SOUTHWESTERN LORE

Official Publication, The Colorado Archaeological Society
Vol. 68, No. 3, Fall 2002

A CLOSER LOOK AT EASTERN UTE SUBSISTENCE

By
Rand A. Greubel

ABSTRACT

Until recently there have been little archaeological data regarding the subsistence practices of the Eastern Ute during the Protohistoric and early Historic periods, from approximately A.D. 1300 to the mid-nineteenth century. Due to the sparse archaeological evidence, Eastern Ute subsistence frequently has been inferred from ethnographic data, historical accounts, and even optimal foraging or other subsistence models constructed for Great Basin Numic groups who inhabited environments quite different from those occupied by the Eastern Ute. A number of sites with Ute components in western Colorado and eastern Utah have been excavated during the past few years, allowing a more accurate subsistence model for Numic peoples of the northern Colorado Plateau. Lithic tools and reduction strategies, subsistence remains, ceramic technology, and hearth form and furniture collectively suggest that the Ute economy was heavily reliant on fauna, with a lack of evidence for intensive exploitation of floral resources.

INTRODUCTION

Archaeologists' understanding of Eastern Ute subsistence until recently was based on ethnographic data, historic accounts, and a rather scant body of archaeological evidence. A spate of work during the past few years in western Colorado and eastern Utah—at least nine projects involving the excavation of 22 Protohistoric- and Historic-period Ute components—has rectified this situation somewhat. The picture remains rather sketchy, but we now have more solid evidence for Eastern Ute subsistence recovered from occupations ranging from pre-contact (roughly before A.D. 1600) to the Historic period. The Protohistoric period, for the purposes of this paper, is defined as the period of time between the disappearance of a Formative-stage lifeway from the region at approximately A.D. 1300 to the adoption of an equestrian lifestyle around A.D. 1650 (Reed and Metcalf

Rand A. Greubel ■ Alpine Archaeological Consultants, Inc., P.O. Box 2075, Montrose, CO 81402

1999). The Historic period spanned from A.D. 1650 to the final forcible removal of the Ute to reservations in A.D. 1881. As defined here, the Historic period began somewhat earlier than many researchers have seen it, but after A.D. 1650 Eastern Utes obtained not only horses, but also increasing amounts of European and Euroamerican goods such as firearms and metal tools, acquisitions that may have altered subsistence patterns. The Eastern Ute are defined as those bands who resided chiefly east of the Green River and the Colorado River south of its confluence with the Green (Nickens 1988).

A review of what was known or believed to be known about this subject prior to about 1990 is an appropriate beginning point. The archaeological evidence was relatively sparse at that time. Buckles' (1971) excavations at Uncompahgre Plateau wickiup sites, excavations by the Midwest Archeological Center at 5GN41 (Dial 1989), Conner's (1988) investigations at 5EA433, and Baker's (1991) work at the Roatcap Game Trail site provided the best excavated data for Ute subsistence from western Colorado. Collectively, these investigations yielded evidence suggesting the consumption of deer, elk, bison, bighorn sheep, cottontail, grass seeds, goosefoot seeds, and pinyon nuts. An important study by Grady (1980) dealing with settlement patterns in the Piceance Basin inferred that mule deer may have been a staple food of the Eastern Ute, at least in some areas. Also, Martorano (1981, 1988) focused attention on Ute procurement of ponderosa pine cambium as a food resource.

Historical accounts from the eighteenth and nineteenth centuries mention a number of floral and faunal food resources used by the Eastern Ute, including manzanita and squawbush berries, chokecherries, gooseberries, serviceberries, pinyon nuts, deer, bison, and antelope (Hunt 1953; Petersen 1977; Warner 1995). Powell, writing in the 1870s, notes that the northernmost bands of the Eastern Ute "never cultivated the soil, but gathered wild seeds and roots and were famous hunters and fishermen. As the region abounds in game, these tribes have always been well clad in skins and furs" (Fowler and Matley 1979:8). Some Ute groups in western Colorado even kept flocks of tame goats by the 1850s (Petersen 1977).

Ethnographic interviews conducted during the first half of the twentieth-century seem to flesh out a broader and more diverse picture of Ute subsistence than that derived from historical and archaeological data, listing numerous mammal, fish, bird, plant, and even insect species exploited for food (Smith 1974; Stewart 1942; see also Callaway et al. 1986). Seeds, nuts, roots and tubers, berries, and other floral resources tend to be prominently featured in the ethnographic data. The fact that few of these types of resources had been recovered from Ute archaeological components—and those that had been recovered were commonly present in very small quantities—seemed to cause little concern. After all, one might reason that the remains of such materials could be small, highly perishable, and generally difficult to recover, and the number of excavated Ute sites was very small. In general, there was no real reason to doubt the ethnographic record, nor

to think that it might present a biased, inaccurate, or at least misleading view of Ute subsistence. In view of certain historical events, however, too much reliance on the ethnographic record in this regard is clearly dangerous. Game populations apparently declined substantially after 1860 (Petersen 1977), probably as a result of over-hunting both by Utes and, especially, increasing numbers of Euroamericans. This process actually may have begun generations earlier, when the use of horses and guns resulted in greater hunting success and larger harvests. At any rate, the depletion of game herds likely forced a greater reliance on floral resources during the period of time remembered by Smith's and Stewart's informants; that is, the late nineteenth century.

Since 1990, a growing number of archaeological components attributed to the Eastern Ute have been subjected to excavation, some of them quite extensively. Data from 26 sites, including 22 excavated after 1990, were examined for this paper. The sites, which are in a variety of environmental settings, were selected because they were thoroughly investigated or well reported. These data seem to indicate that the Eastern Ute relied more on faunal resources—especially deer—than many researchers have suggested.

THE ARCHAEOLOGICAL EVIDENCE FOR UTE SUBSISTENCE

The 26 Ute sites that yielded useful subsistence data are in western Colorado and eastern Utah, from San Miguel County, Colorado, and San Juan County, Utah, on the south to Moffat County, Colorado, and Uinta County, Utah, on the north. The sites range from base camps with wickiups to ephemeral or short-term camps exhibiting one or two hearths. Faunal species identified as subsistence remains include deer, elk, bison, bighorn sheep, pronghorn, cottontail rabbit, bobcat, quail, large birds, woodrat, rock squirrel, and ground squirrel (Table 1). Deer remains dominate in the more southerly sites, whereas bison and pronghorn remains tend to be more common on sites in the northern part of this region, possibly reflecting the geographic distributions of these species rather than indicating the food preferences of different Ute bands. Floral species found in contexts that suggest their use as food resources include seeds of goosefoot, pickleweed, wild buckwheat, tansy mustard, and grass, juniper berries, cattail, prickly pear, and pinyon nuts (Table 1). The faunal evidence consisted of bones, frequently highly fragmented, found in or near hearths and habitation structures, commonly in substantial quantities. In contrast, the floral remains consisted of trace amounts of pollen from hearths or ground stone and small quantities of charred seeds and other materials from hearths.

In almost every case the faunal remains from these sites were unambiguously interpreted as food remains, whereas the floral remains were present in such minute quantities that often it was not clear whether they served as food or, despite their charred condition, were simply ambient materials fortuitously introduced into cultural contexts. Because this is a common problem with identifying the economic use of wild plant resources, often inferences are made based on relatively scant evidence. Based on the

TABLE 1. Subsistence Remains Recovered from Regional Ute Sites.

Site	Fauna	Flora	Reference
5DT271	312 total elements. Deer (MNI=5), elk (MNI=3), bison (MNI=1), cottontail (MNI=1).	Grass seeds	Baker (1991)
5EA433	Elk, total elements & MNI unknown.	Pinyon nut hulls	Conner (1988)
5GF620	256 total elements. Deer-sized to elk/bison-sized* bone.	Greasewood/pickleweed pollen, wild buckwheat pollen, and *Rosaceae* pollen, juniper berries	Davis (2002b)
5GN41	330 total elements. Mule deer, bison/cow, sheep/goat, dog/wolf. MNIs unknown.	Goosefoot and grass seeds	Dial (1989)
5LP2345	N/A	Ponderosa pine cambium	Sybrowsky and Pfertsh (2002)
5ME213	630 total elements. Cottontail, deer, pronghorn, possibly quail. MNIs unknown.	Goosefoot seeds	Greubel (2001b)
5ME625	110 total elements. Deer, cottontail, medium mammal. MNIs unknown.	None	Kalasz et al. (2001)
5ME4970	93 total elements. Unidentified large mammal unidentified bone fragments.	None	Greubel and Reed (2001)
5ME5997	9 total elements, including nearly complete bison scapula. Bison (MNI=1).	Cheno-Am, saltbush	Conner et al. (1998)
5MF2631	1,318 total elements. Bison (MNI=1), cottontail (MNI=4), unknown artiodactyl, deer/antelope-sized, small/medium/large mammal bone.	None	Murcray et al. (1993)
5MN41	Burned bone fragments (unidentified ‡) in and around hearths.	Unknown	Buckles (1971)
5MN44	Burned bone fragments (unidentified ‡) in and around hearths.	Unknown	Buckles (1971)
5MN2341	242 total elements. Rock squirrel and rabbit. Fragmented large and indeterminate-sized mammal bones in and around hearths.	None	Horn and Greubel (1997)
5MN4253	2,943 total elements. Deer, cottontail, bighorn sheep, unidentified carnivore. MNIs unknown.	Prickly pear and cattail pollen from a mano	Greubel and Cater (2001)

Site	Fauna	Flora	Reference
5RB2926	50 total elements. Bison (MNI=1), pronghorn (MNI=1).	None	Baker (1993)
5RB2982	21 total elements. Medium artiodactyl.	None	Baker (1993)
5RB3060	42 total elements. Bison (MNI=1), medium-large mammal, small-medium mammal.	None	Baker (1995)
5RB3182	903 total elements. Bison (MNI=1), pronghorn (MNI=1), cottontail, woodrat, ground squirrel. Possibly bighorn sheep. Medium and large artiodactyl and large mammal.	Cattail pollen, charred Cheno-am seed embryo	Baker (1996)
5SM2425	3,389 total elements. Deer (MNI=4), cottontail (MNI=13), bighorn sheep (MNI=1), possibly large bird.	Juniper berries, goosefoot seeds, seeds of mustard, mint †	Greubel (2001a)
42GR1013	4 total. Deer/bison-sized bone.	Globemallow seed	Davis (2002a)
42GR1014	N/A	N/A	Eckman (2002)
42SA11540	N/A	Goosefoot seeds	Davis (2002c)
42SA11542	N/A	Goosefoot seeds	Eckman and Diederichs (2002)
42SA11581	56+ total elements. Cottontail (MNI=1), jackrabbit (MNI=1), deer-sized bone, bighorn sheep (MNI=1), bison (MNI=1).	Goosefoot, tansy mustard, and grass seeds	Firor (2002)
42SA11586	1,318 total elements. Cottontail (MNI=1), deer (MNI=1), pronghorn (MNI=1), bison/cow (MNI=1), bobcat (MNI=1).	Goosefoot seeds and tissue of fruit/berry/ succulent	Greubel et al. (2002)
42UN1477	2,390 total elements. Bison/cow (MNI=1), sheep (MNI=1), deer-sized bone, bison-sized bone.	None	Cater (2002)

* Blood residue analyses suggest the elk/bison-sized elements are elk (Davis 2002b).
† Large roasting pits (associated with Ute component) may have functioned for cooking roots or tubers.
‡ The faunal materials recovered from these sites were apparently lost before analysis could be conducted (Buckles 1971:650).

excavated data, one can suggest a model of Ute subsistence characterized by a strong reliance on faunal resources supplemented by small to modest amounts of vegetal food items, mainly seeds, berries, and nuts. The disparity between the evidence for fauna vs. flora in Ute contexts is so pronounced that one immediately wonders if there is some sort of sampling bias involved or a problem with preservation.

Bias may have been introduced through the selection of sites that were associated primarily with faunal procurement and processing, perhaps because they are archaeologically more visible. If sites associated with floral procurement and processing are comparatively less visible, they would not tend to be chosen for excavation. This seems unlikely, however; plant food processing likely required tools and facilities at least as visible as those needed for faunal processing, such as grinding implements, flake tools, and a variety of thermal features. Another possibility is that floral processing took place in special activity areas well removed from habitations and their immediate environs, and are therefore less likely to be investigated. This may have some validity; at one Ute habitation site, large roasting pits were located in relatively isolated areas some distance from the habitations and domestic features (Greubel 2001a). Pine nut processing and the baking of roots may have been the types of activities that were carried out in areas well removed from habitations. Yet, the fact remains that ground stone tools and large fire-cracked rock features tend to be highly visible, and on relatively recent sites some sign of them should be apparent on the surface. It seems improbable that sampling bias is entirely responsible for the apparent under-representation of plant food remains on Ute sites.

Differential preservation of bone vs. plant macrofossils and pollen is another potential explanation for the paucity of evidence for plant food processing on Ute sites. This issue is difficult to address because most excavation reports do not comment on the state of preservation of recovered plant remains. One way to determine if preservation of perishable remains was a factor is to examine the macrofloral and pollen contents of earlier components on the same sites. Several sites in this sample had discrete Archaic or Formative components that yielded pollen and flotation samples from undisturbed contexts. Poor preservation may have played a role at site 5SM2425 (the Simpson Wickiup site), where all five components—two Archaic, one Formative, and two Ute—produced negligible quantities of plant remains (Greubel 2001a). At five other sites (5ME213, 5MN4253, 42SA11540, 42SA11581, and 42UN1477), earlier components actually yielded greater quantities and more taxa of economic plant remains—both macrofossils and pollen—than the Ute components (Cater 2002; Davis 2002c; Firor 2002; Greubel 2001b; Greubel and Cater 2001). Components 2 and 4 at site 5ME213 (the Watershed Rockshelter), both representing Formative-era occupations, produced a mean of 10 taxa of edible, charred plant remains, whereas the Ute component produced only one—goosefoot. Poor preservation of plant materials was apparently not a factor at these sites.

FIGURE 1. A fairly typical Ute extramural hearth on the Simpson Wickiup site. The sandstone slab on the right of the photo is interpreted as hearth furniture; it may have been used as an anvil for bone reduction or simply as a clean surface upon which to place food.

Another way of examining subsistence is through more indirect means, namely the technologies represented by lithic tools, cooking and storage features, and ceramic vessels. The Ute components examined for this paper typically yielded robust assemblages of projectile points, cutting and scraping tools, and biface-thinning debitage but, in general, few grinding implements. In short, these components yielded hunting and faunal processing tool kits. Where ground stone tools were present, they did not always reflect floral processing. In some cases, context and use wear analyses suggested that ground stone was used for faunal processing or bone reduction. Manos may have occasionally functioned for reducing bones or pulverizing meat, as noted in ethnographic descriptions (Smith 1974). In addition to their usual function (i.e., vegetal processing), metates also may have been used as anvils or small tables, based on use wear patterns and context, respectively. The specialized thermal features that might be expected if certain types of intensive floral processing were conducted—such as roasting pits—were relatively uncommon on these sites. Instead, Ute hearths tend to be shallow, informal, and associated with burned bone (see Figure 1 for an example). Overall, the technology data accord well with the subsistence data, and reflect a heavy reliance on big game.

UTE CERAMIC TECHNOLOGY

Ceramics, known as Uncompahgre Brown ware (Buckles 1971; Reed 1988, 1994, 1995; Reed and Metcalf 1999; Reed et al. 2001), are frequently found on Eastern Ute sites. Ute pottery is usually roughly made. Large temper size, variable surface treatment, and poorly controlled firing reflect low investment of labor that seems to be linked to high mobility (Bright and Ugan 1999; Simms et al. 1997). Ute pottery—like the brown ware of all Numic groups—was apparently designed to be functional but not particularly durable or aesthetic, providing serviceable cooking and storage vessels for a mobile population. One might ask why such a mobile group of hunter-gatherers needed pottery at all. As it turns out, Ute sites with evidence of intensive faunal processing quite frequently also yield ceramics, but sites lacking faunal remains rarely contain pottery. At the twenty-six Ute components examined for this paper, thirteen sites (50 percent) yielded both faunal remains and pottery (Table 2). None of the sites that lacked faunal remains contained pottery. The majority of the sites (69 percent) that produced both faunal remains and pottery also had evidence of intensive bone processing in the form of relatively substantial quantities of highly fragmented bone associated with hearths (Table 2). One site (5MN2341) from the late Historic period that lacked pottery had evidence of intensive bone processing, but the occupants of this site had access to metal pots and cans. These data are far from conclusive, but nonetheless suggest a possible link between the intensive focus on fauna and the use of ceramic cooking pots. There is some ethnographic evidence for this; Smith (1974:87) notes that "clay pots were used for boiling meat."

Another important aspect of the possible relationship between faunal

TABLE 2. Pottery and Subsistence-Related Materials Recovered from Regional Ute Sites.

Site	Fauna*	Flora*	Ground Stone	Pottery	Intensive Bone Processing	Reference
5DT271	+	+	+	+	+	Baker (1991)
5EA433	+	+	+	+	+	Conner (1988)
5GF620	+	+	+	+	+	Davis (2002b)
5GN41	+	+	+	+	-	Dial (1989)
5LP2345	-	+	-	-	-	Sybrowsky and Pfertsh (2002)
5ME213	+	+	+	-	+	Greubel (2001b)
5ME625	+	-	+§	-	+	Kalasz et al. (2001)
5ME4970	+	-	-	+	-	Greubel and Reed (2001)
5ME5997	+	+	-	-	-	Conner et al. (1998)
5MF2631	+	-	-	+	+	Murcray et al. (1993)
5MN41	+	Unknown	+	+	+	Buckles (1971)
5MN44	+	Unknown	-	-	+	Buckles (1971)
5MN2341	+	-	-	**	+	Horn and Greubel (1997)
5MN4253	+	+	+	+	+	Greubel and Cater (2001)
5RB2926	+	-	-	-	+	Baker (1993)
5RB2982	+	-	-	+	-	Baker (1993)
5RB3060	+	-	-	-	+	Baker (1995)
5RB3182	+	+	+	+	+	Baker (1996)
5SM2425	+	+	+	+	+	Greubel (2001a)
42GR1013	+	-	+	-	-	Davis (2002a)
42GR1014	-	-	-	-	-	Eckman (2002)
42SA11540	-	+	-	-	-	Davis (2002c)
42SA11581	+	+	+	-	-	Firor (2002)
42SA11542	-	+	-	-	-	Eckman and Diederichs (2002)
42SA11586	+	+	+†	+‡	+	Greubel et al. (2002)
42UN1477	+	-	+	+	+	Cater (2002)

* Potential food remains only, the floral consisting of macrofloral or pollen evidence.
† The single broken mano was probably used as a hammerstone for bone reduction.
‡ Pueblo III Anasazi sherds were recovered; it is not clear if these vessels were curated by the Ute occupants of the site.
§ One small, thin slab metate was recovered that is tenuously associated with the Ute component.
** No pottery was recovered, but the Ute occupants of this late Historic site likely had metal pots or used tin cans for cooking.

processing and ceramic technology may have been the increased importance of bone grease rendering. The extraction of bone grease represents an intensification of faunal processing with the goal of wringing every bit of nutritional value out of an animal. Bone contains valuable nutrients in the form of marrow and fats (Lupo and Schmitt 1997). Obtaining these nutrients may have been critical to groups that were committed to heavy reliance on game at the expense of plant foods. The recovery of within-bone nutrients is a messy and laborious task that was likely simplified by the use of cooking pots, as opposed to the alternative method of stone boiling inside a hide or basket. Thus, what may have been a difficult task in preceramic times, possibly undertaken only in times of food stress (Rood 1991; Todd and Rapson 1988), became considerably easier with ceramic technology. Furthermore, there is evidence that the Ute processed animal bone more intensively than most earlier cultural groups, based on the high frequency of unidentified, fragmented large mammal bone in Ute components (Reed et al. 2001:Table 41-2). Such processing may have functioned to offset the lessened reliance on lower-rate-of-return floral resources.

THE IMPLICATIONS OF A COMMITMENT TO HUNTING

It would be a mistake to assume that the Ute did not collect and consume a variety of floral resources. The data from Ute sites in the region indicate that goosefoot and grass seeds, berries, cactus, seeds or greens of various herbs, pinyon nuts, and inner pine bark were eaten, albeit in seemingly modest quantities. These floral resources were probably quite important seasonally and also may have composed part of the stored winter food supply. The strong focus on game, however, suggests that the Ute were committed to hunting large mammals in much the same sense as the Anasazi were committed to growing maize. That is, this subsistence orientation or focus structured group mobility, settlement patterns, technology, and nearly every other aspect of their lives. It might be hypothesized that even the gathering of plant resources was largely embedded into the larger goal of procuring game and storing dried meat and bone grease as staple food items.

Along with the scarce evidence for plant food procurement and processing, another puzzling aspect of the Ute archaeological record has been the lack of identified storage features. A few apparent bark-lined storage pits dating to the Protohistoric period have been found in rockshelters, but no Ute habitation sites, it seems, have yielded such features. An examination of the ethnographic record suggests that the Ute did occasionally use subterranean storage methods, but seemed to rely more on rawhide bags, baskets, pots, and even tree platforms for food storage (Smith 1974; Stewart 1942). The lack or infrequent use of storage facilities such as pits and cists might mean that few plant foods were stored unless they were mixed with meat or grease as a form of pemmican. The exception would be pine nuts that were stored in the cone in large caches, but, again, while known historically, such storage facilities are quite rare in the archaeological record.

The strong reliance on faunal resources has implications for settle-

ment patterns. Ute mobility sometimes has been characterized as residential (e.g., Reed and Metcalf 1999). A focus on big game procurement does not necessarily preclude a settlement system that functions primarily through residential mobility, but ethnographic data suggest that much hunting was accomplished logistically (Kelly 1995). The Eastern Ute may have practiced a subsistence system that focused primarily on the logistical procurement and subsequent storage of faunal resources, coupled with ongoing, day-to-day foraging for seeds, berries, nuts, roots, tubers, and small game during the warm season. In other words, one sector of a household or extended family group may have made frequent residential moves in support of a foraging pattern while the other practiced logistical mobility a good part of the year in the pursuit of game, primarily large mammals. Examples of groups that practiced both extensive residential and logistical mobility can be found in the ethnographic and historical literature (Kelly 1995:132). Such a complex system implies considerable planning, because the residential base may have moved continuously even while hunters were engaged in logistical forays. Long experience, intimate knowledge of the home range, and careful scheduling allowed hunters to relocate their families after extended trips. Seasonal use of different ecozones based on elevation—a central feature of numerous prehistoric settlement and subsistence models constructed for the region (e.g., Benedict 1990; Grady 1980; Metcalf and Black 1991, 1997; O'Neil 1993)—was likely the basis of the system.

Hopefully, the relationship between ceramic pots and a heavy reliance on faunal resources posited in this paper can be examined further in the course of future research into Ute ceramic technology and subsistence. The subsistence practices described in this paper, as well as the speculative description of mobility presented above, refer to the Ute of Colorado and upland areas of eastern Utah, a region where large populations of big game animals—mule deer, elk, bison, pronghorn, and mountain sheep—permitted their use as staple food items. Diversity in diet among the Ute as an entire cultural group was likely, given that they occupied diverse environments with differing proportions of plant and animal species. The data from the northeastern Colorado Plateau and southern Rocky Mountains suggest that Eastern Ute bands preferred to make their living mainly from large mammals because it was possible to do so.

ACKNOWLEDGMENTS

I would like to thank Kevin Black and two anonymous reviewers for their many helpful suggestions and comments that resulted in a much-improved final draft of this paper. I thank Alpine Archaeological Consultants, Inc., for providing me with the time, resources, and encouragement to prepare this paper, which is a revised version of a paper I originally presented at the annual meeting of the Colorado Council of Professional Archaeologists in Gunnison in March 2002.

REFERENCES CITED

Baker, Steven G.

1991 *Ephemeral Archaeology on the Mountain of the Sorrel Deer*. Cultural Resource Series No. 32. Bureau of Land Management–Colorado, Denver.

1993 Fremont and Numic Archaeology on the Douglas Creek Arch, Rio Blanco County, Colorado: Salient Topics. Paper presented at the 1st Biennial Meeting of the Rocky Mountain Anthropological Conference, Jackson, Wyoming.

1995 *Fremont and Numic Archaeology on the Douglas Creek Arch, Rio Blanco County, Colorado: The Sandshadow and New Sites (5RB2958 and 5RB3060)*. Copies available from Centuries Research, Inc., Montrose, Colorado. Submitted to the Bureau of Land Management–Colorado, Meeker.

1996 *Numic Archaeology on the Douglas Creek Arch, Rio Blanco County, Colorado: Ute Rancherias and the Broken Blade Wickiup Village (5RB3182)*. Copies available from Centuries Research, Inc., Montrose, Colorado. Submitted to the Bureau of Land Management–Colorado, Meeker.

Benedict, James B.

1990 *Archaeology of the Coney Creek Valley*. Research Report No. 5. Center for Mountain Archeology, Ward, Colorado.

Bright, Jason R., and Andrew Ugan

1999 Ceramics and Mobility: Assessing the Role of Foraging Behavior and Its Implications for Culture-History. *Utah Archaeology* 12:17-29.

Buckles, William G.

1971 *The Uncompahgre Complex: Historic Ute Archaeology and Prehistoric Archaeology of the Uncompahgre Plateau, West Central Colorado*. Ph.D. Dissertation, Department of Anthropology, University of Colorado, Boulder. University Microfilms, Ann Arbor.

Callaway, Donald, Joel Janetski, and Omer C. Stewart

1986 Ute. In *Great Basin*, edited by Warren L. D'Azevedo, pp. 336-367. Handbook of North American Indians, vol. 11, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Cater, John C.

2002 42UN1477. Chapter 18 in *The Mid-America Pipeline Company/Williams Rocky Mountain Expansion Loop Pipeline Data Recovery Project, Northwestern New Mexico, Western Colorado, and Eastern Utah*, compiled by Jonathon C. Horn, Jerry Fetterman, and Linda Honeycutt. Report in preparation, Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Woods Canyon Archaeological Consultants, Inc., Yellow Jacket, Colorado.

Conner, Carl E.

1988 Archaeological Investigations at 5EA433. In *Archaeology of the Eastern Ute: A Symposium*, edited by Paul R. Nickens, pp. 190-205. Occasional Papers No. 1. Colorado Council of Professional Archaeologists, Denver.

Conner, Carl E., Barbara J. Davenport, and Michael Piontkowski

1998 *Archaeological Investigations at Site 5ME5997 and 5ME6144: Evaluative Test Excavations on Part of the Grand River Institute Griffith Land Exchange in Mesa County, Colorado, for the Bureau of Land Management, Grand Junction Resource Area*. Copies available from Grand River Institute, Grand Junction, Colorado. Submitted to the Bureau of Land Management–Colorado, Grand Junction.

Davis, James P.

2002a The Shinbone Site (42GR1013). Chapter 7 in *The Mid-America Pipeline Company/Williams Rocky Mountain Expansion Loop Pipeline Data Recovery Project, Northwestern New Mexico, Western Colorado, and Eastern Utah*, compiled by Jonathon C. Horn, Jerry Fetterman, and Linda Honeycutt. Report in preparation, Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Woods Canyon Archaeological Consultants, Inc., Yellow Jacket, Colorado.

2002b The Wagon Canyon Site (5GF620). Chapter 19 in *The Mid-America Pipeline Company/Williams Rocky Mountain Expansion Loop Pipeline Data Recovery Project, Northwestern New Mexico, Western Colorado, and Eastern Utah*, compiled by Jonathon C. Horn, Jerry Fetterman, and Linda Honeycutt. Report in preparation, Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Woods Canyon Archaeological Consultants, Inc., Yellow Jacket, Colorado.

2002c The White Rock Site (42SA11540). Chapter 11 in *The Mid-America Pipeline Company/Williams Rocky Mountain Expansion Loop Pipeline Data Recovery Project, Northwestern New Mexico, Western Colorado, and Eastern Utah*, compiled by Jonathon C. Horn, Jerry Fetterman, and Linda Honeycutt. Report in preparation, Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Woods Canyon Archaeological Consultants, Inc., Yellow Jacket, Colorado.

Dial, Janis L.

1989 *The Curecanti Archaeological Project: The Late Prehistoric Component at Pioneer Point.* Occasional Studies in Anthropology No. 24. Midwest Archeological Center, Lincoln, Nebraska.

Eckman, Jason C.

2002 Limited Data Recovery and Archaeological Monitoring Results. Chapter 5 in *The Mid-America Pipeline Company/Williams Rocky Mountain Expansion Loop Pipeline Data Recovery Project, Northwestern New Mexico, Western Colorado, and Eastern Utah*, compiled by Jonathon C. Horn, Jerry Fetterman, and Linda Honeycutt. Report in preparation, Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Woods Canyon Archaeological Consultants, Inc., Yellow Jacket, Colorado.

Eckman, Jason C., and Shanna Diederichs

2002 The Debacle Site (42SA11582). Chapter 12 in *The Mid-America Pipeline Company/Williams Rocky Mountain Expansion Loop Pipeline Data Recovery Project, Northwestern New Mexico, Western Colorado, and Eastern Utah*, compiled by Jonathon C. Horn, Jerry Fetterman, and Linda Honeycutt. Report in preparation, Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Woods Canyon Archaeological Consultants, Inc., Yellow Jacket, Colorado.

Firor, James

2002 The Muleshoe Canyon Shelters (42SA11581). Chapter 13 in *The Mid-America Pipeline Company/Williams Rocky Mountain Expansion Loop Pipeline Data Recovery Project, Northwestern New Mexico, Western Colorado, and Eastern Utah*, compiled by Jonathon C. Horn, Jerry Fetterman, and Linda Honeycutt. Report in preparation, Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Woods Canyon Archaeological Consultants, Inc., Yellow Jacket, Colorado.

Fowler, Don D., and John F. Matley

1979 *Material Culture of the Numa: The John Wesley Powell Collection 1867-1880.* Smithsonian Contributions to Anthropology No. 26. Smithsonian Institution Press, Washington, D.C.

Grady, James

1980 *Environmental Factors in Archaeological Site Locations, Piceance Basin, Colorado.* Cultural Resources Series No. 9. Bureau of Land Management–Colorado, Denver.

Greubel, Rand A.
2001a Simpson Wickiup Site (5SM2425). Chapter 24 in *The TransColorado Natural Gas Pipeline Archaeological Data Recovery Project, Western Colorado and Northwestern New Mexico*, compiled by Alan D. Reed. Copies available from Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Centennial Archaeology, Inc., Fort Collins, Colorado. Submitted to Trans Colorado Gas Transmission Company, Lakewood, Colorado, and the Bureau of Land Management–Colorado, Uncompahgre Field Office, Montrose.
2001b Investigations at the Watershed Rockshelter (5ME213). Chapter 5 in *The TransColorado Natural Gas Pipeline Archaeological Data Recovery Project, Western Colorado and Northwestern New Mexico*, compiled by Alan D. Reed. Copies available from Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Centennial Archaeology, Inc., Fort Collins, Colorado. Submitted to TransColorado Gas Transmission Company, Lakewood, Colorado, and the Bureau of Land Management–Colorado, Uncompahgre Field Office, Montrose.

Greubel, Rand A., and John D. Cater
2001 Schmidt Site (5MN4253). Chapter 21 in *The TransColorado Natural Gas Pipeline Archaeological Data Recovery Project, Western Colorado and Northwestern New Mexico*, compiled by Alan D. Reed. Copies available from Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Centennial Archaeology, Inc., Fort Collins, Colorado. Submitted to TransColorado Gas Transmission Company, Lakewood, Colorado, and the Bureau of Land Management–Colorado, Uncompahgre Field Office, Montrose.

Greubel, Rand A., and Alan D. Reed
2001 Investigations at the Broken Vessel Site (5ME4970). Chapter 8 in *The TransColorado Natural Gas Pipeline Archaeological Data Recovery Project, Western Colorado and Northwestern New Mexico*, compiled by Alan D. Reed. Copies available from Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Centennial Archaeology, Inc., Fort Collins, Colorado. Submitted to TransColorado Gas Transmission Company, Lakewood, Colorado, and the Bureau of Land Management–Colorado, Uncompahgre Field Office, Montrose.

Greubel, Rand A., Jason C. Eckman, and Shanna Diederichs
2002 The Two Ridges Site (42SA11586). Chapter 14 in *The Mid-America Pipeline Company/Williams Rocky Mountain Expansion Loop Pipeline Data Recovery Project, Northwestern New Mexico, Western Colorado, and Eastern Utah*, compiled by Jonathon C. Horn, Jerry Fetterman, and Linda Honeycutt. Report in preparation, Alpine Archaeological Consultants, Inc., Montrose, Colorado and Woods Canyon Archaeological Consultants, Inc., Yellow Jacket, Colorado.

Horn, Jonathon C., and Rand A. Greubel
1997 *Archaeological Investigations of the Historic Ute Component at the Harris Site (5MN2341), Montrose County, Colorado*. Chipeta Chapter, Colorado, Archaeological Society, Montrose, Colorado. Submitted to, and copies available from, the Bureau of Land Management–Colorado, Montrose.

Hunt, Alice P.
1953 *Archaeological Survey of the La Sal Mountain Area, Utah*. University of Utah Anthropological Papers No. 14. Salt Lake City.

Kalasz, Stephen M., Scott A. Slessman, and Kathryn L. Joyner
2001 Debeque Cutoff Site (5ME625). Chapter 6 in *The TransColorado Natural Gas Pipeline Archaeological Data Recovery Project, Western Colorado and Northwestern New Mexico*, compiled by Alan D. Reed. Copies available from Alpine Archaeological Consultants, Inc., Montrose, Colorado and Centennial Archaeology, Inc., Fort Collins, Colorado. Submitted to Trans Colorado Gas Transmission Company, Lakewood, Colorado and the Bureau of Land Management–Colorado, Uncompahgre Field Office, Montrose.

Kelly, Robert L.
1995 *The Foraging Spectrum: Diversity in Hunter-Gatherer Lifeways*. Smithsonian Institution Press, Washington, D.C.

Lupo, Karen D., and David N. Schmitt
1997 Experiments in Bone Boiling: Nutritional Returns and Archaeological Reflections. *Anthropozoologica* 25-26:137-144.

Martorano, Marilyn A.
1981 Scarred Ponderosa Pine Trees Reflecting Cultural Utilization of Bark. Unpublished Master's thesis, Department of Anthropology, Colorado State University, Fort Collins.
1988 Culturally Peeled Trees and Ute Indians in Colorado. In *Archaeology of the Eastern Ute: A Symposium*, edited by Paul R. Nickens, pp. 5-21. Occasional Papers No. 1. Colorado Council of Professional Archaeologists, Denver.

Metcalf, Michael D., and Kevin D. Black
1991 *Archaeological Excavations at the Yarmony Pit House Site, Eagle County, Colorado*. Cultural Resource Series No. 31. Bureau of Land Management–Colorado, Denver.
1997 Archaic Period Logistical Organization in the Colorado Rockies. In *Changing Perspectives of the Archaic on the Northwest Plains and Rocky Mountains*, edited by Mary Lou Larson and Julie E. Francis, pp. 168-209. University of South Dakota Press, Vermillion.

Murcray, Dirk, Kevin W. Thompson, Steven D. Creasman, Jana V. Pastor, and Barbara Amidon
1993 *Archaeological Investigations at the Sand Wash Wickiup Site, Moffat County, Colorado*. Copies available from Western Wyoming Community College, Rock Springs. Submitted to the Bureau of Land Management–Colorado, Craig.

Nickens, Paul R.
1988 Introduction. In *Archaeology of the Eastern Ute: A Symposium*, edited by Paul R. Nickens, pp. 1-4. Occasional Papers No. 1. Colorado Council of Professional Archaeologists, Denver.

O'Neil, Brian
1993 *The Archaeology of the Grand Junction Resource Area: Crossroads to the Colorado Plateau and the Southern Rocky Mountains. A Class I Overview*. 3 vols. Submitted to, and copies available from, the Bureau of Land Management–Colorado, Grand Junction.

Petersen, Kenneth Lee
1977 Tabehuache and Elk Mountain Utes: A Historic Test of an Ecological Model. *Southwestern Lore* 43(4):5-21.

Reed, Alan D.
1988 Ute Cultural Chronology. In *Archaeology of the Eastern Ute: A Symposium*, edited by Paul R. Nickens, pp. 79-101. Occasional Papers No. 1. Colorado Council of Professional Archaeologists, Denver.

1994 The Numic Occupation of Western Colorado and Eastern Utah during the Prehistoric and Protohistoric Periods. In *Across the West: Human Population Movement and the Expansion of the Numa*, edited by David B. Madsen and David Rhode, pp. 188-199. University of Utah Press, Salt Lake City.

1995 Ute Ceramics. In *Archaeological Pottery of Colorado: Ceramic Clues to the Prehistoric and Protohistoric Lives of the State's Native Peoples*, edited by Robert H. Brunswig, Jr., Bruce Bradley, and Susan M. Chandler, pp. 120-128. Occasional Papers No. 2. Colorado Council of Professional Archaeologists, Denver.

Reed, Alan D., and Michael D. Metcalf

1999 *Colorado Prehistory: A Context for the Northern Colorado River Basin*. Colorado Council of Professional Archaeologists, Denver.

Reed, Alan D., Rand A. Greubel, Stephen M. Kalasz, Jonathon C. Horn, John D. Cater, and Kimberly Redman

2001 Synthesis of Project Data. In *The TransColorado Natural Gas Pipeline Archaeological Data Recovery Project, Western Colorado and Northwestern New Mexico*, compiled by Alan D. Reed, pp. 41-1–41-170. Copies available from Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Centennial Archaeology, Inc., Fort Collins, Colorado. Submitted to Trans Colorado Gas Transmission Company, Lakewood, Colorado, and the Bureau of Land Management–Colorado, Uncompahgre Field Office, Montrose.

Rood, Ronald J.

1991 Archaeofauna from the Yarmony Site. In *Archaeological Excavations at the Yarmony Pit House Site, Eagle County, Colorado*, by Michael D. Metcalf and Kevin D. Black, pp. 157-178. Cultural Resource Series No. 31. Bureau of Land Management–Colorado, Denver.

Simms, Steven R., Jason R. Bright, and Andrew Ugan

1997 Plain-Ware Ceramics and Residential Mobility: A Case Study from the Great Basin. *Journal of Archaeological Science* 24:779-792.

Smith, Anne M.

1974 *Ethnography of the Northern Utes*. Papers in Anthropology No. 17. Museum of New Mexico Press, Santa Fe.

Stewart, Omer C.

1942 Culture Element Distributions: XVIII, Ute–Southern Paiute. *University of California Anthropological Records* 6(4):231-354.

Sybrowsky, Brandon, and Jack E. Pfertsh

2002 5LP2345. Chapter 20 in *The Mid-America Pipeline Company/Williams Rocky Mountain Expansion Loop Pipeline Data Recovery Project, Northwestern New Mexico, Western Colorado, and Eastern Utah*, compiled by Jonathon C. Horn, Jerry Fetterman, and Linda Honeycutt. Report in preparation, Alpine Archaeological Consultants, Inc., Montrose, Colorado, and Woods Canyon Archaeological Consultants, Inc., Yellow Jacket, Colorado.

Todd, Lawrence C., and David J. Rapson

1988 Long Bone Fragmentation and Interpretation of Faunal Assemblages: Approaches to Comparative Analysis. *Journal of Archaeological Science* 15:307-325.

Warner, Ted J. (editor)

1995 *The Domínguez-Escalante Journal: Their Expedition Through Colorado, Utah, Arizona, and New Mexico in 1776*. University of Utah Press, Salt Lake City.