of vandalized sites to existing roads and trails is indicated in Appendix A: Map 7.

**Off-Road Vehicles**

The exploding popularity of off-road vehicles (referred to in BLM planning documents as off-highway vehicles or OHVs, but in this document as ORVs) and the abundance of designated roads and trails throughout the Greater Cedar Mesa area (see BLM 2008) have significant potential adversely impact archaeological sites, either directly due to motorized travel through cultural sites or indirectly by providing easier and quicker access to sites that were previously protected by their isolation. As discussed in the proposed Monticello Field Office proposed resource management plan (BLM 2007 Vol. 3:100),

... the increase in the use of OHVs has created several issues for the Monticello FO. First, the speed of OHVs allows easier access than foot travel to remote parts of the area, making management of this activity and the area utilized more difficult, while also increasing the potential range of impacts. Secondly, the popularity of this activity continues to grow, and the addition of special events puts additional strain on resources. Planning for areas in which OHVs can be used continues to receive national and local attention. Specific issues identified by the BLM include:

- Although the current RMP identifies all public lands...
as open, limited, or closed, the Plan does not give specific management guidance within these designations.

- The OHV designations outlined in the [plan] do not currently address the amount of recreational use now occurring or the potential of resource damage associated with this use.
- In the current RMP none of the OHV designations have been implemented. Maps depicting existing RMP decisions are out of print and not available to the public.
- Increased use creates the need for additional management and planning, which is not funded.

The management of ORVs is fraught with political considerations that are not always consistent with BLM’s conservation mandates. These conflicts have ranged from minor disagreements between resources users to unauthorized opening of new trails to cross-country travel where it is not allowed. Numerous routes designated in the BLM Travel Plan (BLM 2008) are currently the subject of litigation by several conservation organizations. In CPAA comments on the proposed management plan (BLM 2007), Spangler (2008) made several observations that warrant repeating:

- Given the thousands of miles of existing ORV trails currently being utilized within the Monticello Field Office, it is highly probable that significant impacts to historic properties have already occurred throughout the planning area, although there is little or no baseline data currently available to validate this assumption.
- Unlike permitted uses, no cultural resource inventories were conducted in association with the development of these existing ORV trails. Given that many of the BLM lands were open to cross-country travel prior to the route designations, these activities have likely already impacted historic properties, although the extent of these impacts are not quantifiable due to the fact that most cultural resources remain unknown and undocumented.
- CPAA has been unable to identify any public outreach effort by the BLM in Utah to educate ORV users as to the fragile and irreplaceable nature of cultural resources, to promulgate proper etiquette among ORV users who visit cultural resources or to enlist the vigilance of the ORV community in reporting vandalism and looting.

The primary consideration here is that ORVs allow greater public access to archaeological sites, and that this access facilitates adverse effects. This is tangentially acknowledged by the BLM (2007) with statements that reduced access would reduce impacts to cultural resources, and that “increased human activity tends to equate with increased adverse impacts on cultural resources, even if these impacts are inadvertent” (BLM 2007:4-622). By inference, increased access to cultural sites could increase contact by visitors who could intentionally damage sites by collecting artifacts, vandalizing, illegally digging or otherwise excavating the sites and that reducing such access by closing roads or restricting travel could protect cultural resources.

Direct damage to archaeological sites from motorized vehicles using established routes appears to be a much greater problem in the southeastern Utah than elsewhere in Utah. This is likely attributable to the exceptionally high number of prehistoric sites in open settings that are increasingly accessible to motorized vehicles. Historically, damage to historic properties along vehicle routes has not been well documented, and there has been little effort by the BLM to identify sites along ORV routes that have already been damaged or are vulnerable to ongoing or future damage. In effect, there are no baseline data to evaluate the nature and extent of that damage, or to identify strategies whereby such damage could be avoided.

To test our assumptions that (1) undocumented archaeological sites are located along designated routes and (2) that these sites have been damaged by vehicular traffic, CPAA investigated three disputed routes in the study area (Spangler and Yentsch 2009). Route 1 extends from the Comb Wash floodplain up a ridge to the west
along the south side of the mouth of Fish Creek Canyon. Route 2 extends east from north-south trending U-261 on top of Cedar Mesa in the Snow Flats area. And Route 3 is located near the head of Kane Gulch just northwest of the Kane Gulch Ranger Station.

Approximately 1.5 kilometers of Route 1 were investigated and eight sites were subsequently documented, all of which were artifact scatters and special-use localities, probably prehistoric camps associated with hunting and gathering. Six sites were recommended as eligible for listing on the National Register. Investigations revealed that the existing trail cuts through seven sites where artifacts are subjected to breakage and cultural deposits are experiencing accelerated erosion (Figure 7.15), and that one additional site is located immediately adjacent to the trail (within 15 meters). The trail cuts through a rare Archaic dune encampment with a variety of atlatl dart points present on the site surface. The trail also cuts around the western edge of a major residential complex at the mouth of Fish Creek Canyon (as yet undocumented due to its location outside the 15-meter impact zone investigated). It is assumed the trail provides visitor access to this site (Spangler and Yentsch 2009).

Approximately 0.8 kilometers of Route 2 were investigated and three sites were subsequently documented, of which two were recommended eligible for listing on the National Register. Two of these sites were located immediately adjacent to the existing trail and were not directly impacted by vehicle traffic. The trail cuts through the middle of the third site, which is a locality with hundreds of potsherds, lithics, groundstone tools and chipped-stone tools. Significant numbers of artifacts were observed eroding along the ruts created by vehicle traffic (Figure 7.16) where they are subject to breakage. Also of note, an unauthorized but well traveled spur route extends north from the designated trail at this site and through a dense concentration of artifacts and possible features (Figure 7.17). The purpose for this spur was not determined (Spangler and Yentsch 2009).

Investigations of about 200 meters of Route 3 revealed the presence of one a dense scatter of artifacts without associated features and two

Figure 7.15: Vehicle route through artifact scatter on Route 1 near Fish Creek Canyon. Pin flags denote location of artifacts.
sites with structural features. All three sites were recommended as eligible for listing on the National Register. At one site, construction of the route itself obliterated half of a small rectangular structure, probably a small field house occupied during Pueblo II times. At all three sites, the route cuts through areas with dense concentrations of artifacts (Pueblo II-III), which were observed eroding down slope in the ruts created by the route (Figure 7.18). Only one of three structures identified along this route was being directly impacted by vehicular traffic (Spangler and Yentsch 2009).

Generally, the results of these investigations demonstrated an abundance of artifact scatters (with and without temporally diagnostic artifacts) ranging from simple to very complex, camps and small structures that may be related to nearby agricultural activities. At 11 of 14 sites investigated, the designated trail cuts through all or a portion of the sites. All 14 sites were unknown to the BLM prior to this investigation. Given that the three routes were chosen for ease of access, it cannot be stated whether the 14 sites found along the three routes are representative of the site types, site densities or site impacts that would be found elsewhere in the study area. It is considered likely that many, if not most, of the ORV routes in the study area have been directly impacting archaeological sites and that designation of the routes will result in increased visitation and accelerated damage to undocumented sites.

In light of these findings, we recommend:

- The BLM develop and implement a long-term commitment to conduct Class III surveys of all designated routes within the Greater Cedar Mesa area that are currently unsurveyed, and that these routes be prioritized based on the level of motorized vehicle use (routes with greater use will be surveyed before routes with little or no use).
- The BLM develop strategies whereby adverse impacts from vehicular use can be avoided, minimized or mitigated. Such strategies should include a commitment to closing routes where the density and/or significance of sites is such that continued vehicular use would irreparably harm the National Register qualities of the sites. This recommendation is consistent with Executive Orders 11644 and 11989 that mandate federal land managers “protect the resources of (federal) lands” and that agency heads who determine that the use of off-road vehicles is causing or will cause adverse impacts to cultural or historical resources shall immediately close such areas or trails to the type...
Figure 7.17: Unauthorized spur route extending from designated route through artifact scatter. Blue pin flags denote ceramics, red pin flags denote lithics.

Figure 7.18: Designated vehicle route through artifact scatter along Route 3 in the Kane Gulch area. Blue pin flags denote ceramics, red pin flags denote lithics and yellow pin flags denote groundstone tools.
of off-road vehicle causing such effects, until such time as he determines that such adverse effects have been eliminated and that measures have been implemented to prevent future recurrence (Executive Order 11989).

- The BLM develop and implement a site monitoring plan that includes significant sites being directly or indirectly impacted by vehicular traffic.

Other Impacts

Other adverse impacts to cultural resources in the study area cannot be quantified at this time due to the absence of relevant data on the existing site forms. Livestock have grazed in the area since at least the 1880s, and grazing is assumed to have impacted cultural resources through trampling of archaeological sites, rubbing against standing walls and rock art, and/or bioturbation of middens. However, these impacts are very rarely mentioned in the site documentations, and they cannot be discussed here. Grazing will likely continue in the Comb Wash portion of the Greater Cedar Mesa area, although the new Resource Management Plan (BLM 2008) has eliminated grazing in most Comb Wash side canyons (e.g., Arch, Fish and Owl, Mule and Road Canyons), and other areas of Cedar Mesa are now unavailable to livestock grazing because of conflicts with recreation uses, riparian, relict vegetation conditions, wildlife and/or cultural resources. Likewise, most of the study area has been removed from potential oil and gas leasing and mining claims.

The most significant future impacts to cultural resources in the region will likely be recreation, which is addressed in considerable detail in the BLM Resource Management Plan (BLM 2008) and related planning documents (BLM 2007). The BLM approach involves a variety of strategies, including limiting group size, restricting camping and wood burning, and requiring vehicles to remain on designated trails. It is beyond the scope of this overview to analyze the efficacy of the various approaches to better manage recreational use of the region, but CPAA concurs with the BLM philosophy of limiting public access in archaeologically sensitive areas and implementing visitor outreach as a primary tool to protect sensitive resources, discourage vandalism and encourage visitor appreciation of public lands (BLM 2008).

In light of these considerations, we recommend the BLM actually implement its management objectives as articulated in the Monticello RMP (BLM 2008). The Greater Cedar Mesa area has long been the subject of good BLM intentions, but these have rarely been realized due to budget constraints. As such, only a handful of localities (e.g., Grand Gulch) have been subjected to aggressive management and visitor outreach. Other areas (Mule Canyon, Arch Canyon, Road Canyon) have also experienced significant increases in visitation in recent years, but without the benefit of aggressive management or visitor outreach. Most of the drainages experiencing intense visitation have never been formally surveyed.

Concluding Remarks

The Greater Cedar Mesa area has long been recognized as a national archaeological treasure, and one of the few places in the nation where world-class archaeological resources can be experienced in a wilderness setting. The popularity of the region among hikers, backpackers, equestrians, ORV users and others cannot be understated, and is something easily verified by an Internet search of “Cedar Mesa Utah.” This search revealed 440,000 links to the environmental history and cultural resources of the area, more than double the number of links for Canyons of the Ancients (137,000) and Hovenweep National Monument (196,000), both of which are well known archaeological tourist destinations, each of which was established specifically to recognize and protect archaeological resources of national significance.

As discussed throughout this chapter, managing exceptional cultural resources in an area subject to increasing visitation and growing conflicts between user groups is a daunting challenge that will require an unprecedented commitment of federal resources to ensure their protection for future generations. The BLM’s RMP (BLM 2008, see also BLM 2007) clearly articulates the need for
aggressive management and strategies to ameliorate adverse impacts to cultural resources through area-specific management plans. Given the financial constraints of federal budgets, actual implementation of the plan is not a certainty and will require the BLM to prioritize funding for Cedar Mesa to realize their objectives. It is also recognized that BLM practices in the past have rarely given priority to cultural resources, and that other management concerns (e.g., oil and gas development) have consumed BLM budgets to the detriment of management of non-consumptive uses.

In summary,

- The Greater Cedar Mesa area is home to an estimated 100,000 archaeological sites. The density of sites here is among the highest anywhere in the Southwest. Collectively, they comprise one of the most significant concentrations of archaeological sites in the nation.
- Roughly 98 percent of the study area has never been surveyed, and the nature, density and distribution of sites for Greater Cedar Mesa area as a whole cannot be determined from the available data.
- The archaeological resources here constitute a vast library of untapped knowledge about prehistoric adaptations to desert environments. As such, the area is an ideal laboratory for future generations of environmental scientists.
- The scientific value of the archaeology here, both for present and future studies, is contingent upon the preservation of cultural deposits in relatively undisturbed condition.
- The degradation of archaeological resources through vandalism, looting, irresponsible use of off-road vehicles and inappropriate recreation is ongoing and may be accelerating.
- These archaeological resources are famous the world over, drawing tens of thousands of visitors annually. The BLM acknowledges that visitation is increasing, and that adverse impacts increase with increased visitation.
- The BLM has been unable in the past to meet its management objectives for Cedar Mesa, and it remains unknown if the BLM will commit the necessary resources in the future to actually implement the new RMP.

In light of these considerations, CPAA believes the national significance of the Greater Cedar Mesa area is such that archaeological resources here warrant more comprehensive management that may not be achievable under current BLM approaches, budget constraints and statewide management priorities. As such, the preservation of the integrity of cultural resources found here could be better realized through a special designation, either through executive order or congressional action, that it be accompanied by funding specifically for management of cultural resources in this area. CPAA believes a special designation recognizing the archaeological importance of the region is an appropriate mechanism to further the long-term preservation of the area as a national cultural treasure, and that preservation of cultural resources will enhance future scientific inquiry.
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Windes, Thomas C. and Dabney Ford

Winter, Joseph C.

Wolfe, Michael S. and Donald C. Irwin

Woodbury, Richard B.

Woodbury, Richard B. and Ezra B.W. Zubrow

Woodhouse, Connie A., Stephen T. Gray, and David M. Meko

Woodward-Clyde Consultants

Wormington, H. Marie

Worster, Donald

Wright, Gary A.

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Zarnowski, Pat

Zwinger, Ann H.
Appendix A

Appendix A consists of a series of six large electronic maps found on a compact disk that is part of this report. The maps, produced in PDF format, are not reproduced in the body of this text due to the fact they contain specific site location information. For the same reason, the disk is not attached to copies of this overview, which may become readily accessible to the public. The disk is, however, available upon request by qualified researchers and archaeologists holding valid Department of Interior archaeological permits for the state of Utah. The maps in Appendix A include:

Map 1: Project-area overview with land-ownership status, roads and site locations.
Map 2: Location of Paleoindian and Archaic sites in the Greater Cedar Mesa area.
Map 3: Location of Basketmaker II and Basketmaker III sites in the Greater Cedar Mesa area.
Map 4: Location of Pueblo I, Pueblo II and Pueblo III sites in the Greater Cedar Mesa area.
Map 5: Location of Late Prehistoric and Historic sites, as well as sites where temporal affinity is unknown.
Map 6: Location of vandalized sites in relation to existing roads in the Greater Cedar Mesa area.

To request Appendix A, contact:
Jerry D. Spangler, executive director
Colorado Plateau Archaeological Alliance
801-392-2646 or jerry_cpaa@att.net
Appendix B

Summary of Cultural Resource Management (CRM) Projects Conducted in the Greater Cedar Mesa Area

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Appendix C

Cross-Reference of Smithsonian and Temporary Site Numbers: All Sites in the Greater Cedar Mesa Area

Appendix C consists of a catalog of all sites within the Greater Cedar Mesa area, including a cross-reference of temporary and permanent site numbers. This catalog is not reproduced in the body of this text due to the fact it also lists GPS coordinates for sites within the study area. It is anticipated the printed version of this overview will become readily available to the public. To avoid revealing site-specific information, these data were added to a compact disk, which will be made available upon request to qualified researchers and archaeologists holding valid Department of Interior archaeological permits for the state of Utah.

To request Appendix C, contact:
Jerry D. Spangler, executive director
Colorado Plateau Archaeological Alliance
801-392-2646 or jerry_cpaa@att.net
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Number 2 Innocents Ridge and the San Rafael Fremont by Alan R. Schroedl and Patrick F. Hogan with an appendix by La Mar W. Lindsay. Volume I, Page 29.


Number 5 Man, Mammoth, and Lake Fluctuations in Utah by David B. Madsen, Donald R. Currey, James H. Madsen, Jr. Volume II, Page 43.


Number 8 Unusual or Enigmatic Stone Artifacts: Pots, Pipes, Points, and Pendants From Utah by La Mar W. Lindsay. Volume II, Page 104.


Number 10 Pint-Size Shelter by La Mar W. Lindsay and Christian K. Lund with appendices by La Mar W. Lindsay and Donald R. Currey. Volume III, Page 25.


Number 13 An Archeological Survey of the Upper White Canyon Area, Southeastern Utah by Philip M. Hobler and Audrey E. Hobler with an appendix by Polly Schaafsma. Volume V, Page 1.

Number 14 Prehistory of the Deep Creek Mountain Area by La Mar W. Lindsay and Kay Sargent. Volume VI, Page 1.
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Number 15 Trace Element Analysis of Obsidian Sources and Artifacts from Western Utah by Fred W. Nelson and Richard D. Holmes. Volume VI, Page 65.


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