More Than a Scenic Mountain Landscape:

Valles Caldera National Preserve

Land Use History

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United States
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of Agriculture

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Abstract

This study focuses on the cultural-historical environment of the 88,900-acre (35,560-ha) Valles Caldera National Preserve (VCNP) over the past four centuries of Spanish, Mexican, and U.S. governance. It includes a review and synthesis of available published and unpublished historical, ethnohistorical, and ethnographic literature about the human occupation of the area now contained within the VCNP. Documents include historical maps, texts, letters, diaries, business records, photographs, land and mineral patents, and court testimony.

This study presents a cultural-historical framework of VCNP land use that will be useful to land managers and researchers in assessing the historical ecology of the property. It provides VCNP administrators and agents the cultural-historical background needed to develop management plans that acknowledge traditional associations with the Preserve, and offers managers additional background for structuring and acting on consultations with affiliated communities.

The Authors

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Carol B. Raish, Ph.D., Research Social Scientist, USDA Forest Service, Rocky Mountain Research Station, Albuquerque, NM oversaw the project and the shaping of the report. We are thankful for her critical insight and guidance as we developed a research strategy that deviated from that often followed in land use history studies. Carol's review of our draft manuscript also was a great benefit in helping us to communicate our findings with greater clarity.

William deBuys, Chairman, Board of Trustees, Valles Caldera Trust, discussed the project with us at the outset. As a professional historian, he made specific suggestions about sources and methods that guided our work, and helped us to avoid dead ends and repetition of research already done by others.

Craig Martin of Los Alamos generously shared notes and sources with us. In particular, he allowed us access to his personal research materials, which made our own archival efforts more efficient. When Craig gave us a copy of his excellent book *Valle Grande: A History of the Baca Location No. 1* (Los Alamos, NM: All Seasons Publishing) upon its publication in the fall of 2003, he inspired us to redefine the scope of our study such that we would not repeat a job that already was well done but would explore new research questions made possible because of the foundations that he had established in his contribution. Craig, who was accompanied by Dorothy Hoard of Los Alamos, later met us in the Valle Grande to search for the site of Old Fort.

Robert M. March, Court Clerk, Federal District Court, District of New Mexico, helped us in our search for the record of appeal in *Baca Land and Cattle Company and Dunigan Tool and Supply Company, and George W. Savage, Trustee Under Liquidating Trust Agreement, v. New Mexico Timber, Inc., and T. Gallagher and Co., Inc.* This record had been filed under an incorrect accession number in the National Archives, Rocky Mountain Region, Denver. Eric Bittner and Rick Martinez, archivists in the National Archives, subsequently located the records for us and facilitated our research in Denver. References in this record then led us back to the New Mexico State Archives in Santa Fe, where we also located the record of the partition suit of 1893 (*Joel Parker Whitney v. Mariano S. Otero et al.*).

Fraser Goff of Los Alamos discussed the geological history and literature of the Valles Caldera with us. During these conversations, he helped us to choose essential publications for inclusion in this volume's annotated bibliography. This subject matter is perhaps the only area in which the annotated bibliography remains incomplete because it was impractical to annotate the several thousand relevant publications. Fraser's contributions have helped us ensure that our selections for the annotated bibliography were representative statements of a huge and complex subject matter.

We also wish to recognize the contributions of Dr. Bob Parmeter, VCNP, for his advice throughout this effort. His patient assistance during the review and editing process was invaluable. Dr. Ron Hartman, University of Wyoming, provided us with a comprehensive list of plant species documented with the Preserve; Dr. Anastasia Steffen, VCNP, and Dr. Jeremy Kulisheck, Santa Fe National Forest, were generous in sharing their knowledge of the archaeology of the locality.

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We wish to extend our gratitude to Cherie L. Scheick, President, Río Grande Foundation, for her unflagging support and always helpful advice during the preparation of this document. Although she did not play an active role in either the research or writing of the VCNP land use history, Ms. Smith-Savage fulfilled a valuable role in the completion of this report. Ms. Sheron Smith-Savage

completed the technical edit of portions of the first draft of the manuscript completed before the publication of Martin's (2003) book. (Martin's publication necessitated substantial revision of the existing manuscript.) Ms. Smith-Savage also shared several useful articles about the history of sheep herding in New Mexico. Ms. Gloria J. Vigil provided valuable assistance during the preparation of the final version of this volume.

Loa Collins and Kristi Coughlon, Editorial Staff, Publishing Services, Rocky Mountain Research Station, have earned our appreciation for editing the original manuscript for publication. Their efforts greatly improve the flow of the story that we tell. In addition, they will enable the reader to find reference materials that we have cited by correcting numerous omissions in our citations. We thank the University of Chicago Press and the University of Minnesota Press for granting us permission to adapt illustrations from their publications for use in chapter 9. These materials include fig. 2 in Alfonso Ortiz, "The Tewa World: Space, Time, Being, and Becoming in a Pueblo Society" (Chicago: University of Chicago Press, 1969), and fig. 15 in Yi-Fu Tuan, "Space and Place: The Perspective of Experience" (Minneapolis: University of Minnesota Press, 1977).

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Executive Summary

The USDA Forest Service, Rocky Mountain Research Station, Albuquerque, contracted with the Río Grande Foundation for Communities and Cultural Landscapes (Río Grande Foundation), Santa Fe, during the final quarter of Fiscal Year 2002 to prepare a land use history of the Valles Caldera National Preserve (VCNP). As stipulated in the Joint Venture Agreement between the USDA Forest Service and the Río Grande Foundation (No. 02-JV-11221601-265 [RGF 119]), the purpose of this undertaking was to document the interactions between culturally diverse peoples and this striking physical environment over time.

The Río Grande Foundation assembled a team consisting of Dr. Kurt F. Anschuetz, an anthropologist and archaeologist, and Thomas Merlan, a historian, to conduct the research and to report their findings in this volume. Dr. Carol Raish, Research Social Scientist, Rocky Mountain Research Station, served as the Project Coordinator.

The study focuses on the cultural-historical environment of the 88,900-acre (35,560-ha) preserve over the past 4 centuries of Spanish, Mexican, and U.S. governance. The nature and intensity of human impacts on the physical environment is the central issue explored. The study attempts to determine the technological structure of land use activities, the social organization framing them, the identities of associated communities and major actors over the VCNP's human history, and the timelines of diverse peoples' relationships with the lands now within the VCNP. The scope of work also includes the preparation of an archaeological review of human use and occupation before the Spanish colonization of the New Mexican territory in 1598. This review establishes the cultural context of traditional Native American land use practices and associations, creates a timeline that identifies changing patterns in the technology and organization of the use of the VCNP, and explains the essential social and cultural contexts of patterns of economic activity extending far back into the past.

The work includes a review and synthesis of available published and unpublished historical, ethnohistorical, and ethnographic literature about the human occupation of the area now contained within the VCNP. The documents include historical maps, texts, letters, diaries, business records, photographs, land and mineral patents, and court testimony.

The quality and quantity of available documentary information made it necessary for this land use history to emphasize the material aspects of land use, such as hunting, gathering, mineral collecting, ranching, timbering, and geothermal exploration. By adopting a cultural landscape approach based on the premise that communities interweave meaning, space, and time to form the fabric of their landscapes, this study provides a record of the economic, social, and ideational relationships that culturally diverse Native American (e.g., Pueblo, Navajo, Apache, and Ute), Hispanic, and Anglo-American peoples have maintained with the Valles Caldera. Although needed to build a comprehensive understanding of how communities create and sustain social and ideational associations with the VCNP, a formal program of ethnographic investigation to conduct interviews with knowledgeable persons was outside the contracted scope of the present research.

The publication of Craig Martin's excellent book *Valle Grande: A History of the Baca Location No. 1* (Los Alamos, NM: All Seasons Publishing) in late 2003 allowed the redefinition of the scope and emphasis of the present study. Martin's volume provides substantial background information about the economic and social history of the Baca Location. Consequently, the present land use history could devote greater effort to issues of land title, the changing intensity of industrial timbering, and patterns of everyday land use by neighboring traditional Native American and Hispanic communities that are outside the scope of Martin's book. In addition, because Martin's volume includes clear maps and photographs in a readily available publication, the Río Grande Foundation, in consultation with the Rocky Mountain Research Station, made the decision to devote project resources for original research that could broaden the understanding of the VCNP's land use history rather than to recompile photographs and redraft maps already accessible in Martin's publication.

In implementing this decision, this land use history makes four substantive original contributions. The first includes the analysis of two important case files that have not been fully reported in previous historical studies of the VCNP. These materials include the case file of the 1893–1899 Baca Location partition suit (*Joel Parker Whitney v. Mariano S. Otero et al.,* Civil Case No. 3632, Records

of the U.S. Territorial and New Mexico District Courts for Bernalillo County, Accession No. 1959–124) in the State Records Center and Archives, Santa Fe. This research also incorporates the extensive records of the 1967 suit *Baca Land and Cattle Company and Dunigan Tool and Supply Company, and George W. Savage, Trustee Under Liquidating Trust Agreement, v. New Mexico Timber, Inc., and T. Gallagher and Co., Inc.* (384 F.2d 701, 10th Circuit Court of Appeals, 8NN-021-89-022 #5648, Federal Records Center #76L0201, boxes 110 and 110A), which had been misfiled under an incorrect number in the National Archives, Rocky Mountain Region, Denver. In combination, these resources allow a more complete review of the land grant's complicated title history than had been possible previously (chapter 4).

Second, the study provides a detailed ethnobotanical inventory of Native American and Hispanic plant uses (chapter 5). Through its finding that Native American and Hispanic communities used, or are likely to have used, 350 of the more than 500 native plant species identified in the VCNP, this study demonstrates that traditional communities have developed a comprehensive knowledge of this tract's environment and the resources that it offers.

Third, the volume develops the thesis that Valles Caldera is a multi-layered ethnographic landscape with which people of culturally diverse communities—Native American, Hispanic, and Anglo-American—maintain meaningful relationships for their own purposes as part of a dynamic cultural process (chapter 9). It considers the prominent landscape elements, including mountains, water, caves, volcanoes, calderas, lava rock, shrines, trails, plants, and minerals, that have helped organize and give meaning to the land use activities of communities traditionally associated with this location. In this way, this study outlines the world view and landscape themes that generally inform and organize how traditional communities associate and interact with the VCNP.

Fourth, the volume offers a comprehensive annotated bibliography (appendix I) for major references cited throughout this study. The entries are critical evaluations of literature sources relevant to issues related directly to the VCNP's land use history, as well as its identification and evaluation as an enduring cultural landscape. Additionally, the annotated bibliography provides a wealth of supplemental background information that supports many of the issues and ideas presented in this volume's chapters.

As a whole, this study presents a cultural-historical framework of VCNP land use that will be useful to land managers and researchers in their efforts to assess the historical ecology of the property. This information is relevant not only to the critical assessment of how past human activities have altered the physical ecology of this seemingly pristine physical environment, it is important for evaluating potential impacts of present and future land use practices on the historical ecology of the VCNP. These practices include very old, culturally significant land uses carried on by the people of traditionally associated communities.

In addition, this volume should provide VCNP administrators and agents the cultural-historical background needed to develop management plans that acknowledge traditional associations with the Preserve. This study also explains how some traditional communities maintain important social and ideational associations with the VCNP that go beyond economic relationships. This background helps demonstrate why traditional land use practices that may not be visible on the ground today warrant respect and consideration in planning. Lastly, this volume offers managers additional background for structuring and acting on consultations with affiliated communities.

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Valles Caldera National Preserve. *Photo by Anastasia Steffen*.

CHAPTER 1.

Valles Caldera National Preserve Land Use History

Kurt F. Anschuetz

Overview

The land use history of the Valles Caldera National Preserve (VCNP) extends back over thousands of years. Few known archaeological properties in the Valles Caldera date to the Paleoindian period (10000/9500–5500 B.C.). These finds include the recent discovery, during ongoing archaeological studies (Dr. Bob Parmeter, personal communication, VCNP, Los Alamos, 2005), of several spear points that associate with soils dated at 11,000 years before present. In addition, there is wide distribution of Jémez obsidian across the northern Southwest from archaeological sites dating to the late Pleistocene and the early Holocene. These patterns document that hunters of now-extinct large game animals, such as mammoth (*Mammuthus jeffersonii*) and a kind of bison (*Bison antiquus*), were the first people to visit the calderas.

A variety of evidence attests that many culturally diverse peoples used the Valles Caldera over the nearly eight millennia subsequent to the Paleoindian period. Archaeologists use artifacts and other durable traces to construct a history of land use by Archaic period hunters and gatherers and pre-Columbian Pueblo Indians, who are among the forebears of the people of Jémez Pueblo and other communities. Researchers cite the hunting of game, the gathering of plant resources, and the collection of obsidian for the manufacture of chipped stone tools as the main reasons for the short-term, warm-season use of the locale. Spanish colonial documents (1540–1821) report the periodic presence of Navajo and Hispanic groups in the Valles Caldera. These accounts characteristically describe the Navajos as impediments to the seasonal use of the property's rich grasslands by the colonists' flocks and herds. Navajo war parties periodically raided Hispanic and Pueblo settlements near the Valles Caldera. The Hispanics and Pueblos answered with punitive military forays.

During the Mexican Period (1821–1846), Hispanic settlement moved closer to the Valles Caldera, although this high altitude setting was not to see year-round habitation for nearly another century. An occasional Anglo-American trapper worked the rivers and ponds of the caldera.

Soldiers and settlers in the U.S. Territorial Period (1846–1912) mention Apaches and Utes in the Valles Caldera. From the 1850s to the 1880s, the U.S. Army fought the nomadic tribes of the Southwest and forced them to settle on reservations. Anglos and Hispanics began large-scale—although seasonal—commercial use of the caldera. The resolution of the Indian problem transformed the Valles Caldera from unclaimed mountainous wilderness to a recognized private land grant. In 1860 the U.S. Congress authorized the heirs of Luis María Cabeza de Baca to select alternative lands, including what became known as the Baca Location No. 1, in exchange for termination of all rights to their grandfather's 1821 grant on the Gallinas River in northeastern New Mexico. The New Mexico Surveyor General completed the survey of the 99,289-acre (40,180-ha) Baca Location No. 1 (Baca Location) in 1876. The land use history of the Valles Caldera became a series of actions by known private individuals and business interests. This pattern continued until the acquisition of the property by the United States from the James Patrick Dunigan companies in 2000. The thousands of years of land use before 1876 left comparatively few lasting traces. In contrast, the exploitation of the Valles Caldera for commercial ranching, timber development, mineral extraction, and geothermal exploration from 1876 to the present has deeply marked the physical appearance and historical ecology of this locality. It also has profoundly shaped public perceptions of the nature of the landscape before and after the arrival of Anglo-Americans in the nineteenth century.

This land use history deals mainly with the economic development of the locality over the 124 years of intense use and development. We provide a regional context in which the caldera's users—from the first legal owners, the Baca heirs, to the last private owners, the James Patrick Dunigan companies—acted during their respective tenures.

To focus the land use history of the Valles Caldera during this period of its most intense use, we examine the technological structure and social organization of people's activities on the lands. Building on these findings, we describe the impacts of their actions on the physical environment. With the help of written documents from the late 1800s onward, especially legal records concerning the disposition or adjudication of the tract's land, timber, and mineral rights, we are also able to consider some of the motivations of key actors in making the decisions that they did.

To make this land use history more comprehensive, we will also examine some of the vernacular (*qua* common, indigenous) uses of the Valles Caldera by neighboring Native American and Hispanic communities. These peoples interacted with this tract, not as wilderness, but as an essential part of their respective communities' landscapes. Use of the written record has limits. There are no documentary records

before European colonization. Written accounts are biased as to the land use activities that are considered worthy of mention, however. Traditional users, the Pueblos in particular, are sensitive about revealing some land use practices. The physical effects of traditional uses have been slight. For all these reasons, the identities of most individual users are unknown. Nevertheless, their intimate relationship with the Valles Caldera survives in the oral traditions and histories of many communities. In some cases, the land use relationships that people established with this place in time immemorial are essential for sustaining the identity of their communities today. This discussion, therefore, also considers these associations.

Study Area

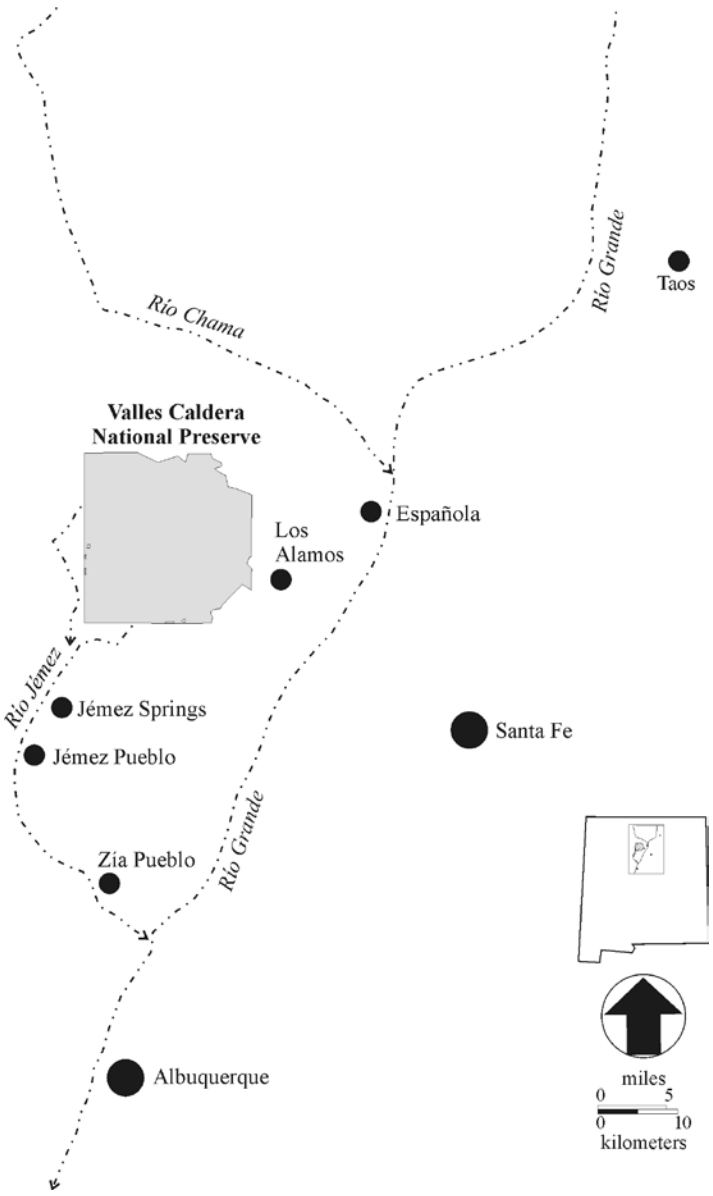
The VCNP is an 88,900-acre (35,560-ha) tract located high in the Jémez Mountains just 5 miles (8 km) west of Los Alamos—the birthplace of the Atomic Age—in north-central New Mexico (fig. 1.1). Acquired in 2000 with the passage of the Valles Caldera Preservation Act by Congress, the property encompasses major portions (89.5%) of the land held in private ownership as the Baca Location since 1860. (Of the other 10,389 acres [4,455 ha] of the original land grant, 5,343 acres [2,137 ha] were transferred to private interests before 2000 and were outside the scope of the congressional act. Santa Clara Pueblo was authorized by the law to buy the remaining 5,046 acres [2,018 ha] at the northeast corner of the Baca Location that are the headwaters of the Santa Clara Creek.) Consequently, the land use history of the VCNP is linked inextricably to the political and social envionment of the old land grant.

The VCNP encompasses most of the 12- to 15-mile wide (19.2- to 24-km wide) bowl-like hollow formed by the collapse of a pair of great volcanic domes following explosive eruptions that date to about 1.6 and 1.2 million years ago. The second volcanic episode, which created the Valles Caldera, is superimposed on the earlier hollow, the Toledo Caldera (see **Martin 2003**:4–6).

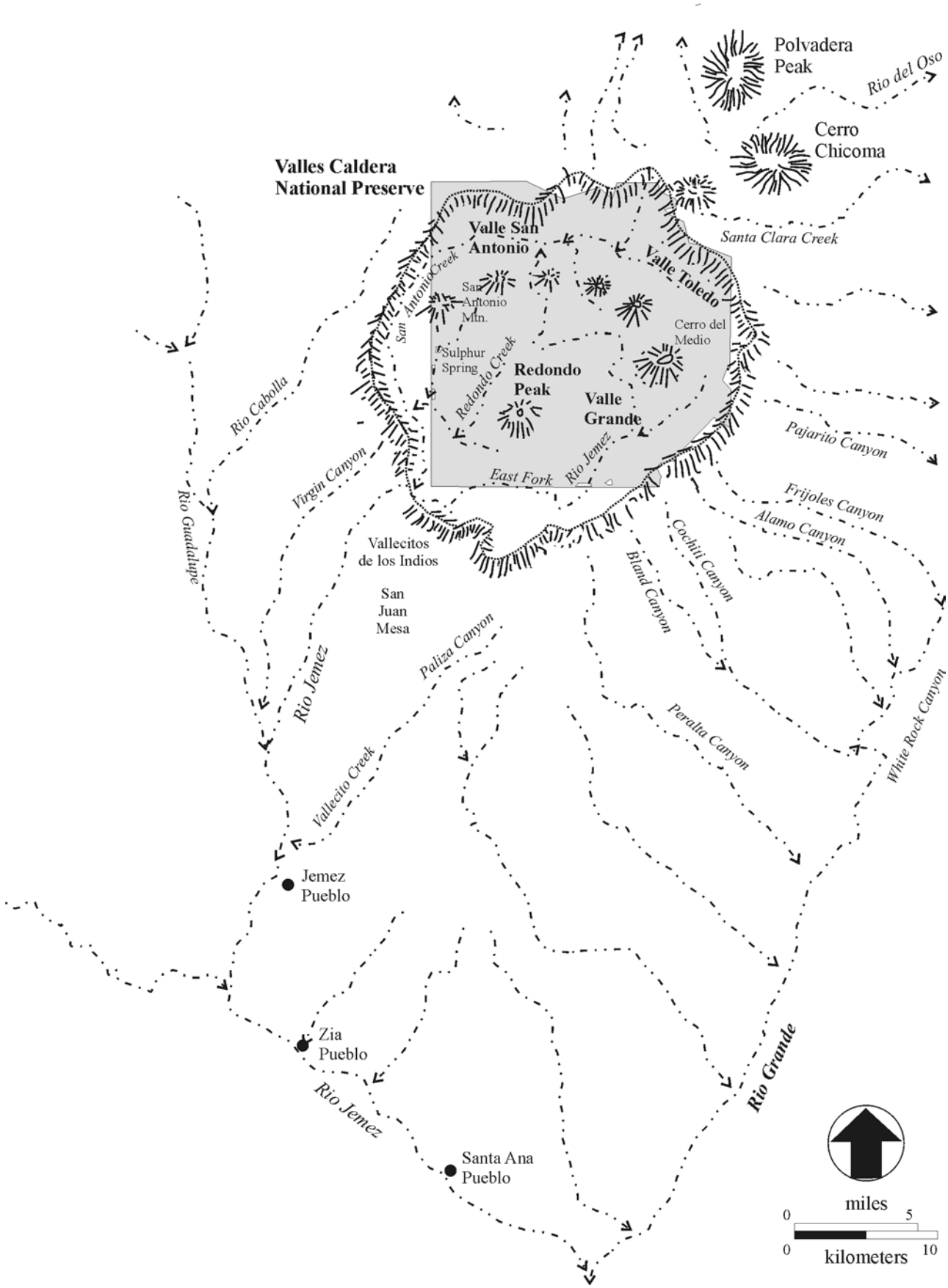
The base elevation of the Valles Caldera exceeds 8,000 feet (2,439 m) and is some 3,000 feet (915 m) below the level of the lava-dome mountains forming the caldera's rim (fig. 1.2). The highest of these summits, most commonly known today by its Spanish name *Cerro Redondo* (Round Hill), rises to an elevation of 11,254 feet (3,431 m) and is one of the highest summits in the Jémez Mountain Range. This peak is also the headwaters of the Río Jémez, which flows past the Pueblos of Jémez, Zía, and Santa Ana and the Hispanic communities of Jémez Springs, San Ysidro, and Bernalillo around the south margin of the Jémez Mountains on its way to the Río Grande (fig. 1.1). The locality is fed by runoff, seeps, and springs, and drained by many streams, including the East Fork Jémez River, Redondo Creek, and San Antonio Creek.

The Valles Caldera is famous for is scenic beauty, geological features, and diversity of flora and fauna. The physical environment ranges from broad open meadows to mountains heavily forested with coniferous trees, creating a unique viewshed unmatched in the Southwest. Besides its calderas and lava-dome peaks, the VCNP's geothermal hot springs and sulfurous gas vents attract attention (**Martin 2003**; **USDA Forest Service 1993**). The great topographic relief of the setting contributes to its ecological diversity, including more than 500 identified plant taxa (Dr. Bob Parmeter, personal communication, VCNP, Los Alamos, 2005). Seventeen Federal- or State-listed endangered or threatened species, including the Jémez Mountains Salamander (*Plethodon neomexicanus*), northern goshawk (*Accipiter gentiles*), peregrine falcon (*Falco peregrinus)*, and bald eagle (*Haliaeetus leucocephalus*, occur in the VCNP (**USDA Forest Service 1993**).

Below elevations of 8,500 feet (2,600 m), plants and animals of the Transition Life Zone predominate (**Bailey 1913**).



1.1—Valles Caldera National Preserve location.



1.2—Valles Caldera National Preserve study area (adapted from **Weslowski 1981**: fig. 10-1).

Major plant species include ponderosa pine (*Pinus ponderosa*), piñon (*Pinus edulis*), juniper (*Juniperus communis* and *Juniperus scopulorum*), mountain mahogany (*Cerocarpus montanus*), serviceberry (*Amelanchier alnifolia*), blue curly grama (*Bouteloua gracilis*), Indian rice grass (*Oryzopsis spp.*), and sand dropseed (*Sporobolus crytandrus*). The Transition Life Zone supports mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), various squirrels (*Sciurus* sp.*, Tamiasciurus* sp*, and Spermophilus* sp.), prairie dog (*Cynomys gunnisoni*), chipmunks (N*eotamias* sp.), raccoon (*Procyon lotor*), black-tailed jackrabbit (*Lepus californicus*), cottontail (*Sylvilagus nuttalli*), woodrat (*Neotoma mexicana*), mice (*Microtus* sp. and *Peromyscus* sp.), weasel (*Mustela frenata* and *Mustela erminea*), beaver (*Castor canadensis*), badger (*Taxidea taxus*), black bear (*Ursus americanus*), and mountain lion (*Puma concolor*). Local birds include grouse (*Dendragapus obscurus*), turkey (*Meleagris gallopavo*), various hawks (*Accipiter* sp.) and owls (*Otus* sp., *Bubo* sp., *Aegolius* sp., *Glaucidium* sp., and *Asio* sp.), robin (*Turdus migratorius), wren (Troglodytes aedon),* woodpeckers (*Picoides* sp. and *Melanerpes* sp.), nighthawk (*Chordiles minor*), hummingbirds (*Selasphorus* sp.), white-throated swift (*Aeronautes saxaialis*), sparrows (*Pooecetes* sp. and *Spizella* sp.), warblers (*Vermivora* sp., *Dendroica* sp.*, and Oporornis* sp.), chickadee (*Parus gambeli*), and golden (*Aquila chrysaetos)* and bald (*Haliaeetus leucocephalus)* eagles.

The Canadian Life Zone rises above the Transition habitat on slopes between 8,500 feet (2,600 m) and 11,000/12,000 feet (3,354/3,659 m) in elevation (**Bailey 1913**). Consequently, this life zone covers the rest of the VCNP. The principal trees are Colorado blue spruce (*Picea pungens*), Engelmann spruce (*Picea engelmannii)*, white fir (*Abies concolor*), Douglas-fir (*Pseudotsuga menziesii*), aspen (*Populus tremuloides*), Rocky mountain maple (*Acer glabrum*), alder (*Alnus* sp.), and currant (*Ribes* sp.). Notable herbaceous plants include cinquefoil (*Potentilla* sp.), columbine (*Aquilegia* sp.), and goldenrod (*Solidago* sp.). Several useful grasses are wheatgrass (*Agropyron* sp.) and fescue (*Festuca* sp.). Elk (*Cervus canadensis*), mule deer, black bear, lynx, weasels, squirrels, chipmunks, and many mice species persist in these higher elevations. This life zone also supports various shrews (*Sorex* sp.). This habitat provides homes for various grouse, woodpeckers, hummingbirds, sparrows, and warblers. Other major bird species include northern goshawk (*Accipiter gentiles*), jay (*Cyanocitta* sp. and *Gymnorhinus* sp.), dark-eyed junco (*Junco hyemalis*), several kinglet species (*Regulus* sp.), and mountain bluebird (*Sialia currucoides*).

To many laypersons, the VCNP appears pristine. With relatively few obtrusive buildings and other infrastructure to clutter the viewshed, the property offers the casual visitor

> *. . . the impression of a large, scenic mountain landscape with little evidence of human presence. This evokes a strong emotional impression derived from the property's atmosphere of solitude and undeveloped character. (**USDA Forest Service 1993:8**)*

Yet this impression overlooks visible reminders of intensive sheep grazing, cattle ranching, timbering, and mineral and geothermal exploration and development on the tract between the late 1800s and the early 1970s. These activities have increased the density and composition of forest cover, shifted the demographic structure of tree populations to a markedly lower mean age, and reduced the frequency and structure of lower canopy grasses and forbes (e.g., see **Allen 1989; USDA Forest Service 1993:15–16**). Nor does this impression acknowledge that the historical ecology of the VCNP includes a human presence that extends back 8,000 years or even longer, possibly to the end of the Pleistocene.

Goals and Methods

At the request of Dr. Carol Raish (Research Social Scientist and Project Coordinator, Rocky Mountain Research Station, USDA Forest Service, Albuquerque, NM), the Río Grande Foundation for Communities and Cultural Landscapes (Río Grande Foundation) made a proposal in the fourth quarter of Fiscal Year 2002 for a land use history of the VCNP. As stipulated in the Joint Venture Agreement between the USDA Forest Service and the Río Grande Foundation (No. 02-JV-11221601-265 [RGF 119]), the purpose of this undertaking was to document the interactions between culturally diverse peoples and this striking physical environment over time.

The study focuses on the cultural-historical environment of the 88,900-acre (35,560-ha) preserve over the past four centuries of Spanish, Mexican, and U.S. governance. The scope of work also includes the preparation of an archaeological review of human use and occupation before the Spanish colonization of the New Mexican territory in 1598. This review establishes the cultural context of traditional Native American land use practices and associations, creates a timeline that identifies changing patterns in the technology and organization of the use of the VCNP, and explains the essential social and cultural contexts of patterns of economic activity extending far back in time.

Accordingly, the study provides a record of the economic, social, and ideational relationships that culturally diverse Native American (e.g., Pueblo, Navajo, Apache, and Ute), Hispanic, and Anglo-American peoples have maintained with the Valles Caldera. The work includes a review and synthesis of available published and unpublished historical, ethnohistorical, and ethnographic literature about the human occupation of the area now contained within the VCNP. The documents include historical maps, texts, letters, diaries, business records, photographs, land and mineral patents, and court testimony. Table 1.1 identifies a list of local and regional archives visited in the course of the study.

In addition to these archival sources, Craig Martin, an historian and ecologist who lives in White Rock, NM, generously shared his research materials. **Martin** (**2003**) also provided copies of his book *Valle Grande: A History of the Baca Location No. 1,* published in late 2003. Although the book was not available until late in our work, it became an

Table 1.1. List of Archival Resources.

University of New Mexico, Albuquerque
- Zimmerman (General) Library
  - Center for Southwest Research, Zimmerman (General) Library
  - Government Publications, Zimmerman (General) Library
  - Spanish Colonial Research Center, Zimmerman (General) Library

State of New Mexico
- Museum of New Mexico, Santa Fe
  - Laboratory of Anthropology
  - Museum of Indian Arts and Culture
  - Museum of New Mexico, Santa Fe
- New Mexico History Library, Santa Fe
- New Mexico State Records Center and Archives, Santa Fe
- Southwest Room, New Mexico State Library, Santa Fe

U.S. Government
- National Archives, Rocky Mountain Region, Denver
- National Park Service Library, Intermountain Support Office, Santa Fe
- Valles Caldera National Preserve, Los Alamos

Other
- Los Alamos Historical Society, Los Alamos

important resource for this study. It identifies additional archival resources worthy of inclusion in this study. It also presents important information about key individuals, including Luis María Cabeza de Baca, his grandsons Francisco Tomás and Tomás Dolores Baca, and entrepreneurs Maríano Sabine Otero, James Greenwood Whitney, and Joel Parker Whitney. Frank Bond and Patrick Dunigan, the owners and developers of the Baca Location during the nineteenth and twentieth centuries, are other key historical figures. Martin's book is the best source for this information about historic persons, since much of it is outside the scope of the present study.

Because **Martin** (**2003**) shared so much information about the economic and social history of the Baca Location, this study should devote greater effort to issues that are outside the scope of Martin's book, such as land title, the changing intensity of industrial timbering, and patterns of vernacular land use by neighboring traditional Native American and Hispanic communities.

The quality and quantity of available documentary information made it necessary for this land use history to emphasize the material aspects of land use, such as hunting, gathering, mineral collecting, ranching, timbering, and geothermal exploration. Two important case files that have not previously been analyzed assisted our work. The discovery of the case file of the 1893–1899 Baca Location partition suit (***Whitney v. Otero***) in the State Records Center and Archives, Santa Fe, NM, as well as the retrieval of the extensive records of *Baca Land and Cattle Co. v. NM Timber, Inc*. (***Baca Co. v. NM Timber, Inc.* 1967**) allowed more comprehensive review of the land grant's complicated title history than had been possible previously. **The *Baca Co. v. NM Timber, Inc.*, (1967)** records had been misfiled under an incorrect number in the National Archives, Rocky Mountain Region, Denver, CO.

Throughout this study the central issue is the nature and intensity of human impacts on the physical environment. The study attempts to determine the technological structure of land use activities, the social organization framing them, the identities of associated communities and major actors over the VCNP's human history, and the timelines of diverse peoples' relationships with the lands now within the VCNP. With this presentation of a cultural-historical framework of VCNP land use, land managers and researchers should be better prepared to assess the historical ecology of the property. This information is relevant not only to the critical assessment of how past human activities have altered the physical ecology, including the biological structure of plant and animal communities in this seemingly pristine physical environment, but is useful as well for evaluating potential impacts of present and future land use practices on the historical ecology of the Preserve. These practices include old, culturally significant vernacular land uses carried on by the people of traditionally associated communities.

The Río Grande Foundation adopted a cultural landscape approach for this study. We have examined how communities created economic, social, and ideational associations with the VCNP. Such cultural knowledge is relevant because it documents how traditionally associated peoples use the VCNP to sustain the economy and important social and cultural traditions within their respective communities.

Central to this approach is the premise that communities interweave meaning, space, and time to form the fabric of their landscapes. With the passage of time, the intimacy of experience, and the sharing of memories, a community's geographical space becomes a place of valued meaning. As each generation lives its life and bestows meaning on its surroundings, landscapes come to represent both mirrors and memories of each community's living history. Moreover, the landscape is a powerful medium through which land-based communities create and sustain their cultural identities.

Because this project depends mainly on the existing documentary record, references to any particular group's social and ideational relationships with the VCNP are usually sparse. In

addition, the cultural meaning of reported observations cannot be comprehensively understood without supporting systematic ethnographic study based on interactive consultation and dialogue. A program of ethnographic investigation, however, is outside the scope of the present research. The Río Grande Foundation did not consult with affiliated traditional communities, families, or business enterprises. Such a phase of study remains to be done.

This study should give VCNP administrators and agents the cultural-historical background needed to develop management plans that acknowledge traditional associations with the Preserve. This study also explains how some traditional communities maintain important social and ideational associations with the VCNP that go beyond economic relationships. This background helps demonstrate why traditional land use practices that may not be visible on the ground today warrant respect and consideration in planning. The study is also intended to give managers additional background for structuring and acting on consultations with affiliated communities.

The authors of this study are Dr. Kurt F. Anschuetz and Thomas Merlan. Both investigators have experience in conducting research into the land use histories of traditional and historical community groups in northern New Mexico. Thomas Merlan is a consulting historian, and familiar with the major documentary archives in the Southwest. Dr. Anschuetz is an archaeologist and anthropologist, and in his role as Program Director, Río Grande Foundation, he further served as the project's Principal Investigator.

Preliminary Identification of Associated Traditional Native American Communities

In the course of this study, Anschuetz and Merlan encountered documentary evidence identifying a large number of culturally diverse, traditional Native American communities that possess either a demonstrable or a probable cultural-historical relationship with the locality. The association of these communities with the VCNP is often neither readily visible archaeologically nor reported outside specialized ethnographic or ethnohistorical accounts.

In addition to the communities mentioned in documentary accounts as possessing direct or indirect associations with the Valles Caldera, there are several other Native American groups that likely maintain a relationship with the VCNP. We have listed these communities at the end of this discussion and stated the basis on which we infer their association with the Valles Caldera.

The following account neither states nor evaluates any community's specific claim of traditional association. It is intended to introduce each of these Native American communities through a brief summary of relevant documentary evidence.

In the early twentieth century, U.S. Surveyor William Boone Douglass recognized (and looted) the shrine on top of Redondo Peak during his restorative cadastral survey of the Baca Location's boundaries. In a subsequent publication of his observations of the shrine, **Douglass** (**1917**:358) reports that the Río Grande Pueblos of Jémez, Cochití, Santo Domingo, Zía, Sandia, San Ildefonso, San Juan, and Santa Clara make ritual pilgrimages to Redondo Peak. His account, therefore, stands as the first substantive statement of the traditional association of Native American peoples with the lands contained within the VCNP.

Decades later, Florence Hawley Ellis restated Douglass' list of associated communities. She added the Río Grande Pueblos of Santa Ana, San Felipe, Nambé, Pojoaque, and Tesuque to the list of Native American communities that make pilgrimages to the shrine on top of Redondo Peak (**Ellis 1956, 1974**:157). She further implied that the Navajo visited the shrines on its summit.

Relying heavily on materials generated by land claims litigated by the **Indian Claims Commission** (ICC) (**1974**) in the late 1940s and early 1950s, **Nancy J. Akins** (**1993**) addresses traditional use areas of aboriginal groups in New Mexico. She states that for several reasons, "The boundaries identified in the ICC cases are not always equivalent to an aboriginal or traditional use area" (**Akins 1993**:4). The Federal statute required Native American land claims to be based on exclusive use and occupancy of a given area at the time the United States assumed political sovereignty over the Southwest in 1848. Given the inherent limitations of information compiled for land claims cases, Akins considers only shrines and ancestral villages as traditional cultural properties associated with a community's aboriginal use areas.

In this overview, **Akins** (**1993**) discusses traditional Native American associations across the State of New Mexico. She identifies the Baca Location as entirely within the aboriginal lands of Jémez Pueblo and lists shrines in and near the Baca Location important to the Pueblo (including *Wa-ve-ma* [a.k.a. Redondo Peak]) (**Akins 1993**:62–69).

Inspection of **Akins**' (**1993**) compiled map information reveals that the following Indian communities included the Valles Caldera locality within their far-reaching aboriginal territories: Jicarilla Apache, (**1993**:70–77), Navajo (**1993**:107–113), San Ildefonso Pueblo (**1993**:126–131), San Juan Pueblo (**1993**: 132–138), Santa Ana Pueblo (**1993**:139–141), Santa Clara Pueblo (**1993**:145–148), Santo Domingo Pueblo (**1993**: 150–153), Tesuque Pueblo (**1993**:163–165), Ute (**1993**:168–174), and Zía Pueblo (**1993**:181–186.

David M. Brugge (1983) offers insights into the association of the Navajo with the VCNP in his excellent summary of early Navajo history. His illustration "Approximate Navajo settlement areas" (**Brugge 1983**:fig. 1) shows the Valles Caldera portion of the Jémez Mountains to the east of the core of the settled Navajo territory. This observation does not necessarily preclude temporary Navajo use of the VCNP, however.

In fact, numerous documentary accounts place the Navajo in the VCNP in the eighteenth and nineteenth centuries as interlopers who passed through the locality to raid Pueblo and

Hispanic settlements along the flanks of the Jémez Mountains (e.g., Bishop Crespo, in **Adams 1954**:98; **McNitt 1972**).

Frederick W. Sleight (**1950**) follows **Washington Matthews** (**1897**) and places the Navajo within the boundaries of the VCNP for purposes other than raiding. In his comprehensive review of 34 contradictory documentary sources, and his supplementary original fieldwork to determine the geographic locations of the principal four Navajo mountains of direction, Sleight concludes that Pelado Peak is *Sisnádjini*, the Holy Mountain of the East. Regardless of the debate over the geographic identification of *Sisnádjini*, **Douglass** (**1917**:344–357) reports that Navajo traveling west of the Jémez Mountains visited the shrine on the top of Cerro Chicoma just outside the northeast corner of the Baca Location. Based on this, it is likely that Navajos would have made ritual pilgrimages to the top of Redondo Peak.

Although the evidence compiled by the **ICC** (**1974**; see also **Akins 1993**) places the Jicarilla Apache and the Ute in the Valles Caldera, the technological structure and social organization of their occupations of this locality are little known. Although she does not discuss the Jicarilla occupation of the Valles Caldera specifically, **Veronica E. Tiller** (**1992**:15). illustrates the location of an undefined "permanent site" west of Los Alamos in the vicinity of the VCNP in a map titled "Aboriginal Sites and Early Settlements" **Donald Callaway and others** (**1986**) identify the Muache and Capote as the principal Ute bands that traveled seasonally into New Mexico's mountains, with the Muache reaching as far south as Santa Fe. Their map showing the geographic expanse of early nineteenth-century Ute territory, however, does not show the full extent of the people's occupation of New Mexico (**Callaway et al. 1986**:fig. 1). **James Jefferson and others** (**1972**:xi), **Charles S. Marsh** (**1982**:3, 18–19), and **Frances Leon Swadesh** (**1974**:47) similarly place Ute bands in north-central New Mexico.

The Hopi Tribe of northeastern Arizona currently consults with Federal agencies about the protection and disposition of cultural resources on lands east of the Jémez Mountains (e.g., Leigh J. Kuwanwisiwma, Director, Cultural Preservation Office, letter to Gilbert Vigil, Forest Supervisor, Carson National Forest, USDA Forest Service, March 20, 2000). The Hopi Tribe's affiliations with these lands are based, in part, on oral traditions that trace clan movements far back in time. In addition, some of the Tewa-Hopi clan leaders from the Pueblo of Hano on the Hopi Mesas variously trace their emigration to the Hopi Buttes from the old village of Tsawari (LA36)[1.1] in the Santa Cruz Valley during late pre-Columbian Pueblo times (Yava 1978:27–28, 44–45) and from the Abiquiu area at the time of the Pueblo Revolt (Poling-Kempes 1997:19–20).

Anthropologists have documented an ethnogeography for the Pueblo of Zuni of west-central New Mexico. This account includes at least four sites in or near the Valles Caldera (**Ferguson and Hart 1985**:map 15—Traditional Zuni Hunting Area [site 31], map 16—Traditional Zuni Plant Collection Area [sites 31 and 93], and map 18—Traditional Zuni Religious Use Area [sites 31, 48, 93, and 94]). There are Zuni sites on the east side of the Jémez Mountains in proximity to the Río Grande Valley as well.

Although this is not documented directly in available literature, it is likely that that the Río Grande Pueblos of Taos, Picuris, and Isleta recognized the Valles Caldera as an important place on their landscape. The Jémez Mountains are visible from the immediate vicinity of each of these Pueblos. In addition, Taos Pueblo traditionally makes pilgrimages to Cerro Chicoma next to the Baca Location (**Douglass 1917**:344–357). We found no information either directly or indirectly associating the Pueblos of Ácoma and Laguna with the VCNP. Given the proximity of these communities to the Río Grande, the observation that their expansive aboriginal homes (**ICC 1974**) extend toward the Jémez Mountains, and their close cultural-historical relationships with Zía and the other southern Río Grande Pueblos, it seems likely that future ethnographic consultation would establish their affiliation with the Valles Caldera.[1.1]

Report Organization

In addition to this introduction, this report includes eight chapters and three appendices.

Chapter 2 presents an archaeological reconstruction of lower Río Grande Valley culture history from time immemorial, beginning with the Paleoindian period in the late Pleistocene and continuing until A.D. 1600 following the establishment of the Spanish colony of New Mexico. The discussion recounts changing patterns of hunting, gathering, and mineral collection in the VCNP. This summary of surviving archaeological traces provides a cultural-historical framework that establishes the peripheral place that the VCNP has always occupied with respect to major centers of residential settlement and areas of intensive economic land use.

Chapter 3 gives a synopsis of lower Río Grande Valley history since the mid-sixteenth-century Spanish *entradas* into New Mexico. This discussion traces broad patterns of documentary history having to do with the changing intensity of land use in the VCNP by Spanish Colonists, Hispanics, and Anglo-Americans over time. This sketch illustrates how the Valles Caldera remained peripheral to major residential centers, while its cycle of intensive economic land use was dependent on greatly expanded regional population levels.

Chapter 4 offers a summary of Baca Location history. It traces the genesis of the Baca Land Grant from its

[1.1] "LA36" is the identification number assigned to the archaeological remnants of the village of Tsawari. The prefix LA refers to the Laboratory of Anthropology, which is part of the Museum of New Mexico, who created this master numbering system in the 1920s for the inventory of every archaeological site documented within the State of New Mexico. Today, the information files for all known archaeological sites within the state are maintained at the Laboratory of Anthropology in Santa Fe by the Archaeological Records Management Section of the Historic Preservation Division in cooperation with the Museum of New Mexico.

beginnings as a grant to Luis María Cabeza de Baca and his family in eastern New Mexico in 1821. The narrative follows the Congressional action in 1860 that substituted five equal-sized alternative tracts or locations (Baca Locations No. 1, 2, 3, 4, and 5) for the original grant. This chapter next explains the economic and political machinations of the 1893–1899 partition suit, which resulted in the transfer of title to the Baca Location No. 1 to individuals unrelated to the Baca family. From this point, the discussion follows the sale of the property to the Redondo Development Company, explaining how Redondo leveraged the assets of the Location, separating the tract's timber and mineral rights from its land rights in 1918. The discussion then generally reviews the use of the property by various ranching interests, including the Bond family, the King family, James Patrick Dunigan, and a succession of logging businesses. This overview, in turn, provides background for examinations of the VCNP's ranching (chapter 6) and timbering (chapter 7) histories.

Chapter 5 reviews the evidence of plant gathering, game hunting, mineral collecting, and agriculture within the Valles Caldera. The discussion focuses mainly on vernacular Native American and Hispanic practices. It recounts a short-lived and ill-fated commercial hay-cutting venture in the mid-nineteenth century. The narrative also considers Anglo-American hunting and trapping as business enterprises and reports brief episodes of agricultural use. Nevertheless, this chapter emphasizes the ways in which the area's traditional land-based, Native American and Hispanic communities used the VCNP's rich botanical assemblage for food, medicines, and other economic or recreational purposes. (Given its cultural sensitivity, in-depth examination of ritual plant use is inappropriate and is not included.) The study finds that of the more than 500 native plant species identified in the VCNP, 350 taxa were used, or are likely to have been used, by Native American and Hispanic communities that maintain associations with this place.

Chapter 6 addresses the VCNP's ranching history since Spanish colonization. The narrative introduces the *partido* system that organized the sheep herding industry in New Mexico from the early 1700s to World War II and examines the various factors that kept herding and ranching in the Valles Caldera at a comparatively low level until the late nineteenth century. The discussion then traces the development and use of the property's rangeland by the Bonds (1918-1963) and by the tract's last private owners, James Patrick Dunigan and his estate (1963-2000).

Chapter 7 gives the history of industrial timbering in the VCNP. It examines why commercial logging operations did not enter the property until 1935, although Redondo Development Company and other business interests had actively traded its timber rights since 1918. In addition to the economic environment that conditioned timbering, the narrative summarizes the changing technological structure and social organization of timbering over time. The discussion highlights how the public concerns over the growing physical and ecological impacts on the Valles Caldera in the late 1950s, and the acquisition of the property by James Patrick Dunigan, were among the reasons for the most intensive and destructive logging cycle. The confrontation between Dunigan, a developer and rancher with environmental interests, and T. P. Gallagher, Jr., the long-term owner of New Mexico Timber, Inc., who tried to maximize his logging profits under terms of his purchase of the Baca Location's timber rights, gives invaluable insights into competing land use values within a broader social context.

Chapter 8 reviews the history of mining and geothermal exploration in the Valles Caldera. The hope of striking gold and silver was a motive in Spanish colonization of New Mexico. This chapter focuses on Maríano Sabine Otero's short-lived sulphur mining operations at the beginning of the 1900s, and the interest in geothermal development in the VCNP that is now more than four decades old.

Chapter 9 helps develop the thesis that Valles Caldera is a multi-layered ethnographic landscape with which people of culturally diverse communities—Native American, Hispanic, and Anglo-American—maintain meaningful relationships for their own purposes as part of a dynamic cultural process. The discussion should lead to a fuller understanding of the social and ideational contexts underlying the traditional land use activities in the VCNP that predominated before 1860, but have persisted since then without attracting public attention. The narrative outlines the world view and landscape themes that generally inform and organize how traditional communities associate and interact with the VCNP. The discussion then considers several prominent landscape elements, including mountains, water, caves, volcanoes, calderas, lava rock, shrines, trails, plants, and minerals, that have helped organize and give meaning to the land use activities of communities traditionally associated with this location.

Following a concluding discussion (chapter 10), appendix I consists of an annotated bibliography of the major references used in writing this report. Entries often include materials not directly cited in the text. Instead, we offer citations and observations that provide supplemental contexts for many issues that we identify in the main body of the report.

Appendix II introduces an anthropological landscape approach. It builds from the premise that landscape is the physical and conceptual interaction of nature and culture, rather than the sum of material modifications. The discussion should help cultural resource managers to understand how people of traditional and historical communities in the region construct and sustain close associations with the VCNP. The narrative helps explain how a community's relationships with particular places and landscape features may embody traditions important to communities for sustaining their cultural identities.

Appendix III contributes to the understanding of landscape as a dynamic cultural process. The premise of this discussion is that people actively contribute to conditions that warrant the restructuring and reorganization of their interactions with their physical settings, with other members of their communities, and with residents of other communities. Land and cultural resource managers may find this section useful in considering how people of traditional and historical communities construct and sustain affiliations with the VCNP. The structure and organization of a group's interactions with a place might change, yet continue a traditional relationship.

Formatting Note

Citations identified in **bold font** in chapter text identify reference materials included in the annotated bibliography (appendix I).

Indexing note

Appendix I, the annotated bibliography, is not fully indexed. The index lists only the name of the author—or, in case of multiple authors, the senior author—of the annotated entries. Upon finding topics of interest in the text of the main body of the volume, the reader can easily identify which bibliographic entries that they might also wish to examine through the use of the bold font formatting convention.

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CHAPTER 2.

A Sketch of the Cultural-Historical Environment—Part 1: The Pre-Columbian Past

Kurt F. Anschuetz

Introduction

This chapter examines the scope and structure of current archaeological interpretations of the pre-Columbian Native American occupation and use of the Valles Caldera National Preserve (VCNP). The discussion provides useful cultural-historical background for the presentation and evaluation of the structure and organization of Native American land use history, as it is known through documentary sources, in subsequent chapters of this volume. It demonstrates that aboriginal communities have sustained important relationships with the Valles Caldera over millennia even though none ever established year-round residential settlements in this locality. Instead, the Valles Caldera represents an edge for residential centers located elsewhere (see chapter 9 for discussion of the essential relationship between edge and center in Native American understandings and occupations of their aboriginal landscapes.)

The primary emphasis of this study is cultural-historical, not archaeological. Consequently, the comprehensive description and assessment of the VCNP's archaeological site and artifact assemblages is outside the scope of the present research. Other investigators (e.g., Steffen 2003; Steffen and Skinner 2002) have reported the archaeology of the VCNP. Nevertheless, this chapter provides background useful to the subsequent identification, interpretation, and evaluation of potentially significant cultural resources in the Preserve.

We rely upon a variety of archaeological reports. We recognize that the descendents of the Indian peoples who occupied the VCNP have often carefully recorded the histories of their forebears in oral accounts. Although some parts of these verbal texts exist in published form (see chapter 9), most of these narratives are not generally available to outsiders today. For this reason, we use the term *pre-Columbian history* to denote the part of our discussion of the human history of the VCNP that depends solely upon the description, assessment, and interpretation of the material traces composing the archaeological record that survives today.

Paleoindian Occupation (10000/9500–5500 B.C.)

Paleoindian culture represents the earliest documented evidence of human occupation in the North American Southwest. Archaeologists typically characterize Paleoindian cultural adaptations as emphasizing the hunting of now extinct species of mammoth (*Mammuthus jeffersonii*), bison (*Bison antiquus*), and several other large-bodied late Pleistocene animals, such as horses, tapirs, and camels. Assuming that Paleoindians relied principally on big game hunting for their livelihood, researchers commonly infer that these people were nomadic. Although many investigators believe that native plants and small game animals were important supplemental resources for the Paleoindians, few of these resources survive in the archaeological record (see Anschuetz 1996; Anschuetz et al. 1997).

Difficulties resulting from small sample sizes and poor archaeological preservation notwithstanding, archaeologists have proposed three major developmental phases for the Paleoindian period in the Southwest on the basis of patterned changes in projectile point form over time. The earliest is the Clovis phase, which researchers have variously dated between 10000/9500 and 9000 B.C. (cf. Agogino 1968; Irwin-Williams and Haynes 1970). Researchers consider large lanceolate spear points with short flute scars and concave bases as characteristic markers of this period.

The distribution of sites across diverse topographic settings and the occurrence of moist environmental conditions suggest that Clovis peoples sought access to a variety of plant resources, game animals, and sources of surface water. Although available archaeological data are not conclusive, it is tempting to characterize Clovis populations as generalized hunters and gatherers rather than as specialized big game hunters (Cordell 1984:145, 148).

The succeeding stage of Paleoindian cultural development is the Folsom phase. Researchers date the Folsom phase from approximately 9000 to 8000 B.C. (Agogino 1968; Judge

1973). Some investigators regard the Folsom phase as an evolutionary refinement of the preceding Clovis phase with the onset of a long-term trend of increasingly dry conditions (e.g., Irwin-Williams 1979:31). This generalized climatic change, known to investigators as the Anathermal (ca. 8600 to 5500 B.C.) (Antevs 1955), persisted through the end of Paleoindian times and saw parkland and boreal forest species dominate across the southern Great Plains (Wendorf 1970, 1975). Under such ecological conditions, it is unlikely that Paleoindian hunters in the northern Southwest had access to great herds of large-bodied game animals (Anschuetz 1996; Anschuetz et al. 1997).

Folsom spear points, which are smaller than their Clovis predecessors, are another kind of distinctively flaked lanceolate implements. Even though they are shorter than their Clovis predecessors, they have proportionately longer flutes. These tools are most commonly associated with *Bison antiquus* remains; mammoth and most other large-bodied Pleistocene mammals were already extinct by this time. Excavated sites have yielded remains of antelopes, deer, elk, wolves, rabbits, other small mammals, birds, and reptiles (Cordell 1979a:21). Some researchers suggest that Folsom populations relied heavily on specialized hunting practices and a highly nomadic lifestyle for their living (Broilo 1971; Judge 1973). These investigators base their argument on the presence of *Bison antiquus*, which likely were solitary or small-herd animals, and the development of a stone tool technology dependent on the careful use and conservation of high quality raw material, including the obsidian that occurs abundantly in and around the VCNP. Cordell (1984:148) urges caution in applying this interpretation, however. Although available archaeological data by no means discount interpretations of specialized hunting practices and high mobility, excavated site assemblages indicate that Folsom phase peoples relied on a variety of plant and animal resources. Not all of the stone tools found at Folsom sites are as highly specialized as the unique spear point.

The Plano phase (ca. 8300 to 6000 B.C.) marks the end of the Paleoindian period of human occupation across North America. This time encompasses a number of distinct material culture complexes, including the Agate Basin (8300 to 8000 B.C.) and Cody (6600 to 6000 B.C.) complexes (Irwin-Williams and Haynes 1970). Late Plano phase hunter-gatherers apparently enjoyed a brief return to greater effective moisture, and the spatial distribution of Cody complex materials is wider than that of the earlier Agate Basin complex (Irwin-Williams 1979). Given kill sites with an average of nearly 130 smaller-bodied late Pleistocene bison (*Bison occidentalis*) per location (Cordell 1979a:21), many researchers continue to describe Plano phase Paleoindian populations as highly specialized big game hunters. Nonetheless, the sustained development of increasingly generalized projectile points from mid to late Paleoindian times implies that these human populations adopted increasingly diverse subsistence strategies, including a reliance on a wide range of plant and animal foods (Anschuetz 1996; Anschuetz et al. 1997).

At the present time, no known archaeological properties in either the VCNP or the upper Río Jémez Valley clearly date to the Paleoindian period. A small number of obsidian artifacts collected during archaeological study in the Redondo Peak Area have hydration rinds sufficiently thick to indicate raw material breakage during Paleoindian times (Russell 1981). In addition, archaeologists have recovered several spear points associated with soils dated at 11,000 ybp during studies now ongoing at the VCNP (Dr. Bob Parmeter, personal communication, VCNP, Los Alamos, 2005).

Recovery of artifacts diagnostic of Paleoindian manufacture elsewhere in the northern Río Grande region shows that these early hunter and gatherers visited the Jémez Mountains. Archaeologists documented a Clovis phase camp (LA66891)[2.1] at an elevation of 8,200 ft (2,240 m) on Cañones Mesa northeast of the VCNP (Acklen 1993; Acklen et al. 1991; Evaskovich et al. 1997a). These researchers also located a second lithic scatter with Paleoindian artifacts but were unable to confirm the presence of an intact early occupation. Steen (1977, 1982) found a small number of isolated Paleoindian projectile points on mesatops in the nearby Pajarito Plateau district.

Archaeologists working at Paleoindian sites in central New Mexico and west Texas have recovered artifacts made of obsidian that outcrops in the Jémez Mountains (**Winter 1983**:105; see also Glascock et al. 1999:861). Because Jémez obsidian nodules occur in the alluvial gravel deposits along the northern Río Grande Valley and the tributary streams that originate in the Jémez Mountains, the central New Mexico and west Texas obsidian finds do not necessarily represent the products of Paleoindian expeditions to the Valles Caldera or its environ.

Archaic Occupation (5500 B.C.– A.D. 600)

Researchers date the Archaic period in the northern Southwest between ca. 5500 B.C. and A.D. 600. Hunting appears to have persisted as a primary economic concern under essentially modern faunal and vegetative conditions during the early Archaic (Judge 1982:49). The ubiquity of grinding implements and roasting ovens at late Archaic base camps sites suggests that over time the people became increasingly dependent on hard-shelled grass seeds (e.g., Irwin-Williams 1973; Reher and Witter 1977; see also Cleland 1966:42–45).

Irwin-Williams (1979:35) argues that the five-century-long break between clearly dated Paleoindian and Archaic period cultural assemblages in the region indicates the withdrawal of Plains-based big game hunters from the northern Southwest in response to the onset of the Altithermal (ca. 5000 to 3000 B.C.) (Antevs 1955), a time of decreased moisture and greater environmental desiccation. She suggests that the appearance of Archaic period hunter and gatherer cultural assemblages in the northern Southwest represents the influx of new populations and that there is no evident connection between populations representing these two adaptations

(Irwin-Williams 1973, 1979). Other researchers (Cordell 1979a; Honea 1969; Judge 1982; Stuart and Gauthier 1981) disagree with this interpretation, however. They reason that the occupation hiatus is more apparent than real. Moreover, as summarized by Judge (1982:48–49), these investigators view Archaic period cultural traditions as an indigenous outgrowth from the preceding Paleoindian cultural historical sequence.

Abel E. B. Renaud (1942) was the first researcher working in the northern Río Grande to provide a discussion of Archaic period cultural materials, which he designated as a distinctive Río Grande Culture complex. The diagnostic projectile point forms, which Renaud describes, resemble those of the Oshara Tradition sequence subsequently defined for the Arroyo Cuervo locality southwest of the VCNP (Irwin-Williams 1973). Because Irwin-Williams' cultural historical framework has received wide acceptance, researchers working in the northern Río Grande over the past two decades have classified projectile point forms encountered during their surveys and excavations within the Oshara Tradition typological sequence. Nonetheless, the Cochise Tradition (Sayles and Antevs 1941), which is traditionally conceptualized as occurring south and west of the Oshara Tradition area, seems to truncate the Oshara Tradition in the Galisteo Basin to the east of the Valles Caldera (Lang 1977). The Cochise Tradition also appears to merge in the Redondo Valley area of the VCNP (Baker and Winter 1981:v).

Irwin-Williams (1973, 1979) divides the Archaic period into developmental phases in her definition of the Oshara Tradition: Jay (5500–4800 B.C.), Bajada (4800–3200 B.C.), San Jose (3200–1800 B.C.), Armijo (1800–800 B.C.), En Medio (800 B.C.–A.D. 400), and Trujillo (A.D. 400–600). Because Cochise Tradition cultural materials "intrude" into the Jémez Mountains as well as the Galisteo Basin, many of these narrow temporal definitions of Irwin-Williams' cultural historical construct might not be appropriate. Moreover, the archaeological record of the VCNP might eventually offer information useful to settling this important question about Archaic cultural affinities in the northern Río Grande.

Archaic population levels apparently were relatively stable during the Jay and Bajada phases (Irwin-Williams 1973, 1979). Researchers suggest that these peoples lived in nuclear or extended groups at a series of short-term camps in the lower elevations, such as those of the San Juan Basin west of the Jémez Mountains, throughout most of the year. Hunting camps and obsidian quarry sites, however, occur in the Jémez Mountains. Yet early Archaic period hunter and gatherer use of this locality was likely brief and sporadic, and there exists little direct evidence for the significant seasonal occupation of the Valles Caldera area before 2000 B.C. (Elliott 1991a:13).

The subsequent San Jose phase saw increased regional population levels. This development apparently coincided with a period of increased effective moisture. Corn horticulture and a residential pattern of seasonal ingathering and dispersal of family groups followed during the drier Armijo phase (Irwin-Williams 1973, 1979).

A direct radiocarbon date for maize kernels recovered from the Jémez Cave demonstrates that Archaic people occupied camps in the upper Río Jémez Valley by the late Armijo phase (Ford 1981; also, see Alexander and Reiter 1935; Ford 1975). In addition, Baker and Winter (1981), during their study of the proposed Baca Geothermal Project area, documented several sites that are roughly contemporaneous with the Armijo phase along Redondo Creek in the VCNP. Artifacts indicate that obsidian quarrying and the manufacture of bifaces were predominant activities. Overall, the investigators describe site use as light. Although direct evidence is lacking, it seems probable that hunting and plant collecting also occurred.

Paleoclimatic data indicate that cool, dry conditions and long winters characterized the late Archaic (Gillispie 1985; Irwin-Williams 1973; Schoenwetter and Dittert 1968). Significantly higher regional population densities also contributed to the adoption of a more sedentary lifestyle in which corn horticulture became increasingly important, even while the economy continued to be based on hunting and gathering.

By far the most intensive uses of the Jémez Mountains, judging from the findings of archaeological studies in the Redondo Creek Valley (Baker 1981; Baker and Winter 1981; **Winter 1983**:94) and along Public Service Company of New Mexico's proposed Ojo Line Extension (OLE) powerline rights-of-way (Acklen 1993), occurred between about 600 B.C. and A.D. 400. Still, these high-altitude sites represent hunting camps, as indicated by high frequencies of bifacially flaked obsidian knives and spear and dart points. In addition, the abundance of waste flakes indicating the manufacture of these tools suggests that the late Archaic hunters made knives and projectile points for export to other places in the region (Anschuetz et al. 1997:92; see also Glascock et al. 1999).

Jémez Cave in the nearby upper Río Jémez Valley offers additional insights. The abundant evidence of obsidian and wood tool manufacture at the cave's margin contrasts markedly with the recovery of diverse plant remains, along with the evidence of plant processing, such as corn grinding, other food preparation, sandal making and textile production, in the grotto's center. While the stone and wood tool manufacturing area likely represents the focus of men's activities, the cave's central zone probably saw use primarily by women (Ford 1975:21). Based on his preliminary analysis of collections and the available excavation notes, Ford concludes, "Jemez Cave was seasonally occupied, probably in the spring and fall for the planting and harvesting of corn and pumpkins" (1975:21). Recovery of broad leaf yucca fruit fragments and seeds, acorns and piñon nuts, all of which ripen in the fall, supports Ford's interpretations of the cave's use during the fall (Anschuetz 1996).

Pueblo Occupation (A.D. 600–1600)

Emergence of adaptations that are qualitatively more Pueblo Indian than Archaic in the northern Río Grande occurred at approximately A.D. 600 (Wendorf 1954; Wendorf and Reed 1955). This date marks the culmination of the sometimes gradual, sometimes punctuated, transition from a

subsistence economy based on the gathering and hunting of a broad spectrum of plant and animal resources to one increasingly focused on agriculture (Anschuetz 1996; Anschuetz et al. 1997). Although a wide variety of native plants and animals continued to be critically important in Pueblo Indian economies, over time they were more limited to use as supplements to agricultural staples. As this shift occurred, group mobility was reduced further and residences increasingly were occupied on a semiannual, if not on a year-round, basis. The introduction of pottery and arrow points are diagnostic markers of the beginning of Pueblo adaptations.

Wendorf (1954) divides the Pueblo Indian cultural sequence during prehistory into three periods: Developmental, Coalition, and Classic (see also Wendorf and Reed 1955). He defines each period by notable shifts in architectural and/or pottery assemblages.

Archaeological evidence of the Pueblo occupation of the northern Jémez Mountains and their neighboring locales does not follow the regional trend of Pueblo adaptations, being characterized by a greater dependence on agriculture and pottery. The discovery of arrow points on aceramic sites in the Jémez Mountains and in neighboring parts of the northern Río Grande Valley show that Pueblo people made short-term forays into areas of higher elevation for hunting and, presumably, gathering (Bertram et al. 1989; Earls et al. 1989; Lord and Cella 1986; see also Schaafsma 1976). Even where early Pueblo period (ca. A.D. 800) pitstructures exist, such as the Abiquiú Reservoir area northeast of the VCNP, ceramics seldom occur in association (Anschuetz et al. 1997:94). Such observations indicate that Archaic-like hunting and gathering adaptations persisted later in north-central New Mexico than commonly recognized by archaeologists.

Developmental Period (A.D. 600–1200)

The early part of the Developmental period in the northern Río Grande dates between A.D. 600 and 900. Archaeological sites dating to the seventh century are rare throughout the region, and known properties tend to be small. Sites dating to the eighth and ninth centuries are more numerous, although they are mainly remnants of limited activity work sites and small settlements (Wendorf and Reed 1955).

Most known early Developmental period sites are in the Albuquerque and Santa Fe districts (Cordell 1979a), although a few notable archaeological properties are reported to the north and northwest of the present-day community of Santa Fe along the Río Tesuque and Río Nambe drainages (McNutt 1969; Peckham 1984:276).

Excavation data indicate that early Developmental period residential sites may be characterized as small villages of shallow, circular pitstructures. Sites commonly feature between one and three dwellings, which generally appear to be more similar to structures used by contemporaneous San Juan populations than to those of Mogollon peoples of west-central New Mexico. Rectangular surface storage rooms also are found commonly in association (Cordell 1979a; Stuart and Gauthier 1981).

Seventh-century Developmental period ceramics include Lino Gray, San Marcial Black-on-white, and a variety of plain brown and red-slipped wares. The eighth- and ninth-century ceramic assemblage is essentially a continuation of its predecessor but includes the addition of neck-banded gray and brown wares (Kana-a Gray and Alma Neck-Banded, respectively) as well as Kiatuthlana Black-on-white, La Plata Black-on-red, and Abajo Black-on-orange (Wendorf and Reed 1955:138). These wares indicate that the early Developmental populations maintained close cultural ties with groups living to the northwest and west. The presence of small amounts of redware and brownware pottery indicates that the people also traded with Mogollon populations living to the south and southeast (Cordell 1979a).

Early Developmental period peoples tended to locate their residential sites in lower elevations near intermittent tributaries of the Río Grande, presumably for access to water (Cordell 1979a). Their preference for higher-altitude settings close to gathering and hunting resources is also visible.

The appearance of Red Mesa Black-on-white, another ceramic ware that occurs throughout much of the western Pueblo Indian culture area during prehistory (Lang 1982; McNutt 1969; Mera 1935; Peckham 1984), marks the beginning of the late Developmental period (A.D. 900 to 1200). The continued close affiliation between the peoples of the northern Río Grande and the Four Corners regions is illustrated by the appearance of Kwahe'e Black-on-white in north-central New Mexico at approximately A.D. 1100 (Warren 1980). This ware is a locally manufactured copy of ceramics produced in the northern San Juan region (Gladwin 1945; Kidder and Shepard 1936).

The late Developmental period is characterized further by a general change in regional settlement patterns and more localized changes in architecture and site size. The changes in settlement pattern include an increase in the number of residential sites in the Albuquerque, southern Santa Fe, and Taos districts (Frisbie 1967; Mera 1940; Oakes 1979; Wetherington 1968; Wiseman 1980; Woosley 1986). Not only did the density of habitation increase, the range of environmental settings exploited by Developmental period Pueblo Indian populations also expanded. Nonetheless, archaeologists suggest that Pueblo populations dependent upon agricultural produce favored locations near permanent water sources in middle (6,000–7,000 feet [1,830–2,135 m]) elevation settings. This archaeological observation further suggests that settlement above 7,000 feet (2,135 m) was unlikely except under conditions of prolonged drought (**Winter 1983**:33).

Even though pitstructures persisted in the Albuquerque district through the eleventh and twelfth centuries, the transition from semi-subterranean, circular dwellings to aboveground, rectilinear pueblos occurred in the Santa Fe district (Wendorf and Reed 1955:140). This architectural shift was not complete, however. McNutt (1969) reports the presence of pithouses in the Red Mesa phase component of the Tesuque By-Pass site.

In locales where Pueblo Indian peoples began to build above ground, site size increased and habitation rooms were

paired with storage facilities. Whereas most pueblos averaged between 10 and 12 rooms, settlements with multiple housemounds and totaling more than 100 rooms occured in some locales (Wendorf and Reed 1955). Often, these villages have one to four pitstructures, which archaeologists have usually interpreted as kivas (ceremonial chambers that commonly are circular in plan and subterranean in construction).

In general, the upper Río Jémez Valley conforms to the archaeological observation elsewhere in the northern Río Grande that Developmental village sites display a riverine focus (Anschuetz 1996; Anschuetz et al. 1997). Several pithouse sites with Kwahe'e Black-on-white pottery are known in the lower reaches of Cañon de San Diego near the present-day communities of Walatowa (Pueblo of Jémez) and Cañon.

Meager available information indicates that Developmental period Pueblo use of the Jémez district was not necessarily parochial. Although only 1 site yielded arrow points diagnostic of this time period, 7 of 21 quarries and camps that archaeologists excavated along Redondo Creek for the Baca Geothermal project yielded obsidian hydration dates indicating that the sites were used between about A.D. 600 and 900 (**Winter 1983**:94). Further use of this locale by Developmental period Pueblo people is not known until the latter part of the twelfth century. Archaeologists conducting studies along the proposed OLE powerline rights-of-way similarly found a small number of artifact scatters, which they interpreted as remnants of briefly occupied hunting and gathering work areas or camps (Acklen et al. 1991).

Joseph C. Winter has argued that there was a link between the regional Pueblo economy centered in Chaco Canyon and the quarrying, processing, and distribution of obsidian in Redondo Creek and the neighboring Jémez Mountains vicinity (**Winter 1981**:181–182, **1983**:106). He suggests further that Chaco Canyon and its outliers might have been important nodes in a formal system of trade and exchange involving the "redistribution, social stratification, craft specialization, information exchange, and use of obsidian as a valuable commodity" (**Winter 1983**:106). He then interprets the low-frequency use of Redondo Creek obsidian as evidence of its controlled distribution in the Chaco Canyon economy, and proposes that its acquisition was a privilege among a small number of high-status persons. He reasons that if Jémez Mountains obsidian was a highly controlled commodity during this time, then hunting and gathering in the locality similarly were restricted (**Winter 1981**).

Archaeological evidence from the VCNP and its environs indicate that Pueblos quarried obsidian and made tools from this resource during the Developmental period (Acklen et al. 1991; **Winter 1981**:183). Available information, however, does not support Winter's interpretation that Chaco Canyon exercised exclusive control over Jémez Mountain resources. Redondo Creek obsidian artifact scatters, although sometimes extensive, do not fulfill the archaeological expectations of formal craft workshops where specialists quarried this resource and manufactured standardized tools for regional trade.

Coalition Period (A.D. 1200–1300)

The adoption of organic-based paints for decorating pottery throughout all but the extreme north and east portions of the northern Río Grande marks the beginning of the Coalition period (Wendorf 1954; Wendorf and Reed 1955). The diagnostic ceramic type for the early Coalition period is Santa Fe Black-on-white (Breternitz 1966). This pottery type has design elements similar to Kwahe'e Black-on-white, the ware it replaced (Dickson 1979). The change in decorative pigment coincides with the shift in the Four Corners region from mineral-based paints used by populations living in Chaco Canyon and Mesa Verde to the organic based paints of Pueblo populations living in western New Mexico and eastern Arizona (Wendorf and Reed 1955:143–144). Many Coalition ceramics, most notably Santa Fe Black-on-white, technologically and stylistically resemble wares manufactured in the northern San Juan drainage and found in Chaco Canyon (e.g., see Douglass 1985; Lang 1982:176; Mera 1935; Warren 1980:156). Wiyo Black-on-white, a common ware at the end of the Coalition period, has less certain cultural affiliations with the Four Corners region. Researchers variously trace connections between these northern Río Grande wares and those of the northern San Juan, Chaco, and Pajarito Plateau districts (cf. Mera 1935; Lang 1982; Wendorf and Reed 1955). Wingate Black-on-red and St. Johns Polychrome, both of which originated in the Upper Little Colorado drainage of east-central Arizona (Carlson 1970), occur as trade wares on early and middle Coalition sites in the Santa Fe and Albuquerque districts (Peckham 1981:131, 133).

A notable characteristic of the Coalition period is the diversity of many locally manufactured wares rather than the predominance of any single ceramic type (Cordell 1979a; Lang 1982; Stuart and Gauthier 1981). Habicht-Mauche (1995) notes that this ceramic diversity includes high variability in vessel form, size, design motifs, complexity of stylistic composition, and quality of artisanship.

The trend toward increasing heterogeneity is also represented in other classes of material culture, including architectural form and construction (Wendorf and Reed 1955). In the Santa Fe district, for example, large quadrangular pueblos were built mainly of adobe, although some rooms had stone slab floors. Pitstructures (kivas) often occur as aboveground features at the corners of roomblocks and commonly are oval or D-shaped. Circular pitstructures (kivas) also are known in the Santa Fe and Tesuque valleys (McNutt 1969; Stubbs and Stallings 1953). In contrast, early Coalition dwellings in a crescent-shaped area encompassing the Pajarito Plateau, Galisteo Basin, and Pecos locales are small linear structures constructed of stone masonry with slab floors (Wendorf and Reed 1955). By the end of the thirteenth century, village size increased markedly and stone masonry became more common in some local settings (e.g., the upper Río Pecos Valley) (Kidder 1958). Peckham (1984:279) reports that habitation sites on the Pajarito Plateau continue the Developmental architectural tradition of one or two aboveground rooms with

kiva-like features and as many as a dozen contiguous storage rooms.

Despite increased diversity in material culture, three population and settlement trends distinguish the Coalition period throughout the region. The first is substantial population growth, as indicated by great increases in the number and size of habitation sites during the thirteenth century. Undoubtedly, this regional change in settlement pattern is a product of the massive immigration of Pueblo people from the central Colorado Plateau throughout the twelfth and thirteenth centuries (Cordell 1979a; Hewett 1953; Mera 1940; Peckham 1984; Stuart and Gauthier 1981; Wendorf and Reed 1955). The second, the concentration of population into larger settlements, implies that population growth led to changes in social organization (Cordell (1979b). The third is the expansion of year-round Pueblo settlement into areas of higher elevation. Pueblo groups settled narrow drainage systems in the upper piedmont of the Albuquerque and Santa Fe districts by the early A.D. 1300s. The appearance of multiroom pueblo villages also occurs in the Taos, Chama, Pajarito Plateau, and Galisteo Basin districts.

Lang (1977) observes that most village sites occur along small drainages with easy access to seeps, springs, and potentially good agricultural lands. Peckham (1984: 279) characterizes Coalition Pueblo populations as being highly mobile and apparently not "reluctant to experiment with new areas of settlement, expanding their development of some localities while abandoning others." Archaeological evidence of intensified agricultural practices, including cobble-grids and terraces, checkdams, and reservoirs, accompanies these changes in population and settlement (**Anschuetz 1998b**).

Although there is scant direct evidence for the Pueblo use of the VCNP during the Coalition period, settlement in the upper Río Jémez Valley was substantial (Anschuetz 1996; Anschuetz et al. 1997:106–107). Ten significant villages first established during the Coalition period occur within an 8-mile (13-km) radius of the present-day community of Jémez Springs. These settlements include Patokwa (LA 96), Pejunkwa (LA 130), Boletswakwa (LA136), Wabakwa (LA478), Totaskwinu (LA479), Setoqua (LA499), Nanishagi (LA541), and Wahajamka (LA573), which the people of Jémez Pueblo remember as some of their ancestral homes (Elliott 1982; 1991b). A number of archaeological sites recorded in San Juan Canyon for the Pueblito Timber sale apparently have Coalition components (Elliott 1991b:18–19). Elliott reports further that other unrecorded sites, including fieldhouses, agricultural terraces, and a probable reservoir also occur in this locale. Habitation sites also cluster at Vallecitos near the present-day settlement of Ponderosa (Dodge 1982; Elliott 1991b:19; Holmes 1905:200–201). This grouping consists of small to medium pueblos, 1- or 2-room fieldhouses, 50- to 100-room villages, and a reservoir (Elliott 1991b:19, 44). Pottery types include common Coalition period wares, such as Santa Fe Black-on-white and St. Johns Polychrome, as well as Vallecitos Black-on-white, which dates from the late thirteenth century into the fourteenth century.

Archaeological studies of the Pajarito Plateau district have also found significant evidence of Pueblo settlement on the east flanks of the Jémez Mountains during the Coalition period (see Anschuetz 1996; Anschuetz et al. 1997). In addition to numerous artifact scatters, which likely represent hunting camps and obsidian quarries, known residential sites include 1 rockshelter, 3 cavate complexes, and 19 pueblos (Hill and Trierweiler 1986).

Given the proximity of these settlements, it seems unlikely that the scarcity of documented Coalition period occupation of the Valles Caldera relates to the sudden avoidance of this locality by Pueblo people. Instead, the relative lack of identified thirteenth-century sites is probably a product of the low archaeological visibility of their land use activities during this period of major population relocation and reorganization (see Anschuetz 1996; Anschuetz et al. 1997).

Citing patterns of site abandonment and population movement, Elliott (1991b:18–19) attributes the increased Pueblo settlement of the Jémez district to the arrival of immigrants from the central San Juan Basin (i.e., Chaco Canyon) and the northern San Juan drainage (i.e., the Four Corners area, including Mesa Verde). He observes that archaeologists working in the upper Jémez Valley long have speculated that certain aspects of Jémez area material culture are products of migrations from the nearby Gallina district northwest of the VCNP. Mera (1935:23) provides the first published reference to this supposed cultural-historical event when he uses ceramic traits to suggest that Gallina populations joined "Río Grande" Pueblo people already living in the locale. **Reiter** (**1938**:69; Reiter et al. 1940:8) compared Hibben's (1938) Gallina phase excavation findings from the Gallina district with his study at the Classic period Jémez Pueblo of Unshagi. He considered the similarities between the bins, deflectors, vents, and firepits found in settlements in both areas as evidence supporting Mera's (1935) migration interpretation.

Wendorf (1954:213) reserves judgment on the merits of Mera's and Reiter's arguments about the supposed Gallina migration into the upper Jémez Valley, given the lack of reported excavation data at the time of his study (see also Wendorf and Reed 1954). Barnett (1973) and Mackey (1982), however, subsequently conducted excavations in the San Ysidro and Vallecitos areas that addressed this gap. Mackey (1982:95) concludes that the resulting tree-ring, chronometric, ceramic, and architectural data represent "a good intermediate evolutionary stage between the Gallina and Jemez Phases."

Elliott (1991b:19) maintains that ancestral Jémez (Towa) culture is not distinguishable archaeologically with certainty until about A.D. 1350. Nonetheless, **Ford and others** (**1972**:25) maintain that Towa culture history in the upper Río Jémez Valley extends back in time to about A.D. 1 in the Navajo Reservoir area and that it is possible to trace their movement into the Jémez district during the thirteenth century. Many other investigators accept the archaeological interpretation that the people of Jémez Pueblo descended from Gallina populations (e.g., Cordell 1979b:143; Dick 1976; Stuart and Gauthier 1981:97). Elliott concedes that the supposed Gallina

to Jémez migration is plausible; however, he notes that the archaeological evidence needed to support this interpretation is circumstantial. He concludes, "The key point concerning the Gallina to Jémez migration hypothesis is that there are [other] substantial differences between the architecture, ceramics, and settlement patterns found in the two areas" (Elliott 1991b:20) that require explanation.

Classic Period (A.D. 1300–1600)

This time span encompasses the late pre-Columbian history of the region. Wendorf and Reed (1955:153) characterize the Classic period, which postdates the central Colorado Plateau abandonment by Pueblo agriculturalists, as a "time of general cultural florescence." Northern Río Grande Pueblo populations reached their highest levels, even though the area of settlement continued to shrink. Construction of large villages with multiple plazas and roomblocks occurred, and elaboration of material culture reached its pinnacle. Habicht-Mauche (1988:75) describes the Classic period as a time of substantive changes in settlement patterning, subsistence structure, social organization, and economic integration.

The beginning of the northern Río Grande Classic period coincides with the appearance of locally manufactured red-slipped and glaze-decorated ceramics—the Glaze A wares—in the Santa Fe, Albuquerque, Galisteo, and Salinas districts after about A.D. 1315 (Mera 1935; Warren 1979, 1980). Biscuitwares (Harlow 1973; Mera 1934), including Biscuit A (a.k.a. Abiquiu Black-on-gray, A.D. 1375–1425) and Biscuit B (a.k.a. Bandelier Black-on-gray, A.D. 1425–1475), predominate in the lower Río Chama Valley and on the Pajarito Plateau. These ceramics, made of soft, thick, and porous volcanic pastes, show great continuity with the earlier Wiyo Black-on-white.

Shrinking of inhabited areas, aggregation of populations into fewer but larger villages, and increased residential instability greatly affected Classic period settlement patterns in the Albuquerque, Chama, Galisteo Basin, Jemez, Pajarito Plateau, Santa Fe, and Taos districts (Anschuetz 1984). With the abandonment of locales with average elevations in excess of 6,000 feet (1,830 m) in favor of the better-watered broad valleys of the Río Grande and its major tributaries during the fifteenth century, the range of year-round settlement declined significantly. Some investigators argue that falling water tables and fluctuating climatic conditions across the region as a whole would have favored the intensification of settlement along middle sections of permanent watercourses where stream irrigation presumably was possible (Dickson 1979; Rose et al. 1981; Stanislawski 1981).

Although agriculture clearly had become a focal part of the subsistence base several centuries earlier, the presence of a wide variety of faunal and native plant remains in the archaeological record indicates the continued importance of hunting and gathering in Pueblo economies (Lang 1995; Lang and Scheick 1989). Classic period populations continued to use the surrounding mountains, hills, and plains for raw materials, native plants, and game animals.

Identifiable Classic period archaeological remains in the VCNP and its vicinity are rare (Anschuetz et al. 1997:116; **Winter 1983**:94). This pattern almost certainly is a product of the low archaeological visibility of Classic period Pueblo hunting, plant gathering, and lithic resource collection and tool manufacture in this mountainous setting (Acklen 1993). This statement rests on the fact that the upper Río Jémez Valley experienced its greatest occupation during the Classic period (Anschuetz 1996:211).

Three-quarters of the more than 1,000 Río Jémez Valley Pueblo architectural settlements are 1- to 4-room fieldhouses. Small pueblos are common (ca. 10% of reported sites), and 31 villages have between 50 and 600 rooms (Anschuetz 1996:218). Nine settlements (Pejunkwa [LA130], Boletswakwa [LA136], Kiatsukwa [LA132–LA133], Seshukwa [LA303, LA5927], Wabakwa [LA478], Amoxiumqua [LA481], Kwastiyukwa [LA482], Tovakwa [LA483–LA484], and Wahajhamka [LA573, LA5913–LA5914]), have between 650 and 1,850 rooms, 2 or 3 story roomblocks, multiple plazas, and 1 great kiva (Elliott 1991b). Most fieldhouses occur on low rises on high mesas with elevations greater than 7,000 feet (2,134 m), with some reaching altitudes of 8,400 feet (2,561 m). The big villages occur at elevations between 5,560 and 8,000 feet (1,695 and 2,439 m) (Anschuetz 1996).

Fliedner (1975:371) describes small agricultural terraces as other Jémez district phenomena. His Hot Springs Pueblo site map shows terrace clusters covering broad expanses around the village (Fliedner 1975:Figure 3). Survey of a geophysical corridor immediately east of Jémez Pueblo identified two large, structurally complex, gridded agricultural terraces dating to the late Classic period (Whatley 1995). Fliedner reports identifying still other agricultural features in the upper Jémez Valley, including "stone rows in flat areas where rocks are arranged in a line, or small dams and heaps of gathered stones, [occur but] are much less important" (1975:372).

Lastly, traces of numerous old trails, which might be parts of a road system that centers on the large Jémez villages, are visible (Fliedner 1975:374–375, Figures 1 and 3). These ruts measure 1.6 feet (.5 m) wide and 8 inches (20 cm) deep and run parallel or oblique to physiographic contours. Some engraved trails cross bedrock slopes and cut hand-and-toe holds occur in rocky ravines (Fliedner 1975:375).

The Classic period Jémez district settlement pattern exhibits three essential characteristics (Elliott 1991b:21). First, population increased greatly from the mid-fourteenth century to the late sixteenth century. Second, habitation settlement locations shifted from permanent streams to higher elevations. Third, Pueblo populations consolidated into fewer but larger villages. Two secondary settlement shifts accompany these major changes (Elliott 1991b:21). Over time, more and more fieldhouses, whose substantial stone construction implies sustained use, were built at greater distances from the major villages. The geographic focus of the Jémez Valley population shifted from the Vallecitos and Paliza Canyon locales northwest to Jémez Canyon and the Virgin, Holiday, and Stable mesas closer to the Valles Grande.

No evidence of permanent Pueblo habitations exists in the VCNP (Kulisheck 2003). LA24553, which dates between A.D. 1325 and 1425, is a 50-room village a short distance south of the VCNP. Smeared indented corrugated pottery and sherds representing early varieties of Jemez Black-on-white occur in rockshelters in Sulfur Canyon, which is west of the Valles Caldera.

Although not a place of year-round occupation, the Valles Caldera was important to the Pueblos. **Martin** provides a brief but evocative summary of archaeological evidence and interpretations regarding the Pueblos' use of the southwestern margin of the locality for farming:

> *On Banco Bonito, the site of the most recent volcanic flow in the range, the farmers built one-room field houses. Situated adjacent to the stands of corn and squash, the simple structures were built of rocks collected in the immediate area. The hard rhyolite was not suitable for shaping into building blocks, so the field houses are made of dry-stacked, irregularly shaped stones. Up to the summer of 2002, the remains of about 100 field houses had been discovered on Banco Bonito, indicating the importance of the lava flow-derived soils to the farmers. Most of the field houses date from after 1350. (***Martin 2003***:13)*

While acknowledging the importance of local exposure, physiography, climate, and cold air drainage in defining the limits to agricultural intensification along the valley bottoms, Elliott (1991b:45) cites the great fourteenth-century population increase in the Jémez district as the driving force behind the settlement changes observed archaeologically. Drawing from Ellis's (1978:59) ethnohistorical study of Río Grande Pueblo land and water use, Elliott suggests further that during the Classic period Jémez populations adopted a land use strategy of moving out of the large pueblos to live in fieldhouses during the warm season. From their scattered farming settlements, the people presumably would make forays into more distant settings, including the heart of the Valles Caldera country, to hunt game, gather native plant materials, and collect obsidian, minerals, and other products. With the fall harvest, the people returned to their large villages for the winter (Elliott 1991b).

Postscript

As evidenced in the archaeological record, the Pueblos' history of association with the Valles Caldera dates far back into the past. Today, many Río Grande Pueblo communities, including Jémez, Zía, Santa Ana, San Felipe, Cochití, Santo Domingo, Tesuque, San Ildefonso, Santa Clara, and San Juan, maintain associations with the area now contained within the VCNP. In addition, the Pueblo of Zuni of west-central New Mexico, the Hopi Tribe of northeastern Arizona, the Diné of the Navajo Nation of the greater Four Corners Region, the Jicarilla Apache Tribe of northwestern New Mexico, and the Ute peoples now living in Colorado all have associations with this same landscape that are variously important to their respective histories.

Many aspects of such traditional relationships, however, are rendered largely invisible both in the surviving traces that make up the archaeological record and the documentary accounts written by Hispanic and Anglo observers. Yet, scholarly accounts either written by individuals from these associated communities or compiled by anthropologists and others who worked closely with these communities offer insights into significant land use traditions and landscape relationships that often date to time immemorial.

In recognition of the existence of traditional community histories relevant to establishing a fuller dialogue about the land use history of the VCNP, chapter 9 reviews some of the available lines of this often overlooked evidence. This chapter also provides cultural frameworks for building understandings of key aspects of the communities' continuing associations with the VCNP through which the people remember and celebrate the culture and history of their communities as an enduring, living process.[2.1]

2.1: See Endnote 1.1 for explanation of the "LA" number designation.

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CHAPTER 3.

A Sketch of the Cultural-Historical Environment—Part 2: Spanish Entradas to the Present

Thomas Merlan

Introduction

This chapter outlines the history and culture of the lands in the Valles Caldera National Preserve (VCNP) from the mid-sixteenth-century Spanish *entradas* (expeditions) into New Mexico to the present. The discussion draws from documentary sources listed in the accompanying annotated bibliography.

The Spanish *Entrada*s (1540–1598)

Francisco Vásquez de Coronado was the first Spanish explorer to reach the Río Grande. In the winter of 1540–1541, he made his headquarters at the Tiguex pueblo of Alcanfor or Coofor near present-day Bernalillo (**Schroeder 1979**:242), within sight of Redondo Peak. Coronado and his lieutenants explored north to Taos, west as far as the Grand Canyon, and east into the Kansas plains, but they did not find a reason to venture into the rugged Jémez Mountains.

In 1541 Captain Francisco Barrionuevo, leading a detachment of Coronado's main expeditionary force, traveled north from Tiguex to the Jémez pueblos. **Pedro de Castañeda** (**1907**:339–340, 352, 359), chronicler of this expedition, recorded seven pueblos in the drainage of Vallecitos Creek and three villages near the *aguas calientes* on the Jémez River.

Forty years later, in 1581, fray Augustín Rodríguez and Captain Francisco Chamuscado led an expedition up the Río Grande to the Southern Tiwa and Keres pueblos. They visited several of the Jémez pueblos and left two Franciscan missionaries at the Southern Tiwa pueblo of Puaray (**Bolton 1930**:139, 147).

An expedition led by Antonio de Espejo returned to the region in 1582 to search for the two missionaries left by Rodríguez and Chamuscado. Espejo learned that the Tiwa of Puaray had killed the priests. Espejo visited the Jémez pueblos as well as Ácoma, Zuni, and the Hopi villages (**Bolton 1930**:163–166, 182). Just as Coronado, Barrionuevo, and Rodríguez and Chamuscado, Espejo did not explore the Jémez Mountains.

In 1598 Juan de Oñate, son of one of the original silver magnates of Zacatecas, Mexico, and a professional miner, was awarded a contract to colonize New Mexico. Oñate established the first permanent Spanish colony and capital in New Mexico at the Tewa Pueblo of Yunge Oweenge (which he renamed San Gabriel) west of the confluence of the Río Grande and the Río Chama. As a mining expert, Oñate also noted mineral indications in his visits to various regions of New Mexico. He visited eight of the Jémez pueblos, including Giusewa at the Jémez hot springs. He noted other springs and deposits of "sulfur and rock alum" in this general area (**Reiter 1938**:27).

According to historian **Lansing B. Bloom**, Oñate passed through the Valles Caldera on his way from San Juan Pueblo to Giusewa and the other Jémez villages:

He "descended" thro [*sic*] the Valles to the Pueblos in the Vallecito drainage then working to the west over the high mesa land he "descended" from the potrero to the "last pueblo" of the province which he associates with the marvelous hot springs. Giusewa is the Pueblo meant beyond any reasonable doubt, and the trail from the Vallecito down into Hot Springs is still in daily use (**Bloom1946 [1922]**:123).

Early Spanish Colonial Settlement (1598–1680)

The establishment of missions was an important part of Oñate's colonization project. Franciscan friars began to set up missions in the pueblos in the early 1600s. Father Alonso de Lugo established a church, probably at Giusewa, about 1600 (**Reiter 1938**:28). The second resident missionary at the Jémez pueblos was fray Gerónimo Zárate de Salmerón, who served there from about 1618 or 1620 to 1626. Zárate de Salmerón was also a prospector. He stated that he filed on numerous mineral locations in the Jémez Mountains in the name of the King of Spain (**Ayer 1916**:217). He might have been the first European to take note of the mineral wealth in what became known as the Cochití Mining District south of the Baca Location No. 1 (Baca Location).

The period between 1598 and 1680 in Spanish colonial New Mexico was one of brutal exploitation of the Pueblos by the new Hispanic overlords. This time also was one of fierce competition between the Franciscans, who had their own settlements (the missions) and their own governing hierarchy, and the governor and his secular officials (**Dozier 1970**:52–55). This competition was mainly over control and

exploitation of the Indians. The Pueblos were decimated by new diseases to which they had no immunity, and driven to the brink of extinction by Hispanic masters who exacted their labor.

The Pueblo Revolt, the Reconquest, and Spanish Colonial Rule (1680–1821)

In 1680 the Pueblos revolted and drove the Spanish colonists out of New Mexico. The exiles camped near the mission of Nuestra Señora de Guadalupe near present-day El Paso, Texas. They stayed there 12 years, until a new governor, Diego de Vargas, led a military expedition into the northern Río Grande in 1692 to begin the reconquest of New Mexico. Vargas obtained the peaceful submission of 23 pueblos, but when he returned with a stronger force in 1693, the Pueblos took up arms. Vargas besieged the former capital of Santa Fe and recaptured it in early 1694 (**Dozier 1970**:61). He then proceeded to subdue the Pueblos along the Río Grande. The Jémez people vacated their villages, and many fled into the Navajo country. They did not reestablish a town until about 1703. A census at the time recorded some 300 Jémez inhabitants—as little as 1 percent of the aboriginal Jémez population of 100 years earlier (see **Schroeder 1979**).

To promote the resettlement of the province of New Mexico, the Spanish colonial government granted lands to colonists. The Pueblos were understood to have certain lands, or "leagues," reserved for their exclusive use. Yet most of the Pueblo leagues were not formalized in writing until the late nineteenth century. Nonetheless, the idea of the Pueblo league was used by the Spanish colonial authorities to protect Indian lands against the growing Hispanic population and encroachment on the Indian lands by the land grants to the colonists.

The Cañada de Cochití Grant (1728) was between Cochití Pueblo and what became the Baca Location; by 1782 this grant had an Hispanic population of 184 residents. A grant that included the Rito de los Frijoles was made before 1740 but was abandoned because of nomadic Indian raids.

Governor Pedro Fermín de Mendinueta made the Ojo de San José Grant on Vallecitos Creek in 1768. Eleven families were living on this grant by 1776. During the 1700s settlers also began moving into San Diego Canyon north of Jémez Pueblo. Governor Fernando Chacón made the Cañon de San Diego Grant in 1798, which extended north from the Jémez Pueblo lands to the area of modern La Cueva and Fenton Lake. The first European settlement on the grant was probably Cañon, at the confluence of the Jémez and Guadalupe rivers. By 1821 the Hispanic population of the Jémez Valley was 864 (**Scurlock 1981**:135).

By about 1790/1800—because of the growing population, a period of peaceful relations with some Apaches and other nomads, and the reforms and development promoted by the ministers of King Charles III (the so-called "Carlist Reforms")—some economic diversification appeared among the Hispanic population. For nearly a century, almost all settlers had been farmers. Some artisans and skilled craftsmen now began to set up shops, and farmers began to switch to herding cattle and sheep. Around this time, Hispanics began to use the lush grazing lands that became the Baca Location (**Scurlock 1981**:134–135).

Although the documentary record is incomplete, the pastoral use of the Valles Caldera might have begun as much as a generation earlier. The Miera y Pacheco Map of 1779 makes clear that some New Mexicans knew of the Valles by the third quarter of the eighteenth century. Cartographer **Bernardo Miera y Pacheco** (1779) drew the map at the request of Governor Juan Bautista de Anza and labeled the Valles Caldera the *Valle de los Bacas* (Valley of the Cows [chapter 6]). The map is not to scale; the caldera is drawn many times its actual size. This distortion probably indicates the obvious: while travelers and herders had admired its majesty, no one had yet measured it.

The Mexican Period (1821–1846)

Anglo-American and French Canadians trappers and traders, arriving in New Mexico as early as 1805, encountered a closed system. Spain limited and often prohibited trade among its colonies, and between its colonies and other nations. Trappers and traders were sometimes arrested and their goods confiscated (**Bancroft 1889**:277–303). After Mexico won independence from Spain in 1821, the United States quickly became New Mexico's trading partner and the main source of cash for the departmental government. A strong American Party, with the declared object of eventual annexation to the United States, grew up in New Mexico. Nevertheless, foreigners were prohibited by law from trapping fur-bearing animals, and many disputes arose between Mexican officials and Americans over fees and customs duties. Luis María Cabeza de Baca, the original grantee of the Baca Grant, died in 1827 after being shot by a soldier attempting to confiscate13 packs of illegally harvested furs, which Baca had hidden in his house for American trapper Ewing Young (**Cleland 1950**:219).

During Spanish colonial times (up to the 1810s), the land grants owned by individual proprietors, or *ricos* (individuals with much land and livestock), were used mainly to raise sheep, especially in outlying areas where nomadic Indian raids made it too dangerous to establish permanent communities. Sheep were a measure of wealth and moved across the internal borders of the Spanish colony with fewer restrictions than those placed on most other goods. U.S. Army Lieutenant Zebulon Pike, taken into custody in 1807 for entering New Mexico illegally, reported seeing large herds of sheep as he was escorted down the Río Grande to Chihuahua, which was a major market for New Mexico sheep. After Mexico gained independence from Spain, relaxed trade restrictions with the United States meant new markets for wool and sheep. U.S. Army Lieutenant James Abert, reporting from New Mexico in

1846, noted that some large proprietors owned tens of thousands of head (**Wentworth 1948**:112, 114).

The Mexican government allowed Anglo-Americans to become citizens and to acquire land. As the demand for land increased, the government made large grants of three kinds: (1) to individuals or groups of families who proposed to develop a new community; (2) to farmers and ranchers for the development of agricultural enterprises; and (3) to the Pueblos, implicit awards of title to the "leagues" which they had occupied either from time immemorial or since the Reconquest. Some grants were also made to naturalized Anglo-Americans, with a view to placing the land under private ownership as a barrier to U.S. expansion. The U.S. Court of Private Land Claims subsequently confirmed 30 land grants of this period.

Two land grants of the Mexican Period, the Luis María Cabeza de Baca Grant (1821) and the Town of Las Vegas Grant (1835), embraced the same lands on the Gallinas River. To settle this conflict, the Baca heirs eventually relinquished their claim in exchange for U.S. Congressional authorization (1860) to select an equal amount of land in five square blocks elsewhere in the Territory of New Mexico. The first block they chose was the Baca Location. They did not receive title, however, until 1876, when the New Mexico Surveyor General completed the survey of the Baca Location.

The U.S. Territorial Period (1846–1912)

In August 1846 U.S. troops marching from Fort Leavenworth invaded New Mexico. That the New Mexican government offered no resistance undoubtedly was due in part to its economic and social ties to the United States. The U.S. then occupied Arizona and California. Two years later the Mexican War officially ended with the signing of the Treaty of Guadalupe Hidalgo. When New Mexico became a territory of the United States in 1850, Santa Fe continued to be the capital. The occupying U.S. Army first quartered troops in private houses, but soon began to build Fort Marcy.

Raiding by various Native American nomadic groups, including the Navajo, Apache, and Ute, was among the challenges the new U.S. administration faced. The Valles Caldera played a role in several notable episodes.

In 1851, after persistent drought conditions and overgrazing had depleted rangelands at lower elevations closer to Santa Fe, a civilian company headed by Robert Nesbit and Hiram R. Parker won a contract from the quartermaster at Fort Marcy to cut hay in the Valle Grande for the Army's horses and mules. Nesbit and Parker established a hay camp, still remembered as "Old Fort," on the East Fork of the Río Jémez (**McNitt 1972**:184). In the early hours of the morning of July 2, a band of about 35 to 40 Navajo warriors attacked Nesbit and Parker's camp, slightly wounded one of the sentries, and kept the rest of the hay men holed up in their log bunkhouse, massively constructed but poorly sited for defense. The attackers decamped two hours later with 6 of Nesbit and Parker's horses and 43 of their mules, only to be ambushed by 11 Jémez Pueblo herders who happened to be running cattle nearby and had heard the commotion. The Jémez herders killed two of the raiders and recaptured five mules (**McNitt 1972**:185; see also chapter 5 for further discussion of the hay camp raid and its aftermath).

The Navajo continued to plague the Jémez Mountains and the region over the next three decades. In 1853 raiders killed two Hispanic shepherds at Vallecitos in the upper watershed of the Río del Oso, a short distance northeast of the VCNP (**McNitt 1972**:256). Three years later Navajos attacked near Peña Blanca on the Río Grande between the Pueblos of Cochiti and Santo Domingo. They killed 2 shepherds and stole 400 sheep belonging to José Ignacio Montoya (**McNitt 1972**:277). New Mexican militiamen tracked the raiders into the Valle Grande. The militiamen attacked four Navajo herdsmen who were tending the stolen animals, killing two and recovering Montoya's flock (**McNitt 1972**:277; **Scurlock 1981**:137).

Sited on a gentle hill with ready access to water, Nesbit and Parker's original hay camp "was apparently later the site of Camp Valles Grandes, established by the U.S. Army as a deterrent to Navajo and Apache movement through the area during the final Navajo Wars of 1863" (**Scurlock 1981**:137; see ***Whitney v. Otero*** **1893**, Exhibit No. 2, in which Walter Marmon indicates the location of the "Old Fort" in a map). Lieutenant Erastus W. Wood, 5 non-commissioned officers, and 31 privates from Company A, 1st Infantry, California Volunteers, manned this encampment under orders from General James A. Carleton. From this location, they were

> *. . . to lie in wait for thirty days to kill every Navajo or Apache Indian who attempts to go through that noted thoroughfare. No women and children will be harmed; these will be captured. [General James A. Carleton, in* **Keleher 1982***:314].*

Although maps dating between 1876 and the 1930s show Old Fort's location, by the late 1950s all traces of the place had been destroyed, according to John Davenport who served as the Baca Location ranch manager during the 1920s. Recent efforts to relocate this site have been unsuccessful (**Martin 2003**:21–22).

On September 27, 1863, 5 weeks after General Carleton's orders to the Company A, 1st Infantry, California Volunteers to set up a month-long post in the Valles Caldera, Lieutenant P. A. J. Russell led four mounted men and a group of Pueblo warriors from the Valle Grande. They rode in pursuit of a band of Navajo raiders who had stolen livestock from nearby Río Grande Pueblo villages. This contingent surprised the raiders at Jémez Springs, killing 8 men, capturing 20 women and children, and recovering 125 sheep and 2 horses (**Keleher 1982**:314).

Jémez Pueblo preserves the memory of another battle with Navajo raiders in the Valles Caldera. A group of young men, including Cristóbal Sando, were tending the Pueblo's horse herd when they spied some Navajos camped on the southeast side of the Valle Grande. As retold by **Joe S. Sando**, Jémez Pueblo historian and Cristóbal Sando's grandson, Cristóbal

stealthily approached the raiders and fired a lethal arrow at the Navajo leader, starting the Jémez' surprise attack. The Pueblo herdsmen then chased the other raiders toward the west with a sustained volley of arrows, which they meant more as a scare tactic than an actual effort to kill the fleeing Navajos (**Sando 1982**).

The development of large single-owner herds of sheep, increased military protection, and the often brutal subjugation of the Navajos and other nomadic Indians during the 1860s and 1870s, caused expansion into previously little-known areas adjacent to the Río Grande Valley. There were two homesteads near the Baca Location by about 1883 (**USDA Forest Service 1883–1913**). Maríano Sabine Otero and his uncle, Miguel Antonio Otero, planned to develop Jémez Springs as a commercial resort (with the backing of officials of the Atchison, Topeka and Santa Fe Railroad). They built a hotel and new bathhouses in 1882. Prospectors discovered gold and silver about 5 miles (8 km) south of the Baca Location in 1889. Major mines and the boomtowns of Albemarle, Allerton, and Bland followed circa 1894. The demand for lumber led to the establishment of several sawmills (**Scurlock 1981**:138).

Maríano Otero bought the Baca Location in 1899 for the Valles Land Company. He appears to have made this purchase in an insider deal made possible by a partition suit (***Whitney v. Otero 1893***; see also chapter 4). Maríano shared ownership of the Valles Land Company with his son, Frederico J. (F. J.). F. J. then became president of the Valles Land Company and used the Baca Location as summer range. In 1905 the Federal government created the Jémez Forest Preserve, known today as part of the Santa Fe National Forest, which surrounds the land grant.

In 1909 F. J. Otero sold the Baca Location to Redondo Development Company (with headquarters in Pennsylvania). He continued to lease the Location for grazing sheep up to 1917.

Early Statehood to World War II (1912–1945)

In 1917, Frank Bond, one of New Mexico's most important general merchants in the late Territorial and early statehood periods, acquired, along with his brother, the summer grazing rights for the Baca Location. By the end of the following year, he entered into a purchase contract for the tract (**Scurlock 1981**:144, 147; see also chapter 4). Despite suffering major losses on the Baca Location during the severe winter of 1918–1919, Bond continued to develop his operations there. He finalized his purchase of the land grant in 1926. The Redondo Development Company retained its timber rights for the next 99 years (Deed, April 8, 1926, Redondo Development Company to George W. Bond and Frank Bond, in Abstract of Title of Timber Interest in and to the Baca Location No. 1, ***Baca Land and Cattle Company v. New Mexico Timber, Inc.*** [***Baca Co. v. NM Timber, Inc. 1967***]). Thus, this sale agreement was the basis for large-scale timbering in the Valles. The logging would continue until James Patrick Dunigan, the major shareholder in the companies that bought the Baca Location in 1963, went to court to restrain logging.

Guy H. Porter and his son, Frank H. Porter, formed the White Pine Lumber Company in 1922. In 1924 they began to ship timber from the Cañon de San Diego Grant by rail to Bernalillo. This meant the condemnation of a right-of-way across Jémez Pueblo, authorized by the (Federal) Pueblo Lands Condemnation Act of 1926, subsequently reenacted in 1928. The White Pine Lumber Company cut about 100 million board feet of lumber between 1924 and 1931 (chapter 7).

T. P. Gallagher, Jr., President of the New Mexico Lumber and Timber Company (later New Mexico Timber, Inc.), bought the White Pine Lumber Company after it stopped operations in 1931 because of falling lumber prices, and resumed logging on the upper Cañon de San Diego Grant. Redondo Development Company sold the logging rights on the Baca Location to the Firesteel Lumber Company in 1935. Under an agreement with Firesteel, New Mexico Lumber and Timber Company began logging in the vicinity of Redondo Creek and built a logging camp (Redondo Camp) consisting of cabins, sheds, stables, a mess hall, and a school for the loggers and their families in Redondo Meadows. This rush of activity led the Civilian Conservation Corps to build a road from Los Alamos to Cuba through Valle Grande in 1935 (**Boyd 1938**; see also chapters 4 and 7). This road continues to be the main access to the Valle Grande.

New Mexico Timber, Inc., received the rights to the Baca Location's timber in 1939 (Deed, December 31, 1939, Redondo Development Company to New Mexico Timber, Inc., in Abstract of Title of Timber Interest in and to the Baca Location No. 1, ***Baca Co. v. NM Timber, Inc.*** **1967**; see also chapter 7). Redondo Camp was abandoned this same year, and most of the Valles' logging was moved to the northwest part of the Baca Location. Logging continued into the war years and included cutting on Redondo Peak, at El Cajete, and along the Jaramillo drainage.

Post-World War II to Present (1945–2003)

Because of the decline in wool prices during 1939 and 1940, Frank Bond added cattle to his operation. After his death in 1945, the Bond family leased the Baca Location to various cattle ranchers. In 1963 James Patrick Dunigan, owner of Dunigan Tool and Supply Company of Abilene, Texas, bought the Baca Location to run cattle. In 1964 Dunigan sued New Mexico Timber, Inc., in federal district court to obtain recognition of his successor interest in the 99-year timber lease. He appealed his case to the 10th Circuit Court of Appeals in 1967, and won some rather minor restraints on logging (***Baca Co. v. NM Timber, Inc*** **1967**; see also chapter 7). Dunigan eventually bought back the timber rights in 1971 and temporarily ended logging on the Baca Location. He also drilled an experimental geothermal steam well in 1963 (following up the discovery of geothermal capacity in 1960). In the 1970s Westates Petroleum Company, Baca Land and Cattle Company, and Union Oil Company drilled wells within the

caldera that produced steam and hot water. Dunigan also made commercial elk hunts a part of his operation.

In 1976 the National Park Service bought 3,076 acres (1,244 ha) of the southeast corner of the grant as an addition to Bandelier National Monument. The National Park Service, the Forest Service, and the Fish and Wildlife Service began studies in 1979 with a view to acquiring the Baca Location for the public.

The Federal Government and the Dunigan companies signed a purchase contract for the Baca Location on October 27, 1999, and the acquisition was carried out in 2000 (**Martin 2003**). The Valles Caldera Trust, a Federally chartered oversight board appointed by the President, assumed responsibility for the operation and development of the property for public purposes.

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CHAPTER 4.

History of the Baca Location No. 1

Thomas Merlan and Kurt F. Anschuetz

Introduction

The Baca Location No. 1 (Baca Location) is unique among New Mexico land grants in having two histories that begin in separate locations. It is the only grant whose patent does not cover any part of the lands originally granted. It is the only grant whose patented lands are in three different states.

The lands that became the Baca Location by Congressional authorization in 1860 lie almost entirely within the Valles Caldera of north-central New Mexico. The original grant was in another location altogether, centering on what became the town of Old Las Vegas in eastern New Mexico.

The lands that became the Baca Location were a frontier long before they were granted to the Baca heirs. The Valles Caldera is only a short distance east of the Navajo country (see also chapter 9). The Valles are within easy striking distance by nomadic raiders who preyed first on the Pueblos, then on the Hispanics, and then on the Anglo-Americans who lived near or used the Valles Caldera. Bishop Crespo, describing his visitation of New Mexico in 1730, notes that Jémez is "five leagues from the Navahos" (**Adams 1954**:98).

Of interest to the Valles Caldera National Preserve (VCNP) is **Frank McNitt's** (**1972**) account of Governor José Antonio Vizcarra's 1823 punitive expedition against Navajo raiders who warred on the Mexican colony. At the end of Vizcarra's expedition, he passed through the Valle Grande on his return to Santa Fe from the Four Corners region:

> *On August 24, after negotiating the pass through the Chuska Mountains and reaching the valley below, Vizcarra discharged two regiments of militia to make their separate ways home to Río Arriba and Río Abajo. With the balance of the command he proceeded directly eastward for fifteen leagues until meeting the Chaco Wash at Fajada Butte. For the next two days he followed his outward route, resting briefly at Pueblo Pintado before continuing past the Chacra Mesa and down Torreon Wash. Below the present town of Cuba the command turned east on a trail leading across the Jemez Mountains by way of the Valle Grande. At sunset on August 31, after an absence of seventy-four days, the troops arrived in Santa Fe. The expedition was over (**McNitt 1972**:65).*

Vizcarra's action did not resolve the trouble with Navajo raiders. For example, between 1826 and 1829, during Governor Antonio Narbona's administration:

> *Navajos raided along the Río Grande, striking repeatedly at Jemez but ranging from Abiquiu and the Valle Grande southward to Belen. Thousands of sheep and other livestock were run off; some of the pastors [shepherders] were carried away as slaves and others were killed. A token force of fifteen soldiers was sent in March 1829 to patrol the frontier at Jemez (**McNitt 1972**:70).*

This proximity to Navajo country became apparent to contractors Robert Nesbit and Hiram Parker when Navajo raiders struck their camp in the Valle Grande in the summer of 1851 (**Church n.d.**; see also **McNitt 1972**:184–185; see also chapters 3 and 5).

The documentary history of the Baca Location, therefore, begins at the end of New Mexico's Spanish colonial era and the opening of the Mexican Period. In this brief span of 25 years (1821–1846) during which New Mexico was part of the Mexican nation, the Mexican authorities made large land grants in northern and eastern New Mexico to place the land under private ownership as a buffer against the expansionist United States. Instead, after the U.S. occupation of the colony of New Mexico in 1846 and the formation of the New Mexico Territory in 1850, the grants became an important part of the economic development of the Territory and subsequently the State of New Mexico. The grant lands and the agricultural and extractive enterprises on them gradually became part of a regional, then a national economic network.

This chapter is a detailed examination of the documentary history of the Baca Location. The discussion derives from the sources provided in the accompanying annotated bibliography. Table 4.1 provides a timeline of selected events important in the history of the Baca Location.

Table 4.1. Timeline of selected events important in the Baca Location No. 1's History.

Year	Date	Event
1820	February 18.	Luis Maria Cabeza de Baca petitions Spanish colonial authorities of New Mexico for land on the Gallinas River at Las Vegas.
	post-February	Spanish colonial authorities place New Mexico under the jurisdiction of the province of Nueva Vizcaya.
1821	January 16	Baca re-petitions the provincial deputation of Nueva Vizcaya for the grant land.
	May 29	The provincial deputation notifies the Governor of New Mexico of the approval of Baca's grant request.
	August 14	Mexico wins its independence from Spain with the signing of the Treaty of Cordova.
1823		Governor José Antonio Vizcarra passes through the Valle Grande on his return to Santa Fe after leading a punitive expedition against Navajo raiders in the Four Corners region.
1826		The Alcalde of San Miguel del Vado delivers legal possession of the grant. Baca builds a house or hut on the Gallinas River, and runs sheep and mules.
1827		Baca dies of a gunshot wound suffered during an argument with a Mexican government soldier over the confiscation of contraband property belonging to an American trapper. His son, Juan Antonio Baca, takes over the family's ranching operation.
1835		Navajo raiders kill Juan Antonio and steal all of the family's sheep. The Baca heirs do not reoccupy the grant because of continuing Indian hostilities.
		The Town of Las Vegas receives its grant (Town of Las Vegas Grant). In 1838 Francisco Tomás Baca, son and executor of Juan Antonio Baca, protests to Governor Armijo that the Town of Las Vegas Grant covers the same lands as the Baca Grant. Armijo takes no action.
1846		U.S. troops (the Army of the West) occupy New Mexico, thereby marking the beginning of the American period.
1850		The U.S. Congress recognizes the former Mexican province of New Mexico as a territory of the United States.
1851		Navajo raiders strike Robert Nesbit and Hiram Parker's hay cutting camp in the Valle Grande.
1855		Luis Maria Cabeza de Baca's heirs petition New Mexico Surveyor General William Pelham for confirmation of the Baca Grant. With Francisco Tomás Baca as the driving force in this effort, the heirs allege that the Town of Las Vegas Grant is null because it was made in the knowledge that its lands were part of the Baca Grant. Pelham conducts a hearing on the two applications.
1856		John Watts files the brief of the claimants and suggests that the Baca family would be willing to select an equivalent number of acres rather than displace the residents of the Las Vegas Grant.

Table 4.1. *Continued*.

Year	Date	Event
1857	May 1	Luis Maria Cabeza de Baca's heirs record an agreement before the probate clerk of Bernalillo County. This agreement confers plenary authority on Francisco Tomás Baca to pursue their land grant claims.
1860		Surveyor General Pelham recommends to Congress that both the Baca and Las Vegas grants be confirmed, leaving it to the courts to determine the rights of the parties. To avoid litigation, the Baca heirs offer to give up their claim, provided they get an equivalent amount of land somewhere else in the Territory of New Mexico.
	June 21	The U.S. Congress confirms the Town of Las Vegas Grant and authorizes the heirs of Luis Maria Cabeza de Baca to select vacant lands in up to five equal-sized tracts, each square in plan, throughout the territory.
		The survey of the Town of Las Vegas Grant totals 496,446.96 acres. The Baca heirs receive scrip for an equivalent amount of land. They choose five tracts, each measuring 99,289.39 acres. The first of these parcels is the Baca Float No. 1 (a.k.a. the Baca Location No. 1 [henceforth, the Baca Location]).
ca. 1861–1872		Francisco Tomás Baca acquires interests of other heirs in the Baca Location and eventually assembles an interest of just over one-third of the tract.
ca. 1875		Tomás Dolores mortgages his claimed 100% interest in the Baca Location to José Leandro Perea, Maríano Sabine Otero's father-in-law, for $10,000.
1876		Deputy U.S. Surveyors Sawyer and McBroom survey the Baca Location. The United States delivers title to Luis Maria Cabeza de Baca's heirs.
1880		Maríano Otero and his uncle, Miguel Antonio Otero, begin planning to develop Jémez Springs as a commercial resort.
1881	August 17	James Greenwood Whitney purchases Francisco Tomás Baca's interest in the Baca Location from his widow, María Gertrudis Lucero Baca. With the additional purchase of Baca's children's interests, Whitney claims a one-third interest in the tract..
1889–1894		The discovery of gold and silver nearby leads to the establishment of mines and mining towns in the area. The demand for lumber also sees the establishment of several sawmills close by in response to the growing demand for timber products.
1884	May 17	Weary of his prolonged personal and legal fights with members of the Otereo family over land issues, James Whitney sells his interests in the Baca Location to his younger brother, Joel Parker Whitney.
1890		Maríano Otero and his son, Frederico J. (F. J.), begin buying interests in the Baca Location from the Baca heirs after Maríano inherits his father-in-law's interest in the land grant.
1893		Joel Whitney petitions for partition of the Baca Location.

Table 4.1. *Continued*.

Year	Date	Event
1897	December 6	An interlocutory decree is entered making findings and an adjudication of the respective fractional interests of each party to Whitney's partition suit.
1898	October	The court enters a decree directing partition of the Baca Location and appoints commissioners to determine the feasibility of partition in kind.
	December	Commissioners report that partition of the Baca Location in kind was infeasible, and they recommend sale of all real property and the division of the proceeds.
1899	January–March	The court enters a decree ordering the sale of the Baca Location. The Special Master sells the grant to Frank W. Clancy, who was Whitney's counsel of record, as well as counsel to Otero's Valles Land Company and Thomas B. Catron, another claimant to the case. The Special Master distributes the proceeds to 46 owners, including two groups of Baca heirs, Whitney, Otero, and Catron.
1899 (*continued*)	March 18	Maríano Otero purchases the balance of the grant. F. J. Otero becomes the president of the Valles Land Company and uses the Baca Location as summer range for large numbers of horses, cattle, and sheep.
1904		Maríano Otero dies. F. J. Otero takes over full responsibility of the family's business interests.
1905		The Federal Government creates the Jemez Forest Preserve (subsequently renamed the Santa Fe National Forest).
1907		Timbering around the Baca Location was decimating local forests. Consequently, the value of the tract's timber holdings were increasing. Estimates of the Baca Location's timber resources were estimated to include 425 million board feet of white pine and from 15 to 25 million board feet of spruce.
1909	October 16, 1909	The Valles Land Company sells the Baca Location to the Redondo Development Company.
1915	April, 1	The Redondo Development Company mortgages the Baca Location to Warren Savings Bank of Pennsylvania.
1917		F. J. Otero does not renew his grazing lease. The Redondo Development Company leases the property's grazing rights to Frank Bond. Bond extends his family's *partido* sheep business operations into the Baca Location.
1918	December 14	Redondo Development Company contracts with George W. and Frank Bond for the sale of the Baca Location, excepting and reserving all timber for a period of 99 years.
1920s		Logging operations expand in the Jemez Valley. White Pine Lumber Company obtains Federal legislation to condemn a right-of-way across the Jemez Pueblo Grant for the transport of their products.
1926	April 8	The Bond brothers complete their purchase of the Baca Location from the Redondo Development Company, which reasserts its 99-year right to all of the tract's timber resources and one-half of all if its minerals.
1930	May 15	Redondo Development Company executes a first mortgage on its timber and mineral rights to Warren Savings Bank and Trust Company.

Table 4.1. *Continued*.

Year	Date	Event
1933	January 16	Redondo Development Company renews its mortgage with Warren Savings Bank and Trust.
	September 9	Warren Savings Bank and Trust pledges the note, bond and mortgage to the Reconstruction Finance Corporation as collateral for borrowing money.
1935		The Civilian Conservation Corps builds a road through the Valle Grande.
	July 19	Redondo Development Company sells its timber right to Robert Anderson, who owns Firesteel Lumber Company, for the term of 99 years.
		Under an agreement with Firesteel Lumber Company, New Mexico Timber Company begins logging operations; establishes the Redondo Logging Camp in Redondo Meadows for 25 employees and their families.
	December 17	Anderson protests his taxes on the timber and wins a reduction in state district court filed this date. He claims that there are 312 million board feet of timber on the Location in 1931, the same in 1932 and 1933, and 270 million board feet in 1935.
1936	May 26	Warren Bank sells the bond of $130,000 and the first mortgage on the timber to Blue Diamond Trading Corporation of New York.
	May 28	Reconstruction Finance Corporation receives Redondo's note for $65,000 from Warren Bank and Trust Company, then reassigns the note to Warren Savings.
	December 31	Anderson assigns all his right, title and interest in the timber to A.I. Kaplan of New York.
1937	October 14	Blue Diamond sells the renewal note and assigns the bond to Calumex Corporation in Delaware.
1938	September 16	Kaplan assigns all his right, title and interest to New Mexico Lumber and Timber Company.
1939	December 31	Redondo Development Company deeds all the timber to New Mexico Timber Co., whose President is T. P. Gallagher. New Mexico Timber Company mortgages the timber to the Reconstruction Finance Corporation for $182,436.52, at interest of 5 percent per year.
		New Mexico Lumber and Timber Company closes the Redondo Camp when it moves its logging activity to the northwest part of the Baca Location.
1940	April 30	New Mexico Lumber and Timber Company assigns all its right to New Mexico Timber Company. T. P. Gallagher remains the President of the new interest.
	June 27	Reconstruction Finance Corporation recognizes the satisfaction of the mortgage and bond dated May 15, 1930.
1942	January 16	Reconstruction Finance Corporation releases the mortgage it holds on the timber.
1945		Frank Bond dies. His son, Franklin, takes over the family business and begins leasing grazing rights for the Baca Location to various cattle operations. Franklin also hires employees to work the ranch, thereby ending the *partido* sheep business system.

Table 4.1. *Continued*.

Year	Date	Event
1954		With Franklin Bond's death, the family leases the Baca Location ranch to outside parties, including the King family. With this transaction, the last of the Bond livestock were removed from the tract.
1963	January 11	George W. Savage, trustee for Ethel Bond Huffman (widow of Franklin Bond), sells the Baca Location to James Patrick Dunigan through the Dunigan Tool & Supply Company. Dunigan establishes the Baca Land and Cattle Company.
1963–1980		While his investors propose various development plans for the Valles Caldera, including a ski resort, a racetrack, and a resort community of home sites and stores, Dunigan remains committed to his idea of maintaining the property as a working ranch and sustaining the Valle Grande's beauty.
1964		Baca Land & Cattle Company, Dunigan Tool & Supply Company, and George W. Savage, Trustee, sue New Mexico Timber, Inc. and T. P. Gallagher & Co., Inc., on three counts: (1) to establish the parties' interests under the deed and contract of 1918 and 1926; (2) to seek damages for timber cut in violation of the terms of the instruments of 1918 and 1926; and (3) to seek damages for wasteful logging practices.
1967		U.S. District Court renders summary judgment for the plaintiffs on first two counts of the complaint, establishing Baca Land & Cattle Company's interest, and for damages for timber cut in violation of the instruments of 1918 and 1926. On third count, for wasteful logging practices, District Court orders trial by jury.
1967 (*continued*)		Baca Land & Cattle Company, Dunigan Tool & Supply Company, and George W. Savage, Trustee, appeal the decision of the District Court. The Tenth Circuit Court of Appeals dismisses the case and remands it back to the District Court.
1969	August 12	The District Court issues ruling, denying plaintiffs' motion for partial summary judgment.
	September 10	New Mexico Timber, Inc., and T. P. Gallagher & Co., Inc., file an appeal in the Tenth Circuit Court of Appeals against the District Court's ruling on logging practices and the award of compensatory damages.
1971		Dunigan buys the timber rights to the Baca Location from New Mexico Timber, Inc. and halts logging on the tract.
1980		James Dunigan dies.
2000		The U.S. government purchases the Baca Location.
2001		Valles Caldera National Preserve permits timber hauling on South Mountain to complete a timber project that was in progress when the Federal Government bought the ranch. The Preserve also begins the rehabilitation and obliteration of existing logging roads on 100.1 acres and 4.9 miles of roads.
2002		Interim cattle grazing program initiated, with up to 2,000 head run on 23,380 acres in Valle Grande, Valle Toledo, Valle San Antonio and Cerro Seco pastures.

Birth and Confirmation of the Baca Location Land Grant

On February 18, 1820, Luis María Cabeza de Baca individually and on behalf of eight other persons petitioned New Mexican colonial authorities for a tract of vacant land on the Gallinas River. The object of Baca's petition is present-day Las Vegas and environs.

Baca's associates dropped out of the project before an answer came from the governmental authorities. In 1820, in the turmoil of the revolution against Spain that had begun in 1810 and would shortly result in an independent Mexico, the New Mexican colony was placed under the jurisdiction of the province of Nueva Vizcaya (now the Mexican States of Chihuauhua and Coahuila). On January 16, 1821, Baca, for himself and his 17 sons, petitioned the provincial deputation of Nueva Vizcaya for the same grant that he had requested originally. Baca and his sons described their requested tract as bounded on the north by the Chapelote River, on the east by the Aguaje de la Yegua and the Antonio Ortíz Grant, on the south by the San Miguel del Vado Grant and on the west by the summit of the Pecos Mountains (**Bowden 1969**:794).

On May 29, 1821, the provincial deputation notified the New Mexican colonial governor that the grant had been approved. The Alcalde of San Miguel del Vado was supposed to deliver legal possession of the grant to Baca and his sons, and after considerable delay, he did so in 1826 (**U.S. Congress, House 1860**). Meanwhile, by the Treaty of Cordova, signed on August 24, 1821, Mexico won its independence from Spain.

Luis María Cabeza de Baca built a little house on the Gallinas River at the place called Loma Montosa, and ran sheep on the grant. He died in 1827 after being fatally wounded by a soldier in an argument over 13 packs of contraband pelts that belonged to American trapper Ewing Young (**Martin 2003**; see also chapter 3). His son, Juan Antonio Baca, took on the ranching operation.

The Baca family had begun taking their sheep into the Jémez Mountains during periods when the Navajos refrained from raids. In 1835, however, Navajo raiders suddenly struck. They killed Juan Antonio and stole his sheep (**Martin 2003**:27).

Because Indian hostilities simultaneously plagued the Gallinas River, Juan Antonio's heirs did not reoccupy the grant given to Luis María Cabeza de Baca. After the Town of Las Vegas received its grant in 1835, Francisco Tomás Baca, son and executor of Juan Antonio Baca and one of Luis María's many grandsons, protested to Governor Armijo that the Town of Las Vegas Grant covered the same lands as the Baca Land Grant, but Armijo took no action (**Bowden 1969**:797).[4.1]

In 1846 U.S. troops (the Army of the West) occupied the colony of New Mexico. In 1850 Congress recognized the former Mexican province as a territory of the United States. The first Anglo-American relationship with the Valles Caldera was military. The Army of the West brought cash and contracts to the region. The U.S. Army was a market for forage and beef, buying first for its own needs. Then, as it pacified the various Indian groups and confined them to reservations, the Army bought beef to feed them. This military activity was the beginning of modern ranching in what was to become the State of New Mexico.

In 1851 Navajos raided the camp that civilian contractors Nesbit and Parker had established to cut hay for the U.S. Army (**Church n.d.**; see also **McNitt 1972**:184–185; see chapter 5). This camp was on the East Fork of the Jémez and "was apparently later the site of Camp Valles Grandes, established by the U.S. Army as a deterrent to Navajo and Apache movement through the area during the final Navajo Wars of 1863" (**Scurlock 1981**:137).

In 1855 the surviving heirs of Luis María Cabeza de Baca petitioned New Mexico Surveyor General William Pelham for confirmation of the grant. Francisco Tomás Baca apparently was the driving force behind this effort. The heirs alleged that the Town of Las Vegas Grant was null because it had been made with the knowledge that its lands were part of the original Baca Land Grant.

The heirs of Luis María Cabeza de Baca waited for the Surveyor General to act on the matter. Two years later, on May 1, 1857, the heirs, including 5 grandsons who represented their deceased fathers and 10 other male heirs (including 2 males representing female heirs) recorded an agreement before the probate clerk of Bernalillo County, New Mexico, conferring plenary authority on Francisco Tomás Baca to pursue their claims to lands granted to Luis María Cabeza de Baca, and which were now occupied by "settlements that have no legal right." Francisco Tomás agreed to assume all expenses. Francisco Tomás' widow, María Gertrudis Lucero Baca, would later claim that the other heirs stated that at the "final conclusion" of the matter, Francisco Tomás would be paid by them either in lands "satisfactory to him" or in money (***Whitney v. Otero* 1893**, Exhibit A, May 1, 1857). In this way, Francisco Tomás Baca and his immediate family claimed to have acquired about one-third interest in the total grant (**Martin 2003**:38). This document neither specifies the Baca Location nor names the specific percentage of any grant, a point that figured prominently in the final resolution of the 1893–1899 partition suit.

New Mexico Surveyor General Pelham conducted a hearing on the Baca and Town of Las Vegas Grant applications. He recommended to Congress in 1860 that both grants be confirmed, leaving it to the courts to try to determine the rights of two parties (**U.S. Congress, House 1860**). To avoid litigation, the Baca heirs offered to give up their claim, provided they got an equivalent amount of land somewhere else in the New Mexican Territory. Congress approved an act on June 21, 1860, confirming the Town of Las Vegas Grant and authorizing the heirs of Luis María Cabeza de Vaca [*sic*] to select vacant lands in "square bodies, not exceeding five in number" (**U.S. Public Law 167 1860**).

[4.1] Because it is a source of considerable historical confusion, it is important to note that Francisco Tomás referred to himself as Tomás even in legal documents. Francisco Tomás, however, had a brother, Tomás Dolores, who was 20 years younger. Tomás Dolores usually appears in historical documents as Tomás D.

The Town of Las Vegas Grant was surveyed in 1860 for a total of 496,447 acres (200,901 ha). The Baca Land Grant heirs received scrip for an equivalent amount of land. They promptly chose five tracts measuring 99,289 acres (40,180 ha). Each appears as a distinctive square on historical land grant maps. All five tracts were in the Territory of New Mexico in 1860. Due to subsequent boundary changes, two parcels are now in Arizona, and one in Colorado.

The first tract, called Baca Float No. 1 because it was "floated" or relocated from the original grant, was located in Sandoval County, New Mexico, on December 6, 1860. Its original description was:

> *Beginning at a point 2½ miles [4 km] west of the corner of Townships 19 and 20 North and Range 4 and 5 East, N.M.P.M., and thence North, South, East and West from said center point a sufficient distance to embrace 99,289.39 acres [40,180.24 ha] (***Bowden 1969***:799).*

This boundary encompassed the Valle Grande, the Valle San Antonio, the Valle Santa Rosa, and Redondo Creek, lands subsequently known as Baca Location.

Baca Float No. 2, in San Miguel County north of Tucumcari, was patented in 1860. Baca Float No. 3, now in Arizona, was subsequently relinquished due to conflicts with a prior grant. Baca Float No. 4, in Saguache County, Colorado, was patented in 1900. Baca Float No. 5, in Yavapai County, Arizona, was patented in 1865 (**Bowden 1969**:799ff).

Competing Interests: The Basis for the Baca Location Partition Suit

Contrary to the claims made by Francisco Tomás Baca and his heirs, several sources identify his younger brother, Tomás Dolores, as the sole inheritor of the Baca Location during the late nineteenth century (**Scurlock 1981**:138; **U.S. Congress, House 1860**). From his base in Peña Blanca, Tomás Dolores ran one of the largest sheep and cattle enterprises in the Territory of New Mexico until he moved to Las Vegas in 1865 to open a mercantile and to run freight wagons over the Santa Fe Trail (**Cabeza de Baca 1994**:80). According to his granddaughter, Fabiola Cabeza de Baca, Tomás Dolores mortgaged the 100,000-acre (40,000 ha) Baca Location to José Leandro Perea, Maríano Sabine Otero's father-in-law, for $10,000 about 1875. Tomás Dolores mortgaged the land to make up a shortfall of $40,000 that became known while he served as a bondsman for the newly elected San Miguel County sheriff-clerk-treasurer (**Cabeza de Baca 1994**:72–73). This action, in which Tomás Dolores treated the whole Baca Location as his exclusive property, helped to create the grounds for the bitter partition suit of 1893 involving Maríano Otero and Joel Parker Whitney. This suit in turn led to the extinction of all the rights that Luis María Cabeza de Baca's heirs had in the Baca Location.

The coming of the railroad created an endeavor never before known in New Mexico: the tourist trade. Two well-to-do businessmen with local and national political connections, Maríano Otero and his uncle, Miguel Antonio Otero, began planning to develop Jémez Springs in 1880 following their purchase of the old bathhouses that local residents had long used.[4.2] The Oteros intended to make Jémez Springs, located outside the west boundary of the Baca Location as defined by the 1876 survey of the land grant (**Sawyer and McBroom 1876**), a commercial resort. Their venture had the backing of officials of the Atchison, Topeka, and Santa Fe Railroad. Their plan was to operate the springs, with customers arriving by spur line that would connect Jémez Springs with Bernalillo. Their company built a hotel and new bathhouses at this location in 1882 (**Otero 1935**:237–238, 241–277). After Miguel Antonio Otero died that same year, plans to make Jémez Springs a major resort were dropped, although the Otero family continued to run successful businesses in the community for the next 20 years (**Martin 2003**:41).

Even after the arrival of the railroad, few people moved into the high country around the Valles Caldera. There were only two homesteads near the Baca Location by about 1883 (**USDA Forest Service 1883–1913**).

Gold and silver were discovered about 5 miles (8 km) south of the Baca Location in 1889. Major mines and the boomtowns of Albemarle, Allerton, and Bland followed about 1894. The demand for lumber led to the establishment of several sawmills (**Scurlock 1981**:140).

Maríano Otero and his son, Frederico J. (F. J.), began buying interests in the Baca Location from the Baca heirs about 1890 after Maríano inherited an interest in the land grant following the death of his father-in-law, José Leandro Perea. As noted previously, Perea bought the mortgage on Tomás Dolores Baca's interest in the property about 1875, after Tomás D. discovered that, as a bondsman, he owed $40,000 to San Miguel County (**Cabeza de Baca 1994**:72–73). Numerous transactions in the records of Bernalillo County show that other grant heirs sold their interest in the Baca Location piecemeal and that the Oteros bought up these interests as they became available. The Oteros also formed the Valles Land Company at this time (**Bernalillo County, New Mexico 1849–1903**).

The Partition Suit of 1893–1899

The Baca Location was transformed from a land grant held by multiple owners to a corporate entity under the sole control of one man by an Anglo-American innovation: the partition suit.

The U.S. Territorial government made the laws necessary to accomplish the transfer of most of the Spanish Colonial

[4.2] Miguel Antonio Otero studied law in St. Louis before returning to New Mexico to serve as private secretary to Governor William Lane (1852–1853). Maríano Otero dealt in real estate in central New Mexico to build upon his family's wealth and influence. He served two terms as the delegate from the Territory of New Mexico to the U.S. Congress (Martin 2003:34).

and Mexican period land grants from the grant heirs to private speculators—usually Anglo-Americans but including several Hispanic *patrones*—men who acquired land and made that land the basis of their participation in regional and national trade networks. Maríano Otero was one of these men.

The partition statute of 1876, variously amended and now codified at 42-5-1 through 9 NMSA 1978, authorizes the holder of an undivided interest in a land grant to sue all other holders in an action for partition. This statute means that anyone who has acquired an undivided interest in a land grant can request its partition, which constitutes a legal action that effectively terminates the grant and allocates exclusive holdings to individuals in proportion to their interest in the tract. For example, an individual with a one-third undivided interest in a land grant of 100 acres (40 ha) would receive exclusive rights to or compensation for 33.33 acres (13.33 ha) upon the grant's termination. Contention between Hispanic and Anglo-American speculators—men who had purchased interests in the Baca Location from various Baca heirs for control of the land grant—took the form of a partition suit.

As noted above, from about 1861 to 1872, Francisco Tomás Baca, grandson of Luis María Cabeza de Baca, and his immediate family claimed to have acquired a 33.3 percent interest in the Baca Location from other heirs. Other individuals, including Maríano Otero, José Leandro Perea, and Thomas B. Catron, subsequently obtained significant interests in the grant through mortgages, purchases, and inheritances. James Greenwood Whitney, an English immigrant who became wealthy from cattle ranching and operating a mercantile, purchased the claimed 20 percent interest that Francisco Tomás Baca held in the Baca Location from his widow, María Gertrudis Lucero Baca, on August 17, 1881. María Gertrudis Lucero, in turn, persuaded her children to sell their interests to Whitney, to give the speculator her family's full one-third interest in the grant (**Martin 2003**:35, 38).

James Greenwood Whitney was a fierce competitor with the Otero family in the acquisition of another important land holding. While gaining a foothold in the Baca Location, he simultaneously claimed the title to the Bartolome Baca Land Grant in the Estancia Basin of central New Mexico, a holding that the Oteros believed they had rightfully acquired.[4.3] Violent and scandalous events followed. Whitney was tried for the murder of Manuel B. Otero, Maríano's first cousin, who died in a gunfight.[4.4]

Weary of his legal troubles, Whitney well knew that the powerful Otero family and its many supporters continued to hold him responsible for Manuel B. Otero's death. Consequently, James Greenwood Whitney sold his right, title, and interest in the Baca Location, Cañada de Cochití, and Ojo del Borrego land grants to his brother, Joel Parker Whitney, on May 17, 1884, for $17,000 (***Whitney v. Otero* 1893**).

After waiting nearly a decade, Joel Parker Whitney filed suit against Maríano Otero et al. on August 25, 1893, requesting partition of the Baca Location (***Whitney v. Otero* 1893**). He claimed that after the death of Luis María Cabeza de Baca, Baca's grandson Francisco Tomás had appeared before the Surveyor General at the request of all the Baca heirs to pursue their land claims. Whitney added that Francisco Tomás' efforts led to the Congressional act of 1860 authorizing the five Baca Locations. The heirs paid Francisco Tomás with a one-third interest in the Las Vegas Grant, in the Ojo del Espiritu Santo Grant, and in any other grants he might locate, by an agreement dated May 2, 1857 (***Whitney v. Otero* 1893**).

Joel Parker Whitney asserted that the 15 signers of this document acted as representatives of all the other Baca Land Grant heirs, but he did not know on what authority and had no written evidence. Whitney also claimed that in this way Francisco Tomás Baca obtained a one-third interest in the Baca Location, which his widow subsequently sold to Whitney's brother, James Greenwood Whitney (***Whitney v. Otero* 1893**).

No agreement of May 2, 1857, appears in the court papers, but a Spanish transcript of a document dated May 1, 1857, is Exhibit A. This certificate states that Francisco Tomás Baca was authorized to represent the heirs, and that he subsequently was to be paid in money or in "a portion of the lands satisfactory to him" (***Whitney v. Otero* 1893**). This document does not mention any particular grant.

Joel Parker Whitney claimed one-third of the Baca Location plus additional interests (i.e., both the interests that Francisco Tomás Baca bought from the other heirs and those that accrued to him for his representation of the other heirs before U.S.

4.3 In the court battle over the Bartolome Baca Land Grant title, Thomas B. Catron, who subsequently played a key role in the Baca Location partition suit, served as legal counsel to the Otero family.

4.4 Whitney engaged in a shootout with Manuel B. Otero at the Otero family's Estancia Springs Ranch house. During the exchange in which 10 shots sounded in 10 seconds, Whitney's brother-in-law died, Otero was mortally wounded, and Whitney himself was wounded. Whitney fled the scene.

Authorities subsequently charged him with murder while he convalesced at St. Vincent Hospital in Santa Fe. He escaped from the hospital with the assistance of his brother, Joel Parker Whitney, and boarded a private car on a train headed to California. He was recaptured at a train stop south of Las Vegas with the help of Miguel Antonio Otero II, Manuel B. Otero's cousin, who would become Governor of the Territory of New Mexico between 1897 and 1906.

While traveling in custody back to Valencia County for trial, Whitney received bail for $25,000 during an unusual, hastily arranged court hearing in Albuquerque. This hearing raises questions about the presiding judge's motives. Among other things, the judge's actions suggest the possibility that he accepted a bribe. Alternatively, his conduct also may be viewed as a prudent act acted to prevent a crowd of incensed Otero family supporters in Los Lunas from lynching Whitney on his return to Valencia County.

After recovering from his gunshot wounds in California, Whitney returned to New Mexico to stand trial for the murder of Manuel B. Otero (**Martin 2003**:36–37). On April 29, 1884, during court proceedings that lasted just one day, the mostly Anglo-American jury acquitted Whitney of the crime, finding that he had acted in self-defense.

authorities) amounting to about 45 percent of the entire grant. The commissioners appointed by the court, however, subsequently found Joel Parker Whitney's interest to be about 19 percent of the grant.

Maríano Otero, aided by Thomas B. Catron, who filed an affidavit in support of Otero's (Valles Land Company) petition in early 1898 (***Whitney v. Otero* 1893**), argued that the Valles Land Company actually had held true right to lands claimed by Whitney because many of Francisco Tomás Baca's purported land purchases were not legally recognized transactions. The defendants called upon the Baca heirs to testify that they never agreed to pay Francisco Tomás Baca for his services with a share of their interest in the land grant. Besides, Maríano Otero had inherited a significant share in the Baca Location following the death of his father-in-law, José Leandro Perea, who had obtained the interest by buying the mortgage on Tomás Dolores Baca's interest in the property.

The court determined that Maríano Otero's interest in the Baca Location was 34.9 percent—just over a full third. On December 6, 1897, an interlocutory decree was entered making findings and an adjudication of the respective fractional interests of each party to the suit (***Whitney v. Otero* 1893**).

On October 4, 1898, a decree was entered directing partition of the Baca Location and appointing commissioners to determine the feasibility of partition in kind. Two months later, on December 5, 1898, the commissioners reported that partition in kind was not feasible, given their identification of 46 valid, undivided interests in the property that ranged from more than 34,700 acres (14,960 ha) to as few as about 113 acres (45.2 ha) (**Martin 2003**:38–39). The commissioners recommended the sale of all the real property and the division of the proceeds. On January 27, 1899, Associate Justice of the Supreme Court of the Territory of New Mexico John R. McVie entered a decree ordering the sale of the entire Baca Location in public auction to the highest bidder. He appointed a special master to carry out the sale and to distribute the proceedings to the claimants (***Whitney v. Otero* 1893**).

In his report to Associate Justice of the Supreme Court of the Territory of New Mexico J. W. Crumpacker, Special Master William D. Lee stated that he sold the Baca Location to Frank W. Clancy for $16,548.21 on March 13, 1899, "for cash at the Court House door of the Court House of Bernalillo County in the Town of Albuquerque" (***Whitney v. Otero* 1893**). Clancy was Joel Parker Whitney's attorney of record. Clancy was also, according to a court decree entered some time subsequent to December 4, 1897, "of counsel" to the Valles Land Company (***Whitney v. Otero* 1893**). Moreover, Clancy simultaneously served as Catron's counsel in a disbarment suit.

The special master's deed from Lee to Clancy was filed in the Bernalillo County Clerk's Office on March 29, 1899. This deed conveyed the full fee title to the Baca Location without exceptions or reservations (**Bernalillo County, New Mexico 1849–1903**, reel 31, Deed Books 352–353).

On March 18, 1899, just 5 days after he bought it, Frank W. Clancy sold the entire Baca Location to the Valles Land Company, whose owners were none other than Maríano and F. J. Otero. The subsequent deed filed for this purchase conveyed the full fee title without exceptions or reservations (**Bernalillo County, New Mexico 1849–1903**, reel 31, Deed Books 354–355).

In this case, a partition suit ended uncharacteristically with a Hispanic capitalist in full control of the lands. Maríano Otero was not an heir to the grant; rather, as a member of New Mexico's economic elite, he was sophisticated enough to use the law to his advantage. Otero demonstrated his ability to make at least temporary alliances with Anglo-American claimants, including Thomas B. Catron, a formidable land speculator and owner of lands within the Baca Location acquired from the Baca heirs. As shown by a much later petition (October 15, 1909) by F. J. Otero to the New Mexico Supreme Court (asking the Court to issue a decree confirming that all unknown heirs of Luis María Cabeza de Baca were bound by the proceedings in the case), Catron became a stockholder in the Valles Land Company (***Whitney v. Otero* 1893**, petition of Valles Land Company, October 18, 1909). This suggests an explanation of Catron's acquiescence in the sale of the Baca Location to the Otero family.

The Otero Family's Tenure

Having acquired the Baca Location, the Valles Land Company began to use the land as summer range for large numbers of horses, cattle, and sheep (**Martin 2003**:44; see also chapter 6). Following his father's death in 1904, F. J. Otero managed the Baca Location as summer range between 1905 and 1909.

While Maríano Otero purchased the Baca Location as a business proposition, he already was a member of the Cañon de San Diego Grant around nearby Jémez Springs by right of being a resident of the grant community. Over the years, however, Otero had increased his interest in this 110,000-acre (44,000-ha) land grant significantly in support of his expanding sheep enterprise. By the time of his death he had come to treat the entire community tract as his private property (**Martin 2003**:44). Trying to assert their interests, the other Cañon de San Diego Grant heirs filed suit against F. J. Otero and his brothers over their inheritance claim.

As recounted previously, the contested inheritance claims between Francisco Tomás and his younger brother, Tomás Dolores, led to the extinction of the claim of the Luis María Cabeza de Baca heirs to the Baca Location. Unintended consequences carried the day: the dispute over the inheritance of right in the Cañon de San Diego Grant led to the sale of the Baca Location by the Otero brothers, and to the end of their family's interest in their community land grant as well.

To settle the dispute, the judge awarded 80 percent of the acres to the heirs of the original grantees and ordered the [Cañon de San Diego] land grant sold and the money divided. Combined with other losses, the settlement forced the brothers to look elsewhere to add to their cash flow. By 1905 Frederico Otero actively marketed the Baca Location to prospective buyers, most of whom hailed from the East Coast (**Martin 2003**:44).

In 1909 F. J. Otero, as president of the Valles Land Company, sold the Baca Location to the Redondo Development Company, an organization with access to eastern capital and headquarters in Warren, Pennsylvania (see also chapter 7). The deed contained no reservations (*Baca Land and Cattle Company v. New Mexico Timber, Inc*. [***Baca Co. v. NM Timber, Inc.*, 1967**], Valles Land Company to Redondo Development Company, October 16, 1909, in Abstract of Title, box 110A). F. J. Otero subsequently leased the grazing rights to the Baca Location for 9 years, from 1909 to 1918.

Redondo Development Company: Mortgaging the Baca Location's Future

Three years after Redondo Development Company purchased the Baca Location, George White, who had firsthand knowledge of the Jemez Mountains going back to the days when he had helped string telephone line through the locality in 1905, filed a homestead entry for 156 acres (62.4 ha) in the Valles de los Posos along the east border of the Baca Location, as determined by Daniel Sawyer and William H. McBroom's 1876 survey. "White and his wife Lottie built a small cabin in the northern arm of the Posos at the foot of an old trail that crossed the Sierra de los Valles from Guaje Canyon" **(Martin 2003**:52). The isolation of this tract, however, led the Whites to abandon the homestead within the year.

One of White's contemporaries, James Leese, who had lived in the locality for about a decade, filed entry for White's abandoned Valles de los Posos homestead on June 3, 1915 (**Martin 2003**:52). The Leese family built a two-story log summer home with a corrugated metal roof, and fenced a 3-acre (1.2-ha) garden in which they grew potatoes and other vegetables. They made none of the other improvements required for a homestead patent, however. The Leese family occupied the property only during the warm season of 1915 and the summers of 1916 and 1917. Even then, James Leese worked elsewhere and only visited the homestead (**Martin 2003**:52).

Redondo Development Company challenged the legality of the Leese homestead entry, citing Lewis D. W. Shelton's unofficial 1910 survey of the Baca Location's boundaries to show that the Sawyer and McBroom survey was in error and that the Leese claim was really on their land. The Santa Fe National Forest supervisor asserted that Leese had not met the requirements of the Homestead Act. The Surveyor General in Santa Fe authorized a new boundary survey to resolve the discrepancies between the Sawyer and McBroom and Shelton surveys. Leese bowed out, giving Redondo Development Company a quitclaim deed for the tract. The company paid Leese for the log house and fencing that he had erected on the property (**Martin 2003**:53).

The resurvey redefined the east, south, and west grant boundaries. Three patented homesteads and the two sulfur-mining claims made by John W. Walton and Maríano Otero, all of which had been thought to lie outside the Baca Location (based on the Sawyer and McBroom survey), were discovered to be within the land grant. "Because these homesteaders and miners had received valid title to their land and had acted in good faith, their ownership was not challenged" **(Martin 2003**:53).

Timbering approached the Baca Location from lower elevations that were more accessible to the railroad (chapter 7). As with the grass needed for herding and ranching, the timber of the Valles Caldera rose in value as the lower areas were sharply reduced in productivity.

In 1898 the Anglo-American owners of the Ramón Vigil Land Grant on the nearby Pajarito Plateau leased the timber rights on the grant to H. S. Buckman, a lumberman from Oregon. Buckman began cutting timber on the Plateau in 1899. **Hal Rothman** (**1989**:203) observes, "Buckman's timber enterprise destroyed what remained of the native ecosystem on the Vigil Grant."

> *[C]hanging patterns of land use in the region ignited a complicated process of economic, social, political, and environmental change. This change was incremental. Each stage pushed the people of the area closer toward dependency on outside markets. Native American and Hispanic populations found themselves with less and less of the plateau at their disposal. The Ramón Vigil Land Grant, its productivity demolished by Bishop and Buckman, was no longer available. The density of Hispanic and Native American stock outside the Vigil Grant increased, and more animals competed for less grazing land. Anglo overgrazing extended the impact of earlier limited overgrazing by Hispanics and Native Americans; cattle and sheep trails were no longer centralized around water sources. Larger herds also drove game higher into the Jemez Mountains, and the black bear, wild turkeys, and pumas that characterized the pre-1800 plateau became scarcer. The advantages of the plateau as a subsistence environment quickly disappeared. The people that depended on this land had to find new sources of sustenance. Prior to the lumber camps and tie-gangs, few Hispanics or Native Americans worked for anyone else. Instead, they grew foodstuffs, tended animals, and traded for items that they could not produce themselves. Cash money was scarce, and labor was a commodity to be bartered, not sold. Buckman's crews received cash for their labor, and the influx of money made the goods in the stores by the railroad in Española more available to the people of the region. With motives born of desire and necessity, Hispanics and Native Americans began to participate in the cash economy. As their base of subsistence became less fruitful, many Hispanics entered the market to trade for foodstuffs. Many also sought to acquire the tools and implements of industrial America. These were expensive, and often required credit—the final step in becoming a part of the cash economy…the need for credit and its availability dramatically changed both farming and grazing in the Pajarito Plateau area. Cash crop farming became prevalent, and new patterns of land use emerged (**Rothman 1989**:205–206).*

The timber on the Baca Location was estimated in 1907 at 425 million board feet of white pine and from 15 to 25 million board feet of spruce. Another informant estimated 403 million board feet of merchantable timber. A "cruiser" stated that there were also "telegraph poles, ties, piling, mine props and stulls in large quantities" (**Laughlin Papers 1907**).

During 1911 and 1912, the U.S. Surveyor General (Santa Fe) made restorative surveys. The object of this work was to clarify the shared boundaries of the Baca Location, the Jémez Forest Preserve, and the Ramón Vigil Land Grant. Notes accompanying the cadastral surveys indicate the interests that would predominate on the Baca Location over the next 50 years: "The ridges, densely timbered with fir and spruce, and considerable pine, give good timber values" (**Douglass and Neighbour n.d.**).

This survey also showed that the operation on the Ramón Vigil Land Grant, carried on under the name of the Ramon Land and Lumber Company, had cut about 100,000 board feet of timber from the Jémez National Preserve (rather than the west side of the Vigil Grant) (**USDA Forest Service 1915**).

A later (1921) cadastral survey again noted:

> *The remainder of the [Baca Location] grant is covered with timber, the bulk of which is spruce, fir and aspen. Some of the lower elevations and southerly slopes, contain considerable valuable pine timber. Oak undergrowth occurs most in the higher pine levels (**Osterhoudt et al. 1921**).*

On April 1, 1915, Redondo Development Company mortgaged the Baca Location to the Warren Savings Bank of Pennsylvania, borrowing $175,000. Redondo Development Company reserved a right to sell timber from the lands for a price not less than $175,000. The company authorized the issuance of bonds in the value of $175,000, securing the payment of principal and interest (at 6%) by this mortgage to Warren Savings Bank of Pennsylvania. The bonds were to mature on April 1, 1925.

This mortgage applied to:

> *. . . all that certain tract of land cummunly [sic] known as Baca Location No. One, situated in the counties of Sandoval and Río Arriba in the Territory of Mexico [sic], the same being one of the tracts of land located by the heirs of Luis María C. de Baca under the authority conffered [sic] by section 8 of an act of Congress of the United States approved June 21, 1860. . . (Redondo Development Company 1915).*

Divided Rights, Part I: Bond Family Ranching and the Beginning of Commercial Timbering

F. J. Otero did not renew his grazing lease in 1917. The Bond brothers, George W. and Frank, first leased the grazing rights to the Baca Location from Redondo Development Company in 1917 as part of their efforts to acquire the pasturage that they needed to sustain their dominant position in northern New Mexico's sheep and wool industries. In March 1918, Frank Bond inquired about buying the Baca Location. On December 14, 1918, Redondo Development Company signed a contract with the G. W. Bond and Brothers Company for the sale of the Baca Location, reserving an exclusive 99-year timber right. G. W. Bond and Brothers Company continued to lease the Baca Location from 1918, fulfilling the terms of the purchase contract in 1926 (**Kelly 1972**:6–7; **Otero 1935**:237; **Wentworth 1948**:239–241).

In the meantime, Guy H. Porter and his son, Frank H. Porter, formed the White Pine Lumber Company in 1922. In 1924 they began to ship timber from the Cañon de San Diego Grant by rail to Bernalillo. This required the condemnation of a right-of-way across Jémez Pueblo. New Mexico's members of Congress obtained passage of the (Federal) Pueblo Lands Condemnation Act of 1926 to enable the lumber company to take the Pueblo lands. The act turned out to be defective—it did not name the United States as the representative of the Indians. New Mexico's members of Congress went back and obtained passage of a second Federal statute in 1928. Anglo-American businesspersons, including New Mexico's U.S. Senators, found ready acceptance in Congress and in the White House of the assumption that the rights of Indians should be set aside to facilitate exploitation of the lands for private profit.

On April 8, 1926, the Bond brothers completed their purchase of the Baca Location, with a half interest in its mineral rights, for $400,000. The terms of the contract excepted and reserved all the:

> *. . . timber, trees and wood and increment thereof, standing, growing, lying and being in and upon the above described premises, with the right of entry and reentry at all times for and during the term or period of ninety-nine years from the date hereof. . . (**Baca Co. v. NM Timber, Inc.** **1967**, 8NN-021-89-022 #5648, FRC#76L0201, box 110A; see also **Bond and Son 1918–1919**; **Scurlock 1981**:144).*

Timber operations on the Baca Location began in 1926 and continued under various auspices until 1971 (chapter 7).

On May 15, 1930, Redondo Development Company mortgaged the "timber, trees and wood owned by this company standing, growing, lying and being upon land…Commonly known as Baca Location No. 1" to Warren Savings Bank and Trust Company (***Baca Co. v. NM Timber, Inc.*** **1967**, Abstract of Title to Timber Interest, box 110A). Redondo Development Company also conveyed a one-half interest in all minerals. The company executed a promissory note to the bank for $65,000 payable in 4 months, with a bond of $130,000 (***Baca Co. v. NM Timber, Inc.*** **1967**, Abstract of Title to Timber Interest, box 110A).

The company renewed its mortgage to Warren Savings Bank and Trust Company on January 16, 1933, by delivering a promissory note for $65,000. Warren Savings Bank and Trust Company, in turn, pledged Redondo Development Company's promissory note, bond, and mortgage to the Reconstruction Finance Corporation on September 9, 1933, to borrow funds

for its own use (***Baca Co. v. NM Timber, Inc.* 1967**, Abstract of Title to Timber Interest, box 110A).

Redondo Development Company sold its timber interests to Robert Anderson of Firesteel Lumber Company for $150,000 on July 19, 1935 (***Baca Co. v. NM Timber, Inc.* 1967**, Abstract of Title to Timber Interest, box 110A). The term of this sale was 99 years and was subject to approval by Warren Savings Bank and Trust Company.

Under an agreement with Firesteel Lumber Company, New Mexico Lumber and Timber Company began logging near Redondo Creek in 1935. Firesteel's owner, Robert Anderson, variously claimed (in a 1935 petition for a reduction of taxes) that there were 270 to 312 million board feet of merchantable timber on the Baca Location (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A). New Mexico Lumber and Timber Company built Redondo Camp at Redondo Meadows to house 25 employees and their families (chapter 7). This logging camp included log cabins, transportable skid-mounted frame houses, sheds, stables, a mess hall, and a school. In addition, during 1935, the Civilian Conservation Corps built the road across the Valle Grande that continues to be the main connection between Los Alamos and Cuba today (**Tucker and Fitzpatrick 1972**:162–171).

New Mexico Lumber and Timber Company's Redondo Camp closed in 1939 when logging activity shifted to the northwest part of the Baca Location (**Scurlock 1981**:151). Heavy logging continued through the war years and included cutting on Redondo Peak, at El Cajete, and along the Jaramillo drainage.

When Frank Bond died in 1945, his son, Franklin, began leasing parts of the Baca Location to various cattle operations. The Bond family also ended their reliance on the traditional *partido* system and began hiring shepherds and cowboys to work their flocks and herds (chapter 6). Following Franklin's death in 1954, the family leased the ranch to outside parties. The King family, whose son Bruce subsequently served three 4-year terms as governor of New Mexico in the 1970s, 1980s, and 1990s, obtained a 5-year lease in 1959 for summer pasturage of their cattle. With this transaction, the last of the Bond sheep were removed from the Valle Grande and this important part of the Bond family's connection to the Baca Location came to an end.

Lena Bonaguidi, Leonard M. Tartaglia, and Irene Tartaglia sued Frank Bond and Son, Inc., and New Mexico Timber, Inc., on January 13, 1959, complaining that they were rightful owners of 74 acres (30 ha) in Section 9, T19N, R3E. The court found for the plaintiffs. The judge determined that the west fence line of the Baca Location is on the east boundary of the tract held by Bonaguidi and others (***Baca Co. v. NM Timber, Inc.* 1967**).

Divided Rights, Part II: James Patrick Dunigan vs. New Mexico Timber

On January 11, 1963 George W. Savage, trustee for Ethel Bond Huffman (Frank Bond's widow), sold the Baca Location to James Patrick Dunigan, owner of Dunigan Tool and Supply Company, Abilene, Texas, for $2.5 million.

Dunigan's acquisition of the Baca Location began a significant interlude in the pattern of use of the Valles Caldera. Dunigan continued cattle leases, but he also initiated the drilling of experimental steam wells. Dunigan was interested specifically in long-term conservation and went to extraordinary lengths, as shown by his lawsuit against New Mexico Timber, Inc., to try to restrain wasteful land use. Further, his companies eventually sold the Baca Location back to the public after his death.

New Mexico Timber, Inc., merged with the San Diego Land Corporation on April 30, 1963. In this transaction, New Mexico Timber, Inc., assumed the name of its parent corporation.

In 1964 Dunigan's Baca Land and Cattle Company sued New Mexico Timber, Inc., and T. P. Gallagher and Co., Inc., on three counts: (1) to establish the parties' interests under the deed and contract of 1918 and 1926; (2) to seek damages for timber cut in violation of the terms of the deed and contract of 1918 and 1926; and (3) to seek damages for wasteful logging practices (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A).

In a response to interrogatories filed on October 19, 1964, in this case, Vega Testman, representing New Mexico Timber, Inc., deposed that the logging operation on the Baca Location between the years 1960 and 1963 had employed 81 men. Based on the employees' surnames, it appeared that 54 were Hispanic. The others apparently were Anglo-Americans, although Jémez Indians could have been in both groups (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A).

Baca Land and Cattle Company argued that the defendant, New Mexico Timber, Inc., did not own any of the trees or wood "which were not in being on December 14, 1918" (***Baca Co. v. NM Timber, Inc.* 1967**, Motion for partial summary judgment filed December 23, 1965, box 110A). That is, Baca Land and Cattle Company claimed that New Mexico Timber, Inc., owned only the trees growing on the land at the time of signing the 1918 agreement.

While Dunigan and the timber companies were in court, logging continued. One deposition noted that logging took place on Cerro Toledo about 1966, with roads built "around and around the mountain" (***Baca Co. v. NM Timber, Inc.* 1967**, Deposition of J. B. Harrell, Jr., July 17, 1968, box 110A). The roads were later bermed and abandoned, but the scars remain clearly visible today.

Dunigan had only partial success in his lawsuit. In 1967 the U.S. District Court rendered summary judgment for the plaintiffs on the first two counts of the complaint (***Baca Co. v. NM Timber, Inc.* 1967**). The Court established Baca Land and Cattle Company's interest in the timber on the Baca Location and right to damages for timber cut in violation of the instruments of 1918 and 1926. With regard to the third count, although the District Court ordered New Mexico Timber, Inc., to restrain wasteful and abusive logging practices, it ordered trial by jury to consider the question of restitution for damages. Importantly, in doing so, the District Court upheld New Mexico Timber, Inc.'s 99-year timber lease on the Baca Location.

Baca Land and Cattle Company, Dunigan Tool and Supply Company, and George W. Savage, the trustee of the Bond family, immediately appealed the District Court's decision. The 10th Circuit Court of Appeals dismissed the case on October 19, 1967. The court found that Baca Land and Cattle Company had set forth three different legal theories on the same set of facts as the basis for its dismissal. Because each theory of the appellants arose out of the same transaction or occurrence, the 10th Circuit said that the common practice of all circuit courts directed it "to conclude that the trial court's ruling is not appealable" (***Baca Co. v. NM Timber, Inc.* 1967**). The case was remanded to the District Court.

Dunigan testified on July 18, 1968, that the Baca Location ran 7,000 steers from about April 15 to November 15 (***Baca Co. v. NM Timber, Inc.* 1967**, Record on Appeal, box 110A). Dunigan said that this had been his operation for the years 1965 through 1968 (in 1963 and 1964, the prior lessee still controlled the grass).

George W. Savage, the Bond family trustee, testified that logging had marred the natural beauty of the Baca Location. He claimed that the severity of this disturbance eliminated "the motive of pride of possession" and that in his opinion this might reduce the value of the Baca Location from $2.5 to $1.5 million (***Baca Co. v. NM Timber, Inc*. 1967**, Deposition of George W. Savage, July 18, 1968, in Record on Appeal, box 110A).

In his findings of fact and conclusions of law dated June 5, 1969, U.S. District Judge H. Vearle Payne found that timbering methods used before the 1960s meant that an area that had been logged could be used for cattle grazing. Moreover, he concluded that:

> *. . . the slash and debris did not form barriers to livestock or deer or other reasonable uses of the land by the fee owner, numerous trees were left standing, and erosion problems were localized to widely spaced lead roads and skid trails. Slash and debris left did not constitute a grave fire danger (**Baca Co. v. NM Timber, Inc. 1967**, Findings of Fact and Conclusions of Law, H. Vearle Payne, June 5, 1969, box 110A).*

Payne added, however, that:

> *. . . as a result of the timbering practices employed by the defendants commencing about the time plaintiffs acquired their interest in the Baca Location, slash and debris is piled upon slash and debris forming a barrier to livestock and deer and depriving plaintiffs of reasonable use of land (**Baca Co. v. NM Timber, Inc.* 1967**, Findings of Fact and Conclusions of Law, H. Vearle Payne, June 5, 1969, box 110A).*

Judge Payne found that clear-cutting meant that both dead and damaged live trees were left standing, such that they might constitute a severe fire danger, or might blow down and increase the tangle on the ground. He added that the recent system of haul roads had created a severe erosion problem (***Baca Co. v. NM Timber, Inc.* 1967,** Abstract of Title to Timber Interest, box 110A).

Judge Payne then found that the timbering methods now being used were not contemplated in 1918 and 1926. He found that clear-cutting had not been anticipated originally and that this method destroyed the scenic value of the Baca Location (to which, he clearly indicated, the fee owner had a right). Yet the judge explicitly authorized clear-cutting of spruce and mixed conifers because this was the common method at the time of his ruling (***Baca Co. v. NM Timber, Inc.* 1967,** Abstract of Title to Timber Interest, box 110A).

Judge Payne awarded damages to the plaintiff to pay for the harm caused by the defendant, but he rejected Baca Land and Cattle Company's argument that New Mexico Timber, Inc., owned only the timber existing as of 1918, pointing to the 99-year provision and ruling that this period controlled, and that "increment" meant the natural increase and growth over this period. He upheld the property right of the defendant, while at the same time recognizing that Baca Land and Cattle Company could use the land for any purpose other than timbering, including scenic value and use (***Baca Co. v. NM Timber, Inc.* 1967,** Abstract of Title to Timber Interest, box 110A).

In the ruling that followed on August 12, 1969, Judge Payne denied the motion of the plaintiffs (Baca Land and Cattle Company, Dunigan Tool and Supply Company, and George W. Savage, Trustee) for partial summary judgment. New Mexico Timber, Inc., and the other defendants, he said, were the owners of all timber, trees and wood "and the increment thereof," and were permitted to clear-cut spruce and "mixed conifer-type" trees (***Baca Co. v. NM Timber, Inc.* 1967**, Abstract of Title to Timber Interest, box 110A).

Judge Payne stipulated methods to repair damage: (1) cut down dead and living trees that were likely to blow over, (2) properly reseed and reconstruct water bars at appropriate spots on all roads not regularly used for timber harvesting, and (3) straighten out slash and debris so it lay on the ground. The timber companies must accomplish these tasks within one year, the judge ruled, and added that Baca Land and Cattle Company could use the Baca Location for any purpose except for the rights reserved in the 1918 contract and the 1926 deed. He also awarded Baca Land and Cattle Company compensatory damages of $202,278.31. Nevertheless, he awarded no damages for the clear-cutting of the Cerro del Medio area as of about January 7, 1969, nor any damages for the timber practices of the defendants up to and including January 7, 1969 (***Baca Co. v. NM Timber, Inc*. 1967**, Abstract of Title to Timber Interest, box 110A). In conclusion, however, Judge Payne's ruling made it inevitable that more logging damages would occur in the future.

New Mexico Timber, Inc., and the other defendant companies appealed this ruling on September 10, 1969 (***Baca Co. v. NM Timber, Inc*. 1967**, Abstract of Title to Timber Interest, box 110A). In 1971, however, the parties settled. Dunigan bought back the timber rights and temporarily halted logging on the Baca Location (chapter 7).

Under Dunigan's ownership, two land sales occurred (**Martin 2003**:103–104). Until this time, three small homestead entries and the sulfur mineral claims filed by John W. Walton and Maríano Otero were the only legally recognized

inholdings within the Baca Location (see chapter 8). Each of the properties received patents because their owners had acted in good faith under the belief that the respective tracts were outside the land grant boundaries that were based on the 1876 Sawyer and McBroom survey.

In 1975, Dunigan finalized the sale of a 165-acre (66-ha) parcel along the Baca Location Land Grant's east margin to the Pajarito Mountain Ski Area. This sale allowed the ski operators to open a new lift and allow development of new north-facing slopes for ski runs. In 1977, the National Park Service (NPS) bought the 3,076-acre (1,245 ha) Upper Frijoles Tract at the southeast corner of the grant as an addition to Bandelier National Monument for $1,350,000. As part of the complex negotiations for this transaction, Dunigan traded a 12-acre (4.8-ha) parcel on the south side of New Mexico Highway near the Upper Frijoles Tract to Jacob Harrell, Union Oil Company of California, in exchange for the undivided mineral interest in the property that the NPS wished to acquire (**Martin 2003**:105–106).

After James Patrick Dunigan died in 1980, his estate sold two other small properties within the land grant to private individuals. These transactions took place in 1986 and 1987 (**Martin 2003**:106).

Federal Acquisition of the Baca Location

By the 1970s, Dunigan was well aware of initiatives by the NPS, USDA Forest Service, and U.S. Fish and Wildlife Service to explore the public acquisition of the Baca ranch. This was not the first time that the U.S. Government had considered the issue. Congress first briefly entertained the idea in 1888, inspired by "the writings of ethnologist Adolph F. Bandelier and journalist Charles Lummis" (**Martin 2003**:73–74). Edgar Lee Hewett, the renowned archaeologist who was the driving force behind the legislative act that established the Bandelier National Monument, first lobbied Congress in 1900 to include the Valles Caldera in a great "Pajarito National Park." The first bill died in committee. Hewett became a tireless advocate for the protection of the Pajarito Plateau's archaeological resources. It took him 16 years, 6 more congressional bills, and countless meetings with ranchers, loggers, homesteaders, and Pueblo communities—who all had stakes and vocal concerns about their access to the Jemez Mountains' land and natural resources to win Congressional authorization of Bandelier National Monument—a small area within the much larger park originally proposed in 1916.

Ranchers, miners and loggers finally accepted the monument to put an end to proposals for a larger park, but Hewett felt that Bandelier National Monument was an inadequate fragment of his vision. He revisited the idea of placing the Valles Caldera in public ownership in his 1923 proposal to establish a geographically expansive "Cliff Cities National Park" (**Martin 2003**:74). The NPS was responsive to the idea because it would have included the transfer of huge tracts to their administration, including 195,000 acres (78,000 ha) of the Santa Fe National Forest, the entire Baca Location, and the culturally significant pre-Columbian and early Historic period Tewa Pueblo villages of Otowi and Puye. The USDA Forest Service, Frank Bond and other ranchers, loggers, homesteaders, and Pueblo communities each renewed its objections to Hewett's plan of creating an archaeological preserve whose reach extended beyond the established boundaries of the now-existing Bandelier National Monument (**Martin 2003**:74).

Two more attempts to establish a national park that included at least major parts of the Valles Caldera were made before Dunigan's acquisition of the Baca Location. In 1938 H. E. Rothrock, Natural Resources Division, NPS, spearheaded an attempt to establish a million-acre (400,000 ha) national park that would have included "the entire Valles Caldera, and thus all of the Baca Location, the ancient villages on the mesas to the north and south, the Bond-owned Ramon Vigil Grant on the Pajarito Plateau, and the Cañada de Cochiti Grant" (**Martin 2003**:75). The coalition of other Federal, private, and tribal interests kept Rothrock's expansive idea from moving from the Department of the Interior to Capitol Hill.

In 1961 an influential local resident, Evelyn Frey, informed New Mexico Senator Dennis Chavez that the Bond family was interested in selling the Baca Location (**Martin 2003**:75–78). Chavez found that the idea of creating a national park that included the Valle Grande interested both his colleague, New Mexico Senator Clinton P. Anderson, and the NPS. By this time the NPS had a long history of welcoming any proposal that would increase its holdings around the Bandelier National Monument. Senator Anderson engaged the Bond Estate, the NPS, and the USDA Forest Service in various discussions. T. P. Gallagher, president of New Mexico Timber, Inc., was steadfast in his opposition to the idea. He repeatedly reminded the parties that his company owned the timber on the Baca Location and intended to log it all (**Martin 2003**:77; see also chapter 7).

Dunigan was sympathetic to the idea of the preservation of the Baca Location, and listed the Valles Caldera with the NPS as a National Natural Landmark (NNL). Rather than focusing on the tract's scenic, cultural-historical, and cultural values, however, the NNL nomination highlighted the Valles Caldera's long, rich volcanic history (**Martin 2003**:111). While his investors proposed various development plans for the Valles Caldera, (including a ski resort, a racetrack, and a resort community of home sites and stores), Dunigan remained committed to his idea of maintaining the property as a working ranch and sustaining the Valle Grande's beauty (see **Martin 2003**:80–82).

After Dunigan died in 1980, negotiations for the Federal acquisition of the Baca Location were shelved until the early 1990s. The **USDA Forest Service** (**1993**) issued a preliminary study titled, *Report on the Study of the Baca Location No. 1 Pursuant to Public Law 101-556*. The study was intended "to support informed and educated decisions regarding the Baca in the future" (**USDA Forest Service 1993**:2). The purpose of this document was to prepare for the acquisition of the Baca Location by the Federal Government. The report did not state this intent because the owners were not offering the Baca Location for sale at the time.

New Mexico's Congressional delegation pursued acquisition throughout the 1990s. After lengthy negotiations with the Dunigan companies, the Federal Government acquired the Baca Location in 2000 and established the VCNP.

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CHAPTER 5.

Plant Gathering, Game Hunting, Fishing, Mineral Collecting, and Agriculture

Kurt F. Anschuetz

Introduction

Native American populations have cut wood for shelters and fuel, gathered native plants, hunted game animals, and collected various other resources, such as obsidian for making chipped-stone tools, clay for crafting pottery vessels, and stone slabs for producing *piki* (corn meal paper bread) griddles, in the Valles Caldera National Preserve (VCNP) for countless centuries (chapter 2). Archaeological evidence recounted in chapter 2 documents that Pueblo groups from the upper Río Jémez Valley farmed the Banco Bonito within the VCNP during pre-Columbian times. Although the available evidence is scanty, it appears likely that Pueblo groups caught trout in the Valles Caldera's former marsh lands and in streams for immediate consumption while they were staying in the locale for other purposes.

Consisting of a relatively narrow assemblage of raw materials—primarily obsidian debitage, chipped stone tools, charred botanical materials, a few fragments of animal bone, and the remnants of stone fieldhouses—the archaeological record offers insights only into a fraction of the activities that took place in the past. Moreover, it is largely silent on the social and ideational contexts underlying the aboriginal use of the locale before the arrival of Europeans in the region in the sixteenth century. Consequently, archaeological constructions of the pre-Columbian occupation in the Valles Caldera, as presented in chapter 2, necessarily focus on economic issues.

The ethnohistoric and ethnographic records reveal that many Pueblo communities have maintained significant relationships with the VCNP throughout the Historic period. Like their pre-Columbian forebears, these peoples have gathered native plants, hunted game animals, fished, and collected various minerals. Similarly, their stays were comparatively brief; the Pueblos never built and occupied permanent habitations in the locality. Because Spanish colonial administrators generally failed to recognize Native Americans' traditional land use practices (**Anschuetz 1998c**), the continued occupation of the Valles Caldera by the Pueblos is underrepresented in the documentary record.

Historic Pueblo communities maintained cultural and historical affiliations with the Valles Caldera. These communities included neighboring settlements (e.g., the Pueblos of Jémez, Santa Clara, and Zía), as well as villages located at great distances (e.g., the Pueblo of Zuni in west-central New Mexico) (chapters 1 and 9). Secrecy has effectively shielded specific detail of the Pueblos' activities in the Valles Caldera from the view of outsiders (e.g., **Weslowski 1981**:114). The keepers of indigenous cultural knowledge invoked confidentiality to protect the sanctity and power of their communities' age-old traditions (**Anschuetz 2002a:3.35–3.37**; **Friedlander and Pinyan 1980**). Ethnographic observations, however, indicate that the Pueblos' gathering, hunting, and collecting pursuits satisfied subsistence, social, and ritual needs (see chapter 9).

Other Native American groups known to have come to the Valles Caldera for their own purposes include the Apache, Navajo, and Ute. Just as with the Pueblos, available documentary evidence indicates that these visits were not necessarily undertaken for material needs or as a stopover along a journey from the north, northwest, or west to the Río Grande Valley. These nomadic groups also held the Valles Caldera in regard for important social and cultural reasons (chapter 9).

Wood cutting, plant gathering, hunting, and mineral collecting in the Valles Caldera by Hispanic soldiers and herdsmen date to the eighteenth century. At this time, raids by various Native American nomads prompted punitive military expeditions. In addition, the diversification of New Mexico's economy fueled the search for new livestock pastures (chapters 3 and 6). The Spanish colonial administration of New Mexico also began making land grants for settlers in the Río Jémez and Río Chama valleys in the early eighteenth century. Hispanic settlers from the Chama district farmed in high elevation settings northeast of the Baca Location No. 1's (Baca Location's) historical boundaries during the mid-early eighteenth-century drought cycle. For this reason, it is possible that other Hispanic, Pueblo, or *Genízaro* (i.e., hispanicized Native American) groups from the south or east similarly planted in selected, well-watered meadows in the Valles Caldera.

The activities undertaken by Hispanic visitors likely were completed at a relatively small scale. Most also probably were undertaken to fulfill some immediate need of individuals during their brief visits to the locale. Detailed information about their specific use of the Valles Caldera is lacking. Ethnohistorical accounts offered by lifelong residents of the locality, however, suggest that the Hispanic residents, like their Native American

counterparts, developed special relationships with this unique upland setting that transcended economic activity.

By the late nineteenth century, permanent settlement moved closer to the Valles Caldera. Hispanic and Anglo-American homesteaders settled around Battleship Rock near Jémez Springs some time after 1876. By 1880 there was a small ranching settlement east of the Baca Location in the setting now occupied by Los Alamos (**Scurlock 1981**:138). The village of Archuleta (subsequently renamed Perea and now Jémez Springs), located near the Jémez Hot Springs on the Cañon de San Diego Land Grant, was established about the same time near Archuleta's original 1850s cabin (Smith 1979, in **Scurlock 1981**:138). Archuleta built the first crude bath houses for commercial use (**Martin 2003**:41). Homesteads gave rise to the settlement of La Cueva near the southwest corner of the Baca Location. At about 1883, homesteaders, including John Kelly, Polito Montoya, N. R. Darey, Angeline Eagle, J. S. Eagle, and S. D. Thompson moved still closer to the Valles Caldera (**USDA Forest Service 1883–1913**; see also chapter 6). Meanwhile, Maríano Sabine Otero and his uncle, Miguel Antonio Otero, working with officials of the Atchison, Topeka, and Santa Fe Railroad, made plans to develop the Jémez Hot Springs—which they bought from Archuleta—and Sulfur Springs as resorts. The passage of the Enlarged Homestead Act (1909) and the Stock-raising or Grazing Homestead Act (1916) brought intense settlement by Hispanics and Anglo-Americans. This act quickly brought the establishment of at least 19 homesteads, occupied land claims, and ranches around La Cueva and Upper Vallecitos, which are just southwest and south of the VCNP, respectively (**Scurlock 1981**:142).

With this development in the last decades of the nineteenth century, local residents and entrepreneurs increasingly looked toward the Valles Caldera for the raw materials and recreational venues for their new communities and businesses. Recreational hunting increased and timber joined ranching, making these the dominant activities. Consequently, game animals, such as elk, rapidly became depleted and the construction of sawmills brought commercial timbering to the upper Río Jémez Valley in the 1890s (**Scurlock 1981**:140). Even as development resulted in increasingly dramatic physical and ecological changes to parts of the Jémez Mountains, traditional Native American and Hispanic hunting, fishing, plant gathering, and various mineral, rock, and other resource collecting activities persisted in comparative obscurity.

This chapter reviews historical and ethnohistorical evidence of plant gathering, game hunting, fishing, mineral collecting, and agriculture within the Valles Caldera. Except for a brief episode of commercial hay cutting in the mid-nineteenth century, small-scale fishing by a small number of Pueblo men to satisfy a limited demand in Santa Fe during the late nineteenth and early twentieth centuries, and a sport hunting business begun by James Patrick Dunigan in the 1960s during his tenure as the owner of the Baca Location, the land uses considered in this chapter were either traditional subsistence or vernacular (*qua* common indigenous practice) activities.

As I note in my preceding comments, gathering, hunting, and collecting pursuits undertaken by traditional Native American and Hispanic groups often have important social and ritual meanings, as well as economic functions. To follow the structure of the chapters on the history of ranching (chapter 6), industrial timbering (chapter 7), and industrial mineral extraction and geothermal exploration (chapter 8) within the Valles Caldera, I primarily focus the following discussion on subsistence issues. I refer the reader to chapter 9, which addresses how the VCNP represents a multilayered ethnographic landscape, for insights into the social and ideational importance of native plant gathering, game hunting, fishing, and obsidian, clay, and other resource collecting among the Native American and Hispanic communities who maintain associations with this locality.

Native Plant Gathering

Collecting plants in the late summer and fall undoubtedly was an important draw for the people who have visited the Valles Caldera over countless centuries. Archaeological sites within the study area do not occur only in areas of the greatest diversity of mammals and birds. These locations generally also have high plant diversity (**Winter 1981**:176). Nevertheless, grinding stones, such as manos and metates, are rare. Excavations conducted in the Redondo Creek Valley for the Baca Geothermal Anthropological Project did not find storage pits, hearths, or other features expected at plant processing sites (**Winter 1981**:177). Investigators recovered small numbers of edible Chenopod and Monocot seeds from sites that also had ground-stone tools.

Secrecy has limited opportunities by anthropologists to observe plant gathering in the Valles Caldera first hand. In comparison, more is known of native plant gathering by Native American groups that used the VCNP. Much of what is known is owed to **Lois Vermilya Weslowski** (**1981**), an anthropologist who reported on Jémez Pueblo's cultural and historical relationships with the Redondo Creek Valley nearly 25 years ago in anticipation of geothermal development. Although the entire Redondo Peak vicinity is important to the Pueblo, **Weslowski** (**1981**:111–112) states that the Redondo Creek watershed was especially important for the gathering of many plants and herbs traditionally used by the community's people. She offers useful context:

> *Plant gathering is viewed as an integral part of community survival and is undertaken as a comprehensive activity. In earlier years, a rich assortment of plant species was collected, providing the village with wild food supplements, raw materials for household needs, building supplies, and fuel. Moreover, all plant collection was ritually tied to the societal gathering of herbs and medicines. These ceremonial plants continue to be regarded as extremely sacred and are still gathered with reverence. The entire Redondo Creek Valley is recognized as the main location for obtaining certain ritual herbs and medicines, as dictated by traditional religious practice (**Weslowski 1981**:111).*

The Redondo Creek Valley supports a large number of the native plants that were historically gathered by the people of

Jémez Pueblo and the other Pueblos for food. These resources include native grapes, strawberries, chokecherries, currants, oceanspray, Gambel oak acorns, white pine nuts, and clusters of pink New Mexico locust flowers. The latter taxon offers a delectable nectar when eaten raw (**Weslowski 1981**:111; citing **Castetter 1935**:27, 42, 49; **Cook 1930**:27, 28).

Betty Woods (1942) speculates that the people of Jémez Pueblo visited the Valles Caldera to harvest piñon nuts and to gather other native plant products. Writing for *New Mexico Magazine* in the early 1940s, she reported, "every day during the piñon season they [the Jémez] pass through [Vallecito de los Indios] on their way to the *mesa* tops, for they, too, are great nut hunters" (**Woods 1942**:30, emphasis in the original). Because the VCNP today supports only a small number (<100) of piñon trees near Redondo Meadow and has no landforms that fulfill the usual physiographic definition of mesas, it is difficult to imagine that extensive piñon stands existed in the VCNP even during pre-Columbian Pueblo times at elevations of 8,500 feet (2,591 m) (Dr. Bob Parmeter, personal communication, VCNP, Los Alamos, 2005).

The Jémez harvested mountain mahogany root, a highly resilient forest product found on the Valles Caldera's mountainous slopes, for making rabbit sticks, clubs, baby cradles, fruit drying racks, and various tool handles (**Weslowski 1981**:111). The people prized the supple boughs of the chokecherry, currant, and New Mexico locust for use in making bows, and favored the hard wood of the Gambel oak as well as mahogany root for making clubs and rabbit sticks **(Cook 1930**:27; **Weslowski 1981**:114). The Jémez produced a red dye to color moccasins by boiling a mixture of alder bark, mountain mahogany, and birch (**Cook 1930**:20). The value of mountain mahogany root and Gambel oak further is illustrated by the fact that the Jémez today continue to use these woods as fuel for firing pottery (**Weslowski 1981**:114).

One of **Weslowski's** (**1981**:114) male informants noted that the Redondo Creek Valley supports the growth of an unspecified tall grass that is used in basketry, and a marsh grass that is needed for weaving mats and pads for drying fruit. He also mentions that Jémez women use yucca, which occurs elsewhere in the Valles Caldera, in their basketry. This informant added that the Jémez also use marsh grass in some of the Pueblo's dances. Finally, he notes that this people visit the Valles Caldera area to obtain ponderosa pine timbers for roof vigas and aspen branches for thatch (in **Weslowski 1981**:114).

The collection of the above resources was undertaken by the Jémez "in relation to the societal gathering of herbs and medicines," which were procured from specific localities "in accordance with ritual procedures passed on by oral history" (**Weslowski 1981**:114). Native plant products used in Jémez Pueblo rituals include Douglas fir boughs and sprigs, which the people use in nearly every dance as part of their costumes. As stated by the Jémez themselves, Douglas fir branches "are commonly carried in the hand as well as tied to headdresses, collars, waist belts, and legs. On some occasions, entire trees are even set out in the plaza" (**Weslowski 1981**:114). After their use in ceremonies, the Jémez dispose of the Douglas fir products that they had gathered for these observances with reverence and through ritual.

Other Valles Caldera plants used in Jémez rituals include blue flag (native iris) flowers dried for certain December dances, cinquefoil blooms for summer ceremonies, native grapes for producing body paints needed by dancers, and moss for costumes used in the sickle dance (**Cook 1930**:22, 24, 28; **Weslowski 1981**:114). The Jémez harvest aspen trunks from alpine settings for making drums and *wati* grass from around mountain springs for use as prayer sticks (**Ellis 1956**:56–57; **Parsons 1925**:104). Other species that grow around springs, such as sedges and rushes, as well as the algae that thrives in the water, are harvested for use in the kivas (**Weslowski 1981**:114). The significance of these resources lies in their association with spring water, which the Pueblos consider powerful medicine **(Parsons 1996 [1939]**:352, 416, 453–454; see chapter 9).

Given the ritual and power associated with medicinal herbs, comparatively little is known publicly about the traditional pharmacology of Jémez Pueblo. Weslowski observes:

> *Sage is documented as a remedy for stomach trouble. Prepared lichens are applied to sores (**Cook 1930**:20, 28). Other studies of Pueblo medicine in general describe uses for a few other plants found in the study [i.e., the Redondo Creek Valley] area, including mountain mahogany, white fir, aspen, and wild rose. Whether or not the Jemez actually utilize these same species for medicinal purposes is unknown (**Weslowski 1981**:114; bold added).*

During their forays into the Valles Caldera, the people of Jémez Pueblo traditionally built temporary shelters of tree boughs and rocks. They occasionally also built more substantial log cabins for shelter, hunting rites, and related ceremonial purposes (**Weslowski 1981**:111).

Another anthropologist, **Leslie A. White** (**1962**), offers a few additional insights into the use of Valles Caldera plants by nearby Pueblo communities. Reporting his study at Zía Pueblo, downstream of Jémez Pueblo in the lower Río Jémez Valley, White (1962) states that retreats into the Jémez Mountains remain an important part of this community's ritual life. Members of Zía's medicine societies, just as those from Jémez and other nearby Pueblo communities, were required by their respective community traditions to make pilgrimages into the Jémez Mountains in general and the Valles Caldera locality in particular. The duties of society members participating in these special expeditions often included the gathering of yucca leaves (used both for making whips and soapy water for blowing bubbles [cloud symbols] in medicine bowls), several unspecified kinds of grass, and oak for use in their respective community's many rituals and ceremonies. During summer pilgrimages, society members collected decorative material, such as spruce and piñon boughs, for their kivas. They would also harvest willow branches for making prayersticks, and oak branches for kicksticks, if ceremonial races were involved in the upcoming ceremony (**White 1962**:172, 232).

The importance of these plant-gathering expeditions was not entirely lost on Frank Bond. From the time of his purchase of the Baca Location Land Grant until his death in 1945 (chapter 4), Bond "permitted the people of the surrounding pueblos various types of access to the property." Through the 1940s, Jémez people received permission to conduct ceremonies on the property. Limited hunting was also allowed, and perhaps included the construction of traditional log structures (**Martin 2003**:66).

Native Americans were not the only people to gather native flora in the Valles Caldera. Hispanic residents of the surrounding valleys have a long, even if little reported, tradition of gathering plants in the Jémez Mountains. **Carrillo and others** (**1997**:136–137) briefly discuss Hispanic land use patterns along the length of the Public Service Company of New Mexico's once-proposed Ojo Line Extension (OLE) construction corridor, which crosses the east margin of the Baca Location land grant boundaries. These authors note generally that area residents visited the Jémez Mountains, including the Baca Location, to gather herbs, berries, nuts, and broom grass for household consumption, medicinal use, and ritual practices (**Carrillo et al. 1997**:137). For example, one of their informants stated:

> *I recall gathering piñon nuts, broom grass, and other things in the area of the power line, especially the Baca Location. Broom grass was a sacred plant found in the Baca Location (Informant I, personal communication 1991, in **Carrillo et al. 1997**:137).*

Another informant added that Hispanics actually harvested two kinds of broom grass.

> *"There is the traditional broom grass, which is out of a thin grass, which is straight stemmed and hard, and then there is another type of broom grass which is quite a bit taller, with a thicker stem" (Informant I, personal communication 1991, in **Carrillo et al. 1997**:137).*

Carrillo and others (1997) note further that area Hispanic residents harvested wood for use as fuel and building material. An informant stated that they favored slower-burning piñon and oak during the winter. Both of these species, however, are much less common in the high elevations of the VCNP than in the surrounding areas (Dr. Bob Parmeter, personal communication, VCNP, Los Alamos, 2005). Local residents preferred "cedar" (possibly meaning tamarisk) and juniper for summer use (Informant B, personal communication 1991, in **Carrillo et al. 1997**:137). These fuels burn rapidly, thereby allowing the fires to cool more quickly.

Hispanic traditions refer to the acquisition of Jémez Mountain timbers for construction since the earliest colonial settlement in the area. Given the remote location of the Valles Caldera, however, lumber harvests were minimal until the twentieth-century (chapter 7). Instead, Hispanic shepherds and ranchers constructed sheds, corrals, lambing pens, and other structures of logs or milled lumber at their larger stock camps (**Winter 1981**:178, after **Scurlock 1981**).

Although **Carrillo and others** (**1997**) do not elaborate on any of these observations, Hispanic gathering traditions overlap markedly with those of the region's Native American communities. That such a blending exists is not surprising, given the process of *mestizaje*—the hybridization of Indian, Mexican, and Iberian cultures through intermarriage—that has characterized northern New Mexico's history and culture since Spanish colonization (e.g., Anzaldúa 1987:5; Lamadrid and Gandert 2001:66; see also Mörner 1967; Wolf 1959). Equally important is *syncretism,* which refers to melding of the structure and symbolic content of Indian and of Iberian (i.e., Catholic) religious belief (e.g., Anzaldúa 1987:25–39; Ingham 1986:180–193; Rodriguez 1994:143–148; see also chapter 9).

Direct observations of specific native plant gathering activity in the VCNP by Native American and Hispanic groups are limited. Nonetheless, an initial survey of key ethnobotanical reference materials illustrates the richness of this mountainous habitat in terms of the number of plant taxa important to the everyday secular and ritual lives of the region's traditional communities that historically have maintained an association with this locality. This sample includes plant uses by the Río Grande Pueblos (i.e., Jémez, the northern Tiwa [Picurís and Taos], the southern Tiwa [Isleta and Sandia], the Eastern Keres [Cochití, Santa Santo Domingo, and Zía], the Tewa [Nambe, Pojoaque, San Ildefonso, San Juan, Santa Clara, and Tesuque], the Western Keres [Acoma and Laguna], Zuni Pueblo, the Hopi Tribe, the Navajo Nation, the Jicarilla Apache Tribe, the Ute tribes of Colorado, and New Mexican Hispanics [chapter 1]). I also include references to archaeological samples collected from pre-Columbian Pueblo and seventeenth-century Spanish colonial assemblages because these resources establish the antiquity of certain plant uses, including some that are not known from direct ethnobotanical observation.

As shown in tables 5.1 and 5.2 (tables are at the end of the chapter), the VCNP may offer as many as 350 native plant taxa that at least one of the associated Native American and Hispanic communities is known to have used traditionally. Of this assemblage, 125 taxa represent plant species that ethnobotanical references identify explicitly. I base the identification of the use of the remaining 225 taxa on analogy. That is, when ethnobotanists identify a plant either by genera or a related species, I assume that the pertinent Valles Calderas botanical specimen(s) possess the potential for similar use(s) as those reported.

To simplify the task of compiling this diverse, rich body of information, I follow ethnobotanists **William W. Dunmire and Gail D. Tierney** (**1995**, **1997**) and report plant uses in terms of seven general categories: (1) food or beverage; (2) medicine; (3) smoking or chewing (for recreation); (4) construction or fuel; (5) dyes, pigments, tanning, soap, or crafts; (6) fiber, cordage, basketry or matting; and (7) tools. In an attempt to document food uses and other ethnographic observations of interest more fully, table 5.1 offers a comment field that identifies edible plant parts and selected supplemental detail. Out of respect for the sensitivity of information related to Native American ceremony, I did not attempt to inventory ritual use

by taxa. The small number of published observations provided in the preceding paragraphs specific to the Jémez Mountains will have to suffice.

While table 5.1 reports uses by individual taxon, table 5.2 offers summary counts. Throughout table 5.1 I distinguish which uses are for plant species that exactly match reported Valles Caldera species and which applications are based on analogy. The reader should note that many of the Valles Caldera plant taxa have plant uses based on both direct observation and analogy. Table 5.2 does not attempt to discriminate between functions based on direct observation and analogy within individual taxa. Instead, I rely on the occurrence of any instance of direct observation within species in classifying my summary counts.

The information represented in tables 5.1 and 5.2 admittedly sacrifices much useful ethnobotanical detail. Nevertheless, it allows identification of several important patterns relevant to evaluations of the land use history of the VCNP before large-scale herding and industrial timbering reached the area.

First, the identification of 290 (82.9%) plants in the category "Foods and Beverages" might initially appear to suggest that the Valles Caldera was a virtual Garden of Eden at some times of the year for subsistence plant gatherers. This raw count is misleading, however. Of this diverse inventory, few species represent either high-quality foods or resources that people can depend upon to occur with unwavering abundance over time.

Dunmire and Tierney (**1995**:56) note that certain key resources, including "wild nuts and grains, cactus fruits, and amaranth and goosefoot seeds and leaves…are high in protein, their inclusion in early diets must have been critical to maintaining a healthy population." In addition, they observe that aboriginal methods for gathering and preparing a variety of supplemental native foods found in the Valles Caldera, such as "wild celery and beeplant greens in the spring; amaranth greens, groundcherry pods, and wild onions in the summer; and…sunflower seeds in the fall" (**Dunmire and Tierney 1995**:57) helped to ensure that Native peoples included a beneficial mix of essential nutrients in their diets.

Native plant resources upon which traditional peoples depended either as staples or key supplemental foodstuffs, however, characteristically have a patchy distribution in high-altitude mountainous settings and/or exhibit a high degree of variability in productivity from year to year. They do not offer either the productivity or the reliability needed to sustain a large number of people in one place for a significant length in time. It is not surprising, therefore, that the archaeological and historical records alike document that the permanent settlement of the VCNP did not occur until the past century. Moreover, year-round habitation of this locality was finally made possible because of a reliance on commercial ranching operations (chapters 4 and 6). Even then, comparatively few people ever lived on the Baca Location year-round. Most of the land grant's residents occupied it, usually from spring to late fall, as seasonal employees.

Equally important, as many indigenous Southwestern peoples became more dependent on corn and other cultigens for their livelihood:

> *. . . gathering became more seasonal and less of a factor in the people's diet. Today, except for piñon nuts, most gathering for food by Pueblo Indians [and all other traditional peoples of the northern Southwest] seems to be done in conjunction with other activities—tending crops, hunting for game, or management of livestock—rather than of itself . . . (**Dunmire and Tierney 1995**:56).*

Area Hispanic residents probably followed the Pueblo model of plant gathering as primarily an adjunct activity during their visits to the Baca Location. As noted previously, the VCNP likely did not support the dense stands of piñon trees needed to sustain intensive nut gathering activity during the fall (Dr. Bob Parmeter, personal communication, VCNP, Los Alamos, 2005). Even among late nineteenth-century populations who still largely pursued hunting and gathering as a way of life, such as the Navajo, Apache, and Ute peoples, plant gathering in the Valles Caldera almost certainly was a periodic, short-term activity undertaken in combination with other transitory purposes.

One additional type of food gathering activity in the VCNP is mentioned because it serves to underscore the tenuous nature of the edible native plant resources in this high altitude forest habitat. Three tree species—Rocky Mountain maple, limber pine, and ponderosa pine—found in the Baca Location locality produce an edible inner bark, the cambium (table 5.1). High in calories because of the concentration of sugars contained in its fibrous mass, cambium was variously consumed by traditional Native American and Hispanic populations at any time of the year during times of need (**Dunmire and Tierney 1995**:100; **Hudspeth 1997**:29).

Writing of the ponderosa pine, whose bark can give the sweet scent of vanilla (especially when the trees are not drought stressed), **Dunmire and Tierney** (**1995**) add that people might simply chew pieces of raw cambium to release its sugars. "The cambium can be very bitter, so if used in quantity, it was probably processed by pounding or grinding and then leaching with water" (**Dunmire and Tierney 1995**:100).

Trees harvested for their cambium on a large scale yield telltale scars on their trunks. Rather than girdling and killing a tree, people would cut through the outer bark and pry off long, vertical planks of outer and inner bark. On mature ponderosa pine trees, the residual scars, which might date back more than a century, can extend from near the base the tree's trunk to heights of nearly 10 feet (3 m) (Author's personal observation, Río Grande Foundation for Communities and Cultural Landscapes, Santa Fe, 1998).

Surviving features of this type, which are part of the archaeological record because they represent a locus of human activity, are important in reaching an understanding of the land use history of the VCNP. They possess the potential to help students of natural and cultural history—archaeologists, historians, and ecologists—understand some of the circumstances that lead people to rely on so-called starvation foods in this setting. Through the adoption of a regional perspective and a multidisciplinary approach that includes climatological and dendrochronological information, investigators might be able to address an intriguing question:

Why did groups who visited the Baca Location over the past several centuries harvest cambium? Widespread drought stress is one possibility. The inherently low productivity of edible native flora in the Valles Caldera might have required groups visiting the locality to intensify their gathering if they were forced to stay in the mountains for extended periods due to times of open raiding and warfare. As noted in chapter 3, the Valles Caldera lies along major routes used by many Native American communities and Spanish and U.S. military forces alike to travel between the Río Grande valley and areas to the west and northwest.

Second, the large number of native plant species in the VCNP with one or more directly documented or inferred medicinal uses (n = 286 [81.7%]) simultaneously illustrates and strengthens the importance of observations made previously by Dunmire and Tierney:

> *Some medicinal plants associated with Pueblo people grow only at higher elevations. Not many of these are detailed… [in published works such as theirs because most of these taxa are not readily visible to the public]. But certain members of the medicine societies that use these plants still make regular forays to the mountains to collect them. Thus, many Puebloans are concerned about having continued legal access and rights to use these lands for medicinal herb collection, even though they may technically be outside the official boundaries of their Pueblo. These people also have a legitimate interest in such lands, which typically are within the national forests of New Mexico, not being developed for heavy recreational or commodity uses that might diminish the quality of habitat for their medicinal plants (**Dunmire and Tierney 1995**:59).*

As shown in the studies by **Karen Cowan Ford** (**1975**) and **Michael Moore** (**1977**), traditional Hispanic communities similarly possess extensive native plant pharmacologies, including numerous taxa found in the mountainous setting of the VCNP (table 5.1). Consequently, the argument that Dunmire and Tierney make for Pueblo concerns about their ability to continue their traditional relationship with the native medicinal plants within the former Baca Location applies to Hispanic communities equally. The same unquestionably holds true for the people of the Navajo Nation whose ethnopharmacology also is comparatively well studied (e.g., **Dunmire and Tierney 1997**; see also table 5.1). Although medicinal plant uses among the Jicarilla Apache and Ute are less well documented (table 5.1), it is reasonable to anticipate that Dunmire and Tierney's commentary would apply similarly to these communities.

The medicinal species identified in table 5.1 are included in the pharmacologies of one or more traditional associated communities because the people have long understood that certain plants by themselves, or particular combinations of plants, possess healing properties. (The persistent interest of today's pharmaceutical companies in ethnopharmacology indicates that the chemical basis of many indigenous cures remains to be discovered and quantified [after **Dunmire and Tierney 1995**:58].) The power of healing, however, is not merely a secular matter. It concurrently enters the realm of ritual, a topic that is beyond the scope of this discussion.

Third, as documented in table 5.1, many of the medicinal plants used by Native Americans and Hispanics are also food plants. We can similarly expect that many of these medicinal plants also have important, highly sensitive ritual applications. It is conceivable that other plant species, which occur in the Valles Caldera but are not listed in table 5.1, might be used in community rituals (after **Dunmire and Tierney 1995**:58).

It is important to emphasize that some medicinal plants found in the Valles Caldera that ethnobotanists and other anthropologists have observed being used by associated communities in ceremonies such as private prayer, public dance, and healing ritual, cannot be collected anywhere else (**Winter 1981**:177). This does not mean that the occurrence of some plants is unique to the Baca Location, however. The geographical association of certain plants with the Valles Caldera contributes to traditional cultural knowledge and values, which specify the need for people to harvest particular plant taxa only from this location (chapter 9).

Fourth, plants that are native to the VCNP and are used for purposes other than food, beverage, or medicine illustrate the breadth of the traditional occupation of this locality by associated communities. The species represented among the five residual categories (i.e., "Smoking or Chewing," "Construction or Fuel," "Dyes, Pigments, Tanning, Soap, or Crafts," "Fiber, Cordage, Basketry or Matting," and "Tools") were necessary for sustaining diverse aspects of Native American and Hispanic people's lives. Although many of these uses are virtually invisible except through ethnographic and ethnobotanical investigation—just as is the case with the harvesting of edible tree bark—the active pruning of long-lived, woody species for certain tools, craft items, such as bows, cradle boards and pine resin, or even fuel wood can embody invaluable, although frequently often overlooked, archaeological evidence (Dr. Richard I. Ford, personal communication, Museum of Anthropology, University of Michigan, Ann Arbor, 1998; Louie Hena, personal communication, Pueblo of Tesuque, 2001; Felipe Ortega, personal communication, Owl Peak Bed and Breakfast, La Madera, NM, 1998). In the case of trees, whether dead or still living, dendrochronology may be used to determine the date when a piece of a trunk or limb was harvested. Moreover, the act of pruning living flora rather than unnecessarily killing an entire plant for certain desired products attests to traditional land use practices than may differ from those that have predominated in the locality over the past century.

Robert Nesbit and Hiram R. Parker's Hay Cutting Enterprise Revisited

The large-scale commercial harvesting of native plant products, other than trees for lumber and pulpwood, in the Valles Caldera was limited to a brief episode in the mid-nineteenth century. Persistent spring drought conditions and overgrazing had combined to deplete rangelands at lower elevations close to Santa Fe at the beginning of the 1850s. The

Army was becoming desperate for fodder to feed the horses and mules on which the Fort Marcy garrison depended. The Army looked toward the well-watered valleys of the Jémez Mountains for hay. The Army's resolution to improve the road between Santa Fe and the Valles Caldera, a distance of 40 miles (64 km), to facilitate the transport of hay harvested in the Jémez Mountains back to Santa Fe partly attests to the great need that the garrison faced. This road crossed the Río Grande at present-day Buckman, ascended the Pajarito Plateau via Mortandad Canyon, and traversed the Sierra de los Valles through Cañon de Valle. The 1851 contract award by Fort Marcy Quartermaster Alexander W. Reynolds to a civilian company headed by Robert Nesbit and Hiram R. Parker to cut and haul Jémez Mountains hay to Santa Fe at the premium rate of $50.00 per ton also seems to attest to the severity of the hay supply shortage (Frazer 1983:50). Quartermaster Reynolds, however, had a history of making shady deals with Robert Nesbit that ensured the two men were among the wealthiest residents in the whole Territory of New Mexico (Jordan et al. 2000:465–468, 470, 494).

Nesbit and Parker expected a substantial profit. They bought a train of mule wagons from Pinckney Tully in Santa Fe. The partners apparently had hoped that they would find good hay in the lower elevation valleys closer to Santa Fe (**McNitt 1972**:184). Not only would their cartage costs be reduced (assuring them of an even larger profit), the hay crew would be less exposed to the threat of Navajo raiders who were moving through the Jémez Mountains upland valleys.

They found that prevailing drought conditions had stunted and browned the grasses in the lower valleys. Nesbit and Parker had to lead their crew higher into the Jémez Mountains (**McNitt 1972**:184). The Valle Grande, which they referred to as the "Grande Bioh" in a letter dated July 6, 1851, to Colonel Munroe, Commander, 9th Military Detachment, U.S. Army (**Church n.d.**), was "an emerald swatch surrounded by tall timber" (**McNitt 1972**:184).

Nesbit and Parker built a stout hay camp near several springs at the head of the East Fork of the Río Jémez. They built a blockhouse of "bottom wood logs" and an attached corral measuring 30 by 50 feet (9.1 by 15.2 m) constructed "of large, green cottonwood logs" (letter from Lieutenant Beverly H. Robertson to 1st Lieutenant L. McLaws, dated July 17, 1851, in **Church n.d**.) that were stacked a height of 4 or 5 feet (1.2 or 1.5 m) (**McNitt 1972**:184).

Historical documents call Nesbit and Parker's hay camp "Old Fort." The camp apparently became "the site of Camp Valles Grandes, established by the U.S. Army as a deterrent to Navajo and Apache movement through the area during the final Navajo Wars of 1863" (**Scurlock 1981**:137; see also chapter 3). Nonetheless, Nesbit and Parker neither situated nor built their encampment for effective defense. It occupied a gently sloping hill within 50 yards (46 m) of a stand of trees. Nesbit and Parker also failed to provide loopholes for firing guns. The only opening in the blockhouse that faced the corral was too high to allow the hay men to protect their horses and mules.

The afternoon of July 2, 1851, saw the haying operation caught by a soaking rainstorm. Although the heavy rain gave way to a steady drizzle at nightfall, the continuing inclement conditions reduced visibility to a minimum, with the two men posted on guard unable to see 20 paces into the night (letter from Robert Nesbit and Hiram R. Parker to Colonel Munroe [Commander, 9th Military Detachment, U.S. Army], dated July 6, 1851, in **Church n.d.**).

At about 1:00 AM on the morning of July 2, the man guarding the corral was struck in the neck by an arrow. The wounded guardsmen fired his rifle almost simultaneously, with his shot waking the other members of the hay party who were asleep in the cabin. Nesbit and Parker's team found themselves under attack by Navajo raiders (letter from Robert Nesbit and Hiram R. Parker to Colonel Munroe [Commander, 9th Military Detachment, U.S. Army], dated July 6, 1851, in **Church n.d.**).

According to Nesbit and Parker, 250 to 300 warriors besieged their camp for two hours. During this time the hay team engaged the raiders in:

> *. . . a continued fight…on three sides of the house, while another portion of the Indians were endeavoring to pull down the corral to get the animals out, which they succeeded in doing after three o'clock—when they drove off all the animals, consisting of over one hundred in all (letter from Robert Nesbit and Hiram R. Parker to Colonel Munroe, Commander, 9th Military Detachment, U.S. Army, dated July 6, 1851, in **Church n.d.**).*

Colonel Munroe repeatedly asked Nesbit and Parker to make affidavits supporting their claims of losses (in **McNitt 1972**:185n4). He believed that the partners were planning to petition Congress for compensation, given their claim that their losses were so great that their business faced ruin. Colonel Munroe even warned the Commissioner of Indian Affairs in Washington against paying "greatly exaggerated" claims based on the "weakest proof" (Jordan et al. 2000:470–471).

Nesbit and Parker never submitted the affidavits that Colonel Munroe required (Jordan et al. 2000:471; **McNitt 1972**:185n4). The documentary record supports Colonel Munroe's conclusion that the two had greatly inflated their claimed losses.

Colonel Munroe sent Lieutenant Beverly H. Robertson from the Abiquiú Army Post to investigate the attack and to document Nesbit and Parker's claimed losses. As Robertson's patrol of dragoons entered the Valle Grande, they spied a group of 11 Jémez Pueblo men herding cattle on the opposite side of the valley (**Martin 2003**:19; **McNitt 1972**:184). Thinking that the herdsmen were Navajos, Robertson ordered his troops to fire their weapons.

> *The Native Americans immediately rushed on horseback across the valley toward the soldiers, frantically making signs of friendship. Robertson recognized the riders as being from Jémez Pueblo and ceased fire before anyone was hurt (**Martin 2003**:19).*

Talking with the Jémez afterward, Robertson learned that they had been herding their cattle near the fort during the

night of the attack (**McNitt 1972**:184). The Jémez stealthily followed the raiders, who numbered perhaps 30 or 40 warriors, as they fled with about 50 of Nesbit and Parker's animals. The Jémez hid until the raiders started down a steep hill. While the Navajos were exposed, the Jémez herdsmen attacked, killing two of the raiders and capturing five mules (**McNitt 1972**:185).

Following Colonel Munroe's orders, Robertson pursued his investigation. He persuaded one of the Jémez herdsmen to accompany his dragoons to Nesbit and Parker's hay camp.

Robertson described the log house and corral. He examined the spot where the raiders had torn down the corral walls to steal the mules and horses. He saw the 40 to 50 arrows that the attackers had fired at the log blockhouse's doorway to prevent the hay men from breaking out. He also noted that there were no rifle loopholes in the blockhouse's walls, and the very high single opening in the wall on the structure's corral side that prevented the men inside from firing at the raiders as they pulled down the stacked log enclosure and drove off the livestock (**McNitt 1972**:185).

Robertson questioned the wounded guard, who said he wasn't sure, but that there were probably only a few more than 40 attackers, not the 250 to 300 warriors that Nesbit and Parker had claimed. Worse still, Nesbit and Parker's hay cutters testified that the raiders made off with only 43 mules and 6 horses, not 100 animals (**McNitt 1972**:185). In addition, besides the shot that the guard had fired to sound the alarm, Robertson learned that Parker fired his revolver only twice because the opening was too high for the defenders to see their targets. One of Parker's shots hit the topmost log on the opposite side of the corral; the other went even higher, into the trees beyond the corral. Robertson concluded that none of the other hay cutters fired their rifles (**McNitt 1972**:185).

Hunting

Hunting in the Valles Caldera has undoubtedly been an important activity for millennia, even though faunal remains were not recovered at pre-Columbian archaeological sites excavated in the Redondo Creek Valley during the Baca Geothermal Anthropological Project (**Winter 1981**:178). Broken dart and arrow points, other hunting tools, and a pattern of preferred site locations downwind from elk calving areas all suggest that the absence of animal bones at the excavated archaeological sites most likely is a product of poor conditions for bone preservation rather than an absence of hunting. In addition, the oral traditions of the region's Native American communities provide invaluable glimpses into the importance that game animals and the Valles Caldera have had since the beginning of human history in the northern Southwest (chapter 9).

Documentary history leaves no question about the value of the Valles Caldera's game animals to Indian, Hispanic, and Anglo-American groups since the time of first contact. Since the arrival of Spanish colonists at the end of the sixteenth century, the many communities that have been associated with the Baca Location hunted elk, deer, bear, mountain lion, bobcat, mountain sheep, rabbit, beaver, and squirrel.

Oral histories of the people of Jémez Pueblo say that mule deer, white tail deer, and elk once were numerous (**Weslowski 1981**:108). As reported by historian **Lansing B. Bloom (1946** [1922]:121), the Jémez held "community rabbit drives in the valley, and in the sierras they hunt the deer and bear, the wolf and fox, the gallina de tierra and the eagle of the sky" through the early decades of the twentieth century.

The Valles Caldera's lush meadows and forested mountain slopes also provided habitats favorable to a variety of birds. The principal game bird species favored by Native American, Hispanic, and Anglo-American hunters alike included turkey and grouse. Jémez Pueblo, and presumably other Native American communities, also hunted hawks, robins, and magpies for ritual purposes (**Weslowski 1981**:111; see also **Tyler 1979)**. Moreover, ethnographic information documents that Jémez Pueblo designated lands around Redondo Peak as one of the places where the community captured eagles alive for community ceremonies (**Weslowski 1981**:111).

Again drawing from Jémez Pueblo ethnographic accounts, Native Americans traditionally relied upon bows and arrows, slings, bolas, traps, and snares in their hunts (**Weslowski 1981**:111). Before guns were available, the bow and arrow was the preferred weapon for hunting turkeys, rabbits, larger game animals, and many predators in wooded habitats. The Jémez reportedly also used the sling, which was thrown with a stone projectile encased in the weapon's pocket, to kill turkeys, bobcats, and even young cougars in open settings (**Weslowski 1981**:111).

As I note in my earlier discussion of plant uses, Jémez Pueblo (and presumably other Native American) hunters traditionally built temporary shelters of tree boughs and rocks for shelter while seeking game in the Valles Caldera. The Jémez occasionally built substantial log cabins as well, in which to observe the requisite rites that accompanied certain hunts (**Weslowski 1981**:111; see also **Martin 2003**:66). Other physical remains of Jémez hunting activity include eagle pit-snares (covered by brush) and hunting shrines. Archaeologically documented examples of seemingly analogous features occur at LA90470[5.1], which is about 8 miles (12.8 km) north of the Baca Location's northeast corner. The site's 14 features occur along a .3-mile-long (500-m) east-facing mesa edge.

> *[They] typically consist of rectangular pits, about 1.5 m [4.9 ft] long, 0.5 m [1.6 ft] wide, and as deep as 2 m [6.6 ft], excavated into solid tuff bedrock. Traces of suspected foot paths worn into the bedrock appear to connect some of the pits. Virtually no artifacts or other cultural manifestations were discovered. Capture of large animals such as deer, elk, or especially mountain sheep is seen as the probable function of the site with the pits serving as traps. Use of some of the features as eagle traps is also considered (Evaskovich et al. 1997a:597–598).*

The broad, grass-covered valleys and the numerous clear streams of the Valles Caldera were probably first used

by Hispanic settlers for hunting and fishing by about 1800, when the expansion of sheep herding and cattle ranching in the territory drove a search for new pasturage (**Scurlock 1981**:134–135, citing Smith 1979; see also chapter 6).

Although Anglo-American and French trappers began operating in New Mexico as early as 1805, commercial fur trading between the territory and the United States was limited until Mexico achieved its independence from Spain with the signing of the Treaty of Cordova in 1821. The opening of the Santa Fe Trail the following year connected the relatively isolated New Mexican territory with U.S. markets and their insatiable demand for fur (**Scurlock 1981**:135).

Mexican law usually prohibited foreigners from trapping fur-bearing animals. The Nuevo Mexico colony, however, allowed nonresidents to obtain trading permits in Santa Fe that allowed them to trap for fur. Between 1821 and 1823, approximately 100 trappers, most of whom were either English or French, were operating along the Río Grande Valley (Hill 1923:4; Yount 1965:ix). Other English and French trappers, including George Yount and James O. Pattie, operated illegally in more remote areas of the colony. Their trapping territory apparently encompassed the Valles Caldera (**Scurlock 1981:135**).

Although documentary records do not directly attest to foreign trappers working the prime beaver country of the Valles Caldera, Historian **Dan Scurlock** bases his inference that Anglo-Americans were working the locality for furs shortly after New Mexico's independence from Spain on two incidents:

> *One party of trappers headed by George Yount cached their beaver pelts on the banks of the Jémez River somewhere near the ruins of Gíusewa Pueblo and San José Church in the summer of 1828 to avoid confiscation by government officials. Later they retrieved the furs and smuggled them into Taos. Santa Fé merchant Thomas H. Boggs and Ramon Vigil were less fortunate, for in the spring of the same year 25 beaver pelts which they had bought from trapper James O. Pattie were confiscated by the alcalde of Jémez Pueblo (**Scurlock 1981**:135, citing Weber 1971:140, 167 and Yount 1965:63).*

Troubles caused by foreign trappers were not limited to the Valles Caldera; they were widespread throughout the territory. As noted in chapter 3, Luis María Cabeza de Baca, the original grantee of the Baca Land Grant, died in 1827 after being shot by a soldier who was trying to confiscate contraband furs that Baca was holding. According to documentary records, Baca had hidden these illegal pelts for American trapper Ewing Young at his house along the Gallinas River near the present-day town of Las Vegas (**Cleland 1950**:219).

By the beginning of the twentieth century, rifles became the preferred weapon for hunting among all of New Mexico's communities (**Van Ness** 1991). Up to this time, most of the region's Native American and Hispanic populations relied on the bow and arrow, including projectiles that were tipped with stone or metal points.

Subsistence hunting remained important throughout the late nineteenth and early twentieth centuries. Residents from the nearby Chama Valley relate that even though local Hispanic communities were running large numbers of cattle, the people did not eat beef. Cattle were for sale in the region's emerging market economy:

> *Men would hunt deer, before the time of licenses, when they wanted meat for jerky (Informant G, personal communication 1991, in **Carrillo et al. 1997**:135).*

> *We grew up eating carne del venado (i.e., venison)…In those days we hardly ever ate any beef, although we raised a lot. The beef was sold at auction, and the money used for paying bills and buying other food we could not raise (Informant H, personal communication 1991, in **Carrillo et al. 1997**:135).*

The large number of newly arrived Anglo-American settlers, who joined the area's established Native American and Hispanic residents, increased subsistence hunting. For example, Dick Cotton, a New Mexico Timber Company employee who arrived at Camp Redondo in 1937 from Missouri, built a cabin (whose remains are designated site BG-19) for his residence on the outskirts of the settlement (**Scurlock 1981**:148, citing Darnell 1979 and Smith 1979). Following Camp Redondo's closure in 1939 (chapter 7), Cotton supported himself by hunting, trapping and poaching (**Winter 1981**:179).

Even though many area residents, such as Dick Cotton, depended on hunting for subsistence, Anglo-American sports enthusiasts who prized hunting primarily as a recreational outlet soon embraced the introduction of efficient new weaponry to the consumer market. Together, increased levels of subsistence and sport hunting quickly led to the decimation of native game animal and bird populations. Mule deer and wild turkey were drastically reduced by the late 1800s and early 1900s. The popularity of elk hunting was so great that this species was eradicated across the State of New Mexico by 1910.

At the same time, a change in management policies adversely affected several other native and introduced animal populations that had become a traditional part of the Valles Caldera's ecology. As recalled by Homer Pickens (1979, in **Scurlock 1981**:148), a long-time trapper and wildlife specialist, ranchers and federal agents placed poisoned grain at Gunnison prairie dog towns on the Baca Location in the 1920s to rid pastures of these pests. Ranchers and government officials also regarded feral burros and horses as nusisances because they competed with cattle and sheep for pasturage. In a concerted effort to rid the Jémez Mountains of such unnecessary competition to the livestock industry, U.S. Forest Service personnel rounded up 1,500 burros and horses from the greater Jémez district area, including the Baca Location (**Tucker and Fitzpatrick 1972**:81).

With the depletion of elk, mule deer, turkey, horse, and prairie dog populations in the Jémez Mountains, gray wolves, mountain lions, and coyotes killed increasing numbers of sheep

and cattle around the Valles Caldera (**Winter 1981**:178). In 1916 the United States Forest Service initiated a new predator control program (**Scurlock 1981**:144). The U.S. Biological Service (now known as the Fish and Wildlife Service) sent trappers into the Jémez Mountains, including the Valles Caldera, to exterminate gray wolves and mountain lions. John Davenport, who once served as one of Frank Bond's Baca Location ranch managers, killed the last New Mexican gray wolf in the Valle Grande in 1932 (Pickens 1979, in **Scurlock 1981**:148).

In 1947, the New Mexico Department of Game and Fish worked to reintroduce elk by releasing 47 head imported from the Yellowstone, Wyoming, area into the Río de las Vacas Valley west of the Baca Location (**Martin 2003**:104, citing Allen 1997). Although the Jémez Mountains grasslands provided favorable habitat, the introduced elk herd increased at a slow rate, with the population reaching only an estimated 200 animals in 1961. The New Mexico Department of Game and Fish introduced another 58 elk from Jackson Hole, Wyoming, between 1964 and 1965. These populations continued their slow increase in the Valles Caldera over the next decade (**Martin 2003**:104, citing Allen 1997). Dramatic ecological change that had both an immediate and great impact on local elk demography occurred in 1977:

> *In June of that year, the 25,000-acre [10,000-ha] La Mesa fire burned in the ponderosa pine forests on the Pajarito Plateau at Bandelier National Monument. The fire converted the forest into grassland and opened up considerable winter habitat for the Jémez elk population. With favorable climatic conditions, the elk herd expanded to about 7,000 in 1989. In 2001 it was estimated that between 4,000 and 6,000 elk used the Baca Ranch for summer range (**Martin 2003**:104, citing Allen 1997).*

The Baca Location's last private owners, Frank Bond, Franklin Bond, and James Patrick Dunigan, all were hunters. They hunted for sport and promoted sport hunting.

> *Despite his hard-nosed attitude toward business, Frank Bond found pleasure in owning the Baca Location beyond its profitability. Bond loved to fish, and from 1917 until he no longer was able to make the journey, he spent two weeks a year in the central Jémez Mountains, trying his luck on the streams (**Martin 2003**:65).*

Frank Bond was also generous in granting permission to the students of the Los Alamos Ranch School to fish, hunt, and camp on the property through the 1930s (**Martin 2003**:66).

> *Ted Mather, who had worked for Frank Bond during the rancher's first year of leasing the property, was the head wrangler at the school and had an intimate knowledge of the Baca Location. Many of the boys, who mostly hailed from eastern cities, caught their first trout in the East Fork of the Jémez in the Valle Grande. Each year the school ran a summer camp that included a three-week trail ride through the Jémez. The route generally started at Camp May in the Sierra de los Valles above the school and descended a steep trail into the Valle de los Posos. A camp also was set up along the Rito de los Indios, and the route to the San Pedro Parks passed through the Valle San Antonio (**Martin 2003**:66–67).*

As noted previously, Frank Bond also allowed members of the various nearby Pueblos limited access to the ranchland for plant gathering, hunting, and ceremonial purposes even though he had rescinded their grazing privileges shortly after buying the property (after **Martin 2003**:66; see also chapter 6). This permission, however, apparently ended in the 1940s about the time of Bond's death.

It is uncertain if Frank Bond or his son, Franklin, ever formally extended recreational hunting and fishing rights during their lifetimes to the employees of New Mexico Lumber and Timber Company (later New Mexico Timber, Inc.), which began commercial logging operations on the Baca Location in 1935 (chapter 7). It is clear, however, that the Bond Estate at least tolerated the loggers' hunting and fishing during the early 1960s. James Patrick Dunigan bought the Baca Location from the Bond Estate in 1963 (chapter 4). When he filed suit against T. P. Gallagher, Jr., over the question of the land grant's timber rights, he forbade Gallagher's employees from fishing and hunting on the property (***Baca Co. v. NM Timber, Inc.* 1967**; see also chapter 7).

By the late 1970s, Dunigan's 1972 decision to decrease his cattle operations to promote the growth of the reintroduced Jémez Mountain elk herd, which he recognized was an important part of the ranch's ecology, began to realize fruition (see **Martin 2003**:104). Helped further by the La Mesa fire within the nearby Bandelier National Monument in 1977, the rapidly expanding Jémez Mountain elk herd provided Dunigan with a new business opportunity: guided elk hunts on the Baca Location.

By the late 1970s, a private operator, North Country Outfitters Company, had leased the hunting rights for the whole Baca Location. Under the terms of the lease, Dunigan issued 40 bull permits each hunting season, which was held in October during the fall rut, at a cost of $4,000.00 per permit (**Winter 1981**:178). By 1998, the elk herd had grown to such an extent that the Baca Land and Cattle Company issued 265 hunting permits, with the fee for a trophy bull selling for $10,000 (**Martin 2003**:105). In addition to the hunting permit fees, the Baca Land and Cattle Company received income for use of the Dunigan Casa de Baca as a hunting lodge.

Fishing

In comparison to most other southwestern Indians, the Pueblos of north-central New Mexico did not have broad proscriptions against catching and eating fish. Information concerning the Pueblos' dietary reliance on fish and their fishing practices is rare and incomplete, however.

Despite the paucity of published reports, the available evidence indicates that the proximity and productivity of large

streams traditionally were the primary factors determining the Pueblos' use of fish. For example, the Keres of Cochiti Pueblo (**Bandelier 1892**:149; **Lange 1959**:140–141, 147–148) and the Tewa from Santa Clara Pueblo (**Hill 1982**:59–61) were known to have organized communal fish seining operations along the Río Grande near their homes during the late nineteenth century. Given the river's productivity and the fact that the use of seining nets possesses the potential to harvest large quantities of fish, catches could be shared among the residents of the fishermen's villages. **Hill** (**1982**) reports that participants in the Santa Clara seining operations commonly took home between 5 and 20 fish to share with their families. **Lange** (**1959**) notes that the Cochiti fishermen probably similarly distributed the fruits of their work among their kin.

By the middle of the twentieth century, the communal fishing of the Río Grande and the broad sharing of catches had become a thing of the past. Lange (1959) tells that individuals and small groups of family members used bated hook-and-lines, small nets, hayforks, and hands to catch fish. **Ford** (**1992**:175) observed that by the time of his study in the 1960s, fish consumption among the San Juan Tewa was limited to harvests resulting from the use of private weirs along the Río Grande mainstem and the gathering of fish found stranded in the bottoms of canals after irrigating their fields. Moreover, given the typically small sizes of these catches, not all members of the Pueblo ate fish (**Ford 1992**). Men were the primary consumers. Children, who were likely to accompany the men while they worked their fields or checked their weirs, had greater access to fish than women, whose duties required them to be elsewhere.

The above patterns suggest that in the absence of opportunities for large and reliable harvests using nets in big watercourses, the Pueblos' consumption of fish was limited to the proceeds of small, and often opportunistic, catches. It is likely, therefore, that Pueblo fishing in the Valles Caldera usually was restricted to comparatively brief and informal episodes when individuals or small groups visited the locality for some other purpose. In addition, it is probable that these catches were consumed immediately as part of the group's foraging activity to sustain itself while traveling away from home, rather than a component of a major economic activity for the benefit of the community as a whole.

Before leaving the subject of fishing, a story that Clayto Tafoya, a Santa Clara elder, shared with Richard I. Ford when he was completing his doctoral studies in anthropology in the 1960s is worth retelling. Tafoya talked about how a small number of Santa Clara men would periodically fish the Valles Caldera's marshes (the caldera bottomlands were swampier back then and had larger standing ponds) and streams for trout as part of private entrepreneurial enterprise (Dr. Richard I. Ford, personal communication, Museum of Anthropology, University of Michigan, Ann Arbor, 2006). Riding into the Valles Caldera at night, they would use basket traps to catch trout, which they would then carry to Santa Fe via horseback for sale. Given Tafoya's age, the context of his remarks, and the time of their conversation, Ford (personal communication, Museum of Anthropology, University of Michigan, Ann Arbor, 2006) estimates that this resourceful and industrious business activity took place between the late 1800s and 1940.

Mineral Collection

Weslowski (**1981**:114) reports that the people of Jémez Pueblo gather manganese and iron ore, both of which are rare, from locations in the Valles Caldera for use as pigment in painting pottery. One of her informants added that clay might also be collected (**Weslowski 1981**:114–115). While this informant claimed that pottery clay was usually found closer to the villages, **Parsons** (**1996 [1939]**:352; see also **Ferguson and Hart 1985**:127) observes that the Pueblos sometimes use clay and mud collected from springs as ritual body paint. As I note in my earlier discussion of the importance of plants and algae gathered from the same springs, the significance of these resources derives from their association with spring water, which the Pueblos consider powerful medicine (**Ellis 1956**:56–57; **Parsons 1996 [1939]**:352, 416, 453–454; see also chapter 9). In fact, the Jémez, like the other Pueblos, gather spring water for use in purification rites and other solemn rituals (**Weslowski 1981**:115).

Other Pueblo similarly visited the Valles Caldera for decorative pottery clay and pigment. For example, **Carl E. Guthe** (**1925**; see also **Friedlander and Pinyan 1980**) notes that the San Ildefonso residents made trips to the Baca Location for orange-red slip and black ware paint for firing their ceramics. He identifies the location, procurement, and use of these resources:

Orange Red Slip

This substance is a yellow clayey earth, in texture somewhat like the two white slips. It occurs in the "Valle" to the west, beyond the first Jémez range, near Ojo Caliente. It was dug with a stick…and is carried home in shawls and bags. Before being stored it is put out into the sun to dry thoroughly, then placed in ollas and kept until needed. Like the other slips, it is prepared for use by being mixed with water. A saturated solution is made, but the consistency remains that of water.

This material, which in solution is a brilliant yellow, is used for two purposes—as a slip to color the bases of bowls and ollas, and as a paint to supply the red elements of polychrome designs. After being fired it assumes an orange-red or burnt-sienna color…

Black Ware Paint

This is a paint used for making matte designs on polished black ware, a new departure in decorative technique first used by Maria and Julian Martinez of San Ildefonso, in June, 1921. The substance is a hard yellow stone, said to occur in the "Valle," west of the Jémez range, near Ojo Caliente, in the same district as the orange-red paint.

The first step in preparing the paint for use is to scrape the stone with a knife. The resulting powder is mixed with

*water, and there is then added about one-fourth as much dissolved "guaco" [powdered roots of the Rocky Mountain Beeplant {Cleome serpulata}]…as there is paint. It is said that the purpose of the guaco is to make the paint "stick" to the polished surface. This paint, when ready for use, is kept in a small earthenware or china dish. The consistency of the mixture, like the other paints, is that of water (**Guthe 1925**:24–25).*

The Pueblos, the Navajo, and other Native American groups traditionally harvested obsidian for ceremonies, including its use as a prayer offering (**Ellis 1956**:56–57; **Van Valkenburgh and Begay 1938**:30; see also **Harrington 1916**). **Weslowski** (**1981**:115) states that the Jémez continue to collect obsidian from the Redondo Creek Valley. She speculates further that they might also harvest the higher-quality volcanic glass present in the neighboring Valle Grande (**Weslowski 1981**:126n20). The Tewa collect obsidian from the slope of *Tsikumu* (Obsidian Covered Mountain [a.k.a. Cerro Chicoma]) at the northeast corner of the Baca Location Land Grant, among other places (**Harrington 1916**).

Acklen and others (1997:301) refer to regional archaeological evidence that demonstrates the great importance of Jémez Mountains obsidian for tool use among the Navajo throughout the early Historic period. Because fine-grained obsidian source information is unavailable, the question whether Valles Caldera obsidian is represented in these archaeological samples cannot be answered. Archaeological surveys in the Chama district similarly report finding rich evidence of Jémez Mountains obsidian use among Historic period sites with Navajo, Apache, and/or Ute cultural components (e.g., Anschuetz 1993, 1995, 2000; Schaafsma 1975, 1976, 1979). Of particular relevance to the management of cultural resources in the VCNP, Anschuetz (1993, 1995, 2000) reports that among the rich assemblage of Jicarilla Apache sites in the nearby Río del Oso Valley, Jémez Mountains obsidian is the predominant raw material used in the manufacture of chipped stone lithic tools. He notes that the lithic reduction technologies are identical to those used by Archaic period (ca. 5500 B.C.–A.D. 600) hunters and gatherers (chapter 2).

The Jémez quarry flagstone slabs, which they use to make *piki* griddles, in the Valles Caldera (**Weslowski 1981**:115). *Piki*, the Pueblos' renown paper-thin bread made of finely ground corn meal, embodies essential cultural tradition. *Piki* griddles and the baking of this bread alike are rich in symbolic meaning (e.g., Anschuetz 1992). Consequently, finished *piki* stones and their quarries are significant traditional cultural properties that the Jémez treat with considered reverence.

Certain pebbles found along watercourses that originate on Redondo Peak (an extremely important summit [chapter 9] for many Pueblo and Navajo communities) and other peaks in the Jémez Mountains were collected for ritual use. According to **White** (**1962:232**), the Zía and other Pueblos placed four waterworn pebbles collected from sacred mountains on each of the four sides of a medicine bowl, which, in turn, is placed on sand and corn meal paintings used in summer rain ritual. This act is highly meaningful because the medicine bowl is a representation of the Pueblos' respective worlds. The terraces formed on the bowls rim and these special stones, which were worn smooth by the water that flowed off these peaks, denote the mountains of cardinal direction and their essential relationship to rain and snow (chapter 9). Although White does not say so, it is probable that within this highly patterned system of significant cultural meaning and associations, at least some of the Pueblos, especially Jémez and Zía, use stones gathered from Redondo Peak to symbolize one of their mountains of cardinal direction during the celebration of these rites. Similarly, **Richard F. Van Valkenburgh** (**1940**:9; **Van Valkenburgh and Begay 1938**:30) describes the ritual use of various stones by the Navajo (besides obsidian) as prayer offerings when visiting mountaintop shrines, such as those that occur within the Valles Grande (see chapter 9). Just as White, Van Valkenburgh does not mention Redondo Peak, but given that some Navajo communities historically considered this summit their Mountain of the East (chapter 9), it is a certainty that some Navajo groups collected pebbles from Redondo Peak and other Valles Caldera area summits in their rites.

People from the Pueblo of Zuni are known to have visited two locations, *He:mushina Yala:we* and *K'ya:k'yałna' K'ya:kwayinna*, at the southwest margin of the Valles Caldera (**Ferguson and Hart 1985**:127). The Zuni collected white powder medicine, hunted, and obtained materials used in kiva initiations, as well as gathered medicinal herbs, at *He:mushina Yala:we*. The Zuni traditionally collected mud and silt at *K'ya:k'yałna' K'ya:kwayinna*.

The use of obsidian in the Historic period for profane and sacred activities was not limited to Native Americans. One of the informants with whom **Carrillo and others** (**1997**) consulted about the proposed construction of the OLE power line revealed that Hispanic residents used bow and arrows, including projectiles tipped with obsidian points, until the time that firearms became broadly available at the turn of the twentieth century:

*I remember hearing stories of people hunting with bows and arrows. There were badgers in those days. The tips of the arrows were made from metal. I remember also seeing some made from obsidian (Informant F, personal communication 1991, in **Carrillo et al. 1997**:135).*

Hermanos (members of the Penitente Brotherhood) living near Abiquiú also collected obsidian for use in Pentiente ritual:

*Most of the obsidian for the Hermanos came from the Polvadera area, because the obsidian from around Abiquiu was not the glass type, the clear type. It was cloudy and pitted. I remember that they would bring in some obsidian, although I was not there to see them gather it…I haven't been to the area of Mesa Pedregosa [which is just 1.5 miles {2.4 km} north of the Baca Location Land Grant]…but I have heard the people say that there is a place up there that you cannot even walk because there is so much obsidian, on the Mesa Pedregosa (Informant B, personal communication 1991, in **Carrillo et al. 1997**:137).*

Agriculture

As recounted in chapter 2, Jémez farmers planted on the Banco Bonito during the Classic period (ca. A.D. 1350–1600) (after **Martin 2003**:13). There is no further mention of farming in the Valles Caldera until the late nineteenth century. Two citations are of interest because they discuss why the production of commercial agricultural crops was climatically and/or economically not feasible.

First, reporting their survey of the Baca Location in June1876, U.S. Deputy Surveyors Daniel Sawyer and William H. McBroom stated that while the soils in the Valles Caldera area were rich, the locale's high elevation brought temperatures "too cold to raise any kind of grain or vegetables" (**Sawyer and McBroom 1876**: 14–15). As a result, no settlers were living upon the Baca Location at this time.

Second, **Adolph F. Bandelier** similarly noted during his explorations in New Mexico in the 1880s that the Valles Caldera offered little inducement for agriculture, "for although the soil is fertile, ingress and egress are so difficult that even potatoes, which grow there with remarkable facility, cannot be cultivated profitably" (**1892**:200).

Final mention of farming in the Baca Location dates to about 1917. This account, retold by **Martin** (**2003**:52), builds on Bandelier's preceding remark that area residents were highly successful in growing root crops for their own consumption in this high altitude environment. According to **Martin** (**2003**:52; see also chapter 4), James Leese filed entry for George White's 1912 homestead claim in the Valle de los Posos in 1915. Leese continued to work elsewhere but made frequent trips to see his wife and three children who occupied the homestead over the next two summers.

> *Little was done to improve the land as required by the Homestead Act. The family continued to plant potatoes on three or four acres [1.2–1.6 ha] but did no additional clearing nor did they attempt to irrigate their field, which were required improvements for those seeking to patent a homestead. However, their farming was successful enough for them to grow 15,000 pounds [6,804 kg] of potatoes in the summer of 1917! (**Martin 2003**:52).*

It is worth noting that documentary evidence of agricultural land use in the Valles Caldera—just as discussed for traditional subsistence or vernacular plant gathering, game hunting, and mineral collecting activities—might be incomplete. While I doubt that agricultural practice ever was intensive outside the Banco Bonito, archaeological investigations along the proposed OLE power line documented the existence of two small eighteenth-century farm sites, LA66859 (Acklen et al. 1997:298–299; Evaskovich et al. 1997b:357–373; Holloway et al. 1997:97–98, 104, 107) and LA66869/LA66870 (Acklen et al. 1997:299–302; Evaskovich et al. 1997a:537–597; Holloway et al. 1997:99–101, 104, 107). It is significant that the agricultural functions of these sites were not suspected based on survey documentation alone; their identification as seasonal farming settlements was made following excavation and analysis of botanical samples.

LA66859, which is at an elevation of 7,660 feet (2,426 m) in an open meadow that enjoys southern exposure and receives runoff, has a poorly preserved fieldhouse, pottery that dates between 1700 and 1760, relatively high maize pollen concentrations, and sheep bone. Although faunal analysts could not determine if the sheep bone represents native bighorn or domesticated species, its presence indicates that the site's occupants either hunted or ran sheep during their stay. Based on the site's dates and artifact assemblages, the excavators suggest that Tewa likely occupied this seasonal farm site (Acklen et al. 1997:298–299; Evaskovich et al. 1997b:357–373; Holloway et al. 1997:97–98, 104, 107). [5.1]

LA66869/LA66870, at a slightly higher elevation of 7,860 feet (2,396 m), yielded the severely eroded remnants of several temporary dwellings, ash pile deposits that date between roughly 1760 and 1800, and comparatively high corn pollen concentrations. Given the artifact assemblage recovered and settlement trends in the local area, this site's inhabitants were probably Hispanic (Acklen et al. 1997:299–302; Evaskovich et al. 1997a:537–597; Holloway et al. 1997:99–101, 104, 107).

The significance of these sites is that the eighteenth century was characterized by repeated severe but short-term drought cycles (Dean et al. 1985:fig. 1). During a similar climatic regime, which lasted from about the mid-A.D. 1300s to the mid-A.D. 1500s, Pueblo populations throughout much of the northern Río Grande region occupied and farmed higher-elevation settings, including the Banco Bonito (e.g., see **Anschuetz 1998b**:9–22, 216–242; Anschuetz et al. 1997). Therefore, it is possible that a record of subtle archaeological traces related to the occupation of the Valles Caldera for comparatively small-scale, seasonal farming by various Native American and Hispanic groups remains to be recognized.

[5.1] See Endnote 1.1 for explanation of the "LA" number designation.

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Table 5.1. VCNP ethnobotanical inventory.

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Abies concolor	White fir	Yes		Northern Tiwa (**Krenetsky 1964**); Tewa (**Robbins et al. 1916**); Western Keres (**Swank 1932**)		Pre-Columbian (**Windes and Ford 1996**); Most Historic Pueblos (**Dunmire and Tierney 1995**)	Most Historic Pueblos (**Dunmire and Tierney 1995**)		Tewa (**Robbins et al. 1916**)	
Acer glabrum	Rocky Mountain maple	Yes	Navajo (**Dunmire and Tierney 1997**)						Southern Tiwa (**Jones 1931**)	Cambium and shoots are edible (**Hudspeth 1997**).
Achillea millefolium	Western yarrow, common yarrow	No	Northern Tiwa (**Krenetsky 1964**)	Eastern Keres, Northern Tiwa, Tewa, and Zuni (**Dunmire and Tierney 1995**); Navajo (**Dunmire and Tierney 1997**); Ute (**Chamber-lin 1909**); Hispano (**Moore 1977**)						Entire aboveground part of plant may be dried, boiled in water, and strained for nutritious broth; also, may be used as remedy for disordered indigestion and run-down feeling (**Kirk 1970**).
Agoseris aurantiaca var. *purpurea*	Mountain dandelion	Yes		Navajo (**Dunmire and Tierney 1997**)						
Agropyron cristatum var. *cristatum*	Crested wheatgrass	Yes	**Yes** **(See comments)**							Rootstocks may be dried and ground, with meal then baked into bread (**Kirk 1970**). Seeds also are edible (**Hudspeth 1997**).
Allium cernuum	Nodding onion	Yes		Hispano (**Ford 1975**; **Moore 1977**)						
		No	Most Historic Pueblos (**Dunmire and Tierney 1995**); Most Four Corners Groups (**Dunmire and Tierney 1997**)	Tewa (**Ford 1992**); Southern Tiwa (**Jones 1931**); Zuni (**Dunmire and Tierney 1995**); Hispano (**Moore 1977**)						Bulbs may be eaten raw, boiled, or steamed. Wild onions often are ingredients for soups or as seasoning (**Kirk 1970**). Seeds also are edible (**Hudspeth 1997**).
Allium geyeri var. *geyeri*	Geyer's onion	No								

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Alnus incana var. *occidentalis/Alnus incana* ssp. *tenuifolia*	Thinleaf alder	Yes		Hispano (**Ford 1975**)						
		No	Western Keres (**Dunmire and Tierney 1995**)				Most Historic Pueblos (**Dunmire and Tierney 1995**); Navajo (**Dunmire and Tierney 1997**)		Pre-Columbian (**Magers 1986a**); Northern Tiwa (**Dunmire and Tierney 1995**)	
Alnus tenuifolia	Mountain alder	Yes								
Amaranthus powellii var. *powellii*	Powell's amaranth	Yes	Zuni (**Bohrer 1960**)							Leaves may be eaten as greens. Seeds may be eaten in a variety of ways, from raw to cooked (**Hudspeth 1997**; **Kirk 1970**).
Amaranthus retroflexus	Redroot pigweed	Yes	Most Historic Pueblos (**Dunmire and Tierney 1995**)	Hispano (**Ford 1975**)						
Amaranthus hybridus	Smooth pigweed	Yes	**Yes (See comments)**	Hispano (**Ford 1975**)						Leaves may be eaten as greens. Seeds may be eaten in a variety of ways, from raw to cooked (**Hudspeth 1997**; **Kirk 1970**).
		No	Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Western Keres (**Swank 1932**); Most Four Corners Groups (**Dunmire and Tierney 1997**)	Navajo (**Dunmire and Tierney 1997**); Western Keres (**Swank 1932**); Hispano (**Ford 1975**; **Moore 1977**)						
Amaranthus wrightii	Wright's amaranth	No								
Amelanchier alnifolia var. *pumila*	Serviceberry, Rocky Mountain juneberry	No	Pre-Columbian (**Stevenson 1915**); Hopi, Navajo, and Ute (**Dunmire and Tierney 1997**) Southern Tiwa (**Jones 1931**)							All species produce edible berries, which may be eaten raw, dried, or cooked (**Kirk 1970**).
Androsace septentrionalis	Rock jasmine	No	Southern Tiwa (**Jones 1931**)	Navajo (**Fewkes 1896**)						
Apocynum cannabinum	Dogbane, Indian hemp dogbane	No		Navajo (**Dunmire and Tierney 1997**); Hispano (**Ford 1975**)	Southern Tiwa (**Jones 1931**)					
Aquilegia elegantula	Red columbine	Yes		Western Keres (**Jones 1931**)						

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Aquilegia triternata	Southwestern red columbine	No		Navajo (**Wyman and Harris 1951**)						
Arabis fendleri var. *spatifolia*	Fender rockcress	Yes	Navajo (**Dunmire and Tierney 1997**); Western Keres (**Swank 1932**)	Navajo (**Dunmire and Tierney 1997**)						
Arctostaphylos uva-ursi var. adenotricha	Bearberry, manzanita	Yes	Navajo (**Dunmire and Tierney 1997**)	Navajo (**Dunmire and Tierney 1997**); Hispano (**Ford 1975**; **Moore 1977**)	Jémez (**Cook 1930**); Northern Tiwa (**Krenetsky 1964**); Tewa (**Ford 1992**)					Acidic berries may be eaten and sometimes are used in beverages. Seeds also may be ground for cooking (**Kirk 1970**). Shoots also are edible (**Hudspeth 1997**).
		No	Navajo (**Dunmire and Tierney 1997**); Tewa (**Ford 1992**)	Navajo (**Dunmire and Tierney 1997**)	Eastern Keres (**Dunmire and Tierney 1995**)					
Arnica chamissonsis var. *foliosa*	Arnica	No		Hispano (**Moore 1977**)						
Artemisia carruthii	Carruth's sagewort	Yes	Zuni (**Stevenson 1915**)		Pre-Columbian (**Dunmire and Tierney 1997**)	Pre-Columbian (**Dunmire and Tierney 1997**)	Navajo (**Bryan and Young 1940**)	Ute (**Dunmire and Tierney 1997**; **Smith 1974**)	Pre-Columbian (**Magers 1986a**); Navajo (**Elmore 1944**)	All species may be used for food, although *A. tridentata*, which is not present in the study area, is the best. Seeds and fruits may be dried, pounded into a meal to make pinole, or eaten raw (**Kirk 1970**). The Hopi use *A. frigida* as a seasoning.
Artemisia dracunculus	Tarragon	Yes	**Yes (See comments)**	Hispano (**Ford 1975**)						
Artemisia franserioides	Ragweed sagebrush	Yes								
Artemisia frigida	Fringed sagebrush	Yes	**Yes (See comments)**	Southern Tiwa (**Jones 1931**); Tewa (**Robbins et al. 1916**); Zuni (**Stevenson 1915**); Hispano (**Ford 1975**; **Moore 1977**)						
Artemisia ludoviciana var. *ludoviciana*	Louisana sagebrush	Yes	**Yes (See comments)**	Tewa (**Dunmire and Tierney 1995**); Western Keres (**Swank 1932**); Hispano (**Ford 1975**)						

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Artemisia campestris var. *pacifica*	Pacific wormwood	No	Pre-Columbian (**Stiger 1977**); Hopi (**Whiting 1939**); Navajo (**Dunmire and Tierney 1997**)	Pre-Columbian? (**Dunmire and Tierney 1995**); Eastern Keres (**Dunmire and Tierney 1995**); Navajo (**Dunmire and Tierney 1995**); Tewa (**Robbins et al. 1916**); Most Historic Groups (**Dunmire and Tierney 1995**, **1997**); Hispano (**Moore 1977**)	Pre-Columbian (**Dunmire and Tierney 1997**)	Pre-Columbian (**Dunmire and Tierney 1997**)	Navajo (**Bryan and Young 1940**)	Ute (**Dunmire and Tierney 1997**; **Smith 1974**)	Pre-Columbian (**Magers 1986a**); Navajo (**Elmore 1944**)	All species may be used for food, although *A. tridentata*, which is not present in the study area, is the best. Seeds and fruits may be dried, pounded into a meal to make pinole, or eaten raw (**Kirk 1970**). The Hopi use *A. frigida* as a seasoning.
Artemisia campestris ssp. *borealis var. scouleriana*	Northern wormwood	No								
Asclepias subverticillata	Horsetail milkweed	No	Hopi (**Fewkes 1896**); Northern Tiwa (**Krenetsky 1964**); Tewa (**Ford 1992**); Most Historic Pueblos (**Dunmire and Tierney 1995**)	Jémez (**Dunmire and Tierney 1995**); Hopi (**Whiting 1939**); Navajo (**Dunmire and Tierney 1997**); Southern Tiwa (**Jones 1931**); Tewa (**Ford 1992**; **Stevenson 1912**); Western Keres (**Swank 1932**); Hispano (**Moore 1977**)	Southern Tiwa (**Dunmire and Tierney 1995**); Western Keres (**Swank 1932**); Zuni (**Dunmire and Tierney 1995**)			Pre-Columbian (**Kent 1983**)		Buds, young shoots, and young leaves may be eaten as greens, seeds and inner pod may be eaten raw or cooked, and sugar may be boiled from flowers (**Kirk 1970**).
Aster ascemdems/ Symphyotrichum ascendens	Western American aster	No	Northern Tiwa (**Krenetsky 1964**)	Navajo (**Vestal 1952**); Zuni (**Stevenson 1915**)						Leaves of these species possibly boiled as greens (**Kirk 1970**).
Aster falcatum var. *commutatum/ Symphyotrichum falcatum* var. *commutatum*	White prairie aster	No								
Aster foliaceus var. *canbyi*	Leafy-bract aster	No	Northern Tiwa (**Krenetsky 1964**)	Navajo (**Vestal 1952**); Zuni (**Stevenson 1915**)						Leaves of these species possibly boiled as greens (**Kirk 1970**).
Aster laevis var. *geyeri*	Smooth aster	No								
Aster lanceolatus spp. *hesperius*	Panicle aster	No								

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Astragalus gilensis	Milkweed	No	Hopi (**Fewkes 1896**); Jémez (**Castetter 1935**); Zuni (**Stevenson 1915**)	Navajo (**Dunmire and Tierney 1997**); Zuni (**Camazine and Bye 1980**)						Fruits are edible (**Hudspeth 1997**).
Bahia dissecta	Yellow ragweed	Yes		Western Keres (**Swank 1932**); Zuni (**Stevenson 1915**)						
		No	Navajo (**Dunmire and Tierney 1997**)							
Berberis fendleri	Colorado barberry	Yes	Jémez (**Cook 1930**)							Berries may be eaten. Leaves also potentially are edible (**Hudspeth 1997**). Brilliant yellow dye may be obtained by boiling roots and bark (**Kirk 1970**).
		No	**Yes** (**See comments**)	Hopi (**Whiting 1939**); Navajo (**Dunmire and Tierney 1997**); Hispano (**Moore 1977**)			Navajo (**Dunmire and Tierney 1997**)		Pre-Columbian (**Whiting 1939**); Hopi (**Whiting 1939**)	
Bessya plantaginea	Kittentails	Yes	Navajo (**Vestal 1952**)							
Betula fontinalis	Water birch	No					Jémez (**Cook 1930**)		Pre-Columbian (**Magers 1986a**)	
Betula occidentalis	Western waterbirch	Yes								
Bouteloua gracilis var. *gracilis*	Blue curly grama	No	**Yes** (**See comments**)						Tewa (**Robbins et al. 1916**); Eastern Keres (**Lange 1959**)	Seeds are edible (**Hudspeth 1997**).
Brickellia californica var. *californica*	California brickellbush	Yes		Hispano (**Ford 1975**)						
Brickellia eupatorioides var. *chlorolepis*	Shinners false boneset	No		Navajo (**Dunmire and Tierney 1997**)						
Brickellia fendleri	Fendler's brickellbush									
Brickellia grandiflora var. *grandiflora*	Tasselflower brickellbush									
Bromus ciliatus	Fringed brome	No	**Yes** (**See comments**)	Navajo (**Dunmire and Tierney 1997**)					Western Keres (**Swank 1932**)	Seeds are edible (**Hudspeth 1997**).

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Calamagrostis canadensis var. *canadensis*	Canadian reedgrass	Yes	**Yes (See comments)**							Seeds are edible (**Hudspeth 1997**).
Calochortus gunnisonii var. *gunnisonii*	Mariposa lily	Yes	**Yes (See comments)**	Western Keres (**Swank 1932**)						Bulbs may be eaten raw or after roasting over a smoky fire. They also may be dried and ground into flour (**Kirk 1970**).
Campanula parryi var. *parryi*	Parry's bellflower	Yes		Navajo (**Vestal 1952**); Zuni (**Stevenson 1915**)						
Carex aquatilis var. *aquatilis*	Water sedge	No	**Yes (See comments)**	Navajo (**Dunmire and Tierney 1997**)						Seeds and roots of these many sedges are edible (**Hudspeth 1997**).
Carex brunnescens	Brownish sedge	No								
Carex canescens var. *canescens*	Brownish sedge	No								
Carex conoidea	Field sedge	No								
Carex deweyana	Dewey's sedge	No								
Carex disperma	Softleaf sedge	No								
Carex douglasii	Douglas' sedge	No								

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Carex foenea var. *foenea*	Bronze-headed oval sedge	No	**Yes (See comments)**	Navajo (**Dunmire and Tierney 1997**)						Seeds and roots of these many sedges are edible (**Hudspeth 1997**).
Carex geophila	Dryland sedge	No								
Carex lanuginosa	Woolly sedge	No								
Carex microptera var. *microptera*	Mackenzie small-wing sedge	No								
Carex norvegica var. *stevenii*	Steven's Scandinavian sedge	No								
Carex obtusata	Obtuse sedge	No								
Carex occidentalis	Bailey western sedge	No								
Carex pensylvanica var. *digyna*	Sun sedge	No								
Carex petasata	Liddon's sedge	No								
Carex rossii	Ross' sedge	No								
Carex simulata	Short-beak sedge	No								
Carex stenophylla	Mackenzie sedge	No								
Carex stipata var. *stipata*	Owlfruit sedge	No								
Carex utriculata /*C. rostrata*	Beaked sedge	No								
Castilleja lineata	Greene marshmeadow Indian paintbrush	No	Hopi (**Whiting 1939**); Navajo (**Dunmire and Tierney 1997**); Tewa (**Dunmire and Tierney 1995**); Jémez (**Cook 1930**)	Tewa (**Stevenson 1915**); Hispano (**Ford 1975**; **Moore 1977**)			Navajo (**Bryan and Young 1940**); Zuni (**Stevenson 1915**)			Although most species have edible raw flowers, *C. lineate* is the best (**Kirk 1970**).
Castilleja miniata var. *miniata*	Scarlet Indian paintbrush	No								
Castilleja sulphurea	Sulphur Indian paintbrush	No								
Ceanothus fendleri	Bulkbrush	Yes	Western Keres (**Swank 1932**)	Navajo (**Dunmire and Tierney 1997**)						Leaves and flowers may be used for tea, although some species are better for this use than others. The bark may be used to make a tonic, while fresh flowers produce an excellent lather (**Hudspeth 1997**; **Kirk 1970**).

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Cercocarpus montanus	Mountain mahogany	Yes		Navajo (**Dunmire and Tierney 1997**); Tewa (**Robbins et al. 1916**); Western Keres (**Swank 1932**)		Pre-Columbian (**Dunmire and Tierney 1995**)	Hopi (**Colton 1965**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Jicarilla (**Dunmire and Tierney 1997**)		Pre-Columbian (**Dunmire and Tierney 1995, 1997**); Hopi (**Colton 1974**); Navajo (**Dunmire and Tierney 1997**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Ute (**Callaway et al. 1986**)	
Chenopodium fremontii	Fremont's goosefoot	Yes	**Yes (See comments)**	Hispano (**Moore 1977**)						All species are edible, but *C. fremontii* is the best species for food use. Leaves may be cooked as greens. Seeds may be eaten raw but best when mixed with other grain for mush or baked cakes (**Hudspeth 1997**; **Kirk 1970**).
Chenopodium graveolens	Fetid goosefoot	Yes	**Yes (See comments)**	Zuni (**Stevenson 1915**)						
Chenopodium leptophyllum	Narrowleaf goosefoot	Yes	Most Historic Pueblos (**Castetter 1935**)							
Chenopodium atrovirens	Piñon goosefoot	No	Pre-Columbian (**Dunmire and Tierney 1995, 1997**); Hopi and Navajo (**Dunmire and Tierney 1997**); Tewa (**Ford 1992**); Most Historic Pueblos (**Castetter 1935**; **Dunmire and Tierney 1995**); Hispano (**Trigg 1999**)	Navajo (**Dunmire and Tierney 1997**); Tewa (**Ford 1992**); Western Keres (**Swank 1932**); Hispano (**Ford 1975**; **Moore 1977**; **Trigg 1999**)					Pre-Columbian (**Magers 1986b**)	All species are edible, but *C. fremontii* is the best species for food use. Leaves may be cooked as greens. Seeds may be eaten raw but best when mixed with other grain for mush or baked cakes (**Hudspeth 1997**; **Kirk 1970**).
Chenopodium berlandieri var. *zschackei*	Pitseed goosefoot	No								
Chenopodium neomexicanum	New Mexico goosefoot	No								
Chenopodium overi	Over's goosefoot	No								
Cicuta maculata var. *angustifolia*	Golden aster	Yes		Navajo (**Chinle Curriculum Center 1995**)						

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Cirsium arvense	Creeping thistle	No	**Yes (See comments)**	Hopi (**Whiting 1939**); Navajo (**Dunmire and Tierney 1997**); Tewa (**Ford 1992**); Western Keres (**Swank 1932**); Zuni (**Camazine and Bye 1980**); Hispano (**Ford 1975**; **Moore 1977**)						All species have edible roots, which may be eaten raw, boiled, or roasted. Peeled stems may be eaten as greens (**Kirk 1970**). Seeds also are edible (**Hudspeth 1997**).
Cirsium parryi	Parry's thistle	No								
Cirsium undulatum	Wavyleaf thistle	Yes								
Cirsium vulgare	Bull thistle	No								
Cirsium wheeleri	Thistle	No								
Clematis columbiana var. tenuiloba	Virgin's bower	No		Navajo (**Dunmire and Tierney 1997**); Hispano (**Moore 1977**)						
Commelina dianthifolia	Dayflower	Yes		Navajo (**Vestal 1952**)						
		No		Navajo (**Dunmire and Tierney 1997**)						
Conioselinum scopulorum	Hemlock-parsley	Yes		Navajo (**Wyman and Harris 1951**)						
		No		Navajo (**Dunmire and Tierney 1997**)						
Corallorhiza maculata var. *occidentalis*	Spotted coral root	Yes		Navajo (**Wyman and Harris 1951**)						
Cornus sericea var. *sericea*	Red-osier dogwood	No		Navajo (**Dunmire and Tierney 1997**)					Jémez (**Cook 1930**)	
Corydalis aurea var. *aurea*	Golden corydalis	Yes		Navajo (**Dunmire and Tierney 1997**)						

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Cryptantha cinerea var. *cinerea*	Hidden flower	No	Pre-Columbian (**Dunmire and Tierney 1997**)	Hopi and Navajo (**Dunmire and Tierney 1997**); Tewa (**Stevenson 1912**); Zuni (**Camazine and Bye 1980**; **Stevenson 1915**)						
Cymopterus alpinus	Alpine parsley	No	Eastern Keres (**Swank 1932**); Tewa (**Ford 1992**); Zuni (**Dunmire and Tierney 1995**); Most Historic Groups (**Dun-mire and Tierney 1995**, **1997**)	Navajo (**Dunmire and Tierney 1997**); Tewa (**Hill 1982**); Western Keres (**Swank 1932**); Hispano (**Moore 1977**)						In spring, the edible roots are sweet. Roots become less sweet later in the year (**Kirk 1970**).
Cymopterus lemmonii/ *Pseudocymopterus montanus*	Mountain parsley	No								
Cyperus fendlerianus	Fendler's flatsedge	No	Western Keres (**Castetter 1935**)			Hispano (**Trigg 1999**)		Hispano (**Trigg 1999**)		Tubers have a nutty flavor when eaten raw (**Kirk 1970**).
Descurainia pinnata ssp. *filipes*	Western tansy mustard	Yes	Hopi (**Dunmire and Tierney 1997**); Navajo (**Vestal 1952**)	Navajo (**Wyman and Harris 1951**); Hispano (**Ford 1975**)			Pre-Columbian (**Peckham 1990**; **Robbins et al. 1916**); Hopi (**Whiting 1939**)			All species are edible, but some are better than others. Stems and leafy parts may be eaten as greens. The seeds may be parched, ground and eaten as mush, or in other ways (**Kirk 1970**).
		No	Pre-Columbian (**Dunmire and Tierney 1997**)				Pre-Columbian (**Robbins et al. 1916**)			
Descurainia incana var. *macrosperma*	Tansy mustard	No								
Descurainia incana var. *viscosa*	Mountain tansy mustard	No								
Descurainia incana ssp. *incisa*	Mountain tansy mustard	No								
Descurainia sophia	Flixweed tansy mustard	No								
Draba aurea	Golden draba	No		Navajo (**Dunmire and Tierney 1997**)						
Draba helleriana var. *helleriana*	Greene Heller's whitlowgrass	No								
Draba rectifructa	Mountain draba	No								
Draba spectabilis	Showy draba	No								

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Echinocereus coccineus var. *coccineus*	Hedgehog cactus	No	Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Eastern Keres (**Castetter 1935**); Hopi (**Castetter 1935**); Navajo (**Castetter 1935**); Western Keres (**Castetter 1935**); Southern Tiwa (**Dunmire and Tierney 1995**); Hispano (**Trigg 1999**)							Fruits, buds, and stems are edible (**Kirk 1970**).
Eleocharis acicularis	Needle spikerush	No		Navajo (**Vestal 1952**)						
Eleocharis palustris	Common spikerush	No								
Eleocharis quinqueflora	Fewflower spikerush	No								
Elymus elongatus var. *elongatus*	Rough tridens	No	**Yes** **(See comments)**							All species yield edible grains, but hairs on seeds must first be singed (**Kirk 1970**).
Elymus elymoides var. *brevifolius*	Bottlebrush squirreltail	No								
Elymus elymoides var. *elymoides*	Bottlebrush squirreltail	No								
Elymus hispidus var. *hispidus*	Intermediate wheatgrass	No								
Elymus hispidus var. *ruthenicus*	Intermediate wheatgrass	No								
Elymus smithii/ pascopyrum smithii	Western wheatgrass	No								
Elymus trachycaulus var. *andinus*	Slender wheatgrass, slender wild rye	No								
Elymus trachycaulus var. *trachycaulus*	Slender wheatgrass	No	**Yes** **(See comments)**							All species yield edible grains, but hairs on seeds must first be singed (**Kirk 1970**).
Elymus x macounii	Quack grass	No								
Elymus x pseudorepens	Thickspike wheatgrass	No								
Elymus x saxicolous	Wild rye	No								

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Epilobium brachycarpum	Field willow herb	No	**Yes (See comments)**	Navajo (**Wyman and Harris 1951**)						Young shoots may be boiled or mixed with other raw greens for salad. Fresh or dried leaves may be used for tea. Stems also may be used to make broth (**Kirk 1970**).
Epilobium ciliatum var. *ciliatum*	Fringed willow herb	Yes								
Epilobium halleanum	Hall willow herb	No								
Epilobium leptophyllum	Alpine fireweed	No								
Equisetum laevigatum	Smooth horsetail	Yes	Eastern Keres (**Castetter 1935**); Western Keres (**Swank 1932**)	Navajo (**Dunmire and Tierney 1997**); Hispano (**Ford 1975**; **Moore 1977**)						Cones and sweet pulp are edible (**Hudspeth 1997**; **Kirk 1970**). Silica-covered stems may be used from scrubbing cookware (**Kirk 1970**).
		No	Hopi (**Fewkes 1896**); Eastern Keres (**Castetter 1935**); Western Keres (**Swank 1932**)	Navajo (**Dunmire and Tierney 1997**); Hispano (**Moore 1977**)						
Equisetum arvense	Field horsetail	No								
		Yes	**Yes (See comments)**	Hispano (**Ford 1975**; **Moore 1977**)						
Erigeron acris var. *asteroides*	Bitter fleabane	No	Navajo (**Dunmire and Tierney 1997**)							
Erigeron divergens var. *divergens*	Spreading fleabane	No								
Erigeron eximius	Sprucefir fleabane	No								
Erigeron flagellaris	Trailing fleabane	No								
Erigeron formosissimus	Beautiful fleabane	No								
Erigeron glabellus var. *glabellus*	Streamside fleabane	No								
Erigeron lonchophyllus	Shortray fleabane	No								
Erigeron modestus	Prairie fleabane	No								
Erigeron speciosus	Oregon fleabane	No								
Erigeron subtrinervis var. *subtrinervis*	Threenerve fleabane	No								

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Eriogonum racemosum var. *racemosum*	Redroot buckwheat	Yes	**Yes (See comments)**	Jémez (**Dunmire and Tierney 1995**); Hispano (**Ford 1975**)						Many species have edible seeds. Stems may be eaten raw or cooked before plant flowers (**Hudspeth 1997**; **Kirk 1970**).
		No	Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Hopi (**Castetter 1935**)	Navajo (**Dunmire and Tierney 1997**; **Wyman and Harris 1951**); Northern Tiwa (**Krenetsky 1964**); Tewa (**Ford 1992**); Ute (**Chamberlin 1909**); Western Keres (**Swank 1932**); Zuni **Stevenson 1915**)			Navajo (**Bryan and Young 1940**)			
Erodium cicutarium	Red-stem filaree	Yes	**Yes (See comments)**	Jémez (**Cook 1930**); Zuni (**Camazine and Bye 1980**); Hispano (**Ford 1975**; **Moore 1977**)						Leaves and stems may be eaten raw as greens or cooked as potherbs (**Kirk 1970**). At Jémez, leaves were pounded and mixed with watermelon seeds to prevent fungus during storage (**Cook 1930**).
		No		Navajo (**Wyman and Harris 1951**); Hispano (**Trigg 1999**)						
Erysimum capitatum var. *capitatum*	Western wallflower	Yes		Hopi (**Colton 1974**); Navajo (**Dunmire and Tierney 1997**); Western Keres (**Swank 1932**); Zuni (**Camazine and Bye 1980**); Hispano (**Ford 1975**; **Moore 1977**)			Western Keres (**Swank 1932**)			

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Eupatorium herbaceum	Western throughwort	Yes		Navajo (**Vestal 1952**); Zuni (**Stevenson 1915**); Hispano (**Ford 1975**)			Tewa (**Stevenson 1912**)			
		No			Eastern Keres (**Lange 1959**)					
Euphorbia brachycera	Horned spurge	No	Pre-Columbian? (**Dunmire and Tierney 1997**; Eastern Keres (**Dunmire and Tierney 1995**)	Eastern Keres (**Lange 1959**); Hopi (**Whiting 1939**); Navajo (**Dunmire and Tierney 1997**); Southern Tiwa (**Dunmire and Tierney 1995**); Tewa (**Stevenson 1912**); Western Keres (**Swank 1932**); Zuni (**Camazine and Bye 1980**; **Stevenson 1915**); Hispano**?** (**Trigg 1999**)						Used as livestock feed; *Euphorbia* sp. said to increase milk production in cows and goats (**Trigg 1999**).
Fallugia paradoxa	Apache plume	Yes		Eastern Keres (**Matthews 1992**); Navajo (**Vestal 1952**); Hispano (**Moore 1977**)					Hopi (**Whiting 1939**); Navajo (**Vestal 1952**)	
Festuca arizonica	Arizona fescue	Yes	**Yes (See comments)**							Seeds are edible (**Hudspeth 1997**).
Festuca thurberi	Thurber fescue	Yes								
Fragaria vesca	Woodland strawberry	Yes	Most Historic Pueblos (**Dunmire and Tierney 1995**)							Berries are edible raw or cooked. Leaves may be used for tea (**Kirk 1970**).
		No	Navajo and Ute (**Dunmire and Tierney 1997**)	Navajo (**Vestal 1952**)						
Fragaria virginiana	Virginia strawberry	No								

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Galium aparine var. *echinospermum*	Cleavers goosegrass	No	**Yes (See comments)**	Navajo (**Vestal 1952**); Hispano (**Ford 1975**)						Seeds may be roasted, ground, and used to make a drink resembling coffee. Stems may be used for bedstraw. Roots of many species may be used for making purple dye (**Kirk 1970**).
Galium boreale	Northern bedstraw	No								
Galium trifidum var. *subbiflorum*	Small bedstraw	No								
Gayophytum diffusum var. *strictipes*	Gayophytum	No		Navajo (**Dunmire and Tierney 1997**)						
Geranium caespitosum	Purple geranium	Yes	**Yes (See comments)**	Western Keres (**Swank 1932**); Hispano (**Ford 1975**)				Jémez (**Cook 1930**)		Leaves are edible (**Hudspeth 1997**).
		No	**Yes (See comments)**	Navajo (**Dunmire and Tierney 1997**); Northern Tiwa (**Krenetsky 1964**)				Jémez (**Cook 1930**)		
Geranium richardsonii	Richardson geranium	No								
Geum aleppicum	Yellow avens	No	**Yes (See comments)**							Roots may be boiled to make a beverage (**Kirk 1970**).
Geum macrophyllum var. *perincisum*	Largeleaf avens	No								
Geum triflorum var. *ciliatum*	Mountain smoke	No								
Glyceria striata var. *stricta*	Fowl manna grass	Yes	**Yes (See comments)**							Seeds yield an excellent flower. They also may be cooked similar to rice (**Kirk 1970**).
Gnaphalium exilifolium	Slender cudweed	No		Navajo (**Vestal 1952**); Western Keres (**Swank 1932**)						
Hackelia floribunda	Many-flowered stickseed	Yes		Tewa (**Ford 1992**)						

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Helianthus rigidus ssp. *subrhomboideus*	Showy sunflower	No	Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Most Historic Groups (**Dunmire and Tierney 1995**, **1997**); Hispano**?** (**Trigg 1999**)	Hopi (**Colton 1974**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Navajo (**Dunmire and Tierney 1997**); Hispano (**Moore 1977**; **Trigg 1999**)			Hopi and Navajo (**Dunmire and Tierney 1997**)		Pre-Columbian (**Magers 1986a**)	Seeds may be eaten raw or roasted. Tubers may be eaten raw, boiled, or roasted. Seeds yield a black or purple dye; flowers produce a yellow dye (**Kirk 1970**).
Heracleum sphondylium var. lanatum	Cow parsnip	Yes		Hispano (**Moore 1977**)						
Heterotheca villosa var. *nana*	Hairy false goldenaster	No		Hispano (**Ford 1975**)						
Heuchera parvifolia	Common alumroot	No	**Yes** **(See comments)**	Navajo (**Dunmire and Tierney 1997**)						Raw roots may be used to treat diarrhea (**Kirk 1970**).
Hieracium fendleri var. *fendleri*	Hawkweed	Yes	**Yes** **(See comments)**	Navajo (**Dunmire and Tierney 1997**)						Green plant parts and coagulated juice may be chewed as gum (**Kirk 1970**).
Holodiscus dumosus var. *dumosus*	Bush mountainspray	Yes	Navajo (**Vestal 1952**); Tewa (**Castetter 1935**); Southern Tiwa (**Jones 1931**)				Zuni (**Underhill 1979**)			One-seeded fruits may be eaten (**Kirk 1970**).
Humulus lupulus var. neomexicanus	Hops	Yes		Hispano (**Moore 1977**)						
Hymenopappus newberryi	Newberry white ragweed	Yes		Southern Tiwa (**Jones 1931**)						
		No	Jémez (**Cook 1930**); Southern Tiwa (**Jones 1931**)	Zuni (**Stevenson 1915**)	Zuni (**Stevenson 1915**)					
Hymenoxys hoopesii	Orange sneezeweed	No		Hopi and Navajo (**Dunmire and Tierney 1997**); Northern Tiwa (**Krenetsky 1964**); Zuni (**Stevenson 1915**)			Navajo (**Bryan and Young 1940**)			

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Hymenoxys richardsonii var. *floribunda*	Pingue rubberweed	Yes		Zuni (**Camazine and Bye 1980**); Hispano (**Ford 1975**; **Moore 1977**)	Most Historic Pueblos (**Dunmire and Tierney 1995**)					
		No		Hopi and Navajo (**Dunmire and Tierney 1997**); Northern Tiwa (**Krenetsky 1964**); Zuni (**Stevenson 1915**)			Navajo (**Bryan and Young 1940**)			
Ipomopsis aggregata subsp. *Formosissima*	Scarlet gilia	No		Hopi and Navajo (**Dunmire and Tierney 1997**); Tewa (**Dunmire and Tierney 1995**; **Stevenson 1912**); Western Keres (**Swank 1932**); Zuni (**Camazine and Bye 1980**)			Hopi (**Colton 1974**)			
Iris missouriensis	Blue flag	Yes		Navajo (**Dunmire and Tierney 1997**); Zuni (**Camazine and Bye 1980**)			Navajo (**Elmore 1944**)			
		No		Hispano (**Ford 1975**)						
Iva axillaris var. *robustior*	Marsh-elder, poverty-weed	No		Navajo (**Dunmire and Tierney 1997**); Ute (**Chamberlin 1909**)						

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Juncus arcticus var. *balticus*	Arctic rush	No	Pre-Columbian (**Adams 1980**)	Navajo (**Mayes and Lacy 1989**)		Southern Tiwa (**Jones 1931**)				
Juncus balticus var. *montanus*	Baltic rush	No								
Juncus bufonius	Toad-rush	No								
Juncus dudleyi	Dudley's rush	No								
Juncus ensifolius var. *montanus*	Dagger-leaf rush	No								
Juncus interior	Inland rush	No								
Juncus longistylis	Longstyle rush	No								
Juncus nevadensis	Sierra rush	No								
Juncus torreyi	Torrey's rush	No	Pre-Columbian (**Adams 1980**)	Navajo (**Mayes and Lacy 1989**)		Southern Tiwa (**Jones 1931**)				
Juniperus communis var. *depressa*	Common juniper	Yes		Hispano (**Ford 1975**; **Moore 1977**)						All species produce edible berries, which may be eaten raw or dried, ground into meal, and cooked as mush or baked as cakes (**Kirk 1970**). *J. communis* bark also is edible (**Hudspeth 1997**).
		No	Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Hopi and Navajo (**Dunmire and Tierney 1997**; **Vestal 1952**)	Pre-Columbian (**Dunmire and Tierney 1995**); Navajo and Ute (**Dunmire and Tierney 1997**); Hispano (**Moore 1977**)		Pre-Columbian (**Dunmire and Tierney 1995**, **1997**)	Navajo (**Bryan and Young 1940**)	Navajo and Ute (**Dunmire and Tierney 1997**)	Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Navajo and Ute (**Dunmire and Tierney 1997**)	
Juniperus scopulorum	Rocky Mountain juniper	Yes	Jémez (**Cook 1930**); Tewa (**Castetter 1935**); Ute (**Callaway et al. 1986**); Western Keres (**Swank 1932**)	Navajo (**Dunmire and Tierney 1997**); Hispano (**Ford 1975**; **Moore 1977**)					Pre-Columbian (**Magers 1986b**)	
Koeleria macrantha	Junegrass	No	Southern Tiwa (**Jones 1931**)						Jémez (**Cook 1930**)	Seeds are edible (**Hudspeth 1997**).
Lactuca serriola	Prickly lettuce	Yes	**Yes (See comments)**	Navajo (**Vestal 1952**)						Aboveground part of plant may be eaten as greens. Gum present in the roots may be chewed (**Kirk 1970**).
		No			Zuni (**Stevenson 1915**)					
Lappula occidentalis var. *occidentalis*/ *L. redowskii*	Flatspine stickseed	No		Navajo (**Dunmire and Tierney 1997**)						

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Lathyrus arizonica	Arizona peavine	No	Eastern Keres (**Castetter 1935**); Navajo (**Wyman and Harris 1941**); Tewa (**Ford 1992**); Western Keres (**Swank 1932**)	Navajo (**Wyman and Harris 1941**)						Seeds may be used as seasoning. Shoots and leaves collected from young plants may be used as edible green (**Hudspeth 1997**; **Kirk 1970**). Pods also are edible (**Hudspeth 1997**).
Lepidium densiflorum	Common peppergrass	Yes		Southern Tiwa (**Jones 1931**); Hispano (**Ford 1975**)						
Lepidium ramosissimum var. *bourgeauanum*	Bourgeau's pepperweed	No	Pre-Columbian (**Dunmire and Tierney 1997**; **Stiger 1977**)	Pre-Columbian? (**Stiger 1977**); Navajo (**Dunmire and Tierney 1997**); Southern Tiwa (**Jones 1931**)						
Lepidium virginicum var. *pubescens*	Clasping pepperweed	No								
		Yes		Hispano (**Ford 1975**)						
Lesquerella ovalifolia	Roundleaf bladderpod	No	**Yes (See comments)**	Navajo (**Dunmire and Tierney 1997**); Western Keres (**Swank 1932**)						Leaves and seeds are edible (**Hudspeth 1997**).
Linum lewisii var. *lewisii*	Prairie flax	No	**Yes (See comments)**	Hopi and Navajo (**Dunmire and Tierney 1997**); Zuni (**Stevenson 1915**)						Seeds may be roasted, dried, and ground for use alone or mixed with other foods (**Kirk 1970**).
Lithospermum multiflorum	Southwestern stoneseed	No	**Yes (See comments)**	Hopi (**Whiting 1939**); Navajo (**Dunmire and Tierney 1997**); Zuni (**Camazine and Bye 1980**)						Cooked roots are edible (**Kirk 1970**).
Lonicera involucrata	Bracted honeysuckle	No		Navajo (**Dunmire and Tierney 1997**)						

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Lotus wrightii	Wright's deervetch	Yes	Navajo (**Dunmire and Tierney 1997**)	Zuni (**Camazine and Bye 1980**)						
Lupinus argenteus var. *argophyllus*	Stemless dwarf lupine	No		Navajo (**Dunmire and Tierney 1997**; **Wyman and Harris 1941**)			Navajo (**Wyman and Harris 1941**)			
Lupinus argenteus var. *fulvomaculatus*	Stemless dwarf lupine	No								
Lupinus kingii	King's lupine, silky lupine	No								
Machaeranthera bigelovii var. *bigelovii*	Bigelow's tansy-aster	No	Western Keres (**Swank 1932**)	Hopi (**Whiting 1939**); Jémez (**Cook 1930**); Navajo (**Dunmire and Tierney 1997**); Tewa (**Stevenson 1912**); Zuni (**Camazine and Bye 1980**; **Stevenson 1915**)			Western Keres (**Swank 1932**)			
Mahonia repens	Creeping barberry	Yes		Hispano (**Moore 1977**)						
Malva neglecta	Common mallow	Yes	**Yes** (**See comments**)	Navajo (**Mayes and Lacy 1989**)						Leaves and stems may be boiled (**Kirk 1970**).
		No		Tewa (**Ford 1992**); Hispano (**Moore 1977**)						
Marrubium vulgare	Blue verbena	Yes	**Yes** (**See comments**)	Hispano (**Ford 1975**; **Moore 1977**)						The dried plant, made into a tea, makes a nutritious tonic. In large quantities, however, the tonic has laxative qualities (**Kirk 1970**).
Matricaria discoidea	Disc mayweed	Yes		Hispano (**Ford 1975**)						
Medicago sativa	Buffalo grass	No	**Yes** (**See comments**)							Seeds may be parched and eaten, or ground into flour (**Kirk 1970**).

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Melilotus albus	White sweet clover	Yes	**Yes (See comments)**	Hispano (**Ford 1975**; **Moore 1977**)						Greens and seeds are edible (**Hudspeth 1997**).
Melilotus officinalis	Yellow sweet clover	No	**Yes (See comments)**							
Mentha arvensis	Field mint	Yes	Eastern Keres (**Castetter 1935**); Zuni (**Dunmire and Tierney 1995**)	Navajo (**Dunmire and Tierney 1997**); Southern Tiwa (**Jones 1931**); Tewa (**Ford 1992**); Western Keres (**Swank 1932**); Hispano (**Ford 1975**; **Moore 1977**)						Leaves, used either fresh or dried, make teas (**Kirk 1970**).
Mentha spicata	Spearmint	Yes	**Yes (See comments)**	Tewa (**Ford 1992**); Hispano (**Ford 1975**; **Moore 1977**)						
Mimulus glabratus var. *jamesii*	Wild lettuce, roundleaf monkeyflower	Yes	Southern Tiwa (**Jones 1931**)							Greens may be eaten raw (**Kirk 1970**).
		No	Navajo (**Wyman and Harris 1951**)							
Mimulus guttatus var. *guttatus*	Wild lettuce, common monkey-flower	Yes	Southern Tiwa (**Jones 1931**)							
		No	Navajo (**Wyman and Harris 1951**)							
Mirabilis oxybaphoides	Smooth spreading four-o'clock	Yes	**Yes (See comments)**	Navajo (**Dunmire and Tierney 1997**)						Roots are edible (**Hudspeth 1997**).
		No		Hopi (**Colton 1974**); Navajo (**Dunmire and Tierney 1997**); Tewa (**Dunmire and Tierney 1995**); Zuni (**Camazine and Bye 1980**); Hispano (**Moore 1977**)	Western Keres (**Swank 1932**)		Navajo (**Dunmire and Tierney 1997**)			
Mirabilis comata	Hairy-tuft four-o'clock	No								
Mirabilis decipiens	Broadleaf four-o'clock	No								
Mirabilis linearis	Narrowleaf four-o'clock	No								

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Monarda fistulosa var. *menthifolia*	Mintleaf bee balm	Yes	**Yes (See comments)**	Most Historic Pueblos (**Dunmire and Tierney 1995**; Hispano (**Ford 1975**; **Moore 1977**)	Tewa (**Dunmire and Tierney 1995**)					The entire aboveground portion of the plant may be used as a potherb (**Kirk 1970**).
		No	Hopi (**Whiting 1939**)	Navajo (**Dunmire and Tierney 1997**)						
Muhlenbergia andina	Foxtail muhly	No	**Yes (See comments)**						Zuni (**Dunmire and Tierney 1995**)	Seeds are edible (**Hudspeth 1997**).
Muhlenbergia filiformis	Pullup muhly	No								
Muhlenbergia minutissima	Annual muhly	No	**Yes (See comments)**						Zuni (**Dunmire and Tierney 1995**)	Seeds are edible (**Hudspeth 1997**).
Muhlenbergia montana	Mountain muhly	No								
Muhlenbergia pauciflora	New Mexico muhly	No								
Muhlenbergia ramulosa	Green muhly	No								
Muhlenbergia richardsonis	Mat muhly, soft-leaf muhly	No								
Muhlenbergia wrightii	Spike muhly	No								
Oenothera caespitosa	Stemless evening primrose	Yes	**Yes (See comments)**	Southern Tiwa (**Jones 1931**)						Spring roots may be cooked (**Kirk 1970**).
		No		Hopi (**Whiting 1939**); Navajo (**Dunmire and Tierney 1997**); Western Keres (**Swank 1932**); Zuni (**Camazine and Bye 1980**; **Stevenson 1915**); Hispano (**Moore 1977**)						
Oenothera coronopifolia	Sand evening primrose	No	**Yes (See comments)**							
		Yes		Zuni (**Camazine and Bye 1980**)						

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Opuntia phaeacantha var. *phaeacantha*	Plains prickly pear	No	Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Zuni (**Stevenson 1915**)	Hispano (**Ford 1975**; **Moore 1977**)						Fruits and joints may be peeled and eaten raw, boiled and then fried, or stewed (**Kirk 1970**).
Orobanche ludoviciana	Louisiana broomrape	No	Jémez (**Dunmire and Tierney 1995**); Navajo (**Wyman and Harris 1951**); Tewa (**Stevenson 1912**); Zuni (**Stevenson 1915**)	Navajo (**Dunmire and Tierney 1997**)					Western Keres (**Swank 1932**)	Entire plant, including its roots, is edible raw but is best if first roasted (**Kirk 1970**).
Oryzopsis hymenoides	Indian ricegrass	No	Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Most Historic Groups (**Dunmire and Tierney 1997**); Zuni (**Stevenson 1915**)							Seeds are edible raw but are best if dried and then ground for mush or baked cakes (**Kirk 1970**).
Osmorhiza depauperata	Sweet cicely	No	Southern Tiwa (**Jones 1931**)							Roots may be used for anise-like flavoring (**Kirk 1970**).
Oxalis violacea	Violet wood sorrel	Yes	**Yes** **(See comments)**	Hispano (**Ford 1975**)						Leaves and stems may be eaten either raw or after slight fermentation (**Kirk 1970**).
Parietaria pensylvanica	Pennsylvania pellitory	Yes		Hispano (**Ford 1975**)						

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Penstemon barbatus var. *trichander*	Scarlet penstemon	Yes		Hispano (**Ford 1975**)						
		No	Tewa (**Ford 1992**)	Tewa (**Robbins et al. 1916**); Western Keres (**Swank 1932**)						
Penstemon inflatus	Crosswhite inflated beardtongue	No	Tewa (**Ford 1992**)	Navajo (**Dunmire and Tierney 1997**); Tewa (**Robbins et al. 1916**); Western Keres (**Swank 1932**); Hispano (**Ford 1975**)						
Penstemon rydbergii var. *rydbergii*	Rydberg's penstemon	No								
Penstemon whippleanus	Whipples penstemon	No								
Pericome caudata	Mountain leaftail	Yes		Navajo (**Dunmire and Tierney 1997**)						
Phacelia alba	White scorpionweed	No		Tewa (**Stevenson 1912**); Western Keres (**Swank 1932**); Zuni (**Camazine and Bye 1980**)						
Phacelia heterophylla var. *heterophylla*	Varileaf phacelia, scorpionweed	No		Tewa (**Stevenson 1912**); Western Keres (**Swank 1932**); Zuni (**Camazine and Bye 1980**)						
Philadelphus microphyllus	Mock orange	Yes	Navajo (**Wyman and Harris 1951**); Southern Tiwa (**Jones 1931**)	Navajo (**Dunmire and Tierney 1997**)			Tewa (**Hill 1982**)			Fruits are edible (**Hudspeth 1997**).
Picea engelmannii var. *engelmannii*	Engelmann spruce	No		Navajo (**Dunmire and Tierney 1997**)		Pre-Columbian (**Windes and Ford 1996**)				
Picea pungens	Colorado blue spruce	Yes	Western Keres (**Swank 1932**)							
		No		Navajo (**Dunmire and Tierney 1997**)		Pre-Columbian (**Windes and Ford 1996**)				

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Pinus edulis	Piñon pine	Yes	Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Most Historic Groups (**Dunmire and Tierney 1995**, **1997**); Hispano (**Trigg 1999**)	Hopi and Navajo (**Dunmire and Tierney 1997**); Tewa (**Hill 1982**); Southern Tiwa (**Dunmire and Tierney 1995**); Western Keres (**Swank 1932**); Zuni (**Camazine and Bye 1980**); Hispano (**Ford 1975**; **Moore 1977**; **Trigg 1999**)	Eastern Keres (**Lange 1959**)	Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Navajo (**Elmore 1944**)	Hopi (**Colton 1965**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Navajo (**Dunmire and Tierney 1997**)		Pre-Columbian and Navajo (**Dunmire and Tierney 1997**); Hopi (**Whiting 1939**); Ute (**Smith 1974**)	Nuts are edible and nutritious either raw or cooked (**Kirk 1970**).
Pinus flexilis	Limber pine	Yes	**Yes** (**See comments**)	Navajo (**Dunmire and Tierney 1997**)						Nuts are edible. Cambium may be eaten as starvation food (**Hudspeth 1997**).
Pinus ponderosa var. *scopulorum*	Ponderosa pine	Yes	Zuni (**Castetter 1935**)	Navajo (**Dunmire and Tierney 1997**); Tewa (**Ford 1992**)		Pre-Columbian (**Dunmire and Tierney 1995**, **1997; Turney 1948**); Most Historic Groups (**Dunmire and Tierney 1995**, **1997**)			Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Navajo (**Mayes and Lacy 1989**)	Cambium may be eaten as starvation food (**Hudspeth 1997**).
Plantago lanceolata	Narrowleaf plantain	No	**Yes** (**See comments**)	Navajo (**Dunmire and Tierney 1997**); Western Keres (**Swank 1932**); Zuni (**Camazine and Bye 1980**)						Young plants may be used raw as a salad green or used in cooking as a potherb. Seeds may be parched and ground into meal (**Kirk 1970**).

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Plantago major var. *major*	Common plantain	Yes	Western Keres (**Castetter 1935**)	Northern Tiwa (**Krenetsky 1964**); Southern Tiwa (**Jones 1931**); Western Keres (**Swank 1932**); Hispano (**Ford 1975**; **Moore 1977**)						Young plants may be used raw as a salad green or used in cooking as a potherb. Seeds may be parched and ground into meal (**Kirk 1970**).
Poa fendleriana	Bluegrass	Yes	Pre-Columbian (**Bohrer 1975**)							Seeds are edible (**Hudspeth 1997**).
Polygonum aviculare	Doorweed	Yes		Hispano (**Ford 1975**)						Seeds of many species may be eaten whole or ground into meal, however, *P aviculare* is the best. Some species have peppery leaves that may be used as a seasoning, while others may be eaten raw as salad greens or cooked as potherbs. Roots also are edible (**Kirk 1970**).
		No	**Yes (See comments)**	Navajo (**Dunmire and Tierney 1997**)						
Polygonum amphibium var. *stipulaceum*	Water buckweed	No								
Polygonum convolvulus var. *convolvulus*	Wild buckwheat, black bindweed	No								
Polygonum douglasii var. *douglasii*	Douglass knotweed	No								
Polygonum erectum	Erect knotweed	No								
Polygonum lapathifolium var. *lapathifolium*	Curlytop knotweed	Yes		Western Keres (**Swank 1932**); Zuni (**Stevenson 1915**)						
Populus angustifolia	Narrowleaf cottonwood	Yes	**Yes (See comments)**	Hispano (**Ford 1975**; **Moore 1977**)			Eastern Keres (**Lange 1959**)			Catkins in some species are edible raw or boiled in stews. Inner bark may be eaten as starvation food (**Kirk 1970**). Aspen flowers also are edible (**Hudspeth 1997**).
		No	Pre-Columbian (**Williams-Dean 1986**)			Pre-Columbian (**Dunmire and Tierney 1997**)			Pre-Columbian (**Dunmire and Tierney 1997**); Hopi (**Colton 1974**)	
Populus tremuloides	Quaking aspen	Yes	Hopi (**Whiting 1939**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Ute (**Smith 1974**)	Southern Tiwa (**Jones 1931**); Tewa (**Robbins et al. 1916**); Hispano (**Ford 1975**)		Hopi (**Whiting 1939**); Navajo (**Elmore 1944**); Tewa (**Ford 1992**)	Most Historic Pueblos (**Dunmire and Tierney 1995**); Ute (**Smith 1974**)		Pre-Columbian and Navajo (**Dunmire and Tierney 1997**); Hopi (**Whiting 1939**); Ute (**Smith 1974**)	

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Potentilla anserina/ Argentina anserina	Silverweed cinquefoil	No	**Yes (See comments)**	Navajo (**Dunmire and Tierney 1997**)						Roots of *P. anserine* are good either boiled or roasted; they are similar to parsnips (**Kirk 1970**).
Potentilla fruticosa/ Dasiphora floribunda/ Pentaphylloides floribunda	Shrubby cinquefoil, bush cinquefoil	No								
Potentilla gracilis var. *pulcherrima*	Soft cinquefoil	No								
Potentilla hippiana var. *hippiana*	Woolly cinquefoil	No								
Potentilla norvegica subsp. *Monspeliensis*	Norwegian cinquefoil	No								
Potentilla pensylvanica var. *pensylvanica*	Pennsylvania cinquefoil	No								
Prunus virginiana var. *melanocarpa*	Common choke cherry	Yes	Pre-Columbian (**Dunmire and Tierney 1995**, **1997**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Navajo (**Dunmire and Tierney 1997**); Ute (**Callaway et al. 1986**); Jicarilla (**Opler 1936**)	Navajo (**Dunmire and Tierney 1997**); Western Keres (**Swank 1932**); Hispano (**Ford 1975**)			Navajo (**Dunmire and Tierney 1997**); Jicarilla (**Dunmire and Tierney 1997**)		Pre-Columbian (**Nichols n.d.**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Ute (**Dunmire and Tierney 1997**)	Sour berries are edible raw or cooked. Leaves may be used to make refreshing beverage (**Kirk 1970**).
		No	Navajo (**Castetter 1935**); Ute (**Callaway et al. 1986**)				Navajo (**Bryan and Young 1940**)			
Pseudotsuga menziesii var. *glauca*	Douglas fir	Yes	**Yes (See comments)**	Most Historic Pueblos (**Dunmire and Tierney 1995**); Navajo (**Dunmire and Tierney 1997**)		Pre-Columbian (**Dunmire and Tierney 1995**, **1997**)			Pre-Columbian (**Dunmire and Tierney 1997**)	Fresh needles may be steeped for tea (**Kirk 1970**).
Pseudotsuga mucronata	Douglas fir	No		Most Historic Pueblos (**Dunmire and Tierney 1995**)		Pre-Columbian (**Dunmire and Tierney 1995**)				

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Pteridium aquilinum var. *pubescens*	Western bracken	Yes	**Yes (See comments)**	Navajo (**Chinle Curriculum Center 1995**)				Navajo (**Chinle Curriculum Center 1995**)		Young fronds are edible raw or cooked. Rootstock may be eaten after roasting or boiling (**Kirk 1970**).
Pterospora andromedea	Pinedrops	Yes		Western Keres (**Swank 1932**)			Navajo (**Bryan and Young 1940**)			
Pyrola chlorantha var. *chlorantha*	Green wintergreen	Yes		Navajo (**Wyman and Harris 1951**)						
Quercus gambelii	Gambel oak	Yes	Most Historic Pueblos (**Dunmire and Tierney 1995**); Navajo (**Dunmire and Tierney 1997**)	Eastern Keres (**White 1942**); Southern Tiwa (**Jones 1931**); Tewa (**Ford 1992**); Hispano (**Ford 1975**; **Moore 1977**)			Navajo (**Dunmire and Tierney 1997**)		Pre-Columbian (**Magers 1986b**); Hopi (**Colton 1974**); Navajo (**Dunmire and Tierney 1997; Turney 1948**)	Sweet acorns may be eaten raw or cooked (**Kirk 1970**). Leaves also are edible (**Hudspeth 1997**).
		No	Pre-Columbian (**Dunmire and Tierney 1997**); Ute (**Callaway et al. 1986**); Jicarilla (**Opler 1936**)			Pre-Columbian (**Dunmire and Tierney 1997**)			Pre-Columbian (**Dunmire and Tierney 1997**)	
Ranunculus aquatilis var. *diffusa* /*Ranunculus longirostris*	Water buttercup	No	Navajo (**Dunmire and Tierney 1997**); Western Keres (**Swank 1932**)	Hispano (**Ford 1975**)						Buttercups are toxic raw but are edible when cooked. Seeds may be parched and ground for baked cakes, and roots may be boiled. Crushed and washed flowers yield yellow dye (**Kirk 1970**).
Ranunculus cardiophyllus	Heart-leaved buttercup	No								
Ranunculus cymbalaria	Northern seaside buttercup	No								
Ranunculus inamoenus	Graceful buttercup	Yes								
Ranunculus macounii	Macoun's buttercup	No								

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Ratibida columnifera	Prairie coneflower	Yes	Zuni (**Stevenson 1915**)	Northern Tiwa (**Krenetsky 1964**); Tewa (**Stevenson 1912**); Zuni (**Stevenson 1915**)						Leaves and flowers may be brewed for tea (**Kirk 1970**).
		No	Navajo (**Vestal 1952**)	Hispano (**Moore 1977**)						
Ribes cereum	Western red currant	Yes	Pre-Columbian (**Dunmire and Tierney 1997**; **Stiger 1977**); Hopi (**Fewkes 1896**); Navajo and Ute (**Dunmire and Tierney 1997**)	Hopi (**Kirk 1970**)			Hopi (**Whiting 1939**)		Pre-Columbian (**Nichols n.d.**); Hopi (**Whiting 1939**); Navajo (**Wyman and Harris 1951**)	All species produce edible berries, but some are better than others. Leaves of some species may also be eaten (**Hudspeth 1997**).
Ribes inebrians	Whiskey currant	Yes	Most Historic Pueblos (**Dunmire and Tierney 1995**)							
Ribes inerme var. inermis	Whitestem gooseberry	Yes	Most Historic Pueblos (**Dunmire and Tierney 1995**)						Pre-Columbian (**Nichols n.d.**); Hopi (**Whiting 1936**); Navajo (**Wyman and Harris 1951**)	
Ribes leptanthum	Trumpet gooseberry	No	Pre-Columbian (**Dunmire and Tierney 1997**; **Stiger 1977; Turney 1948**); Hopi (**Fewkes 1896**); Navajo and Ute (**Dunmire and Tierney 1997**)	Hopi (**Kirk 1970**)			Hopi (**Whiting 1939**)			
Ribes montigenum	Red prickly currant	No								
Ribes wolfii	Wolf's currant	No								
Robinia neomexicana var. *neomexicana*	New Mexico locust	Yes	Jémez (**Cook 1930**)	Hispano (**Ford 1975**)					Pre-Columbian (**Turney 1948**); Jémez (**Cook 1930**); Tewa (**Ford 1992**); Western Keres (**Swank 1932**)	Flowers are edible (**Hudspeth 1997**).

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Rorippa nasturtium-aquaticum	Common watercress	Yes		Hispano (**Ford 1975**)						Leaves and stems may be eaten as greens (**Hudspeth 1997**).
		No	**Yes (See comments)**	Zuni (**Stevenson 1915**)						
Rorippa curvipes	Bluntleaf yellowcress	No								
Rorippa sphaerocarpa	Roundfruit yellowcress	No								
Rosa nutkana	Nootka rose	No	**Yes (See comments)**	Northern Tiwa (**Krenetsky 1964**); Southern Tiwa (**Jones 1931**); Tewa (**Ford 1992**); Hispano (**Ford 1975**; **Moore 1977**)						Rose hips may be eaten raw or cooked. Flower petals, bark, shoots, and leaves also may be eaten (**Hudspeth 1997**; **Kirk 1970**).
Rosa woodsii	Woods rose	Yes	**Yes (See comments)**	Navajo (**Dunmire and Tierney 1997**); Northern Tiwa (**Krenetsky 1964**); Southern Tiwa (**Jones 1931**); Tewa (**Ford 1992**); Ute (**Fowler 1986**); Hispano (**Ford 1975**; **Moore 1977**)	Navajo (**Elmore 1944**)				Ute (**Smith 1974**)	
Rubus parviflorus var. *parviflorus*	Western thimbleberry	Yes	Southern Tiwa (**Jones 1931**)							All species produce edible berries, which may be consumed either raw or cooked (**Kirk 1970**). Shoots and greens also are edible (**Hudspeth 1997**).
		No	Navajo (**Castetter 1935**); Ute (**Dunmire and Tierney 1997**)							
Rudbeckia laciniata var. *ampla*	Cutleaf coneflower	Yes	Eastern Keres (**Castetter 1935**)	Hispano (**Moore 1977**)						

VCNP Species[a]	Common Name	Exact Species Match?[b]	Food or Beverage	Medicine	Smoking or Chewing	Construction or Fuel	Dyes, Pigments, Tanning, Soap, or Crafts	Fiber, Cordage, Basketry or Matting	Tools	Edible Parts and Other Comments
Rumex acetosella	Wild dock, red sorrel	No	Navajo (**Elmore 1944**); Eastern Keres (**Castetter 1935**); Southern Tiwa (**Dunmire and Tierney 1995**)	Hopi (**Whiting 1939**; **Kirk 1970**); Navajo (**Dunmire and Tierney 1997**); Tewa (**Ford 1992**); Western Keres (**Swank 1932**); Zuni (**Stevenson 1915**); Hispano (**Moore 1977**)			Hopi and Navajo (**Dunmire and Tierney 1997**; **Kirk 1970**)			All *Rumex* species bear edible leaves and stems, but some are more acidic than others. Cooking removes toxins (**Kirk 1970**).
Rumex salicifolius var. *triangulivalvis*	Triangle-valve dock	No								
Rumex crispus	Curlyleaf dock	Yes	Southern Tiwa (**Jones 1931**); Tewa (**Castetter 1935**)	Zuni (**Camazine and Bye 1980**); Hispano (**Ford 1975**; **Moore 1977**)						
Sagittaria cuneata	Arum-leaved arrowhead, northern arrowhead	Yes		Navajo (**Elmore 1944**)						
Salix bebbiana	Bebb willow	No	Navajo (**Elmore 1944**); Southern Tiwa (**Jones 1931**); Zuni (**Camazine and Bye 1980**)	Hispano (**Moore 1977**)	Pre-Columbian (**Dunmire and Tierney 1995**)	Pre-Columbian (**Dunmire and Tierney 1995**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Ute (**Dunmire and Tierney 1997**)	Southern Tiwa (**Jones 1931**); Ute (**Dunmire and Tierney 1997**); Zuni (**Camazine and Bye 1980**)	Pre-Columbian, Jicarilla, Navajo, and Ute (**Dunmire and Tierney 1997**)	Pre-Columbian, Jicarilla, Navajo, and Ute (**Dunmire and Tierney 1997**)	Inner bark is edible with minimum processing as emergency food, but it is more palatable if dried and ground into flour (**Kirk 1970**).
Salix eriocephala var. *ligulifolia /S. ligulifolia*	Strapleaf willow	No								
Salix scouleriana	Scouler willow	Yes	**Yes** (**See comments**)	Southern Tiwa (**Jones 1931**); Zuni (**Camazine and Bye 1980**)		Pre-Columbian (**Dunmire and Tierney 1995**)	Pre-Columbian (**Dunmire and Tierney 1995**); Most Historic Pueblos (**Dunmire and Tierney 1995**)			Inner bark is edible with minimum processing as emergency food, but it is more palatable if dried and ground into flour (**Kirk 1970**).
Sambucus racemosa var. *microbotrys*	Red elderberry	No	Ute (**Callaway et al. 1986**)	Hispano (**Moore 1977**)					Pre-Columbian (**Nichols n.d.**); Ute **30**	Berries are edible, especially if cooked. Bark may be used as diuretic or purgative (**Kirk 1970**).

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Senecio atratus	Tall blacktip ragwort	No		Jémez (**Cook 1930**); Hopi and Navajo (**Dunmire and Tierney 1997**); Western Keres (**Swank 1932**); Zuni (**Stevenson 1915**); Hispano (**Moore 1977**)					Pre-Columbian (**Magers 1986b**)	
Senecio bigelovii var. *bigelovii*	Nodding ragwort, Bigelow's groundsel	No								
Senecio bigelovii var. *hallii*	Hall's ragwort	No								
Senecio eremophilus var. *kingii*	King's ragwort	No								
Senecio wootonii	Wooton's ragwort	No								
Shepherdia canadensis	Buffalo berry	No	Ute (**Dunmire and Tierney 1997**)	Navajo (**Dunmire and Tierney 1997**)						Bitter berries are edible if cooked and sweetened (**Kirk 1970**).
Sidalcea candida var. *candida*	White checkerberry	No	**Yes (See comments)**	Navajo (**Dunmire and Tierney 1997**)						Aboveground part of plant is edible as cooked green (**Kirk 1970**).
Silene drummondii var. *drummondii*	Drummond's campion, catchfly	No	**Yes (See comments)**	Navajo (**Dunmire and Tierney 1997**)						Young shoots may be used as a potherb. The complete aboveground part of plant of some species is edible if boiled (**Kirk 1970**).
Silene menziesii var. *menziesii*	Menzie catchfly	No								
Silene scouleri var. *pringlei*	Hall's catchfly	No								
Sisymbrium altissimum	Tumble mustard	No	**Yes (See comments)**	Navajo (**Dunmire and Tierney 1997**)						Seeds may be parched and ground. Young plants may be used as a potherb (**Kirk 1970**).
Sisymbrium loeselii	Loesel thimble mustard	No								

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Solanum ptycanthum	Eastern black nightshade	No	Eastern Keres (**Castetter 1935**; **White 1942**); Hopi (**Dunmire and Tierney 1997**); Navajo (**Dunmire and Tierney 1997**); Southern Tiwa (**Dunmire and Tierney 1995**; **Jones 1931**); Western Keres (**Swank 1932**); Zuni (**Stevenson 1915**); Most Historic Pueblos (**Dunmire and Tierney 1995**)	Navajo (**Elmore 1944**); Zuni (**Stevenson 1915**); Most Historic Pueblos (**Dunmire and Tierney 1995**)	Eastern Keres (**Lange 1959**)					Tubers are edible when cooked (**Kirk 1970**). Zuni eat *S. triflorum* berries even though they are said to be poisonous.
Solanum triflorum	Cutleaf nightshade	Yes	Western Keres (**Castetter 1935**); Zuni (**Stevenson 1915**)							
		No	Eastern Keres (**Castetter 1935**; **White 1942**); Hopi (**Dunmire and Tierney 1997**); Navajo (**Dunmire and Tierney 1997**); Southern Tiwa (**Dunmire and Tierney 1995**; **Jones 1931**); Western Keres (**Swank 1932**); Zuni (**Kirk 1970**; **Stevenson 1915**); Most Historic Pueblos (**Dunmire and Tierney 1995**)	Navajo (**Elmore 1944**); Zuni (**Stevenson 1915**); Most Historic Pueblos (**Dunmire and Tierney 1995**)	Eastern Keres (**Lange 1959**)					Tubers are edible when cooked (**Kirk 1970**). Zuni eat *S. triflorum* berries even though they are said to be poisonous.

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Solidago missouriensis var. *missouriensis*	Missouri goldenrod	No	Hopi (**Castetter 1935**)	Hopi (**Whiting 1939**); Navajo (**Dunmire and Tierney 1997**); Western Keres (**Swank 1932**); Zuni (**Stevenson 1915**)			Western Keres (**Swank 1932**)			Young leaves may be used as a potherb. Dried leaves and fully expanded flowers may be brewed for tea (**Kirk 1970**).
Solidago nana	Baby goldenrod	No								
Solidago nemoralis var. *longipetiolata*	Gray goldenrod	No								
Solidago wrightii var. *adenophora*	Wright's goldenrod	No								
Sonchus arvensis	Field milk thistle	Yes	**Yes (See comments)**	Hispano (**Ford 1975**)						Young leaves and stems may be used for greens (**Kirk 1970**).
Sparganium angustifolium	Narrow-leaf bur reed	No	Pre-Columbian? (**Jones and Fonner 1954**)							Bulbous stem base and rhizome tubers are edible when cooked (**Kirk 1970**).
Sparganium emersum	Common bur reed	No								
Sphaeralcea fendleri var. *fendleri*	Fendler's globe mallow	No	Pre-Columbian? (**Dunmire and Tierney 1995, 1997**); Hopi (**Whiting 1939**); Navajo (**Dunmire and Tierney 1997**)	Pre-Columbian (**Dunmire and Tierney 1995**); Hopi (**Dunmire and Tierney 1997**); Most Historic Pueblos (**Dunmire and Tierney 1995**); Navajo (**Dunmire and Tierney 1997**); Hispano (**Moore 1977**)						Buds are edible (**Hudspeth 1997**).
Sporobolus cryptandrus	Sand dropseed	No	Pre-Columbian (**Dunmire and Tierney 1995, 1997**); Hopi (**Dunmire and Tierney 1997**); Navajo (**Vestal 1952**)	Navajo (**Vestal 1952**)					Pre-Columbian (**Magers 1986a**)	Seeds may be eaten raw but are best if parched and ground into flour for baking (**Kirk 1970**).
Stellaria longipes var. *longipes*	Long-stalk chickweed	No	**Yes (See comments)**							Tips of young plants may be boiled like spinach (**Kirk 1970**). Roots also are edible (**Hudspeth 1997**).
Stipa comata var. *intermedia*	Needle-and-thread	No	Pre-Columbian (**Bohrer 1975**)							

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Stipa lettermanii	Letterman's needlegrass	No	Pre-Columbian (**Bohrer 1975**)							
Symphoricarpos oreophilus	Mountain snowberry	No	Pre-Columbian (**Minnis and Ford 1977**)	Navajo (**Wyman and Harris 1951**)						
Taraxacum laevigatum	Red-seeded dandelion	No	Tewa (**Robbins et al. 1916**)	Tewa (**Robbins et al. 1916**); Western Keres (**Swank 1932**); Hispano (**Ford 1975**; **Moore 1977**)						Flowers are edible if boiled to remove bitterness. Roots are edible raw or cooked. They also may be used to make tonics, mild laxatives, and diuretics (**Kirk 1970**).
Taraxacum officinale	Common dandelion	Yes								
Taraxacum taraxacun	Common dandelion	No								
Thalictrum fendleri	Fendler's meadow rue	Yes	**Yes** (**See comments**)	Navajo (**Wyman and Harris 1941**); Western Keres (**Swank 1932**); Hispano (**Ford 1975**)						Plants produce edible greens (**Hudspeth 1997**).
Thelypodium wrightii var. *wrightii*	Wright's mustard	Yes	Most Historic Pueblos (**Dunmire and Tierney 1995**)				Tewa (**Robbins et al. 1916**)			
		No		Navajo (**Vestal 1952**)						
Townsendia eximia	Townsend's aster	No		Navajo (**Dunmire and Tierney 1997**)			Navajo (**Bryan and Young 1940**)			
Trifolium longipes var. *reflexum*	Long-stalked clover	No		Hispano (**Ford 1975**)						
Trifolium pratense var. *pratense*	Red clover	No								
Trifolium repens	White clover	No								
Trifolium wormskjoldii var. *arizonicum*	Springbank clover	No								

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Typha angustifolia	Narrow-leaf cattail	Yes	**Yes (See comments)**					Pre-Columbian (**Lang 1986**)		Starchy root is edible if roasted, boiled, or dried and ground into meal (**Kirk 1970**). Pollen and greens also may be eaten (**Hudspeth 1997**). Cattail down may be used to dress wounds, pad cradleboards, and stuff pillows (**Kirk 1970**).
		No	Hopi (**Whiting 1939**); Navajo (**Vestal 1952**)	Navajo (**Dunmire and Tierney 1997**)				Navajo (**Vestal 1952**); Ute (**Dunmire and Tierney 1997**)		
Urtica dioica var. *procera*	Common stinging nettle	No	**Yes (See comments)**	Navajo (**Wyman and Harris 1941**)				Ute (**Callaway et al. 1986**)		Boiled young shoots and stems may be eaten like spinach. Roots yield yellow dye (**Kirk 1970**).
Vaccinium myrtillus var. *oreophilum*	Myrle whortleberry	Yes	**Yes (See comments)**							Berries are edible either raw or cooked (**Kirk 1970**). Leaves also may be eaten (**Hudspeth 1997**).
Valeriana edulis var. *edulis*	Thickleaf valerian, tobacco root	Yes	**Yes (See comments)**							Roots are edible if roasted for a day. Cooked roots then may be eaten without further processing or may used to make soup or ground into flour for bread. Seeds edible raw but best if parched (**Kirk 1970**).
Verbascum thapsus	Common mullein	Yes		Hispano (**Ford 1975**; **Moore 1977**)						
Verbena macdougalii	Mountain blue vervain	Yes	**Yes (See comments)**	Hispano (**Ford 1975**; **Moore 1977**)						Seeds may be roasted and ground; best if first leached (**Kirk 1970**).
		No		Navajo (**Dunmire and Tierney 1997**)						
Veronica americana	American brooklime	No	**Yes (See comments)**	Navajo (**Vestal 1952**)						Leaves and stems may be used as salad greens and potherbs (**Kirk 1970**).
Veronica peregrina var. *xalapensis*	Purslane speedwell	No								

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Vicia americana var. *americana*	American vetch	Yes	Eastern Keres (**Castetter 1935**); Western Keres (**Swank 1932**)	Pre-Columbian? (**Jones and Fonner 1954**); Navajo (**Vestal 1952**)						Young stems and seeds may be boiled or baked (**Kirk 1970**).
Viguiera multiflora var. *multiflora* /*Heliomeris multiflora* var. *multiflora*	Showy goldeneye	No		Navajo (**Vestal 1952**)						
Viola adunca	Early blue violet, western dog violet	No	**Yes (See comments)**	Hispano (**Ford 1975**)						Leaves and stems may be eaten as greens (**Kirk 1970**). Buds also are edible (**Hudspeth 1997**).
Viola canadensis	Canadian violet	No								
Viola pedatifida	Birdfoot violet	No								
Woodsia oregana var. *cathcartiana*	Western cliff fern	No		Navajo (**Vestal 1952**)						
Yucca baccata var. *baccata*	Broadleaf yucca	Yes (**See**	Pre-Columbian (**Fry and Hall 1986**); Most Historic Groups (**Dunmire and Tierney 1995**)	Hispano (**Ford 1975**; **Moore 1977**)			Most Historic Pueblos (**Dunmire and Tierney 1995**); Hopi, Navajo, and Ute (**Dunmire and Tierney 1997**)	Pre-Columbian (**Adovasio and Gunn 1986**; **Dunmire and Tierney 1997**); Hopi (**Dunmire and Tierney 1997**); Most Historic Groups (**Bell and Castetter 1941**; **Dunmire and Tierney 1995**)	Pre-Columbian (**Dunmire and Tierney 1997**); Most Historic Pueblos (**Dunmire and Tierney 1995**)	Large, pulpy fruits may be eaten raw, roasted, dried, or ground into meal. Seeds, flowers, buds, and young flower stalks also are edible raw, boiled, or roasted (**Kirk 1970**).
Zigadenus elegans	Mountain death camus	No	Navajo (**Wyman and Harris 1951**)	Navajo (**Dunmire and Tierney 1997**)						

[a] Genera are listed in alphabetical order. Species within genera usually follow alphabetical order; however, some deviations from this rule occur to simplify data presentation among taxa with similar documented uses.

[b] "Exact Species Match" signifies whether the published ethnobotancial references specifically identify plant species known to occur in the VCNP ("yes") or describe plant uses documented by genera or a closely related species ("no").

Table 5.2. Summary VCNP ethnobotanical inventory.

VCNP species		Exact species match?[a]	
Major Uses	**Raw Count**	**Yes**	**No**
Raw Count	350	125	225
Food or Beverage	290	87	203
Medicine	286	104	183
Smoking or Chewing	25	11	14
Construction or Fuel	30	12	18
Dyes, Pigments, Tanning, Soap, or Crafts	67	27	40
Fiber, Cordage, Basketry or Matting	18	8	10
Tools	58	22	36

[a] "Exact Species Match" signifies whether the published ethnobotanical references specifically identify plant species known to occur in the VCNP ("yes") or describe plant uses documented by genera or a closely related species ("no").

Chapter 6.

Ranching History

Thomas Merlan and Kurt F. Anschuetz

Introduction

Adolf Bandelier described the Valles Caldera in the mid-1880s:

> *The Valles Mountains separate the northern section of the Queres district from that claimed by the Jémez tribe. Against the chain of gently sloping summits which forms the main range from the peak of Abiquiu to the Sierra de la Palisada in the south abuts in the west an elevated plateau, containing a series of grassy basins to which the name of "Los Valles" (the valleys) has been applied. Permanent streams water it, and contribute to make an excellent grazing region of this plateau. But the seasons are short. For snow fills the passes sometimes till June and may be expected again as early as September (**Bandelier 1892**:200).*

Writing circa 1911, U.S. Surveyor William Boone Douglass noted:

> *The soil of the valleys is a rich black loam, that may be classed as first rate. At many points in the higher lands the soil is almost as good. This coupled with a copious supply of moisture, produces a heavy growth of grass, making the grant ideal for grazing purposes. The lands, perhaps, have other agricultural values, especially that in the lower valleys, but the high altitude, a mean of about 9,000 ft. [2,744 m] above sea level, tends to prevent the maturing of crops (**Douglass and Neighbour n.d.**:83).*

Having again surveyed the Baca Location No. 1 (Baca Location) in 1921, Cadastral Engineer Charles W. Devendorf concluded,

> *The soil is generally a very rich black loam, but in some of the valleys it is a gravelly brown loam, and in much of the mountain country is more or less thin and stony. In the rougher mountainous portions the soil is largely bare, broken lava rock and huge boulders…At this high elevation, 8,000 to 12,000 ft. [2,439–3,659 m], the rainfall is very heavy, also the snow fall…In the spring of 1921 the period between spring and autumn frosts at my camp was about 60 days. It is probably shorter on the higher mountains (**Osterhoudt et al. 1921**:98–99).*

These characteristics have ensured that the Valles Caldera will never be ground for conventional farming. At the same time, these qualities make the Valles perhaps the finest summer pasture in the Southwest.

Cattle and Sheep

Permanent Hispanic settlement began in New Mexico in 1598 with the arrival of Don Juan de Oñate at the head of a major colonizing expedition. Oñate brought horses, sheep, goats, and cattle. Oñate's breeder sheep flocks thrived, and sheep again dominated the fledgling New Mexican livestock industry after Diego de Vargas' Reconquest in the 1690s. In comparison, Hispanic New Mexico never became a center of cattle ranching. "Perhaps the single greatest retarding factor was the presence of a substantial established population of Pueblo Indian irrigation farmers" (**Jordan 1993**:146). Jordan contends that the Franciscan missions established in New Mexico in the 1600s, including that at Jémez Pueblo, blocked the development of a large-scale cattle industry in order to protect the fields and crops of the Indians as well as their own agricultural enterprises based on Indian labor (**Jordan 1993**:146; see also chapters 5 and 9 for discussions of Jémez Pueblo's traditional relationship with the Valles Caldera).

After the Reconquest, Governor Vargas began to make land grants, a practice that continued through the 1700s. Subsequent governors made grants north of Jémez Pueblo and west of the Río Grande (**Scurlock 1981**:135). Hispanics first occupied the Rito de los Frijoles in 1780, the year Governor Juan Bautista de Anza received a petition from Andrés Montoya to recognize a land grant that former Governor Tomás Veles Cachupín had made in 1740 (**Morley 1938**:150). Although Montoya admitted never occupying this grant, de Anza conveyed Montoya's title to the land to his son-in-law, Juan Antonio Lujan, who began clearing the still virgin acreage for farming (**Morley 1938**:150–151). Similarly, Governor Chacòn made the Cañon de San Diego Grant, immediately southwest of the Baca Location in 1798. The first European settlement on this grant was probably Cañon, at the confluence of the Río Jémez and the Río Guadalupe. By 1821 the Jémez Valley's Hispanic population was 864 (**Scurlock 1981**:135).

New Mexico's ranching economy and the lands it occupied gradually expanded during the eighteenth century.

Herding and pastoralism were the principal means by which the region's Hispanic occupation grew from the time of the Reconquest until after the coming of the Anglo-Americans in the nineteenth century. Richard L. Nostrand, an authority on New Mexico Hispanic history, finds that the Hispanic "homeland," or area of occupation, reached its greatest extent about 1900, mainly owing to the sheep industry (**Norstrand 1992**).

The need for new pastures was the driving force behind this homeland expansion. **John O. Baxter** (**1987**:42) notes that New Mexico's sheep industry, while still comparatively small by later standards, was solidly established by the mid-1700s. This period also roughly coincides with the time when Hispanic travelers and soldiers began crossing the Valles Caldera. The Miera y Pacheco Map of 1779 implies the presence of cattle and other livestock in the Valles Caldera during the latter eighteenth century. In his drawing, made at the request of Governor Juan Bautista de Anza, **Bernardo Miera y Pacheco** (**1779**) identifies the Valle Grande as the *Valle de los Bacas* (Valley of the Cows).

By 1757 the Pueblos and Hispanics of New Mexico together owned significant numbers of livestock, including seven times more sheep than cattle: 7,356 horses, 16,157 cattle, and 112,182 sheep (**Baxter 1987**:42). Diego Padilla, who lived south of Albuquerque, owned 1,700 sheep but only 141 cattle in 1740. Sheep became "the economic hallmark of the regional Euroamerican culture" (**Jordan 1993**:147). The region's Navajo and Ute populations also readily adopted these animals into their economies and cultures.

New Mexico's economy showed little diversification until about 1790. It was almost entirely agricultural and pastoral, and depended primarily on sheep. As sheep became the acceptable means of exchange for imported consumer goods, a small clique of rancher-merchants began to dominate livestock marketing within the province and to control other aspects of the local economy (**Baxter 1987**:42). Many of these individuals were either natives of Spain or *criollos*, born in the New World but of Spanish blood.

Partido

The *partido* system, which was a means of lending capital at interest in the medium of sheep, prevailed in New Mexico from at least the early eighteenth century until it disappeared with the new economic arrangements and dislocations of World War II. The *partido* contract required a *partidario* (participating sharecropper) to return a percentage of the annual increase in the sheep herd and a percentage of the sheared wool, as well as to compensate the owner for all losses (**Scurlock 1982**:4). *Partido* came relatively late to the Valles Caldera, however. Two prominent land barons of the late nineteenth and twentieth centuries, Maríano Sabine Otero and Frank Bond, were largely responsible for the introduction of *partido* to the Baca Location.

The earliest known *partido* contract in New Mexico dates to about 1745. Under this agreement, Captain Joseph Baca of Albuquerque received 417 ewes from Lieutenant Manuel Sáenz de Garvisu for a period of 3 years (**Baxter 1987**:29).

Despite the early introduction of *partido* following the Reconquest, livestock production remained at a subsistence level throughout the Spanish colony until the 1770s. After 1780, New Mexico began to produce a truly exportable surplus in numbers such that the trade significantly aided New Mexico's economy rather than depleting it, as had earlier been the case. In 1788 Governor Fernando de la Concha estimated the number of New Mexican sheep sold in Chihuahua at 15,000 head valued at about 30,000 pesos. Six years later:

> *"[a friar noted] 15 to 20,000 sheep leave this province annually, and there have been some years when up to 25,000 left." In 1803 Governor Chacon estimated the number of cattle and horses going to market annually in Sonora and Nueva Vizcaya at more than 600 annually, plus 25 to 26,000 sheep and goats. In 1827 Colonel Antonio Narbona reported that there were 5,000 cattle, 240,000 sheep and goats, 550 horses, 2,150 mules, and 300 mares in New Mexico (**Gutiérrez 1991**:319–320).*

At the end of the century, sheep marketing involved provincial merchants who brought their livestock to La Joya de Sevilleta, the last settlement north of the Jornada del Muerto. November was the traditional departure date. As exports increased, however, the dealers began to favor August when summer rains improved grazing and filled waterholes. The caravans that took sheep to market, called *conductas* or *cordones*, that went to Nueva Vizcaya were escorted by detachments of soldiers from the Santa Fe presidio to guard against Indian attack.

In 1786, after signal military victories, Governor de Anza negotiated the Comanche Peace at Pecos, which also brought a period of peaceful relations with Apaches and some other nomads (but not the Navajo who were unrelenting in their raids on Hispanic settlements in the Río Puerco). In addition, the reforms and development promoted by the ministers of King Charles III (the so-called "Carlist reforms") encouraged economic diversification among Hispanics of New Mexico. After nearly a hundred years of living as subsistence farmers, artisans and skilled artisans began to set up shops, and some cultivators began switching to herding sheep, cattle, and other livestock. Together, these peaceful relations and economic developments encouraged the expansion not only of the Spanish colonial population but also of the territory's livestock industry during the 1790s.

The Nineteenth Century

The increase in numbers of livestock, especially sheep, created a need for new pastures on New Mexico's frontiers. Ranchers began to move onto the plains between the Sandia and Manzano mountains, and sometimes founded villages. In the period between 1818 and 1824, several rancher-merchant families from Santa Fe and the Río Abajo also requested land grants on the Pecos in what are now San Miguel and

Guadalupe counties. This expansion persisted for more than half a century, until the arrival of Anglo-American ranchers along New Mexico's margins checked and pushed it back.

By the 1820s the sheep population had grown to over 200,000, not counting Navajo and other Indian herds. Hispanic herdsmen were pushing out into the borderlands of northeastern New Mexico and as far as the Texas panhandle in search of pasture. In 1832 there were 240,000 sheep in the department but only 5,000 cattle and 850 horses.

Around this time, Hispanics probably were regularly using the lush high-altitude grazing lands that became the Baca Location for summer grazing (**Scurlock 1981**:134–135), but there is no record of permanent settlement until much later. Manuel Abrego established a ranch at Sulphur Springs in 1856. This operation might represent the first Anglo-American settlement near Redondo Creek (**Huning 1973**:63–64).

As discussed in Chapter 4, the U.S. Congress confirmed the Baca Location to the Baca Land Grant heirs in 1860, although the title was not delivered until the Baca Location was surveyed in 1876. This timing coincides with the development of huge single-owner sheep herds made possible by increased protection by the U.S. Army and the subjugation of the Navajos and other nomadic Indians in the 1860s and 1870s. Like other previously little-known areas next to the Río Grande Valley, the Baca Location became a principal resource for sustaining the continued growth of the New Mexican livestock industry (**Scurlock 1981**:137).

Between the 1860 Congressional authorization and the 1876 survey and patent of the land grant, Baca heirs and other Hispanic *pastores* (an inclusive term that can refer to the owners of the sheep and their *peones,* or employees) appear to have run sheep in the Valles Caldera. As reported by Los Alamos historian and author Craig Martin:

> *Use of the Baca Location by the Cabeza de Baca family and their neighbors probably centered not on the Valle Grande but on the smaller valles [valleys] along the north rim of the Valles Caldera. In summer…[small family groups of herders] set up sheep camps on the Valle Toledo (then called the Valle Santa Rosa), the Valle San Antonio, and the Valle de los Posos. Dates carved on aspen trees still testify to the use of these back valleys as sheep camps before the beginning of the twentieth century. Utilizing the tall grasses of the valleys, the herders ran small flocks, probably no larger than several hundred animals apiece (**Martin 2003**:33, italics in the original).*

The major user apparently was Tomás Dolores Baca, grandson of the original grantee, Luis María Cabeza de Baca (chapter 4). Meanwhile, his older brother, Francisco Tomás, claimed to have obtained the rights from other heirs in the 1860s. Including the land rights then obtained by his children, the Francisco Tomás Baca family claimed to have established ownership of an undivided one-third interest in the entire Baca Location by the early 1870s (chapter 4). Other heirs as well as other *pastores* from the San José, and Cañon de San Diego Grants might have used the Baca Location for summer grazing. No available documentary evidence shows how the land was shared.

Despite their uses of the Baca Location for grazing, the Baca family heirs permitted members of Jémez Pueblo to run sheep and horses in the Valles Caldera's rich grasslands (**Martin 2003**:33). The Jémez use of these valley ranges for herding was apparently a long-lived tradition that dated back to the early Spanish colonization of New Mexico (**Martin 2003**:16). The horse herd, considered by the Jémez to belong to the whole community, was especially valuable, as witnessed by the fact that the Pueblo's War Captain oversaw the care of the animals. The War Captain appointed men to take the horses into the Valles Caldera each spring to graze, with instructions to ensure that they did not allow the animals to damage pastures by overgrazing. The stockmen would bring the horse herd back to the pueblo in August in time for the fall harvest.

Surveyor General H. W. Atkinson documented ranching on the Baca Location by 1876. In the "General Description" concluding their report, which Atkinson signed, the government surveyors describe the Baca Location as:

> *. . . finely adapted for stock growing, raising a fine rank growth of grass especially in the interior which is filled with several small valleys and fine streams containing myriads of trout. The soil in the valley is rich but on account of its altitude is too cold to raise any kind of grain or vegetables. There are no settlers living upon the Grant. Large herds of sheep are kept here during the summer, but not during winter as the cold is too severe. The east and north boundaries run along the summit of the Valles mountains and are high and slightly broken. The grant contains an abundance of pine and aspen timber (**Sawyer and McBroom 1876**:14–15).*

The arrival of the Denver and Río Grande Railroad and the establishment of a New Mexico terminal at Española in 1881 created the modern labor market and introduced cash into what had been a barter economy (**Weigle 1975**:118–123). The 1935 Indian Land Research Unit of the Office of Indian Affairs gives an account of how the railroad gave the Bond Brothers their start:

> *Among the gentlemen opening stores were Scott and Whitehead, who in partnership had the commissary contract with the railroad company…Early in 1883 the railroad company changed its mind and decided to extend its line into Santa Fe and to build its roundhouse in Alamosa. This left the storekeepers in Española faced with the prospect of another dead railroad town…In what must have been a minor panic, all the merchants sold out. Two young brothers, George W. and Frank Bond, were working for Scott and Whitehead, and these men decided to buy out the stock and the tent of Scott and Whitehead…The Bonds, shrewder than the rest, saw the folly of depending for long-range growth upon the railroad. If they were to grow rich in this country they must do so on the one product that could be sold*

elsewhere for cash. Their commercial operations, therefore, led inevitably to livestock. In 1883 they had bought up 40 acres [16 ha] of land adjacent to the railroad depot for $200 and proceeded to build the facilities for shipping stock. Soon after that they began extending credit on livestock mortgages, and their herds began to be built up. At first they concentrated on cattle, but these proved to be less profitable than sheep. The grazing land open for free use at that time appeared limited, as did the prospects in the grazing industry. The Bond herd increased, and soon they entered into the system of renting out sheep on a sharecropper basis. The partidario, or sharecropper, system, under which most of the sheep industry is carried on in New Mexico today, is as old as Spanish colonization and may have been originally an outgrowth of the Spanish colonial encomienda system, whereby the labor of Indians was given to certain grantees, together with grants of land…The Bonds apparently found this system profitable, and their growth since 1883 has been phenomenal. Today this corporation has extended its operations until it covers a good portion of northern New Mexico and controls a good share of the sheep industry.

*The growth of Española has paralleled the growth of the Bond Co . . . (**Weigle 1975**:119–120).*

The arrival of the railroad greatly accelerated economic and environmental change in the Territory of New Mexico. In his discussion of environmental change and degradation on and around the Pajarito Plateau after 1880, Rothman states that American influence "telescoped into a few years much more environmental and cultural change than Spanish practices had produced in nearly three hundred years" (**Rothman 1989**:188). (See chapter 4 for Rothman's [1989:205–206] conclusions on changing land use patterns and how these affected and were affected by grazing.)

Craig D. Allen (**1989**) emphasizes historic human interactions with natural processes. In a short section titled *Anthropogenic Disturbances*, he discusses livestock grazing. He states that the extremely high historic stocking rates have led to gross alterations in the species composition of local vegetation associations, that continuous grazing has also caused marked reductions in herbaceous plant and litter ground cover, that overgrazing has been seen as a major cause of soil erosion and arroyo cutting, and that overgrazing in the late nineteenth and early twentieth centuries effectively suppressed previous surface fire regimes throughout the landscape (**Allen 1989**:145–149).

The earliest homesteads between Redondo Creek and La Cueva were those of John Kelly and Polito Montoya, who established their ranches by 1883. Subsequent homesteads around La Cueva include those of N. R. Darey, Angelien Eagle, J. S. Eagle, and S. D. Thompson (**USDA Forest Service 1883–1913**).

Maríano Otero and his son, Frederico J. (F. J.), acquired the Baca Location in 1899 (chapter 4). With their acquisition of the property, the Valles Land Company began to use the ranch as summer range for large numbers of horses, cattle, and sheep (**Martin 2003**:44). Martin observes further:

*Although they mostly dealt in real estate, the Oteros were also experienced sheepherders. The partners registered a new brand on June 8, 1899, and brought sheep to the ranch that first summer…In a typical pattern of use, the Oteros grazed cattle and horses on the large valles and grazed sheep in the mountains. For lambing grounds the Oteros used the meadows above Sulphur Springs. One benefit of this location was that the herders could use the acidic water from the springs to rid the sheep of scab and ticks (**Martin 2003**:44; emphasis in the original).*

The Twentieth Century

In 1909 Frederico J. (F. J.) Otero sold the Baca Location to the Redondo Development Company, but he continued to lease the Location until 1917 for grazing sheep (chapter 4). F. J. Otero did not renew his grazing lease in 1917, and that year the G. W. Bond and Brothers Company leased the Baca Location from Redondo Development Company for $500 a month. The Bond Brothers used the ranch for summer grazing, while wintering their sheep on the Ramón Vigil Land Grant (which they bought in 1919) and the Alamo Ranch northwest of Bernalillo. The Baca Location lease required the Bonds to make certain improvements; they spent $3,054.20 on fencing and other work in 1918. In late 1918 Frank Bond entered into a contract to buy the Baca Location from the Redondo Development Company. G. W. Bond and Brothers Company continued to lease the Baca Location from 1918 to 1926 (**Kelly 1972**:6–7; **Otero 1935**:237; **Wentworth 1948**:239–241).

G. W. Bond and Brothers made their highest profits in wool and sheep in 1909 and 1912, establishing *partido* arrangements throughout the region. They sustained heavy losses of sheep in the severe winter of 1914–1915 (**Grubbs 1960–1962**). Their greatest profits were made well before they bought the Baca Location and the Ramón Vigil land grants or the Alamo Ranch. Despite further losses on the tract during the severe winter of 1918–1919, the Bonds continued to develop their operations there.

After entering into the 1918 contract to buy the Baca Location, the Bond brothers permitted local Pueblos continued access to the property for ceremonial pilgrimages, limited hunting, and the construction of certain traditional log structures for shelter, hunting rites, and related purposes up to 1963 (**Wezlowski 1981**:115). A misunderstanding between G. W. Bond and Brothers Company and Jémez Pueblo led to the arrest of members of three Jémez Pueblo families for illegal grazing around 1920, however. Even though the court proceedings, which were held in Española, determined in favor of the Indian defendants, Frank Bond ended the unwritten agreement that allowed the Pueblos to pasture their cattle and horses in the Valles Caldera.

Changing patterns of land use in the region made the Valles Caldera increasingly valuable for grazing and timber. **Hal Rothman** (**1989**) notes that the Anglo-American owners leased the timber rights on the Ramón Vigil Land Grant to H. S. Buckman, a lumberman from Oregon, in 1898. Buckman

began large-scale cutting of the Plateau forests with devastating effect. "Buckman's timber enterprise destroyed what remained of the native ecosystem on the Vigil Grant" (**Rothman 1989**:203). Rothman explains further that decline in the quality of forage, the extension of the national forests and the loss of open land forced many Hispanics to run sheep on shares, a business dominated by Frank Bond. (**Rothman 1989**:209)

Bond acquired so much public and private grazing land that small herders, who could not find enough pasture for their stock, had to sign *partido* agreements with him. Bond's system tended to impoverish these small herdsmen. *Partidarios* took his sheep along with their own, and Bond made the herders fully responsible for the animals in their care. Their own stock served as collateral. Bond collected a fee for range use from the *partidarios*, "usually 300 pounds of wool and 25 lambs per 100 ewes (**Martin 2003**:65). *Partidarios* also had to outfit themselves from his store, where he charged a flat 10 percent interest rate. With expenses mounting, most *partidarios* were lucky to keep their own sheep at the end of a contract. As Bond's empire grew, he became the most influential man in the Española Valley (**Rothman 1989**:209–210; see also **Weigle 1975**:219).

Use of the Baca Location remained seasonal despite the increased herding activity. **William Boone Douglass** noted:

> *The grant is without permanent habitation. During the summer months, the owners maintain a cattle ranch, and near the SE. Cor. is a dairy ranch. The members of both ranches leave before winter sets in. In the valleys to the south and West without the bounds of the grant, permanent settlements are found, where the lands appear to be cultivated with a profit (**Douglass and Neighbour n.d.**).*

Historian **Dan Scurlock (1981)** notes that there were 73 Bond employees on the Baca Location in the summer of 1918. He lists the employees identified by informants or found in the Bond and Son business records; all but 3 of the employees were Hispanic or had Hispanic surnames. Most were sheepherders (*pastores*), camp tenders (*camperos*), or camp suppliers (*caporales*). That summer there were 17 sheep camps and 1 cattle camp on the Baca Location. The average number of sheep per camp was 1,257 (**Scurlock 1981**:144, 147). Clyde Smith, who was born on a homestead at Battleship Rock in1899 and worked for Maríano S. Otero as a young man, estimated that there were over 100,000 sheep on the Baca Location during the summers of 1917 and 1918 (**Scurlock 1982**:4). In taped interviews with Scurlock made in 1970, Smith provided a detailed account of life as a shepherd in the Valles Caldera. (See entry for **Scurlock** [**1982**] for an extensive excerpt of this interview; see also **Martin** [**2003**:60–61] for a concise discussion of herding practices, camp structure, and aspen tree carving as a pastime.)

Ledger entries from November 23, 1918, to September 8, 1919, refer to the Baca Location (**Bond and Son 1918–1919**). These documents show that individuals were grazing small numbers of stock, such as "35 cows and 8 horses" and "6 cows and 1 horse" (**Bond and Son 1918–1919**:1) on the Baca Location. The ledgers also indicate fees paid to Bond and Nohl Co. and balances due. The base price for grazing a horse or cow was $1.25 for the summer season (**Bond and Son 1918–1919**).

There is some surviving correspondence about the Baca Location from this period. Herman Wertheim, writing for Vicente Armijo from Domingo, New Mexico on June 19, 1918, enclosed a voucher for $116 in payment for grazing of 116 head of cattle taken to the Baca Location on June 12 (**Bond and Son 1918–1921**).

Moses Abouselman sent payments of $17 for 17 head of cattle and $65 for 65 head of cattle grazing on the Baca Location. Another letter refers to 14 head (**Bond and Son 1918–1921**).

Moses Abouselman wrote on June 10, 1918, that it was his understanding that he would pay 50 cents per head of cattle for the month of May or $1.25 for the season (i.e., "through the summer"). Abouselman wrote a letter dated June 14, 1918, on behalf of José Antonio Pecos of Jémez Pueblo. Pecos requested permission to put his horses on "the grant." There is some correspondence from the Quemado Sheep Company at Peña Blanca (**Bond and Son 1918–1921**).

Life as a herdsman, both for the laborer and owner, was uncertain. The good times experienced during the summers of 1917 and 1919 did not last. Frank Bond's son-in-law, Charles H. Corlett, who worked as manager of the Baca Location for about a year and was later to become a renowned general in the U.S. Army during World War II, describes the great difficulties confronting the Valles Caldera herdsmen in 1919:

> *Because of the severe winter of 1919 many cattle and sheep died of starvation. Frank Bond was beside himself with worry and nearly out of his mind. John Davenport [known as "Juan Largo" by his Hispanic friends (***Scurlock 1981***:144)] was overworked and somewhat discouraged as a result of the dreary winter, did not object when Bond made me manager, but became my loyal and valued assistant. I resigned my commission as lieutenant colonel (temporary) in the Army of the United States and became a stockman…After about four months at La Jara, the headquarters of the Baca, Amy and I moved down into the valley and occupied my mother's house (**Corlett 1974***:46–47).*

The Forest Service had instituted a program of predator control in the Jémez Mountains in 1916 (**Barker 1970**). The U.S. Biological Survey (later renamed the U.S. Fish and Wildlife Service) had been trapping predators, mainly gray wolves, in the mountains before 1916. Elk, mule deer, turkey, and prairie dogs were reduced or eliminated in and around the Baca Location by the Forest Service program of hunting and poisoning. Consequently, gray wolves, mountain lions, and coyotes preyed increasingly on cattle and sheep.

The U.S. Biological Survey continued to hunt predators, primarily gray wolves and mountain lions, from Chama south to the Baca Location and in the mesas and canyons to the south and west. John Davenport killed the last native New Mexican gray wolf in the Valle Grande in 1932 (**Scurlock 1981**:148).

Frank Bond and the G. W. Bond and Brothers Company completed their purchase of the Baca Location, with a half interest in the mineral rights, in 1926 (Chapters 3 and 7). Redondo Development Company retained its full timber rights on the tract for 99 years (**Scurlock 1981**:144; see also Chapter 4).

Most of the *pastores*, *camperos*, and *caporales* who worked on the Baca Location between about 1910 and 1950 lived in the locality. Records show that they came from San Ysidro, Cuba, Regina, Chamita, Española, Cow Springs, Santa Fe, Peña Blanca, Bernalillo, Vallecito de los Indios, and Velarde (**Scurlock 1981**:144).

In its study of the area carried out in March through July 1935 (originally published as the *Tewa Basin Study*), the Indian Land Research Unit of the Office of Indian Affairs discussed the Bond Brothers and how they adopted the *partido* system. Case History No. III describes the *partido* arrangement under which Lazaro Salazar ran his sheep on the Baca Location:

> *Lazaro Salazar has been renting Bond's sheep since 1924. He has 300 of Bond's sheep and 900 of his own. Lazaro rents Bond's sheep only to have the right to use the Baca Location (owned by Bond) to graze his sheep at $.25 per head. Lazaro is an exceptional sheep herder and has been able to stay clear of debt. This he attributed to the fact that only one-fourth of his sheep holdings belong to Bond. When, as is the case with all of the herders, it is necessary to borrow from Bond to finance the herding operations, a contract is made calling for the sale of lambs and wool to the Bond Company at a price to be set by them. In 1934 Bond limited Lazaro's grazing privileges on the Baca Location to 1,200 sheep. He feels that because of the fact that the ratio of his own sheep to Bond's sheep is too great he will be crowded off the Baca Location (Indian Land Research Unit of the Office of Indian Affairs, in **Weigle 1975**:219).*

Following lambing season, the herds were driven to shearing camps, maintained by Bond at Paseo del Norte, which is just south of the junction of Highway 4 and the road to the ranch headquarters, and at San Antonio Springs and at El Cajete (**Scurlock 1981**:144). Some shearers (*trasquiladores*) came from adjacent villages and others came from as far away as Mexico.

A shearer could shear 50 to 100 sheep each day and was paid 25 cents for each animal sheared. About 500 pounds of wool could be stuffed into a gunnysack. Ten or 12 sacks made a freight load, which was hauled by a four-horse or mule team and wagon across the Baca Location through Santa Clara Pueblo to Bond's Española store, or through La Cueva to Jémez Springs. Jémez Pueblo freighters then hauled the wool from Jémez Springs to Bernalillo or Albuquerque (**Scurlock 1981**:144).

Lorin Brown (**1978**:158). gives a detailed account of his visit to a *pastor*, Basilico Garduño, at his camp "in the shadow of El Cerro Redondo (Round Peak), near Jémez Hot Springs." Garduño worked for a *patrón*, presumably Frank Bond. The *patrón* visited the camp later, but Brown offers no details concerning him. Brown does, however, record Garduño's conversation about his former *patrón,* Don Maríano [Otero].

> *My father and I both worked for Don Maríano, who first owned those springs, that is, the grant on which they are located. He was muy rico, a man of many sheep and much land. We used to lamb in the grassy valley just above the springs and dip the sheep in troughs built just below the main sulphur spring. We used nothing else except the very water from the spring to rid the sheep of scab and ticks. It was much better than this stuff we have to use nowadays (Basilico Garduño, in **Brown 1978**:166).*

Brown describes the shearers, who arrived once a year, as "itinerants, shearing sheep on a commission basis all over the state and into Colorado" (**Brown 1978**:171).

Franklin Bond assumed ever greater oversight of the family business dealings in northern New Mexico following the decline in his father's (Frank Bond) health and subsequent moves, first to Albuquerque and then to California. Because wool prices declined in 1939–1940, he added cattle to the Baca Location ranching operation. World War II brought great demand for uniforms, briefly boosting the price of wool.

Frank Bond died on June 21, 1945, just weeks before Japan's unconditional surrender ended World War II. Soon afterward, commercial manufacture of synthetic fibers developed during the war caused the sheep industry to collapse again (**Martin 2003**:67). Franklin Bond increased the number of cattle on the Baca Location, and began leasing rangeland to cattle ranchers who terminated the traditional *partidos* with local men in favor of cowboys who worked as employees (see **Martin 2003**:67–68).

Even the Bond family hired between 5 and 15 cowboys for the ranching season. Martin reports:

> *The ranch hands would be up at 4 AM for a hearty breakfast and arrive at the corrals at 5 AM. Out of the herd of 50, each cowboy was assigned six or seven horses—enough for a week of hard riding. On trail by sunup, the employees rode up to 20 miles [32 km] a day, checking the cows and calves, inspecting the watering holes, and tending other ranch chores. Branding operations were run at Black Corrals near Cerro La Jara in the Valle Grande. During branding time cowboys rode out before sunrise to round up cattle. By afternoon they returned with the stock, the fires were hot, and the branding began. In the 1940s and early 1950s, cowboys and sheepherders received $90 per month. Skilled horse trainers could make $125 per month. Meals were served at the bunkhouse and consisted of lamb, beef, potatoes, chili, and fresh pie twice a day (**Martin 2003**:67).*

In the early 1950s, the Baca Location supported some 30,000 sheep and 5,000 cattle (**Martin 2003**:69). After Franklin Bond's death in 1954 at the age of 52, the trend toward replacing family sheep herds with cattle owned by lessees continued. By the late 1950s, ranchers ran as many as 12,000 cattle on the ranch (**Martin 2003**:67).

Sam King and his younger brother, Bruce (who later served three 4-year terms as governor of New Mexico in the 1970s, 80s and 90s), obtained a 5-year lease of the Baca Location grass in 1959. The King brothers helped remove the last of the Bond sheep from the Valles Caldera, ending this important part of the Baca Location's history.

In 1960, the King brothers ran 3,100 head of cattle, which they trucked into the Valles Caldera from their lower elevation ranches, during the summer and early fall. Martin describes the operation:

> *Starting in mid-September, cowboys rode out each morning to round up the cattle spread over extensive rangeland. It took two weeks to herd the cows and calves into the large pastures of the Valle Grande. In early October heifers were cut from the herds and moved to the loading pens at the old Bond shearing camp near the headquarters road. Seven trucks, all loaded in two hours, took the yearlings to market in Denver. The Kings trucked the calves to feedlots near their home ranch in Stanley, and kept the cattle on the Alamos Ranch near Albuquerque, which they had purchased from the Bonds for winter range (**Martin 2003**:69–70).*

The King brothers offered to buy 25,000 acres (10,000 ha) of the Baca Location (they had just bought the Alamo Ranch and could not make an offer for the entire land grant). The Bond Estate, however, refused to divide the property (Bruce King, in **Martin 2003**:70).

Instead, James Patrick Dunigan, owner of Dunigan Tool and Supply Company in Abilene, Texas, bought the Baca Location from the Bond Estate in 1963 (see also chapter 4, "Divided Rights Part II: James Patrick Dunigan vs. New Mexico Timber" section). After honoring existing grazing lease contracts, Dunigan started running his own cattle on the ranch in 1965.

In his 1968 testimony before 10th Circuit Court of Appeals, J. B. Harrell, Jr., a Dunigan employee, states that Dunigan ran about 7,000 yearling steers on the Baca Location. The ranching season ran from about April 15 to November 15, depending on weather conditions (***Baca Co. v. NM Timber, Inc.* 1967**). Most of these animals belonged to Texas ranchers who trucked their herds to the Valles Caldera. Under the terms of their grazing contracts, lessees paid Dunigan a per head fee at the end of the ranching season based on the animal's weight gain (**Martin 2003**:103).

The following year, while making his statement before 10th Circuit Court of Appeals for the same case, Dunigan was asked about the range improvement and ranching programs that his companies had initiated:

> *Collectively, when the partners and representatives of Dunigan Tool & Supply Company in a management capacity, took a look at the ranch and decided upon a course of fencing, developing water, creating areas in which to put our cattle, and we had committed ourselves at this point to a steer operation…we felt that we'd get a movement of our steers up into the high county with the proper techniques of salts and minerals and with the development of spring tanks, and we purchased a D-8 Caterpillar and in accordance with plans, proceeded to build sixty-five earthen stock tanks on the ranch. At the time we came to the Baca Location there was a total of six tanks…, besides the running water in streams and natural springs (James Patrick Dunigan, in **Baca Co. v. NM Timber, Inc. 1967**).*

Dunigan reported that his newly constructed stock tanks captured flows from intermittent springs, streams, and draws, and that some features were placed in high country grassland areas that previous ranchers had not used.

Under Dunigan's ownership, therefore, ranching operations were expanded into new topographic settings to allow more effective use and long-range management of available grasses. At the beginning of the ranching season, Dunigan separated the cattle among the Valle Grande, Valle Toledo, Valle de los Posos, and Valle Seco, as well as the lower elevations along the streams in the San Luis and Santa Rosa areas of the Baca Location (J. B. Harrell, Jr., in ***Baca Co. v. NM Timber, Inc.* 1967**). Dunigan explained that he adopted this practice because grass comes early to these low-lying elevations and grows well under sub-irrigation through stream diversions (***Baca Co. v. NM Timber, Inc.* 1967**) Dunigan needed to develop alternative pastures in the higher elevations to maintain the productivity of the valley-bottom pastures over the entire ranching season. He reasoned that by starting a program of high country grazing about the middle of June:

> *. . . we will get the growing season benefits in our valleys and then in the valley in the fall, we have that summer's growth that we can bring to our shipping point and, of course, the cattle won't hurt the grass after it is matured and had its growth undisturbed (James Patrick Dunigan, in **Baca Co. v. NM Timber, Inc. 1967**).*

Besides building stock tanks and salt- and mineral-lick stations to develop high-elevation grasslands for range use, Dunigan ran fences along the north side of the Valle San Antonio to help direct the movement of steers into the high country (***Baca Co. v. NM Timber, Inc.* 1967**).

Dunigan's overall fencing program was ambitious. The ranch built fences for the first time along the north and east boundaries of the Baca Location to reduce losses resulting from livestock wandering onto the Santa Fe National Forest. It also fenced the south side of the Valle San Antonio to hold cattle in the valley-bottom pasture when the livestock returned from the uplands. Dunigan indicated that his ranch planned to build other cross fences throughout the Baca Location to allow implementation of pasture deferral and rotation to improve range conditions over the long term (***Baca Co. v. NM Timber, Inc.* 1967**). Dunigan's goal was to allow individual pastures to lie fallow about once every 4 years.

Baca Land and Cattle Company worked with the U.S. Soil Conservation Service and consulted with Texas Technological College on ways to improve the Baca Location's rangeland. One of these collaborations consisted of an experimental plot of 14 grasses to develop cool season varieties to

inter-seed with the native species (James Patrick Dunigan, in ***Baca Co. v. NM Timber, Inc.*** **1967**). The introduction of diverse cool-season grasses would reduce damage to pastures during grazing, and had the potential to lengthen the livestock season by producing useful grass earlier in the spring and later in the fall. Dunigan also hoped that he could use cool-season grasses to reclaim abandoned logging road cuts and other disturbed areas.

Under Dunigan's ownership, use of the Baca Location was not limited to cattle. In the 1960s and 1970s, Dunigan diversified his operation to include commercial elk hunts (Chapter 5), geothermal exploration (Chapter 8), and leases for Hollywood filming (**Martin 2003**:106–110). He also experimented with training thoroughbreds at high altitude to see if he could improve their performance in races at lower elevations.

*In 1977 Dunigan built a large stable for thoroughbreds about a mile [1.6 km] north of the headquarters area and on the western border of the Valle Grande. The stable enclosed 18 stalls in two parallel rows. Paddocks enclosing many acres extended from the stable area toward Jaramillo Creek. A one-bedroom apartment was attached to the stable so that trainers never had to be far from their charges. However, Dunigan's death in 1980 ended the experiment with inconclusive results (**Martin 2003**:104).*

Today

Grazing has continued on the Baca Location since its acquisition by the Federal Government. An interim cattle grazing program began in the summer of 2002 on 23,380 acres (9,461 ha) in the Valles Grande, Toledo and San Antonio, and Cerro Seco pastures, with a maximum defined capacity of 2,000 animal units.

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Chapter 7.

Industrial Timbering

Kurt F. Anschuetz and Thomas Merlan

Establishing the Foundations for a History of Leveraged Buyouts

During their cadastral survey preceding confirmation of the Baca Location No. 1 (Baca Location) to Luis María Cabeza de Baca's heirs in 1876, Daniel Sawyer and William H. McBroom noted that the grant "contained an abundance of pine and aspen timber" (**Sawyer and McBroom 1876**:14–15).

Commercial timbering approached the Baca Location from lower elevations accessible to railroads. H. S. Buckman, a lumberman from Oregon, leased the timber rights on the nearby Ramón Vigil Land Grant in 1898. He logged the grant rapidly, destroying what was left of its native ecosystem (**Rothman 1989**:203).

In 1905 a Presidential proclamation created the 1,237,205-acre (501,000-ha) Jémez Forest Preserve, today part of the Santa Fe National Forest. The purpose of this preserve was to prevent indiscriminate logging and to manage the forest reserves for the benefit of the public. Through its permit and fee provision requirements, this executive action brought about notable changes in land use, and increased the use of private land holdings, which were not subject to Federal oversight.

The Baca Location's timber holdings accordingly increased in value. In a 1907 assessment, the land grant's rich forests included 425 million board feet of white pine and between 15 and 25 million board feet of spruce, a supply so abundant that it could "keep 6 to 8 mills busy for 35 to 60 years" (**Laughlin Papers 1907**).

After years of arguments with his brothers over the disposition of the property (**Martin 2003**), F. J. Otero sold the Baca Location to Redondo Development Company (based in Warren, Pennsylvania) on October 16, 1909. Its president, Edward D. Wetmore, later described himself as a capitalist in the lumber industry (1930 Federal Census, Warren County, Pennsylvania, in **Martin 2003**:47). Wetmore's enterprise reportedly bought the property for $300,000, a sum that far exceeded the tract's assessed ranchland value of $53,000 (**Bernalillo County, New Mexico 1849–1903**). The disparity suggests that Wetmore and his investors were speculating on a resource other than pasture. More than likely, they were speculating on the Baca Location's timber.

Redondo Development Company investigated developing a commercial logging operation on the Baca Location, but ultimately decided against it. The impediment was the heavy capital investment needed to develop the roads and other infrastructure for hauling timber from this still-remote location (**Martin 2003**:47). Instead, Wetmore used his connections to mortgage the Baca Location on April 1, 1915, to a bank in his hometown, the Warren Savings Bank, for $175,000. Redondo Development Company reserved the right to harvest and sell timber from the land for a stipulated total of not less than $175,000. This stipulation suggests the now-familiar device of the leveraged buyout, which is a strategy where a buyer pays for a property by selling parts of itself. What the land could be expected to earn from renewable resources, such as pasture, and its market price (reflecting its speculative value) were getting further and further apart, something to be expected in a region where the cash and market economy was still young. Wetmore apparently was looking for another way to raise money from the Baca Location other than ranching, but the calculation concerning the timber was a fateful one.

The Severing of Timber Rights from Grazing Rights

George W. and Frank Bond, the biggest wool and sheep men in the region, leased the grazing rights to the Baca Location in 1917. In March 1918, Frank Bond made an inquiry about buying the tract. He proposed to give Redondo Development Company a 50-year timber right. Wetmore asked for a longer period, and this, together with the Bond brothers' simultaneous commitment to buy the Ramon Vigil Grant, and wartime market uncertainties, led the Bonds to put the matter off. With the end of the World War, the brothers took up the negotiation again. In a contract dated December 17,1918, they agreed that Redondo Development Company would retain a 99-year right to the timber, and one half the mineral interests (***Baca Co. v. NM Timber, Inc*. 1967,** Trial record on file, National Archives, Rocky Mountain Region, 8NN-021-89-022 #5648, FRC#76L0201, box 110A; see also **Bond and Son 1918–1919**; **Scurlock 1981**:144). The Bond brothers were to pay a total of $400,000 for the property by the end of 1925; the deed of sale would not be executed until 1926.

The Bonds took the deed on April 8, 1926. With ownership came the deed's requirement that they maintain the property's timber reserves.

*As part of the consideration for this conveyance, and this conveyance is made upon the express understanding, covenant and agreement of the second party [the Bond brothers], that they will at all times hereafter exercise due care and use all reasonable means to protect the timber, trees and wood upon said premises from fire, and during the grazing season will keep at least three men riding in and about said timber, and will at all times co-operate with the United States Forestry Service, and the agents and employees of the party of the first part [Redondo Development Company] to protect said timber from fire, and this shall be a covenant running with the land and be binding upon the heirs, executors, administrators and assigns of the parties of the second part (**Baca Co. v. NM Timber, Inc. 1967**).*

Under the terms of their purchase contract, the Bond brothers could cut only timber sufficient "for building houses, sheds, barns, corrals and fences, and also such dead and down timber as may be necessary for firewood" (T. P. Gallagher, Jr., in ***Baca Co. v. NM Timber, Inc.* 1967**, Answers of New Mexico Timber, Inc., to Interrogatories, October 16, 1964, box 110A). Clearly, the Bond brothers bought the Baca Location as stockmen. The terms of the sale were designed to ensure that they would conduct their livestock operations in ways that did not adversely affect the timber.

The Early History of Timbering on the Baca Location

By 1900, several small sawmills were processing timber from the Cañon de San Diego Land Grant or under permit from the Jémez Forest Preserve in the upper Río Jemez Valley (**Scurlock 1981**:142, citing Kintzinger 1978 and Smith 1979). Jim Smith ran a water turbine-powered mill at Battleship Rock from the late nineteenth century to about 1912. Surveyors noted that the Freelove sawmill, which was on San Antonio Creek to the northwest of Redondo Creek, was working between 1913 and 1914. Lew Caldwell started a sawmill on his homestead at Vallecito de los Indios in 1925. The Hughes brothers started a mill at Ponderosa farther downstream in 1930 (**Scurlock 1981**).

Guy H. Porter and his son, Frank H., established the White Pine Lumber Company in 1922. They invested $2,000,000 to build a sawmill at Bernalillo and a rail line from this mill to San Ysidro near Zia Pueblo (**Scurlock 1981**:148). By 1924, White Pine Lumber Company mill was in operation and the company extended its line—known first as the Santa Fe Northwestern and subsequently as the Santa Fe Northern—to Porter, the operation's main logging camp in Guadalupe Canyon. Like some other area mills, White Pine Lumber Company processed lumber primarily from private holdings on the Cañon de San Diego Land Grant. By 1927 White Pine Lumber Company averaged 145,000 board feet of lumber daily, until a shortage of timber forced a reduction in production levels (**Scurlock 1981**:148, citing Southwest History Class 1976:66–67). To restore its timber output, White Pine Lumber Company extended its tracks from Porter to various landings higher up Guadalupe Canyon, following the Río Vacas (**Scurlock 1981**:148, citing Weinstein 1979). The White Pine Lumber Company cut about 100 million board feet of lumber from the beginning of its major operations in 1924 until its shutdown in 1931. With the onset of the Depression and a drop in demand for lumber, economic conditions forced the company to close.

While White Pine Lumber Company failed, New Mexico Lumber and Timber Company, which had also worked the 110,000-acre (44,515-ha) Cañon de San Diego Land Grant since 1922, expanded its operations. The company's president, T. P. Gallagher, Jr., bought White Pine Lumber Company later that year and continued working its timber rights in the upper San Diego Land Grant through 1936, depleting the tract's commercial timber reserves (**Scurlock 1981**:138, 148, citing Southwest History Class 1976). Before exhausting its timber rights, however, New Mexico Lumber and Timber Company began searching for new privately owned tracts.

The Baca Location was the company's obvious choice. Not only was the tract rich in timber, the introduction of logging trucks and the Civilian Conservation Corps' construction of the first graded road between Los Alamos and Cuba in 1935 freed commercial loggers from the heavy expense of building a rail line. Redondo Development Company had waited 26 years for the conditions that would make its investment profitable (Vernon Glover, personal communication 2002, in **Martin 2003**:85).

Redondo Development Company, with the approval of Warren Savings Bank and Trust Company, sold the logging rights on the Baca Location to the Firesteel Lumber Company on July 19, 1935, for $150,000. On tax assessment forms filed between 1931 and 1935, Firesteel's owner, Robert Anderson, had variously claimed that the Baca Location had anywhere from 270 to 312 million board feet of commercially valuable timber (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A; see also chapter 4).

New Mexico Lumber and Timber Company immediately signed an agreement with Firesteel Lumber Company and began the first industrial logging on the Baca Location (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A; see also chapter 4). The company's president, T. P. Gallagher, Jr., decided to log the stands of ponderosa pine, white fir, and Douglas fir that had been growing largely untouched on Redondo Border and Banco Bonito, and between Redondo Creek and Vallecito de los Indios for countless generations. According to Gallagher, the logging focused exclusively on this timber because it could be cut "in high grade because of economic reasons and because it could be sold in the market" (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A; see also Vernon Glover, in **Martin 2003**:85). The "economic reasons" included the great size of the trees and the comparatively flat terrain.

*A sawmill in Redondo Meadow handled the logs, and the lumber was shipped on the good downhill grades through Jemez Springs to the railroad landing at Cañones. Anderson reported that 42 million board feet of timber was cut in 1935 (Glover 1990:36, in **Martin 2003**:85–86).*

As the U.S. emerged from the Great Depression and trucking of timber became practical, the mortgage on the Baca Location's timber changed hands among banks, agencies, and speculators (***Baca Co. v. NM Timber, Inc.* 1967,** Abstract of Title to Timber Interest, box 110A). In the short term, mortgage holders moved to consolidate their interests. Warren Savings Bank and Trust Company sold Redondo Development Company's bond of $130,000 and first mortgage on the Baca Location timber rights to Blue Diamond Trading Corporation of New York on May 26, 1936. The Reconstruction Finance Corporation received Redondo Development Company's 1933 promissory note for $65,000 from Warren Savings Bank and Trust Company on May 28, 1936. It immediately reassigned the note to Warren Savings Bank.

New Mexico Lumber and Timber Company established a logging camp, called Camp Redondo or Redondo Camp, for about 25 employees and their families near the mouth of Redondo Creek. The camp consisted of 12 by 16 foot (3.7 by 4.9 m) log cabins, transportable skid-mounted frame houses, sheds, stables, a mess hall, a log schoolhouse, and miscellaneous huts and tents (**Scurlock 1981**:148, citing Darnell 1979 and Weinstein 1979). The remnants of some of these structures, particularly those of the log cabins (e.g., sites BG-24, BG-25, BG-27, BG-28, and BG-29) and the old schoolhouse (site BG-26), are visible today. Dick Cotton, a New Mexico Timber Company employee who arrived at Camp Redondo from Missouri in 1937, built and lived in an outlying cabin (site BG-19) (**Scurlock 1981**:148, citing Darnell 1979 and Smith 1979).

Interviews with two of the New Mexico Lumber and Timber Company's surviving logging supervisors, Henry Darnell (1979) and Yale Weinstein (1979), showed that employees included "Anglos from Arkansas, Oklahoma, and northeast Texas, Mexican nationals, and local Hispanos" (**Scurlock 1981**:148). While Anglo-American employees presumably received preferential consideration in company housing, the former employees noted, "The Mexicans built their own huts at the main camp or lived in tents near the active tree cutting sites (**Scurlock 1981**:148, citing Darnell 1979 and Weinstein 1979).

During its relatively brief history, Camp Redondo saw significant change in logging technology and organization. During its first year or two, the camp was home to *fellers* (timber cutters), as well as *skidders* (horse and mule team drivers) and *barn dogs* (skidding team supervisors) alike (**Scurlock 1981**:148).

Martin succinctly describes the early logging operations:

> *The easiest, least expensive logging centered on the ponderosa stands. Limitations of equipment and the difficulty of moving logs on steep terrains kept sawyers off steep slopes. The company constructed rough roads through the grasslands that reached the quality [ponderosa] pine stands without requiring extensive engineering plans. Sawyers made their cuts with two-man saws that were most easily used at chest height. Pushing and pulling and using wedges to keep a saw from binding, a team could fell even the largest pines in several hours. (The tall stumps left by the sawyers are distinctive of this era.) Felled trees were skidded—dragged—by teams of horses or by machinery to loading areas. Lacking cranes to lift the logs onto the backs of trucks, the loading areas often were flat landings excavated into hillsides. Even the largest diameter logs could be rolled from the hill onto the flatbed trucks, which sat by the depressions (**Martin 2003**:86–87).*

The introduction of more powerful and efficient logging trucks and caterpillar tractors, however, saw the transformation of the area's logging industry and changes in the demography and social structure of Camp Redondo. The logging trucks and tractors quickly replaced the draft animals. With families replacing single men, Henry Darnell moved to the log schoolhouse (BG-26) as early as 1936 (in **Scurlock 1981**:148, citing Darnell 1979).

The loggers hauled their timber to the Porters' old railway in Guadalupe Canyon until the winter of 1940–1941. When winter storms destroyed the rail bed, trucks began hauling the logs all the way to the Bernalillo mill (**Scurlock 1981**).

Weather permitting, logging and associated work ran nonstop from May to March. "Off-days were whenever the weather was too inclement to work. On these days employees played cards or went to Billy Mann's bar in Jemez Springs" (**Scurlock 1981**:148, citing Weinstein 1979).

Logging had clear-cut Redondo Border and Banco Bonito by the late 1930s. In addition, small, unmarketable trees were often knocked down and left on the ground. Recalling these heady days (while attempting to downplay the fact that his logging operation was returning to the practice of clear-cutting two decades later), Gallagher proudly testified in the 1960s that his loggers left this desolated tract to natural restoration (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A). Nonetheless, the record still visible on the ground reveals Gallagher's testimony that his operations had clear-cut the forests since the beginning. The size of some surviving trees reveals that loggers actually left "a few old giants…to provide a seed source for regeneration" (**Martin 2003:87**, citing Craig Allen, personal communication 2002).

The success of this initial enterprise inspired another flurry of business transactions. Anderson formally transferred all his rights, title, and interest in the Baca Location timber to A. I. Kaplan of New York on December 31, 1936 (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A). Shortly thereafter, Blue Diamond Trading Corporation sold its renewal note and assigned the bond to Calumex Corporation, based in Delaware, on October 14, 1937. Kaplan, who was the largest investor in New Mexico Lumber and Timber Company, in turn assigned all his rights, title, and interest to New Mexico Lumber and Timber Company (T. P. Gallagher, Jr., President) on September 16, 1938 (***Baca Co. v. NM Timber, Inc.* 1967**, Abstract of Title to Timber Interest, box 110A). Redondo Development Company deeded all of its Baca Location No. 1 timber rights to New Mexico Lumber and Timber Company on December 31, 1939. New Mexico Lumber and Timber Company subsequently mortgaged the timber to the Reconstruction Finance Corporation for $182,436.52 at 5 percent interest per year (Deed, December 31, 1939, Redondo Development Company

to New Mexico Timber, Inc., in Abstract of Title of Timber Interest in and to the Baca Location No. 1, ***Baca Co. v. NM Timber, Inc.* 1967**, box 110A; see also chapter 4).

Camp Redondo closed in 1939. Most of the Valles Caldera's logging activity shifted to the northwest part of the Baca Location. Loggers built more roads and several sawmills in the new locale. Small-scale, intermittent logging continued in the Redondo Creek area.

In a corporate reorganization, New Mexico Lumber and Timber Company assigned all of its rights to New Mexico Timber, Inc., on April 30, 1940. T. P. Gallagher, Jr., continued to serve as the enterprise's president (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A). On June 27, 1940, the Reconstruction Finance Corporation recognized the satisfaction of the mortgage and bond dated May 15, 1930. It released the mortgage on the Baca Location timber on January 16, 1942.

New Mexico Timber, Inc., continued intensive, large-scale operations in the Valles Caldera through World War II. Logging sites included Redondo Peak, El Cajete, and the Jaramillo drainage. Gallagher stated that his corporation started cutting spruce at this time because economic conditions favored its marketability (***Baca Co. v. NM Timber, Inc.* 1967**, Answers of New Mexico Timber, Inc., to Interrogatories, October 16, 1964, box 110A).

The Intensification of Timbering

From 1946 through the mid-1960s, New Mexico Timber, Inc., harvested thousands of nursery trees in addition to the great ponderosa pine, spruce, and fir timbers. Gallagher stated that these trees consisted primarily of blue spruce, Engelmann spruce, Douglas fire, white fir, and ponderosa pine transplants. Following State of New Mexico laws regulating the commercial logging industry, the trees felled were 12 inches (30 cm) or larger in diameter. Logging operations often left four of these larger trees per acre (.4 ha) to reseed the cut tracts (**Martin 2003**:88).

Gallagher's timber men also harvested thousands of young white fir, Douglas fir, and spruce trees for sale as Christmas trees in Albuquerque and Santa Fe. In 1961 New Mexico Timber, Inc., ran advertisements in the *Albuquerque Journal* and the *Santa Fe New Mexican* during the month of November to promote the sale of two sizes of Christmas trees—up to 8 feet (2.4 m) tall, and from 8 to 12 feet (2.4–3.7 m) tall. In 1962, the company entered into a contract with the Pueblo of Jémez, which cut and sold Christmas trees as a tribal business enterprise (***Baca Co. v. NM Timber, Inc.* 1967**, Answers of New Mexico Timber, Inc., to Interrogatories, October 16, 1964, box 110A). These enterprises do not appear to have been very successful. By the late 1960s, the Christmas tree business was operated mainly by the Los Alamos Boy Scouts, who cut thousands of trees each Holiday season for sale primarily to residents of Los Alamos (**Los Alamos Monitor 1970**:1).

By 1963, Gallagher's logging operations had cut more than 25,000 acres (10,000 ha) of timber, including 15,000 acres (6,000 ha) of ponderosa pine and 10,000 acres (4,000 ha) of spruce-fir and mixed conifer stands. "The base of the eastern and northern caldera rims, the lowermost slopes of Cerros del Medio, Cerros del Abrigo, and the Cerros de Trasquilar were extensively logged during the later years of this period" (**Martin 2003**:87).

During the four operating seasons from 1960 to 1963 alone, New Mexico Timber, Inc., processed 14,575 thousand board feet of finished spruce lumber. Most of this harvest, 7,915 thousand board feet (54.3%), however, happened in 1963. In addition to the finished spruce lumber, New Mexico Timber, Inc., and Bernalillo Log & Lumber Company cut 115 thousand board feet of pulpwood and sold nursery stock and Christmas trees (***Baca Co. v. NM Timber, Inc.* 1967**, Answers of New Mexico Timber, Inc., to Interrogatories, October 16, 1964, box 110A).

This 3.5-fold increase in logging on the Baca Location was a product of several notable events. The first was a change in regulations governing New Mexico's logging industry. The second was the opening of new markets for previously noncommercial wood resources. The third was a renewed effort by various Federal, State, and local interests to create a new national park that would center on the Valle Grande. The last event was a change in the ownership of the Baca Location.

In 1962 the New Mexico Legislature redefined the legal minimum size limits for tree harvests. Depending on the species, the new laws allowed loggers to begin cutting trees as small as five inches (12.5 cm) in diameter.

This legislative change gave previously unmarketable stands of small trees commercial timber value. For the first time, New Mexico Timber, Inc. could harvest the small-diameter spruce and fir trees growing on the Baca Location's many steep slopes to supply a new pulpwood mill in Snowflake, Arizona, scheduled to open early in 1963 (**Martin 2003:87–88**). At the beginning of the 1963 timber harvest season, New Mexico Timber, Inc., announced that it had signed a contract with the mill's operators "to cut millions of dollars worth of pulpwood…on the Baca Ranch" (**Martin 2003:88–89**).

Along with its pulpwood expansion, New Mexico Timber, Inc., began to seek commercial markets for aspen logs from the Baca Location. Gallagher noted that his company had cut aspen since 1950, but it did so only on an experimental basis (***Baca Co. v. NM Timber, Inc.* 1967**, Answers of New Mexico Timber, Inc., to Interrogatories, October 16, 1964, box 110A). In 1964 the company signed a major contract to begin harvesting the Baca Location's aspen groves.

The movement begun in 1961 to create a "Valle Grande National Park" was one in a series of initiatives dating back to 1888 to place major parts of the Valles Caldera in public ownership and to protect its natural and cultural resources (chapter 4). The National Park Service (NPS), under the watchful eye of area residents concerned about the still-expanding, highly visible damage that logging was inflicting on the scenic landscape of the Valles Caldera, lobbied for the proposal. If approved by Congress, the initiative would have linked the Valle Grande with the Bandelier National Monument under NPS administration and given most of the Baca Location to the Forest Service. Gallagher was adamant in his opposition to the park plan, and said again that his company owned the timber on

the Baca Location and intended to log it all. In a letter to New Mexico Senator Clinton P. Anderson that October, Gallagher stated, "The government would find itself in a rather strange position if they bought only the Valle Grande meadow, and found us later operating portable sawmills, spewing slabs and sawdust across the national park" (**Martin 2003**:77).

James Patrick Dunigan vs. New Mexico Timber Revisited

On January 11, 1963, James Patrick Dunigan of Dunigan Tool and Supply Company, Abilene, Texas, with the backing of a group of investors, bought the Baca Location. Dunigan created a new entity, the Baca Land and Cattle Company, to operate the property, making it clear that he intended to use the tract as a ranch.

Increased timbering greeted Dunigan's acquisition of the Baca Location. His relations with T. P. Gallagher over the next decade were usually antagonistic. Their dispute took place in an economic environment in which "The activities of the livestock business and timber business have become less and less compatible…because of the various attempts of both businesses to eliminate manpower" (Mr. Bigbee, Esq., reading a quote attributed to T. P. Gallagher, Jr., in ***Baca Co. v. NM Timber, Inc.* 1967**, box 100A).

Martin does not believe that Dunigan's purchase of the Baca Location had much to do with the increased volume and expanded focus of Gallagher's logging activity in 1963 (**Martin 2003**:87). Martin correctly points out that the change in the legal definition of harvestable trees was Gallagher's main incentive. Nonetheless, Dunigan's ideas about conservation and the concern of area residents undoubtedly contributed to the intensification of logging operations. Although he held legal timber rights on the Baca Location through 2017, Gallagher had reason to know that public sentiment and government action might soon curtail his operations.

It is clear that Dunigan was interested in long-term conservation and went to great lengths to restore and sustain the property's scenic qualities. He made range improvements and built erosion control features in an effort to address the cumulative effects of three decades of timber cutting. In 1975 he agreed to listing of the Baca Location by the National Park Service as a National Natural Landmark (NNL). Although the property's stated significance was its geological structure, not its scenic beauty, the listing implied the owner's intention to preserve the Baca Location (chapter 4).

Dunigan was also well aware that Federal, State, and local interests were considering the possibility of creating a "Valle Grande National Park" to preserve the tract's environmental values (see chapter 4). While Dunigan's investors proposed various development plans for the Valles Caldera, including a ski resort, a racetrack, and a resort community of home sites and stores, he remained committed to his idea of maintaining the property as a working ranch and sustaining the Valle Grande's beauty (**Martin 2003**:80–82).

In an effort to restrain or to halt logging of the Baca Location, Dunigan sued New Mexico Timber, Inc., in Federal district court on May 12, 1964, to obtain recognition of his successor interest in the 99-year timber lease. Having lost this initial round, he appealed the case to the 10th Circuit Court of Appeals in 1967. In a series of depositions for this case, James Patrick Dunigan, J. B. Harrell, Jr., who was a Dunigan employee, and T. P. Gallagher, Jr., each offered insight into the modified logging practices used by New Mexico Timber, Inc., after Dunigan's purchase of the Baca Location.

After meeting with Gallagher in 1963, Dunigan reported finding that New Mexico Timber, Inc., had just begun cable-logging and clear-cutting of spruce stands in the Burrita area (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A). Rather than cutting trees one at a time, lumbermen working steep slopes covered by small-diameter trees strung a stout cable between closely spaced logging roads. As they dragged the cable, they could quickly—and indiscriminately—knock over all timber standing in their path.

> *Once the trees were stripped from the soil, swampers lopped off the branches. Heavy equipment piled the trucks. A convoy of trucks carried off the valuable logs (**Martin 2003**:90).*

Dunigan stated that from its first chain and boom logging area in 1963, New Mexico Timber, Inc., moved eastward along the ridges bordering the north side of the Burrita. By the time of his testimony in 1969, the chain and boom clear-cut area had expanded to include the areas around "Indian Point and Cerra de Polita" and to reach "Los Posos" and "the back side of Medio" on the hill slopes enclosing the Valle San Antonio and the Valle Toledo (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A; **Los Alamos Monitor 1972**:1). In his deposition a year earlier, Harrell noted that New Mexico Timber, Inc., had clear-cut approximately 8,500 acres (3,440 ha) of forest using the chain and boom method since 1963 (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A).

Dunigan also complained that for the lumbermen to cable-log on steep slopes, New Mexico Timber, Inc., had begun building roads at close intervals of just 200, 300, or 400 feet (61, 91, or 122 m) through timber stands to accommodate equipment and cable. The previous practice, Dunigan asserted, was for loggers to build their access and haul roads at intervals averaging between one-quarter to one-half mile (400–800 m). Some substantial timber stands were being serviced by just one road, while others required closer spacing and converging trails (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A).

In his testimony T. P. Gallagher initially held that topographic factors, not logging methods, dictated his logging road intervals (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A). As we noted earlier, Gallagher testified that his operations had clear-cut the Baca Location's timber stands beginning in 1935. Under direct examination, Gallagher was somewhat evasive as he answered attorneys' questions about his logging practices after 1963. Under continued questioning Gallagher admitted that his timbering since Dunigan bought the ranch was "somewhat different than it was prior to 1960," including the introduction of chain and boom "operations…on the north

side of the Baca location" (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A) around 1961. Gallagher also acknowledged that the crane operation required the construction of roads at closer intervals than had logging conducted without this equipment in previous decades.

Along with clear-cutting and logging road construction, the issue of slash and other logging debris was a focal point of the dispute between Dunigan and Gallagher. Chain and boom logging:

> *. . . left behind three- to six-feet [.9–1.8 m] high piles of jumbled limbs, brush, and debris…[that] were formidable barriers to livestock and wildlife. The slash piles and remaining snags increased the fire danger in the area to unacceptable levels (**Martin 2003:90**).*

In his 1968 deposition before the 10th Circuit Court of Appeals, Dunigan described how this issue proved divisive from the start of his relationship with Gallagher. His comments also reflect the fact that New Mexico Timber, Inc., held an exclusive lease on the property's forests, including rights to all timber, trees, and wood, for another 50 years.

> *On the matter of slash and debris, Mr. Gallagher said that at this point I was starting to get into his pocket, any time we talked about spending over three or four hundred dollars in a given season, and that he was totally unwilling to consider any form of slash disposal and/or erosion control beyond spending the limited amount of money on thank-you-ma'ams [erosion control road berms], and following that statement he reminded me of the fact that he owned all the timber, trees, and wood on the grant and that he also owned anything that poked its head up out of the ground until midnight of the last day of his timber reservation in the year 2017 and that—that is the way it was and there wasn't anything that anybody could do about it (James Patrick Dunigan, in **Baca Co. v. NM Timber, Inc. 1967**, box 110A).*

Dunigan complained bitterly that chain and boom clear-cut areas were useless for ranching. He testified that because downed slash, severed treetops, and old fallen logs completely covered the ground, the newly logged tracts were inaccessible to livestock (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A).

In a 1970 interview, Sam Bailey, who served as New Mexico Timber, Inc.'s forester, succinctly summarized the logging company's view. Bailey acknowledged that New Mexico Timber, Inc., had harvested the majority of the Baca Location's original 68,000 wooded acres (27,200 ha) since 1935. He maintained, however, that only half of the harvested acreage had "been subjected to the present 'clear cutting' techniques" (**Los Alamos Monitor 1970**:1). Bailey said that the rest of this acreage, most of which had been harvested before 1963, had been selectively logged of large, thick-stemmed trees only.

Bailey defended his company, saying that clear-cutting was the most common method of harvesting spruce and fir in New Mexico, and that cable logging caused much less damage to young trees (i.e., those under 5 inches [12.5 cm] in diameter). Nevertheless, Bailey acknowledged:

> *That a freshly clear cut area looks pretty bad, but he claimed that time, even a few years, quickly heals the scars…He said that the slash, which is obviously ugly in the newly logged regions, is soon covered by secondary growth if it is left alone. He said that an attempt to gather and haul off the limbs and tops would be wholly impractical. "There just aren't enough trucks." Burning the slash, Bailey noted, would simply kill the secondary growth (**Los Alamos Monitor 1970**:1).*

Lastly, Bailey stated that, with the Court of Appeal's decision still pending, New Mexico Timber, Inc., was not about to invest in the new equipment needed to replace the contested cable-logging and clear-cutting technique.

Faced with mounting damage and the onset of erosion that accompanied the blading of logging roads, Dunigan implemented range restoration programs that New Mexico Timber, Inc., had refused to undertake. Although New Mexico Timber repeatedly told Dunigan that he had no right to do so, Dunigan had his employees close and reclaim skid trails and logging roads in clear-cut tracts, using a bulldozer to push slash and abandoned down timber into eroded gullies (James Patrick Dunigan, in ***Baca Co. v. NM Timber, Inc.* 1967**, box 110A). Dunigan also testified that some of his earthen tanks served a dual purpose, to capture and hold water for livestock and to control erosion caused by logging roads and a few other areas of natural disturbance. He also collaborated with the U.S. Soil Conservation Service and the Texas Technological College to develop cool-season grasses that might be used to reseed logging road scars.

The uncertainty of the still-pending court case was one issue. Another was the growing public protest against logging operations in the Valles Caldera. The Los Alamos Monitor reported that the State of New Mexico had begun considering

> *. . . a new set of regulations, apparently aimed at logging, on the Baca. These regulations would cause drastic changes in the handling of slash and formalize a requirement for seeding and water barring roads (**Los Alamos Monitor 1970**:1).*

These developments convinced Gallagher that New Mexico Timber, Inc., would not be allowed to continue cable-logging and clear-cutting on the Baca Location for another 47 years. To take full advantage of its timber rights, using the most profitable methods then allowed, New Mexico Timber, Inc., began "cutting trees on the property at a ferocious rate, 24 million board feet of lumber per year" (**Los Alamos Monitor** 1970:1). Achieving these production levels on the Baca Location, required the company to employ 175 men and operate 2 mills in 1970. The number of employees rose to 300 over the next 2 years (**Los Alamos Monitor 1970**:1, **1972**:1).

Logging moved into the Valle Grande in 1971 (**Los Alamos Monitor 1972**:1). Road scars and clear-cut areas were now visible to anyone traveling State Road 4. Area residents grew

angrier. In 1970, the Los Alamos Monitor reported that within 7 years,

> *Virtually every tree on the ranch that can be sawed into two by fours will have been cut down. And it will take nature 40 to 50 years to restore in main the appearance of the ranch (***Los Alamos Monitor 970***:1).*

The Monitor reported even more alarming news to environmentalists and others who hoped that they would some day enjoy public access to the Baca Location. In a sidebar accompanying its main article, the newspaper noted that the harvesting of the Baca Location's timber could be completed "within three years by going to two or three shifts a day at New Mexico Timber's mills" (**Los Alamos Monitor 1970**:1).

By 1971, less than 10 years since it had begun intensifying its cutting of the larger pine trees—using chain and boom logging on steep slopes to harvest smaller diameter trees for pulpwood products, and working aspen groves—New Mexico Timber, Inc., had graded over 1,000 miles of interlocked, maze-like roads. Although the hill slopes enclosing the Valle Toledo were the major area of impact, chain and boom logging also occurred on the north side of Cerro Redondo (**Martin 2003**:93). By a historical irony, logging came back to its point of beginning: one of the last areas to be clear-cut on the Baca Location was reached from a work camp at the headwaters of Redondo Creek. Camp Redondo located near the mouth of the creek had served as the base of operations for some of New Mexico Lumber and Timber Company's earliest logging operations on Redondo Border and Banco Bonito.

Dunigan eventually won several relatively minor restraints on logging, as well as limited damages, through the appeals process (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A; see also chapter 4). In March 1971 the 10th Circuit Court of Appeals upheld U.S. District Judge H. Vearle Payne's June 5, 1969, finding that New Mexico Timber, Inc., should lay slash in ways that would not hinder the movement of livestock and wildlife, cut down dead and living trees that were likely to blow over, and build water bars on abandoned roads to reduce their erosion. This decision, however, did not question the company's right to continue clear-cutting on the Baca Location (***Baca Co. v. NM Timber, Inc.* 1967**, Abstract of Title to Timber Interest, box 110A; see also chapter 4).

The Court of Appeals also upheld Judge Payne's award of $202,278.30 in compensatory damages and interest to Dunigan's Baca Land and Cattle Company. This judgment, however, covered only the 5,000 acres (2,000 ha) that New Mexico Timber, Inc., had logged between the time that Dunigan had begun his suit in 1964 and the date of Judge Payne's finding. If the judgment had covered the entire area logged since 1935, "then Dunigan might have been awarded $2.6 million" (**Los Alamos Monitor 1970**:1).

Just as in Judge Payne's court, Dunigan was denied the third count of his suit. This argument sought to limit New Mexico Timber, Inc.'s, harvest of trees to those that were mature in 1918, the time at which Redondo Development Company separated the Baca Location's timber rights from the land when selling the property to the Bond brothers (***Baca Co. v. NM Timber, Inc.* 1967**, box 110A; see also chapter 4). The message was decisive: clear-cutting, albeit with a few new restrictions governing the disposition of slash and the treatment of logging roads, would continue on the Baca Location.

Dunigan was not satisfied with the Court of Appeals decision. He directed his attorneys to file suits for damages covering the entire area logged by New Mexico Timber, Inc., since 1935. Dunigan and Gallagher wearily prepared to renew their 8-year court battle. They also began negotiations for the sale of the timber rights. The Baca Land and Cattle Company bought the Baca Location timber rights from New Mexico Timber, Inc., on July 1, 1972, for $1,250,000, just 2 days before the parties were scheduled to return to court (**Martin 2003**:93).

In a joint statement announcing the sale of the timber rights and the cessation of logging, Dunigan and Gallagher stated, "The transaction settles all litigation between the parties" (**Los Alamos Monitor 1972**:1). A representative for New Mexico Timber, Inc., added that half of the company's 300 employees might be laid off, although some crews would be kept active "hauling already cut logs from the area, reseeding the logging roads and cleaning up the slash" (**Los Alamos Monitor 1972**:1).

Dunigan's purchase of the Baca Location's timber rights did not mean the end of all logging. When cutting resumed under his stewardship, however, operations were limited to the salvage of vigas on Redondo and Redondito Peaks.

The Persistence of the Timbering Tradition

In 2001, the Valles Caldera National Preserve issued permits to haul timber on South Mountain, as well as to obliterate and rehabilitate 4.9 miles (7.8 km) of old logging roads on a 100.1-acre (40.5-ha) tract. This work was allowed to complete a timber project that was in progress when the Federal Government bought the ranch.

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Chapter 8.

Industrial Mineral Extraction and Geothermal Exploration

Thomas Merlan

Introduction

The Valles Caldera is the result of the youngest major volcanic episode in the creation of the central Jémez volcanic field. This geological feature is a diverse suite of basaltic through rhyolitic rocks, which erupted from some time less than 13 million years ago to no later than .13 million years ago. It represents some of the greatest volcanic activity documented in the earth's history.

The vast heat content and the high subsurface temperatures associated with shallow, crystallizing magma cause convection of hot groundwaters in overlying rocks. These hot convecting waters usually form surface hot springs and fumaroles. At the Valles Caldera, a hydrothermal system at temperatures of 428 to 572 ºF (220 to 300 ºC) exists at depths of 1,968 to 8,200 feet (600 to 2,500 m) in caldera-fill ignimbrites and pre-caldera andesites (**Dondanville 1971**). Acid-sulfate springs, mud pots, and fumaroles at Sulphur Springs issue from the west side of the central resurgent dome of the Valles Caldera. Hot waters leach soluble constituents from fresh volcanic rocks and from older rocks. As temperature, pressure, and chemical environment change, hydrothermal minerals are deposited in favorable structures and horizons within the hydrothermal system. Many of the world's precious and base metal ores are mined from the eroded remnants of ancient calderas. Early Jémez volcanic rocks in the Cochití Mining District south of the caldera contain gold deposits that were mined at the beginning of the twentieth century.

Two reservoirs have been drilled in the Valles hydrothermal system: the Redondo Creek and the Sulphur Springs reservoirs (**Goff et al. 1988**). The deep reservoir fluids are neutral-chloride; they contain about 16 to 58 ounces per ton (500–1,800 mg/kg) total dissolved solids (TDS) (**Goff et al. 1988**). About 16 miles (10 km) from the Valles Caldera, two sets of neutral-chloride hot springs discharge along the pre-caldera Jémez fault zone at Soda Dam and Jémez Springs. These springs have strong chemical similarities to the deep fluids within the caldera. The conclusion generally drawn from this is that a hydrothermal outflow plume travels out of the caldera in the subsurface along the Jémez fault zone and within adjacent sedimentary rocks toward the springs (**Goff et al. 1988**:6041).

The silver and gold deposits of the formation were exploited, with modest success, about a century ago. The hydrothermal resources of the caldera have been the focus of more recent development.

Historical Overview

Fray Gerónimo de Zárate Salmerón served as the resident missionary at the Jémez Pueblo of Giusewa, between 1618 and 1626. He subsequently prepared a report of his observations in or after 1629. Salmerón emphasizes the mineral wealth of New Mexico and states that he filed on many mineral locations in the Jémez Mountains (**Ayer 1916**:217). None of these filings, however, led to any known mining in the region.

John Wesley Powell first described rocks of the Jémez Mountains region during reconnaissance work performed in the 1880s (**Powell 1961 [1885]**). The region was known at the time as the Tewan Plateau. Powell recognized it as an extensive volcanic field that had erupted many types of volcanic rocks including voluminous deposits of ash. **J. P. Iddings** (**1890**) presented petrographic and chemical data for some of Powell's samples, including Bandelier Tuff and some quartz-bearing basalts.

About 1881 Miguel Antonio Otero and his nephew, Maríano Sabine Otero, jointly acquired the Jémez Springs. Maríano also pursued development of Sulphur Springs as a second commercial resort. Maríano became "excited about the possibilities of mining sulfur, an idea that he probably borrowed from John W. Walton, a miner who had staked out a claim along the Baca Location's western boundary in 1865" (**Martin 2003**:42). In 1898 Maríano filed a mineral claim for a 19-acre (7.6 ha) parcel next to Walton's tract. According to the 1876 U.S. Government survey, the Sulphur Springs were just outside the west boundary of the Baca Location No. 1 (Baca Location) (**Sawyer and McBroom 1876**). The resurvey of 1911, however, determined that the Sulphur Springs were inside the tract.

The Oteros formed a development company to operate the Jémez Springs resort, with Miguel Otero as president, and Maríano Otero and various officials of the Atchison, Topeka and Santa Fe Railroad serving on the company's board of directors (chapter 3). They began building new bathhouses, a hotel, and other improvements, while the railroad surveyed and graded a branch that would bring tourists from Bernalillo to Jémez Springs. The hotel and bathhouses at Jémez Springs were completed in 1882. The death of Miguel Antonio Otero later that year stopped the development of a spur railroad, but visitors continued to reach the resort by stage. Plans to make Jémez Springs into a major resort were dropped (**Otero 1935**:237–238, 241–277).

Although he gave up the plans that he had shared with his uncle to enlarge the Jémez Springs resort, Maríano did not quit his resort and mineral interests upstream. He established a 10-acre (4 ha) resort at Sulphur Springs in 1901 (**Scurlock 1981**:153). He first built bathhouses over the largest springs. Building through 1902, Maríano added a hotel for the steady stream of visitors who traveled from Jémez Springs to the Sulphurs (**Martin 2003**:44).

In 1900 Otero established an experimental plant for refining sulfur at Sulphur Springs. Pleased with the trial run, Maríano began planning to expand his mining and milling works to achieve production levels of up to 15 tons (1,361 kg) of refined sulphur per day. To get new equipment to the site, Otero began negotiations with influential Santa Feans in June 1902 to improve transportation over the Jemez Mountains between his Sulphur Springs operations and Santa Fe (**Martin 2003**:42–43). He claimed that the capital investment to rebuild the old military road through the Cañon de Valle Pass and several other unimproved trails would benefit both Jemez Spring and Santa Fe. The Territorial government was not interested. Maríano made a deal with entrepreneurs in Santa Fe; he would fund construction of 13 miles (20.8 km) of road himself, and they would pay for the remaining 2 miles (3.2 km) of the project (**Martin 2003**:43).

Otero miscalculated the quantity and availability of the sulphur at his mine. Through 1903, sulphur was abundant near the surface. By 1904, however, the mining operations had exhausted the surface resource and Otero needed to begin tunneling. Poisonous hydrogen sulfide gas rapidly built up in the mineshaft (**Martin 2003**:44–45), and to make matters worse, prevailing sulfur prices dropped so low that the venture was no longer profitable (**Boyd 1938**:14–14, 35–39). G. R. Mansfield notes, "Old sulphur mill at Sulphur Springs hills built 1902. From 1902–1904, 200,000 lbs. [90,718 kg] of sulphur were produced here. Same locality as No. 426" (**U.S. Geological Survey 1918–1925**, G. R. Mansfield, #428). Maríano Otero died in a buggy accident near Jémez Springs in 1904. G. R. Mansfield photographed the resort in April 1918 (**U.S. Geological Survey 1918–1925)**; a fire destroyed the buildings, probably in the 1970s. In 1983, Goff and Bolivar mention the destruction of the Sulphur Springs resort by fire as having occurred "several years ago" (**Goff and Bolivar 1983**:32).

Gold and silver were discovered about 5 miles (8 km) south of the Baca Location in 1889. Development of major mines and the founding of the boomtowns of Albemarle, Allerton, and Bland followed circa 1894. The demand for lumber led to the establishment of several sawmills (**Scurlock 1981**:140; see also chapter 6).

Gold claims were first staked in the Cochití Mining District in the southeast Jémez Mountains in 1893. The 2 largest mines, Lone Star and Albemarle, produced ore from quartz veins in altered volcanic rocks from about 1897 to 1903 and from 1914 to 1916 (**Lindgren et al. 1910**). About 185,000 tons (167,829 metric tons) of ore grading about 0.2 ounce per ton (6 mg/kg) gold and 4 ounces per ton (124 mg/kg) silver have been mined from the district, "but only recently [i.e., the late 1980s] have workers realized that the deposit was formed in an earlier hydrothermal system of the Jémez Mountains volcanic field" (**Goff and Gardner 1988**:5997).

C. S. Ross of the U.S. Geological Survey first began surveys in the Jémez Mountains in the 1920s (**Ross 1931, 1938**; see also **Goff and Gardner 1988**:5997). Ross returned to the area in the mid-1940s to continue geologic mapping and volcanic studies with R. L. Smith, and again in 1954 with R. A. Bailey (**Goff and Gardner 1988**:5997). These investigations resulted in a series of papers on ash flow tuffs, eruption mechanisms, ring dikes, resurgent cauldrons, and ash flow magmatism (**Ross and Smith 1960**; **Smith 1979**; **Smith and Bailey 1966, 1968**).

The first geothermal well drilled in the Valles Caldera in 1960 was not meant to be such: it was an oil test well on the west flank of the resurgent dome. The Westates–Bond 1 well struck superheated water about 392 ºF (200 ºC) at shallow depths, but found no oil (**Dondanville 1971**). Three more wells followed in the 1960s in the same general area.

Union Oil Company of California drilled a well (Baca 4) in the resurgent dome in 1970. In July 1978 the U.S. Department of Energy (DOE), Union Oil Company of California (Unocal), and the Public Service Company of New Mexico (PSCNM) began a jointly sponsored cooperative geothermal demonstration project. The project drilled 20 more wells over the next 4 years. When this project ended by mutual agreement in January 1982, Unocal's predictions concerning the resource (up to 400 Mwe of electrical capacity) had not been met. To the partnership's disappointment, only 20 Mwe had been proven. Only 2 of the 13 exploratory wells drilled by Unocal were successful. Although all the wells yield superheated water, most were not sufficiently permeable to be considered production wells (**Goff 2002**:9). Because the DOE provided funding to the project, its results are available to the public and represent "one of the most extensive, publicly available data bases of any drilled caldera system in the world" (**Goff and Gardner 1988:5997**).

In all, about 40 deep exploration and research wells, including those described above, were drilled in the Valles Caldera in the Redondo Creek and Sulphur Springs reservoir during the period between 1959 and 1983, defining a small, but hot (572 ºF [300 ºC]), neutral-chloride, liquid-dominated geothermal system (**Goff and Janik 2002**:300; **Goff et al. 1988**). "The system proved to be too small in volume for economic development" (**Goff and Janik 2002**:301).

The Fenton Hill Hot Dry Rock demonstration project, designed and built by Los Alamos National Laboratory, followed in the 1980s (**Goff and Bolivar 1983**:39). The first hot dry rock (HDR) geothermal experiments were performed on the west margin of the Valles Caldera (**Goff and Janik 2002**:300). Four deep wells were drilled to depths as great as 7.2 miles (11.6 km) to determine whether electricity could be generated commercially from a man-made reservoir. High development costs and continuing low prices for fossil fuels finally ended this project in 1998 (**Goff and Janik 2002**:300]).

"The HDR concept was developed and tested in Precambrian crystalline rocks beneath the west margin of the

caldera from 1972 to 1998" (**Goff and Janik 2002**:304). Cold water was pumped down an injection well, forced through artificially fractured reservoir rocks, and extracted from a nearby production well. The cold water dissolved minerals lining the fractured rocks and absorbed CO_2 and other gases while reaching thermal equilibrium ($T \geq 320$ °F [160 °C]). Depth of circulation was greater than 8,200 feet (2.5 km) (**Goff and Janik 2002**:304–305).

The geothermal and HDR experiments were followed in the 1980s by a broad array of investigations of processes in magmatism, hydrothermal systems, and ore deposit mechanisms. The DOE's Office of Basic Energy Sciences sponsored investigations, designated as part of the Continental Scientific Drilling Program, that led to papers describing the hydrothermal system; the collapse, resurgence and location of calderas, the evolution of volcanism and tectonics, and the geophysical structure of the caldera. (**Goff and Gardner 1988**:5997-5998). The first corehole was drilled in August 1984, and a workshop followed that October to organize a scientific drilling program. A second corehole was drilled in September 1986, and a third in 1988 (**Goff and Gardner 1988**:5998).

The demonstration project led to legal challenges by the All Indian Pueblo Council and the State of New Mexico, which contended that the project would deplete or dry up the water flow from the hot springs and aquifers in San Diego Canyon. This issue was never resolved in court because the project ended. Goff concludes, however, that this view is correct—a hydrothermal outflow plume from the Valles reservoir feeds the hot springs in San Diego Canyon (**Goff et al. 1988**; **Goff 2002**:10).

The exploitation of the mineral resources of the Valles Caldera for profit both precedes and follows scientific and theoretical studies. Nonetheless, after many years of work and considerable expense, only 20 Mwe of geothermal reservoir capacity have been proven in the Valles Caldera. Estimates of undeveloped capacity range as high as 1,000 Mwe but remain unsubstantiated. The shallow heat within the Valles rocks is vast, but extraction of large quantities of hot fluids from these rocks has proven difficult (**Goff 2002**:10).

Mining of precious metals in the early twentieth century met with modest results and was abandoned. Geothermal exploration with a view to commercial development has shown small capacity. It appears fair to conclude that the acquisition of the Valles Caldera by the Federal Government in the year 2000 as a permanent public resource and park is a mature judgment of the resources and best use of the lands.

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CHAPTER 9.

The Valles Caldera National Preserve as a Multi-Layered Ethnographic Landscape

Kurt F. Anschuetz

Introduction

The land use history of the Valles Caldera National Preserve (VCNP), as represented in the documentary record maintained in various archives and libraries, focuses primarily on the Hispanic and Anglo-American occupation of the locale subsequent to 1860. In an act of June 21, 1860, the U.S. Congress authorized the Baca Land Grant heirs to choose as many as five square tracts of "vacant land" (i.e., places where there was neither permanent residence nor formally claimed ownership) to replace the 496,447-acre (200,901-ha) grant to which they had agreed to extinguish their rights in favor of the town of Las Vegas (**U.S. Congress, House 1860; U.S. Public Law 167 1860**). Luis María Cabeza de Baca's heirs selected 5 substitute tracts, each measuring 99,289 acres (40,180 ha). Each tract appears as a distinctive square on land grant maps. The first of their selections encompassed the Valle Grande, Valle San Antonio, Valle Santa Rosa, and Redondo Creek (chapter 4).

This sequence of legislative actions changed the Valles Caldera from an unspecified tract of "vacant land" to a legally defined entity known today as the Baca Location No. 1 (Baca Location). With the conveyance of formal rights to Luis María Cabeza de Baca's heirs as the tract's lawful owners, executive, legislative, and judicial authorities immediately viewed the Baca Location as consisting of occupied land, even though for decades the property would not support sustained year-round habitation. Moreover, the land and its individual resources, including pasturage, timber, minerals, and game animals, gained formal status (through the issuance of legal title to the land grant) as properties over which the land grant's authorized owners alone controlled rights to access, use, and disposition.

The legal definition of the Baca Location as a land grant whose owners held exclusive property rights has had significant and lasting consequences. The first consequence concerns access and use rights. Specifically, it was no longer legal (as in earlier decades; chapter 5), for entrepreneurs such as trappers or hay cutters, to enter the Baca Location without consideration. Also, as is illustrated throughout the discussions of subsistence plant gathering, hunting, mineral collecting, and agricultural practices (chapter 5) and ranching (chapter 6) after 1860, it is clear that the Baca Location's owners have variously exercised their rights to permit, deny, or tolerate these activities by others.

The second consequence was that the land grant's owners possessed the right to sever particular access and use rights from the land. The legislative actions of the U.S. Congress rendered obsolete the traditional aboriginal view that the Valles Caldera was a place imbued with certain inseparable qualities whereby resources, including the land, water, plants, animals, and minerals, obtained meaning in relationship to one another (see below). The definition of the Baca Location, built upon the Western idea that the land and its resources were discrete, quantifiable commodities, occurred just as the United States was incorporating the Territory of New Mexico into its national economy and society. By the late nineteenth century, new business opportunities, created by a combination of local growth and increased access to major markets in the Midwest and East, were on the horizon. Many of New Mexico's natural resources became more attractive although historically they had been of little commercial value because of the lack of demand and the inaccessibility of their locations, including those in the Valles Caldera area. Commodity trading increased in existing markets and was fueled by speculation on future market conditions. During the second decade of the twentieth century, the Redondo Development Company, then the owner of the Baca Location, severed the timber and mineral rights from the ranch land (chapters 4, 6, 7, and 8).

The land use history of the Baca Location between 1860 and 2000 saw the owners of the land grant's various rights enter into contracts whereby one or more rights to the land and its other resources were recognized, leased, mortgaged, sold, and bitterly contested in court. With a few notable exceptions, these actions offered the promise of benefit only for the individuals who already possessed a sanctioned interest in the land grant. For example, chapter 4 provides discussion of the history of the partition suit brought by Joel Parker Whitney against Maríano Sabine Otero and others (***Whitney v. Otero* 1893**). chapter 7 similarly reviews the contest between James Patrick Dunigan and T. P. Gallagher, Jr., over the Baca Location's timber rights (***Baca Co. v. NM Timber, Inc.*, 1967**, box 110A).

The emphasis on rights and benefits for individuals following the legal designation of the Baca Location in 1860 represents a transformation in ideas about the occupation

and use of this land. For countless generations, the region's aboriginal populations had recognized that the Valles Caldera constituted common lands that offered benefits to multiple communities. While it is conceivable that various groups might have claimed preferential use rights to particular resources at certain times, there were no economic, social, or political institutions that sanctioned assertions of outright ownership of the land until the U.S. Congress allowed Luis María Cabeza de Baca's heirs to claim alternate grant lands in compensation for the extinguishment of all rights to their contested Las Vegas property.

The legal determination by the U.S. Congress in 1860 that the Valles Caldera was "vacant land" overlooked traditions of land use and occupation dating back to the beginning of human history in the region (chapter 2). As discussed in chapters 2 and 5, Native American populations have visited the VCNP for innumerable centuries. Since about the seventeenth century, aboriginal people have been joined by Hispanics who settled the river valleys surrounding the Jémez Mountains. Together, Native Americans and Hispanics cut wood for shelters and fuel, gathered native plants for food and medicine, hunted game animals, harvested birds for food and feathers, and collected various other resources, such as obsidian, clay, and stone slabs for making *piki* (paper bread) griddles. Some groups even practiced agriculture in and around the high altitude Valles Caldera during times of drought, for example, during late pre-Columbian times and again in the eighteenth century.

As documented through archaeology, history, ethnohistory, and ethnography, these many pursuits were undertaken on a relatively small scale and entailed only brief stays between the early spring and late fall. Although the few existing documentary records emphasize the economic aspects of these activities, among Native American and Hispanic populations alike, these doings frequently had important social and ritual purposes as well. While chapter 5 focuses discussion mainly on subsistence, the present essay provides a framework for a fuller understanding of the social and ideational contexts underlying the traditional land use activities in the VCNP that predominated before 1860, but persisted afterward in obscurity.

The thesis of this chapter is that Valles Caldera represents a multi-layered ethnographic landscape with which people of culturally diverse communities—Native American, Hispanic, and Anglo-American—maintain meaningful relationships for their own purposes as part of a dynamic cultural process. This thesis, in part, derives from the discussion of the landscape approach presented in appendix II. In this supplementary essay, I argue that landscape goes beyond a simple emphasis on the built environment and considers the cultural-historical traditions through which traditional, land-based people have occupied and modified their community lands in their own terms, both materially and ideationally. As the renowned geographer **Carl O. Sauer** (**1925**:46) notes, "The cultural landscape is fashioned from a natural landscape by a culture group. Culture is the agent, the natural area is the medium, the cultural landscape is the result." Building on Sauer's foundations, I add that landscapes are a potent mechanism with which communities record the memory of their culture and history (appendix II).

This chapter's thesis also derives from the examination of how landscapes represent dynamic cultural process presented in appendix III. This appendix considers how the people construct and sustain continuity in their landscape affiliations despite substantive changes in their natural, economic, social, and political environments and explores the role that community traditions play in shaping this course of action. As recognized by archaeologist **Stewart Peckham** (**1990**:2), traditions generally relate to people's valued understandings of "how they became who they are." For our present purposes, I hasten to add that traditions unify how a community creates and occupies its landscapes across the dimensions of space and time (appendix III, after **Anschuetz 1998b**:47).

Distinguishing Land Use Traditions: Landscapes as Memory and Landscapes of Memory

All humans remember and celebrate cultural-historical memories through the traditions sustained by their cultural communities. As I observe in appendix II, every community imbues its landscape with intrinsic meaning based on its cultural patterns of perception and interpretation (after **Anschuetz 1998b**:44–58). These perceptions include not only the community understandings of its physical environment and resources, but time and how people interact with their cultural-historical memories to create and sustain their traditions (e.g., see **Ortiz 1991**). Other customs, including many of the vernacular (*qua* common, indigeneous) land use activities pursued by Native American and Hispanic groups within the Valles Caldera (chapter 5), may simultaneously be informed by, and serve to establish, the veracity of oral traditions. For this reason, it is useful to examine the substantive differences in the ways in which Anglo-American and traditional Native American and Hispanic land-based communities generally organize and interact with their cultural-historical memories in constructing their landscapes (following **Ferguson 2002**:4.5–4.7).

Landscape is a cultural process entailing interaction between relatively static representations of geographical space and dynamic cultural and social factors that underlie the construction of these representations (after Ingold 1993:738; see also appendix III). Landscapes, therefore, are more than the built environment (Tallbull and Deaver 1997) or a cultural resources site (Cleere 1995). **T. J. Ferguson** (**2002**:4.5–4.6) explains further, "Landscapes have complexity and power because they are created by people through experience and engagement with the world." Barbara Bender (1993:2) adds, "Landscape has to be contextualised. The ways in which people—anywhere, everywhere—understand and engage with their worlds depend on the specific time and place and historical conditions." Lastly, **Keith H. Basso** (**1996**:7) observes that landscapes are "a venerable means of *doing* human history…a way of constructing social traditions and,

in the process, personal and social identities." Examinations of how cultural communities construct their landscapes, therefore, should focus on what landscapes do in service of the group rather than what they are or what they mean (**Ferguson 2002**:4.6; Mitchell 1994:1; Whittlesey 1997:20; see also appendix II).

Since the arrival of the Spanish in the region more than 400 years ago, the dominant uses (i.e., activities that were the most visible and had the greatest material or legal impact) of the Valles Caldera and the documentary history of these uses have both complied with, and been informed by, a Western view of landscapes. From a Western perspective, "land is part of a historical process that produces enduring images, place names, and events. Land use and the people using the land change through time" (**Ferguson 2002**:4.5).

To use the terminology proposed by anthropologist Susanne Küchler (1993), Western cultural traditions construct understandings of *landscapes of memory*. Operating within this world view, Anglo-American communities characteristically view history and landscapes in terms of enduring images inscribed on the land. By virtue of having history materially etched into their surfaces, landscapes:

> *. . . can be measured, described, and depicted. Defined in terms of landmarks of ecological, historical, or personal validity, landscape is a widely shared and accessible means to transmit cultural knowledge regarding the past and future (Küchler 1993:85).*

Through graphic representations, such as the map that cartographer **Bernardo Miera y Pacheco** (**1779**) made of the Valle de los Bacas (Valley of the Cows) in the late eighteenth century, and the many written accounts (including the present volume) documenting the land use history of the Valles Caldera, the idea of the landscape's inscribed surface is rendered in material forms that are characteristically replete with inferred, interpreted, or assigned meanings and values. As such, these representations of landscapes of memory validate—and reify—the personal, social, and political remembrances that the dominant Euro-American community chooses to honor and perpetuate (after **Ferguson 2002**:4.5). Moreover, this world view tends to cast history as a series of completed events that people can learn from—and build upon—so as not to repeat the mistakes of those generations that preceded us (after Santayana 1905:284; see also Anschuetz 2000:2, 2004:11).

Many land-based cultural communities that do not ascribe to a Western world view, in comparison, construct and occupy *landscapes as memory* (Küchler 1993). In these landscapes, activities that occur, places where these actions are undertaken, and names that are assigned to recall the significance and meaning of these places are "integrated in a process that acts to freeze time; that makes the past a referent for the present. The present is not so much produced by the past but reproduces itself in the form of the past" (Morphy 1993:239–240). According to Ferguson, in both their conceptualization and occupation, landscapes as memory:

> *. . . are a template in the processes by which traditions are constructed and transmitted. Rather than validating pre-existing memories by inscription, non-European cultural landscapes form an essential part of the memories themselves. They do not represent memory; they are memory. In this view, the land is as important as the human activities that occurred on and marked the land in the past (**Ferguson 2002**:4.5).*

Landscapes as memory are "maps in the mind" (**Basso 1996**:43). They are also much more. Writing about Native American landscapes as memory, **Ferguson** (**2002:4.6**) observes that "landscapes often are conceptualized in a verbal discourse that has moral dimensions. Place names and stories associated with landscapes serve as metaphors that influence how the members of a society view themselves." Young (1987:4–9, cited in **Ferguson 2002:4.6**) adds that points on the land evoke the image of places, the emotions and moral values associated with them, and the stories that they embody. Moreover, natural features, places, and landscapes possess the power to symbolize and recall the ancient past, thereby projecting the past into the contemporary, human world. Places and landscapes evoke stories of the people from the beginning of their history by evoking the emotions associated with these rememberances (**Ferguson 2002:4.6**).

In communities that construct landscapes as memory, the people adopt a view of history that is not cast exclusively in a past that is never again to be repeated. The members of these communities live their history not only to learn from it but *also to repeat it* (Anschuetz 2000:2).

Building Blocks of Land Use Traditions in Constructing Landscapes as Memory

(adapted from Anschuetz 2001:2.13–2.35, 2002a:3.3–3.15)

The interrelated themes of breath, center, emergence, movement, and connectedness generally are shared among the Southwest's many Native American groups (e.g., see **Anschuetz 2002a**,**b**; **Ferguson 2002; Kelley and Francis 2002**) and important in developing an understanding of the continuing relationships that indigenous communities maintain with their traditional homelands. Moreover, northern New Mexico's traditional Hispanic communities possess a system of cultural values and beliefs that generally corresponds to the understanding of landscape that forms the structure of Native American world views and is based on spiritual ecology (after **Cajete** 1993–1994, **1994**, **1999**).

The undertaking of these themes is relevant to this study of the Valles Caldera's land use history because these themes are axiomatic to the way the people construct and sustain coherent senses of place and time within these landscapes today despite the ever-changing conditions that characterize their worlds. In part, this examination is useful for comprehending

the cultural logic that underlies how land-based communities construct landscapes as memory. In addition, the framework developed for this task will be useful for understanding aspects of the important cultural relationships that various chroniclers, historians, and anthropologists have observed in their accounts concerning the land use practices among the traditional communities that maintain associations with the VCNP.

Breath

In writing about the theme of breath, Gregory Cajete, a Santa Clara Pueblo resident and educator, observes:

> *American Indians believe it is the breath that represents the most tangible expression of the spirit in all living things. Language is an expression of the spirit because it contains the power to move people and to express human thought and feeling. It is also the breath, along with water and thought, that connects all living things in direct relationship. The interrelationship of water, thought (wind), and breath personifies the elemental relationship emanating from "that place that the Indians talk about," that place in the Center where all things are created (**Cajete 1994**:42).*

Elsewhere in his volume, *Look to the Mountain: An Ecology of Indigenous Education*, **Cajete** (**1994**:43) expands on the idea of breath in essential relationship to language, learning, and senses of place through reference to the poem, *That's the Place Indians Talk About,* written by the Acoma poet, **Simon J. Ortiz** (**1992**:321–324). Ortiz's verse examines the spiritual connections that Native Americans have with special places in their lives and on their landscapes.

> *By talking about those special places, they connected their spirit to them through their words, thoughts, and feelings. I remember thinking about how beautifully simple, yet how profound, this metaphor was. It illustrates the special quality and power the spirit has to orient us through the breath of its manifestations in language, song, prayer, and thought (**Cajete 1994**:43).*

Cajete (**1994**:43) elaborates, "Breath—consciously formed and activated through language, thought, prayer, chanting, ritual, dance, sport, work, story, play, and art—comprised the parameters of communication."

Based on his work among the Hopi, one of the Pueblo groups that maintains an affiliation with the VCNP (chapter 1), linguist Benjamin Lee Whorf (1956a [1940]) suggested that language simultaneously conditions how people perceive the reality of their landscapes and helps structure all of their activities, including, for example, their land use practices. In speaking of breath and language, **Cajete** (**1994**:45) observes, "As is true in all languages, Indian metaphors reflect the nature of reality they see and to which their mind has been set through experience and cultural understanding." **Cajete** (**1994**:44) extends Whorf's logic of breath and language beyond humans when he writes that for many Native Americans, "Language as prayer and song has a life energy that can influence other energy and life forms toward certain ends."

In retelling a lesson that she learned from her grandmother, Rina Swentzell, another Santa Clara Pueblo author, offers an explanation that supports and helps further explain Cajete's point:

> *Gia Kuhn said that a place breathes in and incorporates thoughts and feelings of all beings who enter its space. She said that we remain a part of any place we visit—any place we breathe or leave our sweat. That is why we must think and move carefully wherever we go, because we become one with the place and, therefore, influence its spiritual quality (Swentzell 1993:144).*

An additional aspect of language warrants further elaboration. Language is a principal medium for cultural learning and experience. Through his identification of the fundamental linkages between language and breath, however, **Cajete** (**1994**:43) recognizes that Native American languages are expressions of spirit. He adds that Indian languages characteristically lack a specific word for religion. Rather, the idea of spirit that is so deeply ingrained in the processes of language, learning, and experience underlies an understanding of the world through a perspective that Cajete terms *spiritual ecology*.

According to Cajete (1993–1994:6), the essence of spiritual ecology is the traditional relationship and participation of indigenous people with place that includes not only the land itself, but also the way people perceive the reality of their worlds and themselves. Although he refers to Pueblo culture to illustrate his point, Cajete ascribes to the view that spiritual ecology, as manifest through breath and language, is a characteristic among traditional land-based communities. "The land has become an extension of Pueblo thought and being because, as one Pueblo elder states, 'it is this place that holds our memories and the bones of our people…this is the place that made us!' " (Cajete 1993–1994:6).

Rather than a religious doctrine, spiritual ecology is an expression of spirit as an orientation toward a living process. It is not a static intellectual structure (**Cajete 1994**:43–44). Tito Naranjo and Rina Swentzell effectively illustrate Cajete's point:

> *In the Tewa Pueblo language there is a word which means "seeking life." That word incorporates the most basic concept of Pueblo thinking, that human life is about the search for harmony and balance, about breathing and walking carefully and sensing the connectiveness between polarities in the human and natural worlds (**Naranjo and Swentzell 1989**:257–258).*

In constructing their landscapes, the people of traditional land-based communities in general draw upon the spiritual power of breath and language to sustain paramount traditions of relationship, not only for renewal and for remembering, but also to perpetuate the spiritual ecology of the world as a whole (Cajete 1993–1994:7; see also discussion by **Carmichael 1994**; **Saile 1977**). People make a place as much as a place

makes people. Among people who construct landscapes as memory through their thoughts, speech, and activities, the land is a reflection of their very soul (after **Cajete 1994**:84). **Cajete** (**1994**:83) refers to this projection of the human sense of soul and the archetypes contained therein as "ensoulment."

As an outside observer, Sophie D. Aberle portrays the objective, material importance of the relationship between the Pueblos and their landscapes to which **Cajete** (1993–1994; **1994**) and **Naranjo and Swentzell** (**1989**) refer. Although her description lacks the poetry used by writers from traditional land-based communities, it effectively conveys the objective quality of their ties to the land:

> *Land being the basis of Pueblo economy, to understand the Indian's relation to his soil is vital. The years of contention over boundaries, titles to grants, and legislation influence the Indian's habit of thought as well as his laws…Land in the eyes of the Indian is his most precious possession (**Aberle 1948**:5).*

In their literary treatise of Native American writers and their landscapes, other outsiders, Patricia Clark Smith and Paula Gunn Allen convey their comprehension of the spirituality of these landscape connections:

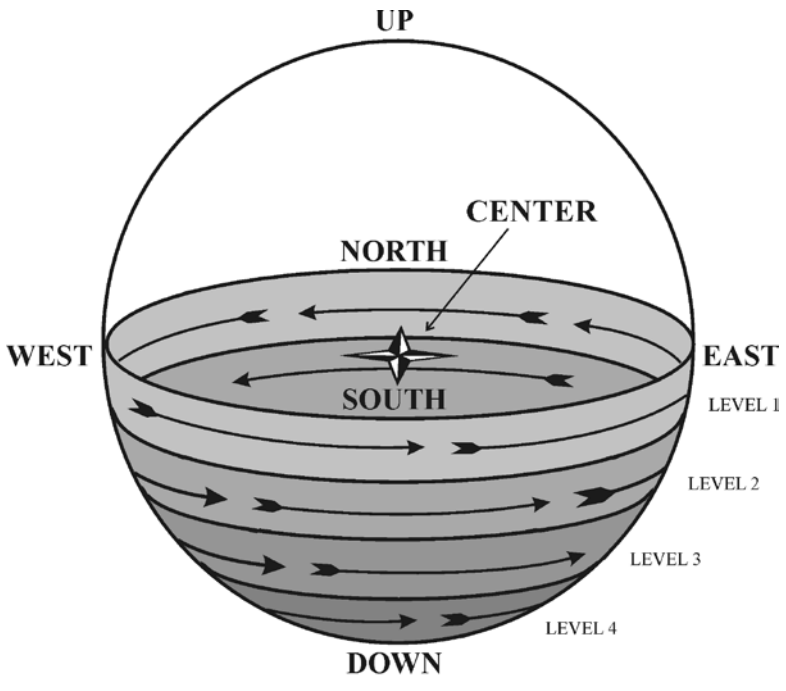
> *For American Indians, the land encompasses the butterfly and ant, man and woman, adobe wall and gourd vine, trout beneath the river water, rattler deep in his winter den, the North Star and the constellations, the flock of sandhill cranes flying too high to be seen against the sun. The land is Spider Woman's creation; it is the whole of the cosmos (**Smith and Allen 1987**:176).*

Center

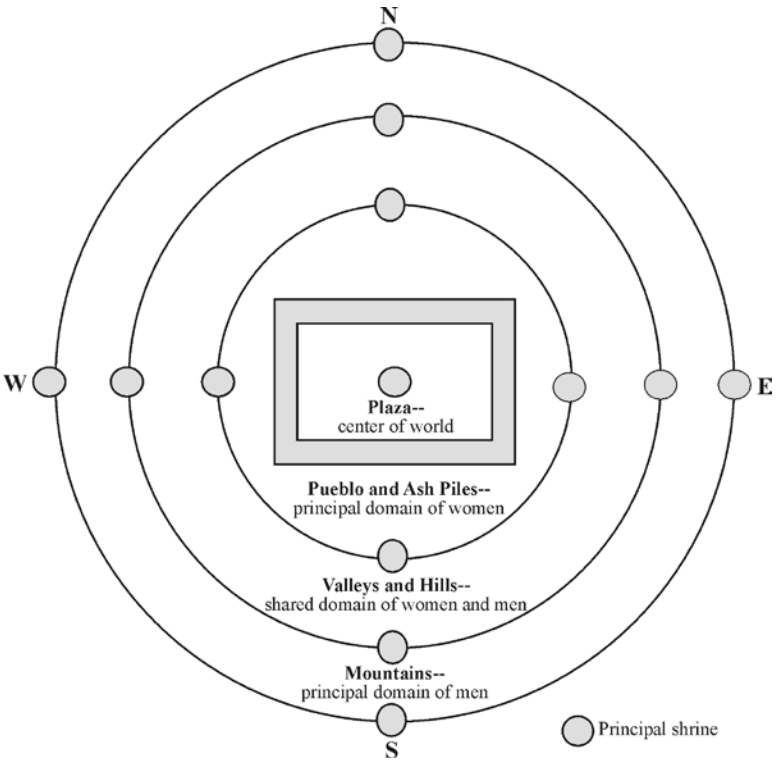
Cajete (**1994**) and **Ortiz** (**1992**) express the idea of center as both "that place Indians talk about" and "that place where all things are created." Traditional land-based communities view the land as inseparable from their very existence and identity, the idea of center has inseparably intertwined physical geographical and spiritual referents.

The definition of center necessarily depends on a comprehension of orientation, which **Cajete** (**1999**:6) identifies as a key and sacred concept among Native Americans. "Orientation is more than physical context and placement…It is about how the human spirit understands itself" (**Cajete 1994**:49). The comprehension of sacredness among many cultures, including the traditional Native American and Hispanic communities that maintain a close cultural association with the Valles Caldera, is a quality inherent to places as a metaphysical process based on timeless tradition. It is not strictly associated with some particular feature or object (after Hubert 1994:12). Within such cultures, sacred locations defined through orientation cannot be deconsecrated or made secular and profane.

In defining center, community traditions transmit ideas regarding the "*rightful orientation* to the natural world" (**Cajete 1994**:37, italics in original) through reference to seven cardinal directions: East, West, North, South, Zenith, Nadir, and Center (fig. 9.1). Through the association of cardinal directions with particular environmental phenomena, traditional communities build mental orders, which seem "less to control the environment than to control the world within" (**Johnson 1995**:200). That is, by defining direction and placement, the people construct a knowable world out of sometimes capricious, often dangerous, and ever-changing surroundings.



9.1—The seven directions and the four levels of the cosmos within a construction of landscape as memory (adapted from **Swentzell 1990**: figs. 3-4).



9.2—A schematic view of a landscape as memory, version 1 (adapted from **Ortiz 1969**: 13–28).

Laguna Pueblo author Leslie Marmon Silko explains how traditional people impose order through their thoughts on the disorder of the world in which they live:

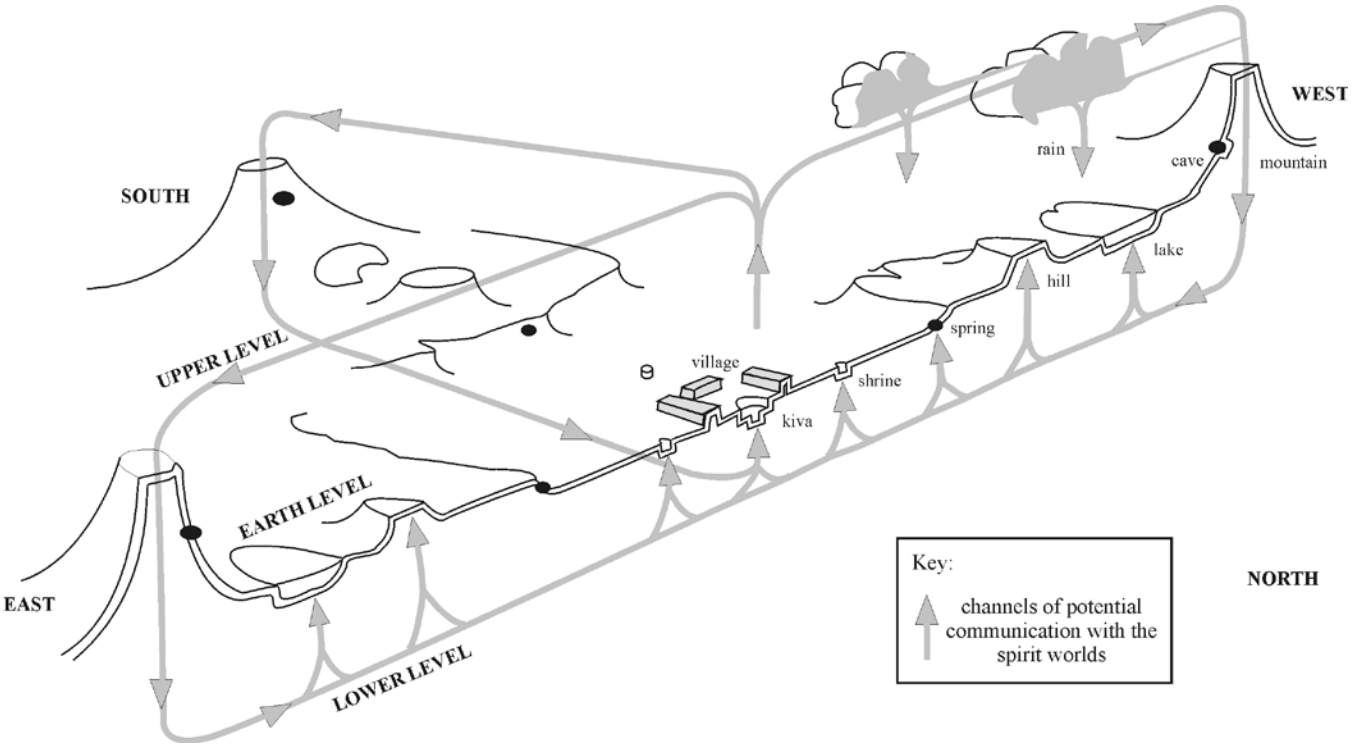
> *The land, the sky, and all that is within them—the landscape—includes human beings. Interrelationships in the Pueblo landscape are complex and fragile. The unpredictability of the weather, the aridity and harshness of much of the terrain in the high plateau country explain in large part the relentless attention the ancient Pueblo people gave to the sky and the earth around them. Survival depended upon harmony and cooperation not only among human beings, but also among all things—the animate and the less animate, since rocks and mountains were known on occasion to move (**Silko 1995**:157).*

Drawing from the perceptions and experiences of its people with their physical and spiritual worlds, each community traces its orientation by associating symbols, ranging from mountains, hills, other natural phenomena, colors, animals, plants, spirits, and holy winds (which are other traditional conceptualizations of breath and thought), with each direction (e.g., see **Benally et al. 1982**; **Reichard 1963**). **Ortiz** (**1972**:142) identifies "the dominant spatial orientation" inward, toward the metaphor of center. For the Pueblo (as well as the Navajo, Apache, and Ute), "all things are defined and represented by reference to a center" (see fig. 9.2).

> *As a way of knowing, thinking, and orientating, it [the spiritual ecology of place] proceeds in concentric rings from the location of the family household, to the segment of the village the household is located in, to the village as a whole, to the land immediately surrounding the village, then to the mountains and other geographic features that form the recognized boundaries of each Indigenous group's territory (**Cajete 1994**:47).*

It is necessary to emphasize that the assemblage of cardinal directions not only includes the usual compass bearings, but also ideas of multiple, layered realms (after **Saile 1977**:76, 1989:173). For example, the Pueblo, Navajo, Apache, and Ute communities ascribe the cardinal directions (East, West, North, and South) to the physical world in which the people live. This landscape represents the middle world. They also recognize Zenith to refer to the upper spirit world in which supernatural beings and powers associated with the sun, sky, clouds, eagles and other birds, and the stars live. Nadir is the lower world, home of the spirits of the ancestors and supernatural beings and powers associated with lakes, springs, caves, and some burrowing animals.

Many kinds of physiographic features (e.g., mountains, hills, lakes, caves, and springs) and culturally constructed features (e.g., houses, plazas, and shrines) in the natural world serve as conduits through which people communicate with the upper and lower world realms (Saile 1989:173). Rising from the ground and reaching into the sky, mountains and hills represent physical intersections between the earth and the sky (**Saile 1977**:76; see also **Blake 1999**) (fig. 9.3). As an ecological metaphor and a symbol of higher thought, mountains and hills often co-occur "with the metaphors of pathway, pilgrimage, and cardinal orientations forming the boundaries of a sacred place" (**Cajete 1994**:92). Springs and caves are other important portals to the lower world (e.g., see **Ellis 1964**:32: **Saile 1977**: fig. 4) (fig. 9.2).

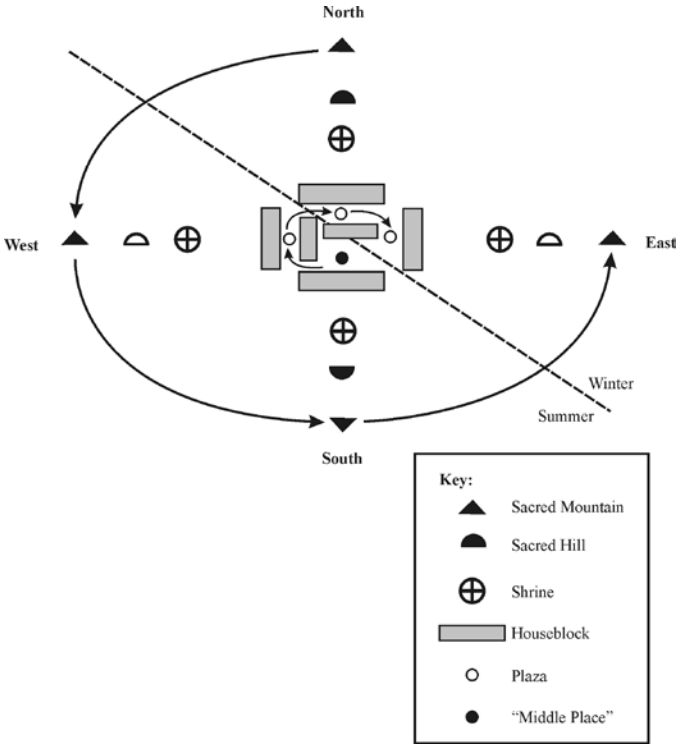


9.3—Cross section of a landscape as memory (adapted from Saile 1990:fig. 5-9; also see **Saile 1977**: fig. 4).

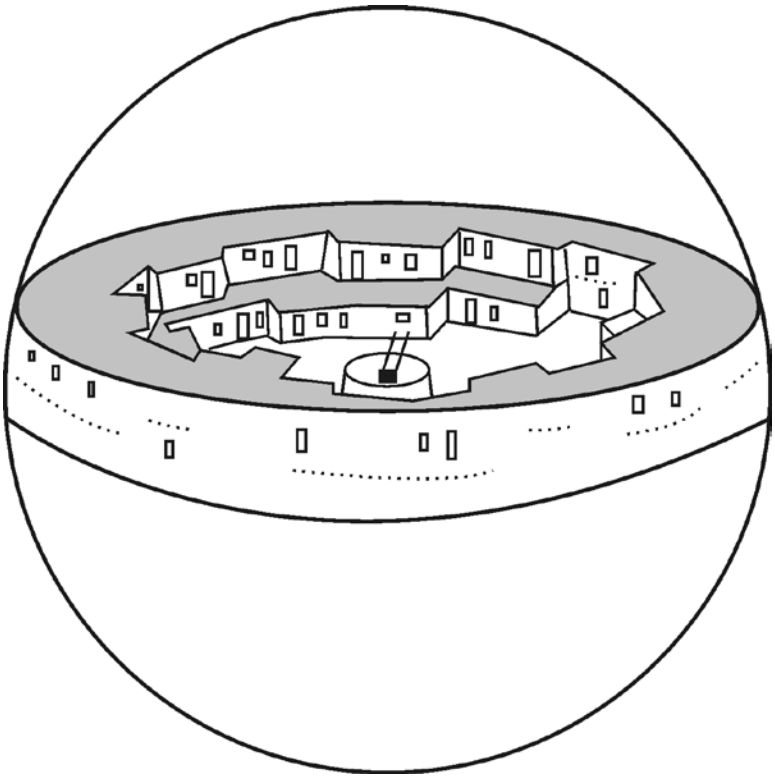
The idea of center unifies the middle, upper, and lower realms of the cosmos. Through a creative, meaningful process based on its traditions of relationship with its natural and supernatural worlds, each community places its people at the center of its cosmos through their occupation of the middle world (after **Cajete 1994**; **Naranjo and Swentzell 1989**; **Ortiz 1969**; **Swentzell 1988**) (figs. 9.2 and 9.4).

In addition, through the conceptualization of their communities as occupying the physical center of the middle world in reference to this system of seven cardinal directions, the residential hub of their landscape lies "at the intersection of the horizontal and vertical regions of the physical and symbolic… universe" (**Swentzell 1988**:15).

An example drawn from Pueblo ethnography illustrates how this system of landscape as memory incorporates essential ideas of space and time. In the living world, the most easily understood physical representation of center is the village plaza (or oldest plaza if the Pueblo has several of these features) (figs. 9.4 and 9.5). As expressed in Pueblo architectural traditions, plazas are enclosed in the horizontal dimension by terraced house structures (fig. 9.5), just as the nearby rising hills surround a village and the distant mountains embrace the whole of a Pueblo's physical world (figs. 9.2 and 9.3). In this sense, the Pueblo concept of space is manifest primarily in an objective (i.e., quantitative) reality. "It includes all that is or has been accessible to the senses, the present as well as the past, but it excludes everything that we call the future" (Tuan 1977:120). This objective realm has certain other fundamental conceptual limits. The Pueblo conceptualization of the world includes a subjective realm that is knowable through the



9.4—A schematic view of a landscape as memory, version 2 (adapted from **Ortiz 1969**:fig. 2, used with permission of University of Chicago Press).



9.5—The plaza, enclosed by terraced houses and with a kiva in the middle, as a center in a Pueblo landscape (adapted from **Swentzell 1990**:fig. 3-7).

communities' coherent bodies of qualitative cultural-historical knowledge. Yi-Fu Tuan (1977:121) notes further, "As the objective horizontal plane stretches away from the observer to the remote distance, a point is reached at which details cease to be knowable" (fig. 9.6).

Pueblo understandings of their landscapes are similar to their comprehensions of the cosmos as a whole because they incorporate subjective realities in their natural and supernatural realms alike. Tuan (1977:121) explains that the periphery, as the borderland between the objective and the subjective realms of the Pueblo world, "is the timeless past, a country told about in myths." Moreover, Pueblo authors observe that their kin "believe that past and future come together in the present—or in the center" (**Naranjo and Swentzell 1989**:257). Residential settlements do not constitute the only centers within such landscapes, however. A center occurs wherever "harmony, balance, and grounding happen. It is where opposites come together to create cyclic movement and flowingness" (**Naranjo and Swentzell 1989**:257). Symbolic openings (e.g., caves and shrines) and other portals to the supernatural realm of the cosmos (e.g., lakes and springs) are other kinds of centers (fig. 9.3). Speaking of the Pueblos, Naranjo and Swentzell state:

> *These openings represent, again, an effort to connect this level of existence with that below. Each of the openings…is a special healing place. Each is the primary point of energy flow [or, to use* **Cajete's (1994)** *term, spiritual power (see above)] between the simultaneous levels of the Pueblo world (**Naranjo and Swentzell 1989**:262).*

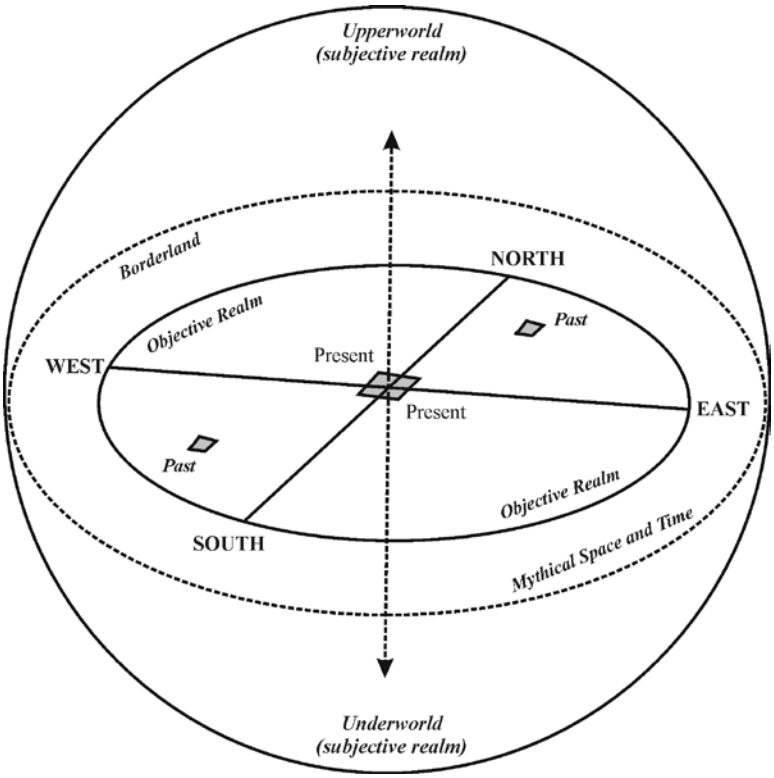
The Apache (**Anschuetz 2002b**; **Basso 1996**; **Carmichael 1994**; **Farrer 1991, 1992**), Navajo (**Kelley and Francis 1994**, **2002**), and some land-based Hispanic communities (**Anschuetz 2002c**; **Enson 1995**), among others, share similar understandings of center, centeredness, and flowingness of spiritual power as forming an interconnected web of relationship that ties the earth, the heavens, and the underworld into a whole.

Based on this body of ethnographic work, it is safe to generalize that within Native American conceptualizations of landscapes as memory, center cannot be comprehended without reference to periphery, and vice versa. Moreover, as I consider next, the idea of center simultaneously refers to the themes of emergence, movement, and connectedness, just as it does to the theme of breath, as portrayed in its reference to spiritual power.

Emergence

The Native American theme of center refers to a place on the landscape with a point of connection and a flow of life energy among the many levels of the world. The idea of center simultaneously refers to the place where people emerged from the underworld (**Naranjo and Swentzell 1989**:262).

The relevance of the idea of emergence in these landscape constructions is much deeper than simply equating center with the beginning of human time in the physical world that traditional people know today. Emergence, a concept imbued with a sense of timelessness through the sanctity of ritualized tradition, refers to both the becoming of the people and of their landscape.



9.6—A schematic view of objective and subjective realms of the cosmos within a landscape as memory (adapted from **Tuan 1977**:fig. 15, used with permission of University of Minnesota Press). As Tuan explains in his figure notes, the objective realm is the horizontal space within the cardinal grid. At the distant edges, the objective realm merges with the subjective realm, which is represented by the vertical axis.

The origin myths recorded among many Native American communities, including the Pueblo, Navajo, Apache, and Ute, exhibit striking similarities. Both the idea of world levels and the intrinsic ahistoricism of the myths are important. Each origin myth:

> *. . . in some fashion, tell[s] of the emergence of crude unfinished people from the lower levels until they reach the light of the upper and present world…Supernatural beings and spirits helped the people in their ascent and showed them how to undertake the tasks necessary for their survival (**Saile 1977:76**).*

Just as with the people, the succession of worlds, which the people have occupied, has become increasingly complete in form. Turning to Pueblo ethnography to illustrate this idea:

> *Each world metaphorically represents a stage of natural evolution through which human beings learn how to become more human. Pueblo people believe that they emerged from an earth navel, a place of mountains looked upon lovingly by the sun and the moon (**Cajete 1999**:15).*

Ortiz (**1969**:16) similarly refers to the idea of becoming, or being fully formed. Among Pueblo origin myths, for example, the world before emergence is described as moist, green, and unripe, whereas the world after emergence is dry, hardened, and ripe. The process of becoming complete (for the people and the land alike) is a gradual one that "is said to have continued long after emergence" (**Ortiz 1969**:17).

In their myths and community histories, traditional communities trace the process of becoming through the successive levels of their world and their movements through the present-day world. In doing so, they are not concerned with questions addressing objective facts of beginnings or origins. Instead, such historical constructions focus on movement according to the recurrence of traditional patterns, such as activities linked to the annual cycle (**Parsons 1996**, 1:17 [1939]). Given the emphasis on repetitive action in these narratives, many authors characterize these stories as a historical (e.g., **Ortiz 1969**:143; Tuan 1977:121–122). **Parsons** (**1996** [1939], 1:102–103) observes, "A formula such as 'it came up with them' or 'thus it was from the time they came up' gives authenticity to precious things as well as a starting point back of which there is no call to search."

Pueblo ethnography again provides useful perspective. The sense of timelessness that obtains from the ahistoricism of emergence is a quality associated with the process and power of healing spaces. Swentzell (**1991**:178) explains, "Simultaneous levels of existence, as told in Pueblo emergence stories, are a part of daily reality and understanding." Moreover:

> *. . . sensing and feeling the whole more easily satisfies the Pueblo person's curiosity. To know the details is extraneous. To sense the large relationships that exist between the parts of a defined whole and to feel their relevance is enough. To know through feeling, intuiting, is to be a strong Pueblo person (**Swentzell 1991**:178).*

With its inalienable association with a healing space, then, emergence is not only the center of space. It also is the center of time (after **Ortiz 1969**:143).

Movement

The archaeological and documentary records of the Valles Caldera are replete with discussion of the transitory use of the locale by Native American and Hispanic groups over time. This system of short-term land use is unsurprising, given that the Baca Location has always been peripheral to settings of major settlement. Then again, the permanency of settled village life among the traditional people who have associated with the Valles Caldera historically also appears to be overstated. The settlement patterns of hunting and gathering groups and farming communities alike were usually fluid. For example, Linda Cordell writes of the dynamic occupational histories of early Pueblo villages:

> *Their inhabitants seemed to come and go, the settlements themselves changing both size and configuration in response to social forces we barely understand. In my mind, the shifting locations of population and the modification of community layout that suggest the incorporation and dispersal of groups of people are signs of a social landscape with far fewer constraints than any we know in the region today. They are mirrored in the fluidity and lack of formality that seem to characterize the patterns of exchange in ceramics. They seem to be part of a larger but much more open social world in which the notion of abandoning a dwelling or a site may have been of minimal importance, perhaps something to have been embraced rather than resisted (Cordell 1998:64).*

Cordell's (1998:64) observation that among the Pueblo, movement was "something to have been embraced rather than resisted" is perceptive. More than an adaptive strategy whereby people merely responded to changes in their economic, social, and political environments, ethnography documents that movement is another big idea of Pueblo culture. In turn, it simultaneously informs and motivates land use patterns.

As stated by Tewa authors in a variety of documentary contexts, "movement is the revered element of life" (**Naranjo and Swentzell 1989**:261). Another Tewa author adds, "Movement, clouds, wind and rain are one. Movement must be emulated by the people" (**Naranjo 1995**:248). In talking about the process of people's movement through a sequence of places, Swentzell observes:

> *They did not settle in place for a long time, but rather emulated the movement of the seasons, winds, clouds, and life cycles by moving frequently. They responded to the movement of floods, droughts, and social tensions. The movement of clouds told them how they should move on the ground (**Swentzell 1993**:145).*

Leland C. Wyman (**1962**:78, **1965**:105) offers additional insights into the importance of movement among southwestern land-based communities. For example, in his opening discussion of the geography of the Navajo Windway myths, he notes that in speeches made by Navajo tradition keepers:

> *. . . movement is described in great detail; he lives conceptually and linguistically in a "universe in motion." In his myths the heroes and supernaturals restlessly undertake long journeys during which many place names are mentioned, even spots merely passed by, and stopping at a spring for a drink of water is an occasion for giving the place a name . . . (**Wyman 1962**:78).*

The task now at hand is to examine movement as both a cosmological and landscape concept. First, the movement of people across their landscapes complies with traditional patterns of relationship with their worlds. Second, the movement of life energy among the landscape's many centers interconnects the natural and supernatural worlds of the cosmos (see also discussion of breath above).

Pueblo authors again provide invaluable perspective about patterns shared by the Navajo, Apace, and Ute. With regard to the cosmological aspect, Cajete observes that Pueblo people recount their forebears' movements in their oral traditions to sanctify the timeless principles of spiritual ecology that underlie their respective communities' senses of place:

> *In the stories Pueblo elders tell, the ancestors journeyed many times and settled in many places, including Chaco Canyon, Mesa Verde, and Canyon de Chelly. And each time they stopped they established a relationship to the place in which they settled, and they learned from each of these places. They came to understand something about the essence of these natural places and something about the delicate environmental balance of nature in such places. They settled by lakes and came to understand the nature of water and its importance and sanctity in an arid environment. They came to understand that water was one of the foundations for maintenance of life on earth. They settled near mountains and came to understand the nature of mountains in terms of the way they provide a context, an environment in which Pueblo people and other living things could live (**Cajete 1999**:13–14).*

Silko (**1995**:158) notes that in tracking their movements, "Whatever the event or the subject, the ancient people perceived the world and themselves within that world as part of an ancient, continuous story composed of innumerable bundles of other stories." **Cajete** (**1994**:91) adds, "In this sense, the landscape is like a textbook of ecological meaning, interpreted through the traditional stories and activities of tribes." The oral narrative, based on metaphor and ritual performance, "became the medium through which the complex of…knowledge and belief was maintained" (**Silko 1995**:158) across the generations. Through these stories Pueblo, Navajo, and other traditional land-based community people hear who they are (after **Silko 1995**:128; see also **Peckham 1990**).

Importantly, the identification of prominent geographic features and landmarks in each community's narratives exists primarily for ritual purposes (**Silko 1995**:162). To pursue **Cajete's** (**1994**, **1999**) and **Silko's** (**1995**) reasoning, these narratives are most important for their affirmation of spiritual

ecological principles and not for their comprehensive environmental or historical detail.

As I discussed previously, the oral traditions maintained among communities that construct landscapes as memory possess the quality of timelessness. Moreover, the question of whether or not the people actually journeyed through the places identified in a community's oral traditions at a particular time is irrelevant. For example, **Naranjo** (**1995**:248) notes, "With migration, movement is the essential element, not where they stopped or which path they took." **Silko** (**1995**:161) adds, "the continuity and accuracy of the oral narratives are reinforced by the landscape—and the…interpretation of that landscape is maintained."

In considering these ethnographic patterns, the relationships between people and their histories of movement through landscapes as memory are both important and beyond question (after **Swentzell 1991**). Silko explains:

> *The myth, the web of memories and ideas that create an identity, is a part of oneself. This sense of identity was intimately linked with the surrounding terrain, to the landscape that has often played a significant role in a story or in the outcome of a conflict (**Silko 1995**:167).*

The second aspect of the concept of movement among communities that construct landscapes as memory—namely, the flow of life energy among the many centers defined in their landscape constructions—reinforces the essence of spiritual ecology as the traditional relationship and interactions of the people with their places. Nowhere is this idea more openly manifest than in communities' conceptualizations of the interrelationships among movement, breath, and center.

The Tewa understanding of "seeking life" illustrates these relationships succinctly (see **Cajete 1994**:45–46; **Naranjo and Swentzell 1989**:257–258; see also Laski 1959). On the one hand, a Pueblo's plaza (or oldest plaza, if there are several), as the center of all centers for the community and a focal healing place, is the terminus of all blessings that emanate from the shrines scattered across the landscape. The plaza is one part of the link between the supernatural and natural realms of the Pueblo cosmos. On the other hand, the people, through the sacred power and solemn petitions of their public and individualistic rituals in their subscription to a living process (see above), channel blessings back across the landscape through a hierarchy of shrines of direction even as they receive blessings from the supernatural world.

In this metaphorical ebb and flow of energies between the cosmos' natural and supernatural realms, the blessings that emanate from the living world and intersect the underworld undergo a transformation in power through the renewal of their supernatural associations. These strengthened blessings renew the cycle of movement from the plaza center upon their return to the community. The power of the blessings builds upon itself yet again as the goodness manifest in the public ceremony, private ritual and everyday action that people demonstrate in their conduct once more flows outward from the village center. Just as the power of Pueblo ritual accumulates through the act of controlled, repetitive action (e.g., see Whorf 1956b [1939]), the power contained in blessings apparently also accumulates within itself through its renewing cycles of movement between the cosmos' natural and supernatural realms. Therefore, through this system of continually reproducing, continually invigorating life force energies, people's actions help sustain harmony between the contrasting/complementary realms of the cosmos. **Ortiz** (**1969**:22) explains, "By the system of ideas at work here, everything good and desirable stays within the…world."

Connectedness

The sense of intrinsic connectedness between northern New Mexico's traditional people and the worlds in which they live is the general basis of their spiritual ecology and the specific basis of their understandings of healing and seeking life. Naranjo and Swentzell illustrate the importance of the idea of connectedness:

> *For Pueblo people, the building, the landscape, the region, all together are the physical expressions of their beliefs. These things form the invisible link between the spiritual and material parallels of their lives. The building, the landscape, the region make up the world within which people live. It is a holistic and symbolic world. It is a description of the physical environment in terms of what it should be like or what feels right, rather than what makes sense or what is rational (**Naranjo and Swentzell 1989**:261).*

Swentzell explains further how the theme of connectedness informs the common idea among Native American communities that spiritual power—the very force of life itself—permeates everything in their world, including objects that Western traditions consider inanimate:

> *That connection is—creativity from the source…, the po-wa-ha, literally "water-wind-breath." It is that energy that flows from everybody, everything—plants, stones. That's why everything takes on life in that world. We all breathe of the same breath the plants do, the rocks do. And so the world itself takes on a different structure (**Swentzell 1989a**:25).*

Swentzell (**1989b**:12) adds, "All of life, including walls, rocks and people, were part of an exquisite, flowing unity" (see also **Cajete 1994**; **Silko 1995**; **Tiller 1983**).

Connectedness is one of the big ideas shared by people who build and sustain landscapes as memory. It is not surprising that they communicate these perceptions of their life in relationship with the land in their oral traditions and through their ritual, symbols, and everyday activities. Drawing from Pueblo ethnography, Cajete introduces the focal understanding of connectedness in terms of the "theology of place," which is characteristic among the people of traditional Native American and Hispanic communities alike:

> *It is through these symbols and participating with the land in a kind of symbolic dance that Pueblo people have traditionally maintained the memory of their relationship*

*to the places. Through traditional art forms…, which are replete with designs based on their relationship to the land, its plants, animals, Pueblo people have symbolized their sense of identity as a people of place. This continual establishing of relationship is not only for renewal and for remembering to remember who they are as a people, but is also an attempt to perpetuate the spiritual ecology of the world as a whole. This is the complex of relationship, symbolism, attitude, and way of interacting with the land that comprises the Pueblo theology of place (**Cajete 1999**:15).*

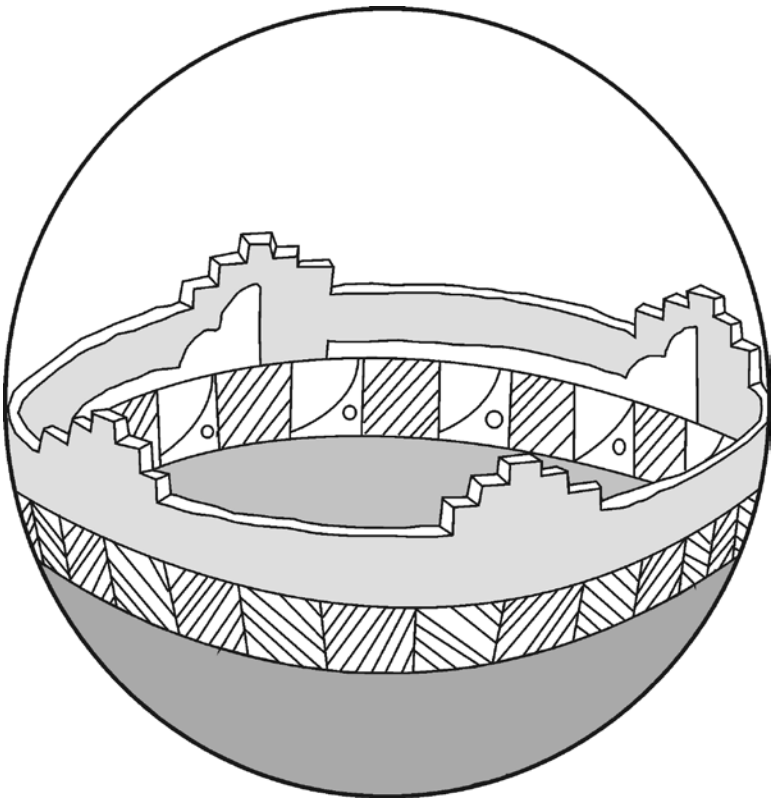
We now can begin to grasp some of the most meaningful elements embodied in constructions of landscape as memory. To understand the ideas of breath, center, emergence, and movement within a spiritual process of healing, it is necessary first to possess an explicit comprehension of periphery in the relationship between the natural and supernatural realms of the cosmos. People who construct and interact with landscapes as memory create a whole that is greater than the sum of its parts by uniting their world through a system of social and symbolic dualism (after **Ortiz 1969**).

In the process of acculturation into their communities of birth, "children learn about connections to the earth through virtually every experience in their culture" (**Trimble 1993**:170). So pervasive is this world view that early in their lives, children comprehend ideas of center and periphery along with their interdependence to form a whole. For example, a young Santa Clara Pueblo girl, Rose Bean, remarks, "A Pueblo is more than physical buildings and landscape…It's living in a circle with a kiva in the middle" (in **Hucko 1996**:44; see also **Swentzell 1989b**).

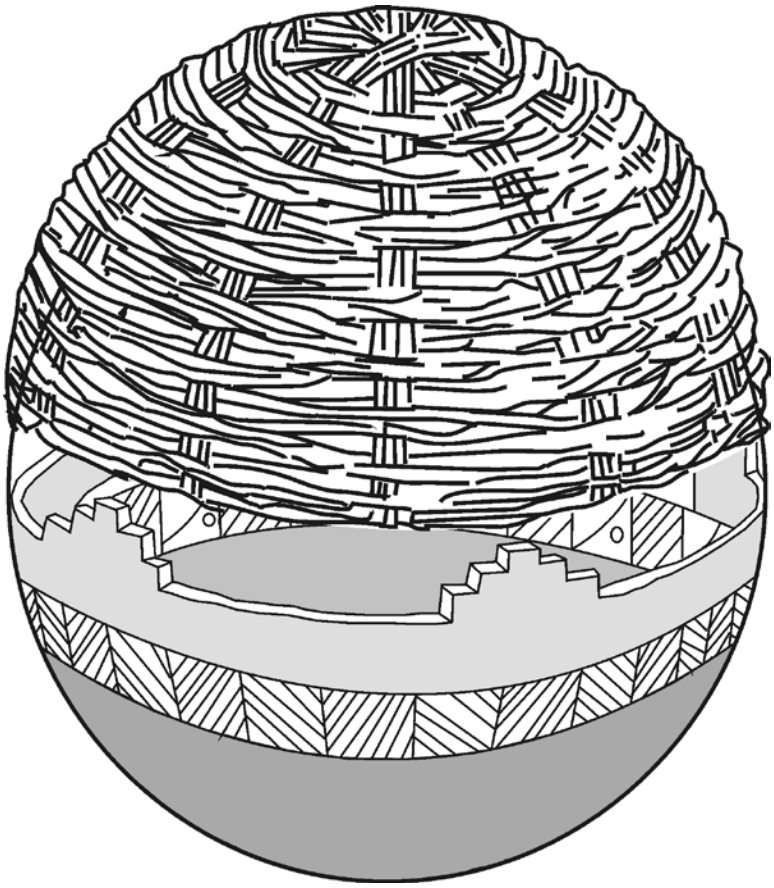
Individuals acquire sophistication in their knowledge and understanding of these traditional themes and apply them to their everyday activities when they became adults and contributing members of their communities. Nora Naranjo-Morse, a Santa Clara Pueblo artist, "speaks of the circle that connects her with her clay people—a circle that takes in thousands of years of history and connections to clouds and mountains, spirits and underworlds. The Pueblo people live and pray and dance and shape pots to maintain these connections" (**Trimble 1993**:119).

Witherspoon (**1977**, **1983**) and **Wyman** (**1983**) similarly explain that the Navajo live their daily lives and observe their ceremonies through a complex system of beliefs about the dynamics of the universe. To earn their living, the Navajo attempt to influence the physical manifestation of the world for the benefit of all people through the orderly demonstration of traditional knowledge about the web of interrelationships between the natural and supernatural realms of the cosmos. Just as among the Pueblos, the cultural ideal among the Navajo is to draw upon their cultural traditions for knowledge about how to structure all of their actions, including their land use activities, to sustain connectedness and balance throughout the whole of their cosmos.

The analogy of the Pueblo's Earth-Mother bowl and Sky-Father basket pair (figs. 9.7 and 9.8) helps convey this essential idea of connectedness. Bowls and baskets are efficient



9.7—A Pueblo view of the Earth-Mother as a bowl (from **Swentzell 1990**:fig. 3-2).



9.8—A Pueblo view of the world as a sphere, with the Sky-Father-Basket atop the Earth-Mother-Bowl (adapted from **Swentzell 1990**:fig. 3-1).

containers. Together, they form a coherent, protective sphere. (**Farrer's** [**1991, 1992**] discussion of Apache world view suggests that Athapaskan groups possess similar ideas about their cosmos consisting of a protective sphere that embraces all life.) The breakage and subsequent loss of a bowl's rim and body sherds, and the tearing of the basket's woven fabric, however, compromise the vessels' forms and functions. Such damage also ruins the sphere's integrity and its ability to sustain its contents. So, too, landscapes that become fragmented lose their power. No longer able to sustain relationships and connectedness in the harmony of a whole, the spiritual thought process is rendered incomplete and its healing power is diminished.

Cajete (1993–1994, **1994**, **1999**) has commented extensively on the ill effects that plague traditional land-based communities when the wholeness of their landscape constructions is not respected and the people lose their sense of spiritual ecology. While acknowledging the world is inherently ever changing, Swentzell observes:

Transformation is a part of life, and is a very part of life, but it has to be transformed in terms of continuing…When you leave behind the past it is detrimental not just to yourself but to the world at large. Because you leave behind respect, connectedness—which is love (**Swentzell 1989a**:28)

Landscapes as Memory and Vernacular Land Use History in the VCNP

As discussed earlier, people understand themselves to be an integral part of the land within a world view that encompasses the idea of landscape as memory. As such, the people's history, culture, and the very essence of their spiritual being is intrinsic to the landscape. Silko eloquently expresses this perspective:

> *So long as the human consciousness remains within the hills, canyons, cliffs, and the plants, clouds, and sky, the term landscape, as it has entered the English language, is misleading. "A portion of territory the eye can comprehend in a single view" does not correctly describe the relationship between the human being and his or her surroundings. This assumes the viewer is somehow outside or separate from the territory she or he surveys. Viewers are as much a part of the landscape as the boulders they stand on (**Silko 1995**:156, italics in original).*

To extend this cultural logic fully, communities that create landscapes as memory do not define themselves only in terms of the intimate relationships among the myriad of places and

features found extending from the center to the periphery of their natural world. This landscape approach simultaneously unites the middle realm of the cosmos with the supernatural worlds above and below within a process of becoming that transcends time, whereby the past is a referent for the present and the landscape is the recollection and celebration of age old tradition itself. In stating their relationship with their culture history over time, the people of traditional land-based communities reveal that they recollect their history not only to learn from it but *also to repeat it* so as to renew and reassert the veracity of their traditions (**Anschuetz 2002a**:3.42–3.43). In this way, communities periodically restate their relationships with the cosmos and its power (**Saile 1977**:79). Landscape features, therefore, are more than products of history. They represent the media through which the devotion of living of, and for, one's cultural community is sustained across the generations despite the inevitability of change in the natural world.

For many Pueblo and Navajo communities, as well some Apache, Ute, and northern New Mexican Hispanic communities, the natural and cultural resources of the VCNP traditionally are elements of landscapes that refer simultaneously to the physical and metaphysical realms of the cosmos. Physical environmental features, including the volcanic mountains that enclose the Valles Caldera, springs, caves, shrines, streams, plants, animals, vistas, and the hollow of the great caldera itself, contribute to the construction of the landscape in terms of each community's cultural-historical traditions. Informed by the interrelated themes of breath, center, emergence, movement, and connectedness, these environmental features are more than just an assemblage of objective attributes. Physical features embody metaphysical referents through which associated traditional community sustain their cultural identities. They do this through their geographic association with the subjective realm of the Valles Caldera as a periphery of their landscapes. The people of the traditional Native American and Hispanic communities variously gathered, hunted, and collected the material resources of this locality to sustain their economic livelihoods (see chapter 5). They relied on the symbolic qualities of these land use activities and their material products to sustain their communities economically, socially, and ideationally as living cultural entities.

The following discussion considers several prominent landscape elements present within the VCNP that have helped organize and give meaning to the land use activities of communities traditionally associated with this location. As noted in chapter 5, comparatively few details are available concerning the vernacular land use of the Valles Caldera because of common oversight involving mundane practices and the compelling need of secrecy to protect ritual and spiritual power. Consequently, the following discussion cannot be, and does not pretend to be, a comprehensive ethnographic inventory and assessment of how individual Pueblo, Navajo, Apache, Ute, or Hispanic communities interacted with particular landscape features. Instead, this narrative consists of ethnographic insights into how particular groups have interacted with the VCNP in the past to recall, verify, and reaffirm traditions important to their history, culture, and identity. In most cases, I cite ethnographic and other commentaries that identify the Valles Caldera locality directly. To help illustrate the importance of their relationship with the Valles Caldera settings, I refer to accounts of community relationships with analogous landscape features, such as mountains and volcanic calderas with which some of the associated communities are affiliated.

The categorization of particular feature types for the purposes of structuring this discussion is troublesome in the sense that it breaks a unified whole into its major constituent elements. This organizational device, therefore, fragments important connective relationships, which define a whole that is clearly greater than its parts, as discussed.

Mountains

Mountains within landscapes

Among cultural communities everywhere, but especially among those that construct landscapes as memory:

> *. . . [m]ountains are spiritually and culturally significant landscapes that evoke emotions ranging from awe and fear to reverence and wonder. Towering crags, violent storms, rare flora and fauna, snow-capped peaks, and serrated ridges all contribute to a mystical sense of the sublime. [**Blake 1999**:487]*

A rich body of ethnographic information demonstrates that Pueblo communities and the other Native American groups affiliated with the VCNP regard mountains with reverence for more than just their plant, animal, and mineral resources (table 9.1). The *mestizos*, *criollos*, and many other mixed-blood people that make up a large proportion of the rural Spanish colonist population (e.g., see Anzaldúa 1987:5; see also Mörner 1967; Wolf 1959) almost certainly shared the views of the indigenous communities concerning the sanctity of the southwestern mountains (see **Anschuetz 2002c**:7.7–7.8). This shared vision is the product of the blending of the structure and symbolic content of Indian and of Iberian (i.e., Catholic) religious belief (e.g., Anzaldúa 1987:25–39; Ingham 1986:180–193; Rodriguez 1994:143–148).

Among all these communities, summits signify the borderland between the objective and the subjective realms (Tuan 1977:120). **Alfonso Ortiz** (**1972**:157) explains, "the further one ranges outward from a particular village or group of villages, the greater is the tendency to attribute characteristics opposite of normal to anything of symbolic value, even if only by surrounding it with an aura of sacredness and mystery." The power inherent in the landscape becomes potentially more dangerous and uncontrollable at greater distances from the center, and at greater depths or heights (after **Saile 1977**:77). For the region's Native American and traditional Hispanic communities, "The mountain, as ecological metaphor and symbol of higher thought and attainment, is often integrated with the metaphors of pathway, pilgrimage, and cardinal orientations forming the boundaries of a sacred place" (**Cajete 1994**:92).

All 16 Pueblo communities living along the Río Grande Valley and its major tributaries (Cochití, Isleta, Jémez, Nambé, Picurís, Pojoaque, Sandía, San Felipe, San Ildefonso,

Table 9.1. Native American cultural communities associated with the VCNP that view mountains as places of sanctity and power.

Cultural community	References
Pueblo	Blake 1999; Ellis 1956; Hewett and Dutton 1945; Hewett and Mausy 1940; Ortiz 1969; Page and Page 1982; Parsons 1996 [1939]; Saile 1977
Navajo	Blake 1999; Kelley and Francis 1994; 2002; Witherspoon 1977, 1983
Apache	Basso 1996; Buskirk 1986; Carmichael 1994; Farrer 1991; Mails 1974; Opler 1946; Schaafsma 2001
Ute	James A. Goth, in Wright 2000; Hillstrom 1998; Liljeblad 1986; Romeo 1985; Wroth 2000

San Juan, Santa Ana, Santa Clara, Santo Domingo, Taos, Tesuque, and Zía), maintain significant associations with the Jémez Mountains (e.g., **Douglass 1917**; **Ellis 1956**, **1974**; **Harrington 1916**; **Ortiz 1969**; **Weslowski 1981**; **White 1942, 1960, 1962**). The Jémez use the Towa name *Wavema* to refer generally to the mountainous region to the north of their Pueblo (**Weslowki 1981**:117). (As I discuss later, the Jémez also use the name *Wavema* to designate Redondo Peak. The differentiation of the name to designate the Jémez Mountains as a whole or to identify Redondo Peak specifically is contextually dependent within speech acts.) Most names for most places known by individual Pueblo communities in the Jémez Mountains rarely have been documented by outsiders. Among those who construct landscapes as memory, appellations "exist in people's hearts and souls and history and oral tradition, and in their love" (**Ortiz 1992**:338).

Despite the fact that the Jémez Mountains are far outside the core areas of their respective homelands, the Pueblos of Hopi and Zuni maintain memories of northern New Mexico in their landscape traditions. The Hopi recall cultural-historical connections to specific settlements in the Tewa Basin on the east flanks of the Jémez Mountains (e.g., see Poling-Kempes 1997:19–20; Yava 1978:27–28, 44–45.). Anthropologists have documented a Zuni ethnogeography that includes at least four Jémez Mountains sites in or near the Valles Caldera (**Ferguson and Hart 1985**:Map 15—Traditional Zuni Hunting Area [site 31], Map 16—Traditional Zuni Plant Collection Area [sites 31 and 93], and Map 18—Traditional Zuni Religious Use Area [sites 31, 48, 93, and 94]). There are Zuni cultural sites on the east side of the Jémez Mountains in proximity to the Río Grande Valley, as well.

The Navajo similarly view the Jémez Mountains as generally delimiting the eastern margin of their aboriginal homelands. **Frederick W. Sleight** (**1950**), who relies on translation of the place-name *sisnádjini* as "Horizontal black belt" (**Haile 1938**:66), states that the description embodied in this term can easily be applied to the Jémez Mountains in general. "When viewed from deep within the old Navajo country, the Jémez Range appears as an extended, level black belt on the eastern horizon, and is the only mountain mass on the eastern side of the Navajo domain with this appearance" (**Sleight 1950**:391). Sleight's statement, however, is not simply the random observation of an outsider. Of interest are commentaries made by medicine men with whom Sleight worked. These informants note that *sisnádjini* (1) is visible on the eastern horizon from the Lukachukai Mountains in northwestern New Mexico, (2) appears as "that long line of mountain" (unidentified informant) on the eastern side of the Navajo homeland, and (3) can be seen on the north horizon from Albuquerque's heights **(Sleight 1950**:394; see also **Wyman 1962**:81).

Sallie Brewer provides the recollections offered by Peshlakai Etsedi of a conference at which Navajo leaders, including Nah Zizii, Hosteen Iltsuee Etsosa (Marriano), Hostin Be Dah Gah, and Becenti, agreed upon the territory that their people would occupy following their release from Bosque Redondo in the late 1860s:

> *These men decided that the Navajos would have the country between Sisnajinee [Black Belt in the Jémez Mountains], Zoet Zilth [Mount Taylor], Nahtah Ah Say Ay [Corn Stairs or Mount Thomas], Do Ko-osteed [Suspended by Yellow Shell or San Francisco Peaks], Nahto Zilth [Tobacco Mountain or Buckskin Mountain near Grand Canyon], Nah Ah Tsees Ahn [Navajo Mountain] and Devehn Tsah (**Brewer 1937**:61).*

The association with the Jémez Mountains is stronger among Pueblo and Navajo communities that identify particular summits within this range as their east mountain of cardinal direction. All six of the Tewa Pueblos (Nambé, Pojoaque, San Ildefonso, San Juan, Santa Clara, Tesuque) recognize *Tsikumu* (a.k.a. Cerro Chicoma [Obsidian Covered Mountain]) as their West Mountain in their landscape constructions (**Harrington 1916**; **Ortiz 1969**). This summit is just beyond the northeast corner of the Baca Location. Within the Valles Caldera, Redondo Peak (a.k.a. Pelado) is the North Mountain for Jémez Pueblo. The Jémez use the name *Wavema* (Father of All Northern Mountains [**Harper 1929**:Section 2, p. 30]) to designate this summit (**Sando 1982**:11) and the entire mountain region north of their community (**Weslowski 1981**:117). Some Navajo communities historically identified this same summit, which they know by the name *sisná˙djiní*, as their Holy Mountain of the East (**Amsden 1934**:123; **Brewer 1937**; **Goddard 1933**:11; **Keur 1941**:8; **Linford 2000**:242–243; **Matthews 1897**:78; **Sleight 1950**:*passim*)[9.1].

[9.1] For other Navajo communities, some authors, notably **Benally and others** (**1982**) and **Haile** (**1938**:66, **1950**:112, 114), identify Sierra Blanca in southern Colorado as the Holy Mountain of the East. Several authors (**Reichard 1963**:452–453; **Sleight 1950**; **Wyman 1962**:70) recount the debate over the identification. **Sleight** [**1950**] concludes that different Navajo communities probably identify different peaks as their Holy Mountain of the East for a variety of reasons related to their specific location and historical experience.

The preceding discussion of the themes of breath, center, emergence, movement, and connectedness stated that traditional communities define themselves within their cosmos through their identification of mountains of cardinal direction. The mountains of cardinal direction, therefore, are not just geographical referents. These summits are "an essential component to a system of cultural meaning at both a community and regional scale, sustaining people in physical and spiritual terms" (**Blake 1999**:488). On the one hand, they establish foundations upon which the communities construct their senses of timelessness in their occupation of the land itself. **Charles Avery Amsden** (**1934**:123). refers to this quality in his statement that each mountain of cardinal direction specifies "the cosmic limit in that direction as seen through the mist of tradition." On the other hand, the mountains of cardinal direction convey more than privilege and legitimacy in a community's occupation and use of the land through their reference to timeless tradition; they entail lasting obligations for present and future generations. Mountains of cardinal direction, as some of the most holy places within a group's landscape, "have a special power to make holy spirits accessible to mortals and bring together the Navajo origin legends, ways of life, and the correct pursuit of those ways" (**Blake 1999**:502–503).

Among the Jémez, regardless of their use of the placename *Wavema* to denote either the Jémez Mountains generally or Redondo Peak specifically, the mention of their "Northern Mountains" collectively or the "Father of All Northern Mountains" is imbued with great cultural meaning. In turn, the Valles Caldera landscape simultaneously possesses multiple levels of significance informed by Jémez Pueblo oral traditions of emergence and migration. According to Jémez tradition keepers, the Towa's forebears lived among other native people in the underworld in some unearthly form under the guidance of the spiritual powers. "These beings taught them all the ceremonials as explicit dictates for how they should live on the newly formed lands. The Towa brought these traditions with them when they emerged to the present earth as human beings" (**Weslowski 1981**:118).

At the time of the Towa forebears' Emergence upon the surface of this world, which is the place that the Jémez remember as *Wanatota*, somewhere far north of their present-day Pueblo, the spiritual powers created the original four mountains of cardinal direction for the people. They did this for the people so the Jémez would have appropriate places upon which they could fulfill their solemn obligations. These peaks included "Yellow-Flint Mountain" to the east, "Blue-Flint Mountain" (i.e., *Wavema*) to the north, "Red-Flint Mountain" to the west, and "Black-Flint Mountain" to the south (after **Parsons 1925:137**; **Weslowski 1981**:119). The people were always to visit these holy summits over the span of the yearly cycle to make prayers and to offer feather blessings, asking the spiritual powers for their continued assistance and giving thanks for the goodness that they had already received.

As the Towa forebears moved south through a series of migrations that would eventually bring them to the present-day site of Jémez Pueblo, the people would always designate cardinal mountains of directions, including *Wavema*, at each of the homelands that they occupied along their long journey (**Weslowski 1981**:117). The designation of Redondo Peak as *Wavema* immediately followed the Towa forebear's arrival in the upper Río Jémez Valley seven centuries ago (chapter 2), (see **Sando 1982**:11).

The Jémez have perpetuated the history of their community through the many levels of ritual associated with the mountains of cardinal direction (and other places of power created at the time of Emergence, or inhabited or visited by the Towa forebears during their migrations). They also recall the spiritual instructions, which their forebears accepted and to which they still are bound, as to how to live within and to use their homelands within the precepts set forth at the time of Emergence (**Weslowski 1981**:119–120).

Today, the Jémez still visit Redondo Peak throughout the year. Societal duties are performed on all sides of the peak and in the adjacent valleys" (**Weslowski 1981**:117). Weslowski explains further:

> *. . . that this peak is used regularly by the underworld's chief's society. This group is greatly respected as a ceremonial supervisor and conserver of custom…The underworld chiefs made a pilgrimage to Redondo Peak every June to begin the summer series of rain retreats and ceremonies . . . (**Weslowski 1981**:117, citing an unnamed consultant; **Parsons 1925**:63, and her own field notes; see also **Ellis 1964**).*

The Jémez, just as their Towa forebears, sustain the flow of power and harmony between the natural and supernatural realms of the cosmos through their perpetuation of their cultural-historical memory and the fulfillment of their obligatory traditions. Within this living landscape tradition, Redondo Peak and the Jémez Mountains together symbolize the cardinal direction North, Emergence, and the many places the Jémez occupied and visited on their migrations. For the Jémez, the Northern Mountains—the Jémez Mountains generally and Redondo Peak specifically—recall the origins and ends of natural life and the eternity of all spiritual life. The North is "the place from which the people came and whence the newborn still come" (**Parsons 1925**:125). Today the further association of spiritual powers with North (as the place of Emergence) and the souls of the deceased (as the direction where the first Towa lived and died), partially informs the cultural rationale linking the Northern Mountains with the cloud people, the *katsina*s, and the dead (**Ellis 1964**:19; **Parsons 1925**; **Weslowski 1981**:123). Finally, the additional essential connection of these many supernatural beings with moisture in its varied material and ethereal forms (e.g., rain, snow, clouds, and breath), contributes to the Jémez view of the Jémez Mountains as "the home of the flowing water" and "the perpetuators of rainfall" (**Weslowski 1981**:122). One community member gracefully summarized this relationship: "Water and mountains are intertwined as beneficial places. The mountains are the source of energy of existence. We receive energy from the places we believe in" (in **Weslowski 1981**:122).

In her examination of this web of relationships, **Weslowski** (**1981**:123) reports that the North encompasses the whole of Jémez Pueblo aboriginal lands. In this world view, Redondo Peak, as *Wavema*, and its valleys represent the totality of Jémez' culture and history. Continued occupation and use of the Valles Caldera for traditional game hunting, plant gathering, mineral collection, and ritual activities is compulsory for sustaining the Pueblo cultural identity.

There is some variability in the identification of the Holy Mountain of the East among the communities of the Navajo Nation. Nonetheless, even among the groups that specify the location of *sisnádjiní* as someplace other than the Valle Grande, the Jémez Mountains generally, and the great caldera especially, are basic to the ceremonial repertoire through which the Diné recount, enact, and reaffirm their own emergence traditions.

Just as among the Pueblo, the Navajo holy mountains figure prominently in Navajo creation tales. To pick up Washington Matthews' comprehensive account of the Navajo Creation Story at the point before the people emerge onto the Fifth World (which is the present world):

> *First Man and First Woman, Black Body and Blue Body, set out to build the seven [sic] sacred mountains of the present Navajo land. They made them all of earth which they had brought from similar mountains in the fourth world. The mountains they made were Tsisnadzi´ni [sisná´djiní] in the east, Tsotsil (Taylor, San Mateo) in the south, Dokoslíd (San Francisco) in the west, Depě´ntsa (San Juan) in the north, with Dsilnáotil, Tsolíhi, and Akidanastáni (Hosta Butte) in the middle of the land.*
>
> *Through Tsisnadzi´ni [sisnádjiní], in the east, they ran a bolt of lightning to fasten it to the earth. They decorated it with white shells, white lightning, white corn, white clouds, and he-rain. They set a big dish or bowl of shell on its summit, and in it they put two eggs of the Pigeon to make feathers for the mountain. The eggs they covered with a sacred buckskin to make them hatch (there are many wild pigeons in this mountain now). All these things they covered with a sheet of daylight, and they put Rock Crystal Boy and Rock Crystal Girl into the mountain to dwell (**Matthews 1897:**78–79).*

Mountains as stories

In this account and other Navajo Emergence accounts (e.g., **Benally et al. 1982**:8; **Klah 1942**; **O'Bryan 1956**:24, 26; **Van Valkenburgh and Begay 1938**:30–31), authors establish a subjective quality of timelessness in the Navajo conceptualization of the holy mountains. That is, the sacred peaks were created and re-created through the succession of worlds from the beginning of time to the present. These stories and various pictorial representations of these summits (e.g., Harrison Begay, in **Gill 1983**:fig. 1) also allow the identification of the many symbols that the Navajo associate with each of these peaks. For example, **Gladys Amanda Reichard** (**1963**:chart 1) documented the symbolic associations of *sisnádjiní*, the Holy Mountain of the East (table 9.2).

The care invested in detailing these many associations is not a mere literary device. "The order and character of the world and of the place of human beings in that world, including their relationships with one another and with all other living things, is defined in these stories" (**Gill 1983**:505). These written and graphic depictions also establish the principles with which the Navajo define their relationship with the physical geography, which includes the VCNP, of the world in which they live.

The Jémez Mountains and Redondo Peak figure in other Navajo oral traditions as important places within the Navajo construction of the landscape as memory. On the one hand, these stories are important vehicles for encoding information about the physical appearance and resources available at these locations (e.g., **Coolidge and Coolidge 1930**). More importantly, in many stories, mention of these summits is independent of their geographic location. They are important because they help perpetuate the memory of the cultural history of the Navajo people since time immemorial. These stories explain how the world and the people became what they are today. **Leland C. Wyman** (**1962**: 78–80) observes that these narratives emphasize the underlying importance of locality and the even greater significance of the movement of characters in Navajo oral traditions. They also remind the Navajo of the spiritual obligations for living properly, which may include ritual use of the Jémez Mountains generally, and the Valles Caldera specifically, both now and in the future.

Table 9.2. Symbolic Associations for S*isnádjiní*, the Navajo Holy Mountain of the East (adapted from Reichard 1963:Chart 1).

Mountain attribute	Associated symbol
color:	white
fastened by:	lightning
covered by:	daylight, dawn
jewel:	whiteshell, whiteshell with belt of dark cloud
bird:	pigeon, white thunder
vegetation:	spotted, white corn
sound:	thunder in young eagle's mouth
peopled by:	Rock Crystal Boy, Rock Crystal Girl, Whiteshell Boy, Whiteshell Girl, Dawn Boy, Dawn Girl
moved by:	spotted wind
extra gifts:	white lightning, dark cloud, male rain, white corn
guardian deity::	*xa´ctc´é´δγan*

For example, in his account of the Navajo Creation Story, **Hasteen Klah** (**1942**) refers to *Nehochee-otso*, a large hollow place on the top of the Jémez Mountains where *Tseh-nagi* (Rolling Rock) lived. This monster was "a great striped rock which could roll very quickly in any direction, and killed people by rolling on them" (**Klah 1942**:71). The story of the destruction of Rolling Rock establishes that the Navajo view the Jémez Mountains as a portal between the natural and supernatural worlds of the cosmos:

> *Nayenezgani, the Hero Twin Monster Slayer, traveled to the Jemez Mountains to kill Tseh-nagi in his quest to rid the world of the monsters that plagued the people. When Nayenezgani tried to approach Tseh-nagi, the Rock began to roll towards him and he shot his lightning arrow at the Rock from the east, but could not hit it, and the Rock then rolled back to its den. Then Nayenezgani shot at it from the south and managed to knock a little splinter from it while the Rock pursued him. He then approached the Rock from the west and the same thing happened, and also from the north, and at the end he only managed to knock off a few pieces and could not injure it, and meanwhile it kept chasing him while he was barely able to avoid it.*
>
> *At his home at Huerfano the magic kehtahn [prayer stick] began to burn very brightly, which showed that Nayenezgani was in great danger. So they [other immortals] sent hail, big rain, and cyclones to attack the Rock. And the water soaked it, and Hashjeshjin [the Fire God] burnt it with his fire, and then hit it with a stone knife, and large pieces were broken off it. The Rock tried to escape them, but they chased it into a mountain from which it burst out as though from a volcano, and finally they chased the Rock four times around the earth, while it grew smaller and smaller, until at last it fell into the Grand Canyon, where it is now (**Klah 1942**:93–94).*

In her account of the Mountainway origin story, **Mary C. Wheelwright** (1946:78–79) reports that the Jémez Mountains are the place where the Youth, who has become a medicine man, visits the Kisahni (a Pueblo group that Wheelwright identifies as the Hopi in a sidebar). Here he finds two individuals, who learn the Tohe ceremony that he performs during his visit:

> *The medicine man said to these two that they must have ceremonies given over them before they could be medicine men, and have the Jish or medicine pouch. They said they would have these ceremonies up on Tsilth Klizhin, the Dark Mountain (Jemez Mountain). So all the Kisahni People left their homes to go to this place, and there they built a hogahn with twelve upright posts. It was a very big hogahn called Taytah-haskahni. After this was finished they built another hogahn for the cooking of food during the ceremony, and sent someone out to collect herbs and everything needed for the Wohltrahd, and wood to make the Tse-panse hoops; so now they were prepared to start the ceremony that night (**Wheelwright 1946**:79).*

The Jémez Mountains are also the setting where two *akananillis* (Meal Sprinklers) depart in the Mountainway origin story (**Wheelwright 1946**; **Wyman 1975**). The runner who goes to the west to the White Mountain Apaches is Asheen Tsiskai, whose name derives from the fact that "he was a racer on the plains and valleys, running from the Dark Mountain [the Jémez Mountains] down the valley to the south, and then north to Debehentsah before the sun rose in the morning" (**Wheelwright 1946**:80). The other runner is Kah-jes-tyinee (Sleeps to Noon, [a.k.a. Valley Boy]), who is believed by all Navajos other than his grandmother to be a lazy youth but was transformed into a perfect young man by being named a Meal Sprinkler. Kah-jes-tyinee variously runs east or north to the Jicarilla Apaches and the Río Grande Pueblos in different accounts of the Mountainway origin story (cf. **Wheelwright 1946**; **Wyman 1975**).

Wyman (**1975**:238) identifies the Meal Sprinklers' starting place as "behind Black Mountain." This place-name is a likely reference to the Jémez Mountains in general and may even refer more specifically to the Valle Grande, which is "behind" the Jémez Mountains.

According to **Wyman** (**1975**), when recounting the details of his journey, Valley Boy speaks of his visits to the Pueblos of Santo Domingo and Zía to obtain these communities' pledges to arrive back home before the close of the Mountainway ceremonial. On the last leg of his journey, Valley Boy (a.k.a. Sleeps to Noon [Kah-jes-tyinee]) ran from Zía Pueblo up into the Jémez Mountains, climbed its summit (possibly Redondo Peak), and visited a supernatural being before returning to the race's starting point.

> *Next he set out towards the Black Mountain range again, and required much time before he arrived at its base. He went up to the summit, where he found a narrow canyon and came to a waterfall. Suddenly the Ye'i granduncle gave his call. He descended down into the canyon and there called to him with his whistle. He [Valley Boy] entered his [the Ye'i's] home . . . (**Wyman 1975**:240).*

Wheelwright's (**1946**) version of the Mountainway origin story concludes when Kah-jes-tyinee returns to his people in the Jémez Mountains. He arrives just before his counterpart, Asheen Tsiskai.

The Navajo traditionally re-enact parts of these narratives both symbolically and literally. **Wheelwright** (**1946**) notes that *Akananillis* go out on the ninth (and last) night of the Mountainway ceremony to summon the people to the corral dance in a symbolic recreation of this tale. **Richard F. Van Valkenburgh** (**1940:9**) reports that one Navajo tradition keeper, Maríano Chávez of Torreon, once told him about a man who ran from the Chuska Mountains to the Jémez Mountains and who started building a number of rock shrines along the way.

Matthews (**1887**:451) describes prayer sticks, made "of nothing more than a few sticks and feathers, with the occasional addition of strings and beads" used as offerings in the Mountainway and other ceremonials that recall the origin

stories. He includes an illustration of a prayer stick that belongs to:

> *. . . klèdji-qaçàl, or chant of the night. It is sacred to the Youth and the Maiden of the Rock Crystal, divine beings who dwell in Tsisnàtcini [sisnádjini], a great mountain north of the Pueblo of Jemez (**Matthews 1887**:452).*

Matthews' figure caption explains:

> *The original is in the National Museum at Washington. It consists of two sticks coated with white earth and joined by a cotton string a yard long, which is tied to each stick by a clove hitch. A black bead is in the center of the string; a turkey feather and eagle feather are secured with the clove hitch to one of the strings (**Matthews 1887**:fig. 58).*

In his discussion of Windway repertoires, **Wyman** (**1962**) reports that Horizontal Black Belt (*sisnádjiní* [Redondo Peak?]) was the home of a Talking God, while the Black Range (Jémez Mountains) not only was shattered by Thunder, but was the home of the Black Ant People. In reference to the part of the Windway myth concerning cotton chord divination, **Wyman (1965)** notes that Horizontal Black Belt was one of the homes of the Small Bird People. He repeats the association of the Ant People with the Black Range in his retelling of the Red Antway ceremonial.

The Blessingway repertoire mentions both the Jémez Mountains and the Valles Caldera. Through his documentation of three versions of the myth, Wyman reveals that the Navajo view the Jémez Mountains as the home of Bear, a potent symbol of wisdom (**Wyman 1970**:330, 456). In his version of the Blessingway myth, River Junction Curly (in **Wyman 1970**:554) refers to a place called "the Hollow Gap at the upper end of Black Mountain (Jemez Range)" when telling of Monster Slayer's destruction of the monsters that plagued the people. Based on this description, "Hollow Gap" might refer to the Valle Grande.

Later in his account, River Junction Curly tells about Monster Slayer and the Twelve Roaming Antelopes (which were terrible beasts that killed people) at Dark Mountain (the Jémez Mountains) (in **Wyman 1970**:569–571). Monster Slayer gave chase to the Twelve Roaming Antelopes with the intent of destroying them to rid the world of their evil. Klara B. Kelley (personal communication, Gallup, NM, 2003) speculates that Monster Slayer might have trapped the Twelve Roaming Antelopes in the Valle Grande. Kelley suggests that the caldera symbolizes a primordial antelope trap.

River Junction Curly's story is notable because it tells that Monster Slayer spares the terrible antelope beasts after receiving their word that they will become peaceful game animals that humans can hunt for food (**Wyman 1970**:570–571). In doing so, this narrative not only explains the origin of the antelope as docile game animals, but also places their original home in the Jémez Mountains.

Haile (1947) reports that toward the end of the third day of the Shootingway ceremonial, the singer recites a prayer for each of the eight sticks that he makes. Haile recounts the basic prayer and provides a synoptic summary of additions, including mention of the Jémez Mountains:

> *Additions to this prayer are concerned with place names of Shootingway and holy young man: may good conditions come to me from jarring mountain; from rock extending to the skies…from trees extending up the mountain side… from floating feather, Jemez range and other Shootingway localities (**Haile 1947**:170).*

Water

Water resources, such as ponds and springs, are portals to the underworld through which blessings pass into the supernatural realm of the cosmos. In return, the spiritual powers provide their assistance to the natural world by bringing forth water from the underworld, which is the source of all life-giving moisture in the cosmos. The Pueblo, Navajo, Apache, and Ute associate lakes, springs, rivers, and clouds with supernatural beings (**Basso 1996**; **Carmichael 1994**:91–93; **Ellis 1964**:32; **Hillstrom 1998**; **Kelly and Francis 1994**; **Ortiz 1969**; **Romeo 1985**). Each of these groups views these water sources as conduits fed by the great underground ocean that is the source of all moisture in the natural world (e.g., **Parsons 1996 [1939]**; see also **Hewett and Dutton 1945**:29). The underworld is manifest variously as breath, wind, clouds, rain, snow, seep moisture, spring water, and rivers. Cloud flowers grow over mountains. Springs feed ponds found below the summits of the mountains of direction. Rivers are umbilical cords from the mountains, through which the underworld helps sustain life energy in the living world (after **Anschuetz 1998b**:450; see also Simmons 1969:39). Consequently, water is a powerful ritual medicine (**Ellis 1956**:56–57; **Parsons 1996 [1939]**:352, 416, 453–454)

The people of Jémez Pueblo look to their Northern Mountains (i.e., the Jémez Mountains) as "the home of the flowing water" and "the perpetuators of rainfall" (**Weslowski 1981**:122). Collectively, the lakes, springs, rivers, and clouds associated with *Wavema* symbolize the cardinal direction *North* and are referred to by a ceremonial name that translates as "North…side where the sacred water stands" (**Harper 1929**:Section 2, p. 9).

The Jémez also consider springs to be "the doorways to the homes of the clouds" (**Weslowski 1981**:123). While all springs are highly revered, those associated with *Wavema* in the south-central part of the Valles Caldera are held with even greater regard as shrines. "Springs located on the mountains are utilized along with the very sacred shrine at the top" (**Weslowski 1981**:117). In addition, springs along Redondo Creek, which drains from *Wavema*, are visited regularly "by societal groups or individuals for the offering of prayer. Young men who train in the mountains as ritual runners sometimes bath in some of these pools as well" (**Weslowski 1981**:117).

Besides the springs directly on Redondo Peak, the hot springs within the Valles Caldera contribute to the area's significance and justify the need by the Jémez for continuing ritual pilgrimage (**Harper 1929**:Section 2, p. 33). Weslowski reports:

*There are hot mineral springs to the north and west of Redondo Creek that have long been used for therapeutic purposes…One Jemez consultant recalled that other Indians (Pueblo and non-Pueblo) came to these baths as well, some traveling for very long distances (**Weslowski 1981**:117).*

Laurie Collier Hillstrom (**1998**) includes a Ute story titled "Smoking Waters" that talks about Ute cosmology and the origins of hot springs. Although this passage does not identify the Valles Caldera, the account explains why the Ute groups, which briefly visited this locality for seasonal hunting on a stop over place during their journeys from the north to Santa Fe and the Río Grande Valley, would have been drawn to the area's hot springs. According to their oral traditions, mountain hot springs possess the power to soothe the sick and the weary and heal the wounded because they are a gift of love and peace made by a medicine man who did not wander from the proper path of living in accordance with Ute cultural traditions.

As discussed in chapter 5**,** the Jémez are known ethnographically to collect water and other products found alongside streams, ponds, and springs at Redondo Peak for use in rites back in their communities (e.g., **Ellis 1956**:67, **1964:32**; **Friedlander and Pinyan 1980**:28; **Weslowski 1981**:114, 115). Navajo traditionalists are also known to have collected water from their Holy Mountains of the East and South (**Reichard 1963**: 452–453; **Sleight 1950**:380–381; **Wyman 1970**:20), which might include Redondo Peak.

Caves

As is illustrated in figure 9.3, caves are another of the portals of communication between the natural and supernatural worlds that are closely associated with mountains. Perceptible air movement in and out of caves is understood as the earth breathing (Brunnemann 1995:29; Schaafsma 1987:4; see also Simmons 1982:8). Grottoes are connected physically and metaphysically by passages through the underworld (e.g., **Curtis 1926**:172; Usner 1995:16; see also Evans et al. 2001:33; **Page and Page 1982**:187). Also, people emerged from the world below through openings in the earth's crust.

Florence Hawley Ellis (**1956**:57) reports that hunters from the Pueblos of Jémez, Santa Ana, and Zía formerly hunted deer in the high country of the Jémez Mountains, including the Valles Caldera. Some hunts were made by men from the individual Pueblos; others by hunters from two or three Pueblos. When the hunts involved men from all three communities, the participants visited shrines maintained at caves and springs within their shared hunting territory. The different Pueblo communities customarily took turns directing the hunts and leading the requisite ceremonies in a cave, which was marked with an eagle on its ceiling. Although Ellis does not specify the cave's location, the great importance of the Valles Caldera to each of these communities suggests that the grotto was near Redondo Peak.

Ellis further offers useful ethnographic detail about the ritual pilgrimages by the members of the Jémez Underworld Chiefs Society into the Valles Caldera. The society, consisting ideally of 12 members, is a highly secretive organization that relies heavily on seclusion.

*Their name refers to their relationships with the underworld. They use underground chambers, such as hidden caves beneath waterfalls or high in the mountains, for initiations, and shrines, although their meetings are held in the home of their chief in the village. Springs or lagoons, the home of their patron, the plumed serpent, also are used as places of initiation, for the society members are supposed to associate with the supernaturals of the underworld in springs and caves and to prophesy the future for the Pueblo, on the basis of what they have seen below the water or on the walls or floors of caves, or of what they have heard in such underground contacts (**Ellis 1964**:32).*

Despite the secrecy of these rites, Jémez Pueblo pilgrimages to Valles Caldera area caves were general knowledge. Writing a general interest piece for *New Mexico Magazine*, Betty Woods says that the Jémez were avid piñon nut hunters. Further, the community's medicine men went into the canyon lands below Vallecito "to gather herbs and mix their wonder-working potions…we can suppose that ancient Indian medicine men came to the same canyons for their healing herbs and went to the caves for ceremonial making of medicine" (**Woods 1942**:30).

Volcanoes, Calderas, and Lava Rock

There is no specific mention of the Valles Caldera in the available ethnohistorical or ethnographic literature concerning traditional Native American and Hispanic community beliefs about volcanoes, calderas, and lava rock. Nevertheless, there are several Pueblo, Navajo, Apache, and Hispanic references suggesting that the Valles' volcanoes, calderas, and lava rock contribute to the landscape associations of several Native American communities.

Among Pueblo and Navajo communities alike, giants, witches, or gigantic monsters variously terrorized the people far back in time. These groups consequently sought the assistance of the Warrior Twins who, in those days, were living among the people (**Curtis 1926**; **Cushing 1896**, **1920**; **Kelley and Francis 2002**; **Reichard 1963**;**White 1935**). The warriors chased the giants and fought them. When they finally killed the evil beings, the people saw nearby volcanic peaks and their caves belch smoke, if not also lava and fire, which hardened the earth (e.g., **Curtis 1926**:172; cf. **Cushing 1896**:398, **1920**:32–33).

These oral traditions indicate that lava, whose flows are traceable from definable peaks, is associated with water, moisture, life's essence, and movement. First, when people emerged onto the surface of the living world, they found it was still moist (unripe), moving or flowing, and in need of hardening so the people might occupy the land (Cushing 1967:14 [1883]). Second, at least some Río Grande Pueblos conceptualize flowing lava as "hot water." For example, the Tewa tell a story that fire and water flowed from the volcanic peaks

at Black Mesa (between the Pueblos of San Ildefonso and Santa Clara), Cabezón Peak in the Río Puerco Valley of the East, and Tsimayo in the Santa Cruz Valley after the Warrior Twins killed one of the monsters that stalked the earth (after **Johnson 1995**:300; see also **Cushing 1896**:398 for a similar story maintained by Zuni Pueblo). Third, Zuni Pueblo and Navajo people characterize lava flows as the hardened blood that gushed from the lethal wounds inflicted on the giants by the Warrior Twins (**Cushing 1896**:398–399; **Kelley and Francis 2002**:5.21–5.23; **Reichard 1963**:22).

Considered as an assemblage, these accounts indicate that Native American groups have long recognized that lava once was a flowing liquid. Moreover, they interpret the patterns of movement frozen in the rock in terms of the flow of water that they observe in streams and rivers in their everyday lives. Through this system of associations, lava beds combine with mountains, water, and caves in the communities' knowledge of their landscapes to form complex interwoven cosmological relationships that help explain the ideas of breath, center, emergence, movement, and connectedness.

Kelley and Francis (**1994**:125) state that volcanic calderas "are important in the songs, prayers, and stories of many ceremonial repertoires that involve the power of thunder and lightning (which seeks depressions and lava rock) and wind." The association of calderas with thunder and lightning is of additional interest, given the rumbling and fiery explosions associated with some volcanic eruptions.

Concerning the topic of lava rock, Pueblo tradition-keepers consider this resource to possess essential spiritual qualities. In some instances, lava beds and flows define places of worship (**Anschuetz 2002b**:3.31–3.32). Lava beds, and the lava tubes that occur within them, are important because they simultaneously serve as arrays and portals for communication with the powerful spiritual beings, the deceased, and the souls of "people and animals yet to come" (Weahkee 1997:2; see also Phillip Lauriano, in Brunnemann 1995:29 and in Schwingendorf 1995:1). Within holy places on their landscapes, exposures of lava rock can contribute to the healing properties of these locations (**Anschuetz 2002b**:3.31–3.32; after **Naranjo and Swentzell 1989**).

Navajo informants similarly disclose that basalt is the best type of rock for use in their all-important sweat lodge rituals (**Kelley and Francis 2002**:5.23). The special quality of lava rock derives, in part, from it association with the blood of the monsters killed by the Warrior Twins.

Western Apache ethnographies provide references to the power contained within volcanic rock. For example, among the Cibecue Apache "a large lightweight red pumice stone was kept at one camp to ward off lightning" (Buskirk 1986:106). Other associations of rocks of volcanic origin as protection against harm include the observance among the White Mountain Apache of people placing obsidian "at the four corners of a field to keep away lightning and 'bad things' " (Buskirk 1986:106).

Some traditional Hispanic community groups use volcanic rock to adorn local graves, shrines, and churches (Jaime Chávez, in Hartranft 1989). This material also is favored for ritual hearths and sweat lodges (**Anschuetz 2002c**:7.22). These practices demonstrate "a spiritual connection between the community and lava rocks" (Brunneman 1997:51). As explained by some consultants, the steaming rock used in sweat lodges refers to "breath of our ancestors" (Pablo A. Lopez and Phil Crazy Bull, letter to Steve Thomas, Open Space Division, City of Albuquerque, October 24, 1997, in **Anschuetz 2002c**:7.22).

Shrines

In her discussion of shrines and other special power points that Pueblo people characteristically build on their landscapes, Ellis (**1994**:104) offers several relevant observations about how traditional communities generally interact with such features. Foremost, "shrines clearly are central to the practice of Pueblo religion, whether located within the village or at a distance." She adds, "Communication with Earth Mothers and other types of [supernatural beings]…is primarily through shrines. They are locations where the spirits are believed to be at hand, or possibly live, thus a shrine area may be small like a sipapu in a kiva or quite large" (**Ellis 1994**:103). In this definition, Ellis implicitly refers to the ideas of center, healing place, and the healing process that Pueblo authors (e.g., **Cajete 1994**; **Naranjo and Swentzell 1989**) identify as critical to understanding their communities' traditions and relationships with the land and its resources. That is, careful consideration of "rightful orientation" (after **Cajete 1994**:37) within the complexity of Pueblo understandings of breath, center, emergence, movement, and connectedness imbue places with special qualities, such as (but not necessarily limited to) sacredness, and mark them as middle places or shrines.

First, among traditional communities that prescribe to landscapes as memory, physical visits to places for communication with the supernatural realms of their cosmos are not a precondition for sustaining the special quality of these locations. Second, buffer areas that are "necessarily and consistently" (**Ellis 1994**:110) free from trespass are required to maintain the sanctity of the power points that the people perceive and sustain on their landscapes. Finally, **Ellis** (**1994**:104) observes, "Shrines that have fallen out of present use remain sacred and revered, since each shrine is like a telephone receiver, whose line communicates with the supernatural switchboard even when rarely employed. Each shrine contains a sacred power to be respected and never desecrated." Shrines are loci of powers until they are destroyed or their vital contextual associations that are inherent to the place they occupy are altered (see Hubert 1994:12).

When **Ellis** (**1994**) characterizes shrines as places "where the spirits are believed to be at hand" and recognizes that shrines are not defined by size or construction criteria, she departs from traditional materialist anthropological constructs (e.g., Fewkes 1910:558) that view shrines as formally defined features (either by geology or cultural construction) within which people physically deposit sacred offerings or erect certain kinds of markers. Rather, Ellis contributes to a refined anthropological definition of shrines that recognizes (1) that the prayers directed outward from the community's centers

represent offerings, and (2) the idea that whole localities can be understood by the people as special places where communication with the supernatural powers of the cosmos can converge, transform, and reradiate outward.

The best known constructed Pueblo shrine within the Valles Caldera is on top of Redondo Peak. U.S. Surveyor **William Boone Douglass** (**1917**) first reported this feature and provides a comprehensive description (**1917**:357–362): two sketch maps (**1917**:figs. 7 and 8), and two photographs of the shrine, which he designates as the "La Sierra de la Bola shrine" (**1917**: figs. 9 and 10). He describes finding a broken metate at the shrine during his visit, and tells of a local Hispanic resident who found a heavy cast silver ornament buried within the feature (**Douglass 1917**: fig. 6), which apparently resembles styles made at the end of the seventeenth century. This latter offering suggests that area Hispanics might also have made solemn pilgrimages up this mountain, just as they still do at *Tsikumu*.

Douglass (**1917**:358) reports that people from the Towa Pueblo of Jémez, the Keres Pueblos of Cochití, Santo Domingo, and Zía, the Southern Tiwa Pueblo of Sandía, and the Tewa Pueblos of San Ildefonso, San Juan, and Santa Clara are known to visit the shrine "every year during August." **Ellis** (**1956**, **1974**:157) subsequently added the Keres Pueblos of San Felipe and Santa Ana, and the Tewa Pueblos of Nambé, Pojoaque, and Tesuque to this list of Pueblo communities that made pilgrimages to the summit of this peak. She further implies that the Navajo made use of the Pueblo shrine for their own purposes.

Joe S. Sando, the well-known Jémez Pueblo historian, notes that the shrine on the crest of *Wavema* (Redondo Peak) is only one of the most important shrines outside the core area of Jémez Pueblo owned by the community. He describes the parcel: "a 'generous' area, four feet by four feet, [1.2 by 1.2 m] is set aside by the 'benevolent' owner [i.e., James Patrick Dunigan] of the surrounding timber and grazing area. The only reason it is set aside is that it contains a visible shrine" (**Sando 1982**:11).

Douglass (**1917**:344–357: figs. 1–5) provides a comprehensive description and illustration of the other widely known shrine located on the top of Cerro Chicoma, just outside the northeast corner of the Baca Location. Pueblo and Navajo communities alike visited this shrine, just as they did the one atop Redondo Peak, through at least the mid-twentieth century. Douglass states that the directional orientation of the six trails (*awu-mu-waya* ["rain-roads"]) radiating from northeast to south out of the shrine's center represent the spirit trails and pilgrimage routes of the Pueblos of Taos, San Juan, Santa Clara, San Ildefonso, Cochití, and Jémez. The final opening, which leaves the shrine from the northwest, represents the pathway through which the Navajo visit this holy place. At the very least, the Jémez and the Navajo usually would have needed to cross the Valles Caldera to access this holy place during their pilgrimages. The presence of a nearby rock cairn and wood cross demonstrates that local Hispanics climb this summit to make their own prayers and offerings (Author's personal observation, Río Grande Foundation for Communities and Cultural Landscapes, Santa Fe, 2001).

Available ethnographic accounts for the Jémez (e.g., **Ellis 1956**, **1964**; **Weslowski 1981**) refer to the presence of many more community shrines throughout the Valles Caldera. The specific physical attributes and the locations of these features, however, are not known by outsiders. **Ellis** (**1956**:56–58) notes that the members of particular societies, such as the Underground Chiefs Society, built and maintained some shrines. The participants of communal hunts consisting of men from the Pueblos of Jémez, Santa Ana, and Zía jointly used other shrines, and individuals from the community privately made prayer places for their own purposes.

Although they do not mention either Redondo Peak or Cerro Pelado specifically, Richard F. Van Valkenburgh and Scotty Begay (1938) discuss Navajo shrines and the kinds of offerings the people typically leave in them. Their account is broadly applicable to the kinds of healing places and types of offerings that the Pueblos would use in the Valles Caldera area:

> *Many types of shrines exist. Some are simple, while others are elaborate. Among the various types of shrines are stone cists or boxes, sealed enclosures, walled or unwalled springs, cienegas or pools, natural concavities and peculiarities in rock formations, caves, and rock shelters…and simple monuments of rough stone…*
>
> *In many shrines are found objects which have been either transported to or are natural parts of the shrine and become a part of the shrine itself. In some instances these act as altars or receptacles for altar paraphernalia. Some of these are boulders with natural or worked concavities, incised or painted images or carved or uncarved wood or stone. Occasionally anthropomorphic or geometric figures are found on the walls or boulders of the shrine.*
>
> *Offerings made to these shrines may be practically anything: Prayer sticks of assorted types, semi-precious stones such as turquoise, malachite, lignite, or native jet, beads of these stones, native red and yellow garnets, obsidian and chert flakes, flaked implements, smooth banded stones, petrified wood, fossils, arrowshafts, lengths of reed and wood, stone and semiprecious stone fetishes, both painted and unpainted, metal objects, whole pottery vessels (sometimes as a stationary part of the shrine) and sherds, and very often simple monuments of rocks, twigs and branches of trees (**Van Valkenburgh and Begay 1938**:29–30).*

In a subsequent publication, **Van Valkenburgh** (**1940**:6,9) discusses another common Navajo shrine, *tsenadjihih*, whose name means "picking up and putting on stones." Although *tsenadjihih* are not as dynamic as shrines on the holy mountains or *kethan* (prayer stick) depositories, the Navajo revere these features and account for their origin in Blessingway mythology. One of his consultants told of a man who ran from the Chuska Mountains to the Jémez Mountains. "He picked up rocks and started a number of *tsenadjihih*. One is on the old Navajo trail by Jemez Hot Springs, and another is near Cabezon" (in **Van Valkenburgh 1940**:9).

Van Valkenburgh (**1940**:9) elaborates that Navajo made *tsenadjihih* and made prayers for success and luck "while

passing over a trail to some destination where he or she considers luck is needed…" He adds:

> *Turquoise and other sacred stones make the prayer effective, but an improvised prayer and offering will also work. Burned rocks are never placed on a tsenadjihih. Warriors used Yucca baccata leaves with the points directed toward their enemies. If the wind is blowing, a rock is placed over the twig to hold it on the pile. Nothing that has been struck by lightning, whirlwinds, or touched by snakes or bears should be placed on a tsenadjihih. It would bring misfortune (**Van Valkenburgh 1940**:9, emphasis in the original).*

Available ethnographic information indicates that the traditional communities do not view the sanctity of the Valles Caldera simply as a location for a series of individual, society, and community shrines. Instead, the groups that associate with Redondo Peak and the Valle Grande understand this landscape as a whole, as a center of communication between the natural and supernatural worlds. As Weslowski makes clear, the Valles Caldera itself is a shrine:

> *The mountain and the surrounding lands for some distance are recognized as a prominent religious location. Again, the Towa explain that the actual physical boundaries of the constructed shrine do not define the sacred value of this ritual location. Rather, the marker provides a symbolic point of reference for designating a large area as spiritually significant (**Weslowski 1981**:122).*

Trails

In 1851, the U.S. Army improved an existing road between Santa Fe and the Valles Caldera, a distance of 40 miles (64 km), to facilitate the transport of hay harvested in the Jémez Mountains to supply Ft. Marcy (chapter 5). This road crossed the Río Grande at present-day Buckman, ascended the Pajarito Plateau via Mortandad Canyon, and traversed the Sierra de los Valles through Cañon del Valle. Similarly, chapter 8 discusses the contract between Maríano Sabine Otero and the Santa Fe business community in the early 1900s to rebuild the old military road through the Cañon del Valle Pass, as well as several other unimproved trails. Otero claimed that this effort would benefit both the Jémez Springs and Santa Fe communities, as well as his sulphur mining operations at Sulphur Springs. Additionally, chapter 7 mentions that in 1935 the Civilian Conservation Corps built the graded road between Los Alamos and Cuba to free commercial loggers from the great capital investment of having to lay railroad tracks as a precondition to opening forests for timbering. The interested reader should also see Craig Martin's (**2003**:xv, 18, 22, 49) history of the Baca Location for examples of maps showing sections of major historic trails.

Each of these observations and maps is important in tracing the foundations of commercial development of the Valles Caldera over the past 150 years. The documentary record, however, is generally silent (beyond the cursory mention of "unimproved" pathways) about the presence and use of the many trails used by local Native American and Hispanic residents in their occupation of this locality. Even in his famed map of 1779, cartographer **Bernardo Miera y Pacheco** (**1779**) showed no established routes providing access to the Valle de los Bacas (Valley of the Cows).

As the present discussion illustrates, the Valles Caldera has been a focus of significant human occupation for millenia. Still, most of the physical pathways or trails used for economic, social, or cultural practices are invisible now, even to a trained eye. **Carrillo and others** (**1997**:132–133), however, report that Tewa populations in the seventeenth and eighteenth centuries used a trail that started in Santa Clara Canyon to reach Navajo and Hispanic communities to the west and north. Apparently used only during the warm season, this upland route allowed travelers to avoid flooded areas along the Río Chama valley.

> *The trail left Santa Clara and traveled up the Cañada de Santa Clara to the headwaters of the canyon near Tsichoma Peak. From here the western branch of the route briefly headed in a southwestern direction and then down the Río de los Indios to the Río San Antonio. The Río San Antonio is located in the Valle de San Antonio across the northern third of Baca Location Number 1. This creek continues in a western direction toward the western edge of the Jemez Range. At one point a traveler can turn off this western branch and head south toward San Diego Canyon at Jemez. The other branch of the trail continues northward to Río del Oso, passes San Antonio de los Vallecitos, and swings in a western direction toward Polvadera Creek where it continues in a northern direction along the creek until it reaches the Piedra Lumbre Valley. A traveler can branch off the trail at Vallecitos and travel in a northerly direction (**Carrillo et al. 1997**:133).*

In his account of the shrine on top of Cerro Chicoma, **Douglass** (**1917**) reports that there also exist many spirit trails throughout the Jémez Mountains. Although many spirit trails do not leave a physical track, they are significant features in the cognitive maps maintained among the Native American communities that include the Valles Caldera in their constructions of landscape as memory.

For example, **John Peabody Harrington** (**1916**) provides sufficient information about the linguistic structure of the Tewa language concerning the ideas of breath, water, people, and pathways. This suggests that Tewas (and likely other Pueblo people) conceptualize the movement of people and their breath along trails as a phenomenon analogous to the movement of water along a stream course. Recent ethnographic study at the Petroglyph National Monument on Albuquerque's West Mesa makes clear the associations between spiritual trails, volcanic mountains within holy places, and the caves and lava outcrops associated with these summits (**Anschuetz 2002b**:3.33–3.34). Together, these features represent key parts of an interrelated communication nexus between the natural and supernatural realms of the cosmos. Several other observers report that the souls of the deceased and the prayer blessings of people travel along spirit trails (Brody 1998:26; Evans et al. 2001:17; Weahkee 1997:7). Ethnographic evidence suggests further

that within this system of belief, key mountains within holy places (such as Redondo Peak and Cerro Chicoma) serve as obvious guideposts and visual markers for people, their blessings, and the souls of the dead in their journeys from the center to the periphery of their landscapes (after Evans et al. 2001:18). Based on ethnographic analogy explaining the function of the spirit trails radiating outward from the shrine on top of Cerro Chicoma (Dr. Richard I. Ford, personal communication, Museum of Anthropology, University of Michigan, Ann Arbor, 1991), the spiritual beings, their blessings, and the clouds follow these same pathways to those people who made prayers and offerings asking for assistance.

Plants, Animals, and Minerals

Chapter 5 reviews what little is known about specific vernacular plant gathering, game hunting, and mineral collecting activities of Native American and rural Hispanic communities that maintain associations with the Valles Caldera. Unquestionably, many of these activities, such as gathering piñon nuts, hunting deer and elk, and collecting materials for making pottery, have important economic functions. Nevertheless, each of these actions, in combination with gathering medicinal herbs, hunting eagles and other birds (**Tyler 1979**), and quarrying specific kinds of stones slabs for making *piki* griddles, relate to the web of relationships informed by each community's cultural-historical understandings of its landscape. Widely known (but rarely seen) pilgrimages that Pueblo of Jémez still makes into the Valles Caldera throughout the year demonstrate how the themes of breath, center, emergence, movement, and connectedness motivate and inform a host of highly specific land use activities.

The harvest of particular plant, animal, and mineral resources from certain locations for use on site, at some distant shrine, or back in a community center might be dictated by the need to perpetuate timeless traditions in accordance with a group's construction of its landscape as memory. The people bring the life energies of material resources from the distant realms of their natural world to mix with those of their communities' centers as a part of pilgrimage and through the characteristic act of carrying certain plant and animal products back to their villages (after **Swentzell 1991**). Community members give new life energies in exchange for those they harvested from their landscape's periphery. Their intent is to preserve the whole of the cosmos by using selected products from particularly revered locations in village ceremonies (after Anschuetz 1992). The significance of such plant, animal, and mineral products, therefore, might derive exclusively from their association with the Valles Caldera generally, or from one of its many defined landscape features, such as Redondo Peak.

To re-emphasize: the significance of plants, animals, and minerals for use within constructions of landscape as memory is contextually dependent. The differing bodies of traditional knowledge sustained among—and within—each of the associated communities defines the significance of certain products and the need of access to these products at particular times and places within the Valles Caldera. Consequently, the culture-history of many land use activities defies generalization based on Western criteria for floral, faunal, and geological classification.

Lastly, there are suggestions in the available ethnographic literature that some communities introduced corn to the Valles Caldera to fulfill their obligations. For example, W. W. Hill discusses ritual actions associated with the induction of a Navajo headman into office during the Chief Blessingway:

> *According to Slim Gambler, it was customary for the newly elected man to journey to the four sacred mountains and plant corn at each one. White corn was planted at Pelado Peak (Blanco Peak) in the east, yellow corn at Mt. Taylor in the south, blue corn at the San Francisco Peaks in the west, and variegated corn at the San Juan Mountains (La Plata Mountains) in the north (**Hill 1940**:27).*

This account, therefore, suggests that some headman initiates from Navajo communities might have ritually planted corn in the Valles Caldera.

Summary and Conclusions

The land use history of the VCNP was motivated, organized, and lived through two contrasting views of the world. The perspective constructs landscapes of memory and dominates the available documentary record that was imposed across the northern Southwest with the beginning of European colonization in the late sixteenth century. These accounts characteristically view history and landscapes in terms of enduring images inscribed on the land. Moreover, the Western world view tends to cast history as a series of completed events that we can learn from—and build upon—to avoid the mistakes of those generations that preceded us.

In comparison, Native American communities, whose existence predates the establishment of the Spanish colony of Nuevo Mexico in 1598, maintain traditional histories and cultural identities that construct landscapes as memory. Hispanic groups that have incorporated aspects of the Native American world view into their own landscape understandings through the processes of *mestizaje* and syncretism also construct landscapes as memory. In this world view, age-old traditions underlie the construction of mental maps whose temporal and spatial dimensions are defined by moral principles that project the past into the present and future. Members of these communities live their history to repeat the positive lessons that their ancestors learned in their lifetimes rather than viewing the past as a resource for learning from previous generation's failings so that humanity may avoid commiting the same mistakes in the future.

Documentary accounts usually trace the land use history of the Valles Caldera in terms of the rights that specific individuals obtained and exercised during their respective tenures as owners of the Baca Location. Therefore, most of the preceding chapters in this volume (chapters 3—sketch of documentary history, 4—history of the Baca Location, 6—ranching history, 7—industrial timbering history, and 8—industrial mineral extraction and geothermal exploration history)

implicitly embrace a landscape of memory perspective. The constructions of the pre-Columbian past (chapter 2) and the history of vernacular plant gathering, game hunting, mineral collecting, and agriculture (chapter 5) focus primarily on topics concerning economic activity. These narratives necessarily ascribe to a view of history as a series of distinctive events and patterns of activity. Most attempts to break out of this perspective fail because transitory activities do not leave a lasting footprint on the ground for archaeologists to observe later. Further, the secrecy that still surrounds the practice of some culturally significant land use activities poses an additional obstacle to the comprehensive evaluation of traditional land histories. Consequently, the examination of relationships sustained over time and maintained among seemingly disparate actions is minimized.

This chapter has examined several interrelated themes basic to understanding how traditional Pueblo, Navajo, Apache, Ute, and Hispanic communities have occupied the Valles Caldera across the generations and into the present through constructions of landscapes as memory. These themes, which are based on cultural rather than economic precepts, encompass commonly shared ideas about breath, center, emergence, movement, and connectedness.

After establishing a generalized cultural framework for addressing constructions of landscapes as memory, this discussion then considered selected landscape elements within the Valles Caldera. These features, which include mountains, water, caves, volcanoes, calderas, lava rock, shrines, trails, plants, animals, and minerals, serve as focal points for physical and metaphysical interaction. The assertion that landscapes constructed as memories constitute a dynamic cultural process is demonstrated through the consideration of how traditional communities are known ethnographically to have interacted with these landscape elements. In combination, these discussions establish the foundations for an understanding of how associated traditional communities sustain culturally important relationships with the Valles Caldera that require the continuance of certain age-old land use traditions.

Evaluation of traditionally associated communities' land use histories and practices warrants consideration of several interrelated issues. These concerns, which recognize that the natural environment is more than just an economic resource, follow.

Communities understand themselves to be integral parts of a living historical-ecological process in which the people are as much of a part of the land as the land is part of the people over time. Communities project their sense of soul onto the Valles Caldera landscape. The Valles Caldera, therefore, is more than a geographic place that communities visited to obtain various material resources. It is an essential part of peoples' histories and cultural identities.

Communities maintain a refined system of cultural logic that places great emphasis on orientation within a matrix of intertwined geographical and cosmological referents. Communities view the Valles Caldera as a sanctified place imbued with spiritual qualities through this framework of ideas. The cultural importance of the Valles Caldera as a place that the people talk about in their origin myths dates back to the beginning of a community's history.

Many communities use the Valles Grande to define the geographic orientation their cultural landscape by associating the Jémez Mountains with some cardinal direction (e.g., North among the Río Grande Pueblos and East among some Navajo groups historically). They view the Valles Caldera as a conceptual periphery on their cultural landscapes in this process. Communities, in turn, use the Valles Caldera as a reference for establishing periphery to delimit their center.

Communities associate the mountains, springs, caves, shrines, streams, and the hollow of the Valles Grande with a borderland where the sky, the earth, and underworld intersect. The Valles Caldera is a place of power because it is a location where the objective world (i.e., the earth) meets the subjective realms of the cosmos (i.e., the heavens and the underworld). Communities characteristically include the Valles Caldera in a system of mythological belief about a timeless place where the past and future come together in the present (after **Naranjo and Swentzell 1989**:257; Tuan 1977:121).

The Valles Caldera is a symbol of a community's cultural traditions and history that inform the people of "how they became who they are" (after **Peckham 1990**:2). The Valles Caldera as physical place within the landscape evokes certain emotions and moral values (after **Ferguson 2002**:4.6) just as the stories that traditional communities tell about this place. As such, the Valles Caldera as a landscape feature recalls the communities' moral obligations to sustain their traditions to perpetuate their cultural identity into the future.

Communities interact with the Valles Caldera through offsite references in stories, songs, and prayers and periodic onsite visits through structured orders of cultural knowledge. Direct visits include game hunting, plant gathering, mineral and other resource collecting, and ceremonial pilgrimage. Hunting, gathering, and collecting expeditions, which might superficially appear to relate to mundane economic activity, might include a mix of important social and ceremonial action.

The cultural-historical significance of the Valles Caldera does not depend on permanent residence, large-scale land altering activity, or public ceremonial display. Temporary, small-scale expeditions for hunting, gathering, collecting, and pilgrimage to this place are important to many communities for maintaining and reaffirming their cultural identities.

Characteristically, there is variability among community members in their access to traditional cultural knowledge. No individual is likely conversant with the entire corpus of this wisdom. It is important to recognize this fact when addressing issues concerning the significance of Valles Caldera to traditional communities. Individuals associated with various societies and institutions within a particular community might have different understandings of the significance of landscape features and products. They might also stipulate the need to visit this place at different times and places for markedly contrasting purposes.

Outsiders might discount a community's cultural-historical construction of a landscape as memory if they impose their own objectified material reference on the Valles Caldera. For example, the culture-history of many land use activities defies generalization based on Western criteria for floral, faunal, and geological classification. As a landscape feature, the Valles Caldera represents an essential stage and symbol of a living cultural process that is not usually recognized by documentary histories that focus on the land use histories of particular environmental features and resources.

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CHAPTER 10.

Summary and Conclusions

Kurt F. Anschuetz

The land use history of the Valles Caldera National Preserve (VCNP) extends back in time thousands of years. Given the great length of time involved and the many culturally diverse communities—Native American, Hispanic, and Anglo-American—that have interacted with this place, it is not surprising that this history evidences tremendous technological and organizational variability in how people have used and constructed affiliations with the VCNP. Nonetheless, throughout this long history, the VCNP was, and continues to be, peripheral to major centers of residential settlement and areas of intensive economic land use.

The archaeological record is a principal medium for tracing the human occupation of the Valles Caldera before the arrival of European explorers in 1540 and the subsequent establishment of the Spanish colony in 1598 . Using artifacts and other durable material traces that survive the ravages of time (e.g., obsidian debitage, chipped stone tools, charred botanical materials, a few fragments of animal bone, and the remnants of stone fieldhouses), archaeologists have constructed a history of land use by Archaic period hunters and gatherers (5500 B.C.–A.D. 600) and pre-Columbian Pueblo Indians (A.D. 600–1600), who are among the forebears of the people of the Pueblo of Jémez and the other Pueblo communities (chapter 2).

Investigators cite the hunting of game, the gathering of plant resources, and the collection of obsidian for the manufacture of stone tools as the main reasons for the short-term, warm-season use of the locale.

Archaeological evidence also documents that Pueblo groups from the upper Río Jémez Valley farmed the Banco Bonito within the VCNP during the Classic Period (A.D. 1300–1600). In addition, by tracing the broad distribution of Jémez obsidian across the northern Southwest from archaeological sites dating to the late Pleistocene and the early Holocene, researchers infer that Paleoindians were the first people to visit the caldera.

As documented by Governor Juan de Oñate, who had passed through the Valles Caldera on his way from San Juan Pueblo to the Jémez Pueblo of Giusewa during the first years of his administration of the New Mexican colony, Spanish colonial authorities clearly were aware of this place (chapter 3). Even though the colony expanded its settlement reach following the Pueblo Revolt (1680–1692), the presence of Navajo raiders, who periodically raided Hispanic and Pueblo settlements near the Valles Caldera, were major impediments to the regular occupation of the VCNP during the Late Spanish Colonial period (1692–1821). Punitive military expeditions led to further exploration of this locality and its natural resources. As exemplified by the Miera y Pacheco Map of 1779, it is certain that this knowledge of the Valles Caldera and its rich grasslands had drawn the attention of New Mexican herders and ranchers by the third quarter of the eighteenth century. By 1800, Hispanics began using the lush grazing lands that eventually were to become the Baca Location No. 1 (Baca Location) and the VCNP.

The Mexican period (1821–1846) is notable in the Valles Caldera's land use history for two reasons. First, this period saw the introduction of a new cultural community to the Valles Caldera landscape: Anglo-Americans entered the area as trappers as part of a highly regulated trading partnership between New Mexico and the United States. The second was the Mexican government's issuance of two land grants, the Luis María Cabeza de Baca Grant (1821) and the Town of Las Vegas Grant (1835), that embraced the same acreage along the Gallinas River of north-central New Mexico (chapter 3).

The start of the U.S. Territorial period (1846–1912) saw the U.S. Army fighting the nomadic tribes of the Southwest and forcing them to settle on reservations. With the decline of threats by Native America raiders, Anglos and Hispanics began large-scale—although seasonal-commercial use of the Valles Caldera. The ill-fated hay-cutting expedition led by Santa Fe entrepreneurs Robert Nesbit and Hiram R. Parker in 1851 under contract to the U.S. Army was the first recorded commercial venture in this locality under the new administration (chapter 3). The questionable circumstances of both Nesbit and Parker's contract and their claimed losses following the attack of their haying party by a group of Navajo raiders was a harbinger of the self-interest profiteering that was to profoundly shape the Valles Caldera's land use history over the subsequent 150 years.

The overlapping Las Vegas land grant rights, created by Mexican authorities during their brief administration and subsequently confirmed by the U.S. Congress in 1860 during the U.S. Territorial Period, forever changed the legal basis of land use rights in the Valles Caldera (chapter 4). To resolve the land grant conflict, María Cabeza de Baca's heirs relinquished their Las Vegas claim in 1860 in exchange for U.S. Congressional authorization to select an equal amount of land in five square blocks elsewhere in the Territory of New Mexico. The first block they chose was the Baca Location in

the Valles Caldera, to which they formally received title in 1876 after the New Mexico Surveyor General completed the survey of the property.

These legislative actions transformed the Valles Caldera from an unspecified tract of "vacant land" to a legally defined entity known today as the Baca Location. With the conveyance of formal rights to Luis María Cabeza de Baca's heirs, executive, legislative, and judicial authorities viewed the Baca Location as consisting of occupied land, even though the property still would not support sustained habitation by anyone for decades. Moreover, through the issuance of legal title to the land grant, the land and its individual resources, including pasturage, timber, minerals, and game animals, gained formal status as properties over which the land grant's authorized owners alone controlled rights of access, use, and disposition (chapter 9).

The legal definition of the Baca Location as a land grant whose owners held exclusive property rights has had significant and lasting consequences. The first effect concerned access and use rights. Specifically, it was no longer legal for Native American communities and private entrepreneurs, such as trappers or hay cutters, to enter the Baca Location without consideration (chapter 5). The second consequence was that the land grant's owners possessed the right to sever particular access and use rights from the land (chapters 6, 7, and 8). The legislative actions of the U.S. Congress rendered obsolete the traditional aboriginal view that the Valles Caldera was a place imbued with certain inseparable qualities whereby resources, including the land, water, plants, animals, and minerals, obtained meaning in relationship to one another (chapters 5 and 9). The definition of the Baca Location, built on the Western idea that the land and its resources were discrete, quantifiable commodities, occurred just as the United States was incorporating New Mexico into its national economy and society (chapter 3).

New business opportunities, created by a combination of local growth and increased access to major markets in the Midwest and East, were becoming apparent in New Mexico by the late nineteenth century. As the Valles Caldera became increasingly attractive as an economic property, speculation on future market conditions and commodity trading led to yet another transformation in the landscape's uses and political status.

Motivated by self-interest, two of Luis María Cabeza de Baca's grandsons, Francisco Tomás Baca and Tomás Dolores Baca, claimed inflated interests in the Baca Location. In transferring their interests to fierce competitors unrelated to the Baca family, the Baca brothers established the legal basis for the partition suit of 1893, which Joel Whitney brought against Maríano Sabine Otero and others. In its resolution, the partition suit led to the extinction of all the rights that Luis María Cabeza de Baca's heirs had in the Baca Location. Through a series of suspect legal dealings and business transactions, the tract became the exclusive property of Maríano Sabine Otero and his family (chapter 4).

Following Otero's death, the Redondo Development Company acquired the Baca Location in 1909. This corporation subsequently severed the timber and mineral rights from the ranch land in 1915 when it first mortgaged the tract's timber rights to raise capital for other business interests (chapter 4; see also chapters 6, 7, and 8). With the development of roads, sawmills, and other infrastructure that made this once remote tract accessible to development, this action provided the foundations for the most intensive use of the Valles Caldera in its history. Moreover, the segregation of land rights from timber and mineral rights made the Valles Caldera a battleground for competing commercial interests.

The more than century-long use of the Valles Caldera's rich rangeland for herding sheep underwent modification when George W. and Frank Bond purchased the Baca Location's surface rights in 1918. The terms of the purchase contract, however, stated that Redondo Development Company would retain a 99-year right to the property's timber and one-half of its mineral interests (chapter 6). The Bond brothers were allowed to cut only sufficient timber for building necessary ranch facilities and for use as fuel. Clearly, the Bond brothers bought the Baca Location as stockmen, and the terms of their purchase agreement were designed to ensure that their livestock operations would not adversely affect the property's timber value.

Although the Bond brother's business was based on the traditional *partido* system of sharecropping sheep they greatly intensified the intensity of grazing on the tract to earn huge profits, often at the expense of the *partidarios* (sharecroppers) who ran sheep on their ranchlands, until the end of World War II. With the decline in wool prices following the war, the Bond family business operations shifted to cattle ranching and the leasing of range rights to independent interests, including the King family.

The Bond estate subsequently sold the Baca Ranch to James Patrick Dunigan in 1963. Under Dunigan's stewardship, the Baca Ranch saw a variety of range improvements within a business enterprise based, in part, on more effective use and long-range management of available grasses (chapter 6). Dunigan also diversified his ranch land operations in the 1960s and 1970s to include commercial elk hunts (chapter 5), geothermal exploration (chapter 8), and leases for Hollywood filming. He also experimented with training thoroughbreds at high altitude to see if he could improve their performance in races at lower elevations.

The Redondo Development Company had waited 26 years for the conditions that would make its investment in the Baca Location fully profitable. Its sale of the tract's surface grazing rights to the Bond Brothers in 1918 was just one part of their long-term strategy. Redondo Development Company expected additional profits from the income that the timber would bring when loggers could economically transport timber to sawmills. After all, with the development occurring throughout New Mexico at the time, the depletion of nearby private timber holdings, and the restrictions increasingly imposed by the U.S. Government on loggers working federal lands, the Redondo Development Company realized that the Baca Location's timber had a waiting market.

The commercial introduction of efficient logging trucks was a key technological innovation; costly railroad investments no longer were necessary. The Civilian Conservation Corps'

construction of an improved road that linked Los Alamos with Jémez Springs in 1935 fulfilled the final economic requirements. Redondo Development Company sold its 99-year timber right to Firesteel Lumber Company, which, in turn, immediately transferred its interest New Mexico Lumber and Timber Company. The Valles Caldera, which represented the last large tract of rich timberland in the Jémez Mountains held in private ownership (therefore, not subject to federal restrictions), finally opened to commercial logging that same year (chapter 7).

The timber operations initially harvested mature ponderosa pine, white fir, and Douglas fir, leaving stands of smaller diameter pulpwood trees alone. In addition, loggers left a few mature trees in cutting areas for natural reseeding. In the late 1950s and early 1960s, the public outcry over the logging operations began to grow and talk of incorporating the Valles Caldera as the center of a new national park generated interest. In addition, Dunigan, a developer and rancher with environmental interests who was antagonistic to the logging industry (and vice versa), purchased the Baca Ranch in 1963 (chapter 7).

Consequently, T. P. Gallagher, Jr., the president of the reorganized New Mexico Timber, Inc., began to fear that his business interest would never realize the 2017 maturity date of Redondo Development Company's original 99-year timber lease. Simultaneously, plans for a pulp mill in the region and a change in New Mexico law permitting the harvest of trees as small as five inches (12.5 cm) in diameter created a market for previously non-commercial wood resources. In addition, the decade-long attempt by New Mexico Timber, Inc., to develop a market for aspen logs began to enjoy success. Within this changing economic, social, and political environment, Gallagher intensified his logging, including the use of clear-cutting practices based on chain and boom tree harvesting technologies, to maximize his logging profits. In combination, competing land use values among logging, ranching, and environmental interests fueled the most concentrated cycle of destructive land use activity in the Valles Caldera's history (chapter 7).

Dunigan and Gallagher engaged in a protracted cycle of lawsuits over the validity of the 99-year timber lease and the damages inflicted on the environment during logging. They resolved their conflict in 1970 when Dunigan's business, Baca Land and Cattle Company, bought the Baca Location's timber rights from New Mexico Timber, Inc., in 1972, just two days before the parties were scheduled to return to court for a renewed round of litigation (chapter 7). Following this transaction, Dunigan and his estate allowed only limited logging activity.

The hope of striking gold and silver was a motive in the Spanish colonization of New Mexico. Although the prospectors did not find great mineral wealth in the Jémez Mountains, they located sufficient quantities of sulphur that caused Maríano Sabine Otero to launch short-lived sulphur mining operations at the beginning of the 1900s. In addition, interest in geothermal development in the VCNP is now more than four decades old. With some of the VCNP geothermal rights still remaining in private ownership and the federal mandate for the VCNP to become a economically self-sustaining enterprise, geothermal development continues to represent a potential land use activity.

The occupation of the Valles Caldera by Native American and local Hispanic groups for small-scale hunting, gathering, and mineral collecting, as well as for ritual purposes, is underrepresented in the documentary record (chapters 5 and 9). For example, ethnographic resources demonstrate that Pueblo communities have clearly sustained cultural and historical affiliations with the Valles Caldera throughout the Historic period and into the present. These communities include neighboring settlements (e.g., the Pueblos of Jémez, Santa Clara, and Zía), as well as villages located at great distances (e.g., the Pueblo of Zuni in west-central New Mexico) (chapters 1 and 9). Just as with the Pueblos, available documentary evidence indicates that Apache, Navajo, Ute, and Hispanic groups made periodic visits to the Valles Caldera.

Historical and ethnohistorical documentary records often overlook the occupation of the Valles Caldera by traditional, land-based Native American and Hispanic communities because it places comparatively low value on commonplace, subsistence level economic activity. Ethnographic accounts, however, reveal that the region's Native American and Hispanic communities used the Valles Caldera for food, medicines, and other economic or recreational purposes. In the process of their interactions, traditional communities have developed a comprehensive knowledge of this tract's environment and the resources that it offers. For instance, this study finds that of the more than 500 native plant species identified in the VCNP, 350 taxa were used, or are likely to have been used, by Native American and Hispanic communities that maintain associations with this place for secular and ceremonial purposes (chapter 5).

Available ethnographic information, which has recorded valuable insights into aspects of the oral traditions and histories maintained by Native American and Hispanic communities, also indicates that many culturally diverse peoples hold the Valles Caldera in regard for important social and cultural reasons that transcend economic concerns. These groups have interacted with this tract, not as wilderness, but as an essential part of their respective community's landscapes (chapters 5 and 9). Their visits to the Valles Caldera were not undertaken just to satisfy some material need, nor was this locality merely a convenient stopover during long journeys across the Jémez Mountains. The mountains, water, caves, volcanoes, calderas, lava rock, shrines, trails, plants, and minerals encompassed by the VCNP boundaries have helped organize and give meaning to the land use activities of communities traditionally associated with this location.

When viewed in combination through an anthropological perspective, available historical, ethnohistorical, and ethnographic evidence pertaining to the Valles Caldera's land use history reveals that this locale is a multi-layered landscape. Today, diverse Native American, Hispanic, and Anglo-American communities maintain meaningful relationships with the Valles Caldera for their own purposes (chapter 9; see also appendices II and III).

Although seldom visible to casual observers who visit the VCNP today primarily to experience the location's majesty

first-hand, the Valles Caldera land use history is part of a dynamic cultural process. Subtle social and ideational contexts, which do not attract much public attention, underlie how each community has interacted historically with the Valles Caldera and used its many resources. A significant challenge for the management of the VCNP is the recognition, acceptance, and valuation of the cultural diversity inherent in living land use traditions that contribute to the Valles Caldera being much more than just a scenic mountain landscape

APPENDIX I.

Annotated Bibliography

Kurt F. Anschuetz and Thomas Merlan

Aberle, Sophie D.

1948 The Pueblo Indians of New Mexico: Their Land, Economy, and Civil Organization. Memoirs 70. Menasha, WI: American Anthropological Association.

In the introduction, Aberle emphasizes the importance of the relationship between the Pueblos and their ethnographic landscapes:

> *Land being the basis of Pueblo economy, to understand the Indian's relation to his soil is vital. The years of contention over boundaries, titles to grants, and legislation influence the Indian's habit of thought as well as his laws…Land in the eyes of the Indian is his most precious possession. (p. 5)*

Aberle adds that before the Europeans' introduction of legal concepts for the private ownership of land, "Land was probably owned communally as is all the range and some agricultural land today, with small farms controlled by generations of the same family, but always with the tacit approval of the head man of the tribe" (p. 7).

Adams, Eleanor B., ed.

1954 Bishop Tamarón's Visitation of New Mexico, 1760. Publications in History, 15. Santa Fe: Historical Society of New Mexico.

Bishop Tamarón visited New Mexico in 1760. He briefly described Jémez Pueblo.

Adams also includes two letters of Bishop Crespo describing his visitation of 1730. Crespo notes that Jémez is "five leagues from the Navahos" (p. 98). Nesbit and Parker note the proximity of Jémez Pueblo to Navajo country in 1851 (see entry for Church n.d.).

Adams, Karen R.

1980 Pollen, Parched Seeds and Prehistory: A Pilot Investigation of Prehistoric Plant Remains from Salmon Ruin, A Chacoan Pueblo in Northwestern New Mexico. Contributions in Anthropology, 9. Portales, NM: Eastern New Mexico University Press.

Adams offers a wealth of ethnobotanical information for plants found in archaeological contexts. Major plant groups from Adam's study also found in the Valles Caldera National Preserve (VCNP) today include the amaranth (*Amaranthus* sp.), cactus (*Opuntia* sp.), goosefoot (*Chenopodium* sp.), sunflower (*Artemesia* sp. and *Helianthus* sp.), mustard (*Descurainia* sp.), sedge (*Scirpus* sp.), spurge (*Euphorbia* sp.), grass (*Oryzopsis* sp.), rush (*Juncus* sp.), buckwheat (*Eriogonom* sp. and *Polygonom* sp.), potato (*Physalis* sp.), and cattail (*Typha* sp.) families.

Adovasio, J. M., and J. D. Gunn

1986 The Antelope House Basketry Industry. *In* Archaeological Investigations at Antelope House. Don P. Morris, ed. Pp. 306–397. Washington, DC: U.S. Department of the Interior, National Park Service.

The authors discuss archaeological evidence for the pre-Columbian use of *Yucca baccata* in basketry.

Akins, Nancy J.

1993 Traditional Use Areas in New Mexico. Archaeology Notes 141. Santa Fe: Museum of New Mexico, Office of Archaeological Studies.

Relying heavily on materials generated by land claims litigated by the Indian Claims Commission (ICC), Akins addresses traditional use areas of aboriginal groups in New Mexico. The author states that given a number of reasons, "The boundaries identified in the

ICC cases are not always equivalent to an aboriginal or traditional use area" (p. 4). The land claims were based on exclusive use and occupancy of an area at the time the U.S. assumed political sovereignty over the Southwest in 1848. Akins implicitly recognizes this and notes, "No attempt was made to include areas that might be claimed on the basis of remote ancestry" (p. 9). Given the inherent limitations of information compiled for land claims cases, Akins considers only shrines and ancestral villages as traditional cultural properties associated with a community's aboriginal use areas.

In this overview, Akins discusses traditional (Indian) associations with all regions of New Mexico. She identifies the Baca Location No. 1 (Baca Location) as entirely within the aboriginal lands of the Jémez people and lists shrines in and near the Baca Location important to the Pueblo (including Wa-ve-ma; a.k.a. Cerro Redondo) (pp. 62–69). She references archeological evidence that suggests the first arrival of Towa speakers in this general area dates to ca. A.D. 1300–1325 (see entry for Ford et al. 1972).

Further inspection of Akins' compiled map information reveals that the following Indian communities included the Valles Caldera locality within their far-reaching aboriginal territories: Jicarilla Apache (pp. 70–77), Navajo (pp. 107–113), San Ildefonso Pueblo (pp. 126–131), San Juan Pueblo (pp. 132–138), Santa Ana Pueblo (pp. 139–141), Santa Clara Pueblo (pp. 145–148), Santo Domingo Pueblo (pp. 150–153), Tesuque Pueblo (pp. 163–165), Ute (pp. 168–174), and Zía Pueblo (pp. 181–186).

Allen, Craig D.

1989 Changes in the Landscape of the Jemez Mountains, New Mexico. Ph.D. dissertation. Wildlife Resource Science, University of California, Berkeley.

This dissertation examines the landscape ecology of the Jémez Mountains in and around Bandelier National Monument. The objectives of the study were to document and explain current landscape patterns, to identify and explain historic landscape changes and to discuss the implications of landscape change for local land management, in particular, Bandelier National Monument.

Allen emphasizes historic human interactions with natural processes. In a short section (pp. 145–149) titled "Anthropogenic Disturbances," he discusses livestock grazing. He concludes that (1) the extremely high historic stocking rates have led to gross alterations in the species composition of local vegetation associations (p. 147), (2) continuous grazing has caused marked reductions in herbaceous plant and litter ground cover and overgrazing has been seen as a major cause of soil erosion and arroyo cutting, and (3) overgrazing in the late nineteenth and early twentieth centuries effectively suppressed previous surface fire regimes throughout the landscape.

The accompanying references are extensive, and relate mainly to natural history and ecology.

Amsden, Charles Avery

1934 Navajo Weaving: Its Technic and History. Santa Ana, CA: Fine Arts Press, in cooperation with Southwest Museum.

Amsden follows Matthews (1897) in defining the Navajo landscape:

> *Each of the four cardinal points has its sacred mountains, the cosmic limit in that direction. North is marked by a mountain (not surely identified) in the San Juan range of southwestern Colorado; South by Mount San Mateo, later called Mount Taylor in the region of Laguna; East by a peak in the Jemez Mountains, thought by Matthews to be Pelado; West by the San Francisco Peaks, just north of Flagstaff, Arizona. (p. 123)*

Anschuetz, Kurt F.

1998a Genesis of Centers Within a Whole: Considering Community Formation Within the Tewa Cultural Landscape. Paper presented at Representing Common Destinies: History and the Social Construction of Community in the Southwest, sponsored by Center for Southwest Research, University of New Mexico, and the Southwest Center, University of Arizona General Library, Albuquerque, November 6, 1998.

In this short paper, Anschuetz elaborates on the Tewa concept of center in traditional community landscape constructions. Centers are formally understood negative spaces, such as plazas and caves. In the Pueblos' world view, centers are understood and sustained through their many-tiered relationships and connectedness to peripheries.

Anschuetz, Kurt F.

1998b Not Waiting for the Rain: Integrated Systems of Water Management by Pre-Columbian Pueblo Farmers in North-Central New Mexico. Ph.D. dissertation. Department of Anthropology, University of Michigan. Ann Arbor, MI: University Microfilms.

This archaeological study deals primarily with the tactics and strategies of agricultural production by Tewa Pueblo people in upland settings of the Tewa Basin. Anschuetz's evaluation of the settlement dynamics observed archaeologically in the Lower Río Chama Valley—one of the places of intensive Tewa occupation between the late thirteenth and sixteenth centuries—is germane to the VCNP land use history study because it develops a landscape framework for considering archaeological traces in terms of what Pueblo people say about their world.

Anschuetz draws from a variety of Tewa ethnographic literature for ideas about Pueblo people's understandings of their cultural landscapes and their senses of place and time across expansive homelands in the face of ever changing natural, social, and cultural environmental conditions. This study considers the Tewas' understandings about movement as an intrinsic part of all life in their cosmos to be congruent with the people's material need to shift residence in response to changing environmental conditions. In doing so, this work provides a useful review of the Pueblos concepts of center, periphery, process, and connectedness.

Anschuetz, Kurt F.

1998c The View from Atop Tsi Mayoh: Reflections on Spanish Colonial History; Refractions of Pueblo Tradition. Paper presented at Pecos Conference, Pecos National Historical Park, August 13–16, 1998.

Anschuetz reviews traditional archaeological and historical constructions that characterize late pre-Columbian Pueblo and early Historic period Pueblo landscape occupation in terms of the abandonment of major tracts of the communities' traditional homeland areas. He offers a landscape approach as an alternative perspective for viewing the archaeological record of Pueblo history. The paper neither casts static descriptions of Pueblo architecture, features, and artifacts as sufficient measures of culture nor depends on interpretive frameworks that view the Pueblos continued occupation of their traditional homelands only in terms of habitation sites.

Anschuetz, Kurt F., and Cherie L. Scheick

1998 Unveiling Archaeological Terra Incognita: Evaluating Time, Place-making and Tradition through a Cultural Landscape Paradigm. Paper presented at the 63rd Annual Meeting of the Society for American Archaeology, Seattle, March 25–29, 1998.

Anschuetz and Scheick examine how the cultural landscape construct, as defined in explicitly anthropological terms, provides an umbrella for integrating diverse studies of human behavior, both past and present. They suggest that this construct provides a framework for evaluating the ideationally informed grammars that helped structure the composition and distribution of the material traces making up the archaeological record. They frame the argument that landscape, as a material construct that communicates information and serves as a kind of historical text, embodies fundamental organizing principles that refer to the forms and structures of activities as people interact with the land, its waters and other resources, as well as one another. They suggest further that the cultural landscape offers an integrative framework for examining how past communities of people organized time, space, and activity in their day-to-day interactions with their physical, social, and ideational environments.

Anschuetz, Kurt F., Richard W. Wilshusen, and Cherie L. Scheick

2001 An Archaeology of Landscapes: Perspectives and Directions. Journal of Archaeological Research 9:157–211.

The authors, building upon the preliminary framework offered by Anschuetz and Scheick (1998), contribute further to a comprehensive landscape approach in explicitly anthropological terms. They trace the development of the landscape idea over its history in the social sciences and examine the compatibility between this concept and traditional anthropological practice. They call for practitioners to adopt a common terminology and methodology to build a construct paradigm that will allow them to use a landscape approach as a "pattern which connects" human behavior with particular places and times. They suggest understandings of settlement ecology, ritual landscapes, and ethnic landscapes not only will

contribute toward the definition of a construct paradigm but also will facilitate dialogue with traditional communities.

Anschuetz, Kurt F.

2002a A Healing Place: Río Grande Pueblo Cultural Landscapes and the Petroglyph National Monument. *In* **"That Place People Talk About": The Petroglyph National Monument Ethnographic Landscape Report, by Kurt F. Anschuetz, T. J. Ferguson, Harris Francis, Klara B. Kelley, and Cherie L. Scheick. Pp. 3.1–3.47. Community and Cultural Landscape Contribution VIII. Prepared for: National Park Service, Petroglyph National Monument, Albuquerque, New Mexico, NPS Contract No. 14431CX712098003 (RGF 109B). Santa Fe, NM: Río Grande Foundation for Communities and Cultural Landscapes.**

This discussion provides a review of the ideational and organizational principles of the traditional landscape constructions generally shared among New Mexico's 16 Río Grande Pueblos (i.e., Cochití, Isleta, Jémez, Nambé, Picurís, Pojoaque, Sandia, Santa Ana, San Felipe, San Ildefonso, San Juan, Santa Clara, Santo Domingo, Taos, Tesuque, and Zía). The themes of center, breath, emergence, movement, and connectedness are relevant to the VCNP Land-Use History Project.

Anschuetz provides insights into why the Río Grande Pueblos consider shrines, volcanoes, caves, trails, plants, and animals to be important landscape features. He also reviews community concerns about the protection and management of these landscape elements.

Anschuetz, Kurt F.

2002b A Place of Power at the Edge: Apache Cultural Landscapes and the Petroglyph National Monument. *In* **That Place People Talk About: The Petroglyph National Monument Ethnographic Landscape Report, by Kurt F. Anschuetz, T. J. Ferguson, Harris Francis, Klara B. Kelley, and Cherie L. Scheick. Pp. 6.1–6.18. Community and Cultural Landscape Contribution VIII. Prepared for: National Park Service, Petroglyph National Monument, Albuquerque, New Mexico, NPS Contract No. 14431CX712098003 (RGF 109B). Santa Fe, NM: Río Grande Foundation for Communities and Cultural Landscapes.**

This essay examines the founding principles of the traditional landscape constructions sustained by Apache communities. The discussion focuses on how places at the edge of the Apache landscape, such as the Jémez Mountains, are the source of power for sustaining life throughout the cosmos.

Anschuetz considers the cultural significance of mountains, caves, lava rocks, plants, animals, and minerals. He reviews community concerns about the protection and management of these features.

Anschuetz, Kurt F.

2002c Contested Commons: Nuevomexicano and Hispano Cultural Landscapes and the Petroglyph National Monument. *In* **"That Place People Talk About": The Petroglyph National Monument Ethnographic Landscape Report, by Kurt F. Anschuetz, T. J. Ferguson, Harris Francis, Klara B. Kelley, and Cherie L. Scheick. Pp. 7.1–7.28. Community and Cultural Landscape Contribution VIII. Prepared for: National Park Service, Petroglyph National Monument, Albuquerque, New Mexico, NPS Contract No. 14431CX712098003 (RGF 109B). Santa Fe, NM: Río Grande Foundation for Communities and Cultural Landscapes.**

This chapter addresses the landscape constructions of New Mexico's traditional Hispanic communities. It finds that through cultural processes of *mestizaje* and religious syncretism, northern New Mexico's rural Hispanic communities have incorporated the ideas of center, periphery, and ensoulment found among the region's cultural diverse aboriginal people into their own understandings of landscape.

Anschuetz's review of important Hispanic landscape elements includes many of the kinds of features found in the VCNP, including shrines, lava rock, plants, animals, minerals, and vistas. Just as the authors of the other chapters in this volume (see entries for Anschuetz 2002a,b; Ferguson 2002; and Kelley and Francis 2002), he reviews community concerns about the protection and management of these features.

Arnon, Nancy S., and W. W. Hill

1979 Santa Clara Pueblo. *In* Southwest. Alfonso Ortiz, ed. Pp. 296–307. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.

This article provides a concise overview of the anthropology and history of Santa Clara Pueblo.

Ayer, Mrs. Edward E., trans.

1916 The Memorial of Fray Alonso de Benavides. Chicago, IL: Privately printed.

Father Custodian Benavides wrote this report in 1630 and revised it 4 years later, to induce King Philip IV of Spain to send more missionaries to New Mexico and to build more churches. Although his population figures for the New Mexico pueblos were grossly exaggerated, his general and comparative descriptions are valuable because so few pre-Revolt sources exist. Benavides briefly describes Jémez Pueblo (pp. 24–25).

Notes include a background on fray Gerónimo de Zárate Salmerón, who served in New Mexico between 1618 and 1626, and prepared a report of his observations in or after 1629. As the resident missionary at Jémez Pueblo, Benavides prepared a catechism in Towa. He emphasizes the mineral wealth of New Mexico and states that he filed on many mineral locations in the Jémez Mountains (p. 217).

Baca Co. v. NM Timber, Inc.

1967 *Baca Land and Cattle Company and Dunigan Tool and Supply Company, and George W. Savage, Trustee Under Liquidating Trust Agreement, v. New Mexico Timber, Inc., and T. Gallagher and Co., Inc.* 384 F.2d 701 (10th Circuit Court of Appeals). 8NN-021-89-022 #5648, Federal Records Center (FRC) #76L0201, boxes 110 and 110A. Denver, CO: National Archives, Rocky Mountain Region.

Circuit Judges Warren L. Jones and John J. Hickey heard the appeal. Their opinion notes that the trial court granted summary judgment for the appellees (defendants) on the first two of three counts of the complaint. For Count I, the judges established the company's interest in a deed and contract conveying timber rights for 99 years to the company's predecessors in title. For Count II, they recognized damages for timber cut in violation of the terms of the "instruments" (that is, the deed of 1918 and the agreement of 1926). The court permitted an immediate appeal of their decisions for Counts I and II. It also directed that Count III, seeking damages for wasteful logging practices, be tried by a jury.

The Court of Appeals dismissed the plaintiffs' appeal because it was not appealable. The court explained this by saying that plaintiffs had a different legal theory for each count of their complaint but applied these different theories to the same set of facts. "Therefore, because each theory of the appellants arises out of the same transaction or occurrence, the pragmatic approach which all circuits apply directs us to conclude that the trail court's ruling is not appealable."

Bailey, Vernon

1913 Life Zones and Crop Zones of New Mexico. North American Fauna 35. Washington, DC: U.S. Department of Agriculture, Bureau of Biological Survey.

Bailey made a reconnaissance in the Valle Grande in 1906. This volume is a part of a series intended to encourage immigration to New Mexico by disseminating information about areas suitable for agriculture.

Bailey assigns the Valles Grande, San Antonio, and Santa Rosa to the Transition Life Zone.

Bancroft, Hubert Howe

1889 Works of Hubert Howe Bancroft, vol. 17. History of Arizona and New Mexico 1530–1888. San Francisco, CA: The History Company.

Although Bancroft's work has been greatly amplified by later generations of historians, his histories are still standard references. This volume covers Arizona and New Mexico from the beginnings of Spanish exploration to the late 1880s.

In his discussion of the last years of colonial administration (pp. 283–309), Bancroft covers early Anglo-American forays into New Mexico. Anglo-American and French Canadian trappers who tried to take furs into colonial New Mexico as well as traders who ventured

into the province were sometimes arrested and their goods confiscated. The Anglos established trade with an independent Mexico after 1821.

Bandelier, Adolf F.

1892 Final Report of Investigations among the Indians of the Southwestern United States, Carried on Mainly in the Years from 1880 to 1885, pt. 2. American Series IV. Papers of the Archaeological Institute of America. Cambridge, MA: John Wilson and Son.

This summary of Bandelier's early and immensely influential investigations in Southwestern archeology, prehistory, and ethnography contains a section on "The Country of the Jemez" (p. 200 ff.). Bandelier describes the area then as being used mainly for summer grazing, with only marginal agricultural development, and traditionally related to Jémez Pueblo:

> *The Valles Mountains separate the northern section of the Queres district from that claimed by the Jemez tribe. Against the chain of gently sloping summits which forms the main range from the peak of Abiquiu to the Sierra de la Palisada in the south abuts in the west an elevated plateau, containing a series of grassy basins to which the name of "Los Valles" (the valleys) has been applied. Permanent streams water it, and contribute to make an excellent grazing region of this plateau. But the seasons are short. For snow fills the passes sometimes till June, and may be expected again as early as September. During the three months of summer that the Valles enjoy, however, their appearance is very lovely. Heavy dews fall daily, and rains are common. The high summits are seldom completely shrouded for more than a few hours at a time, and as soon as the sun breaks through the mist, the grassy basins shine like sheets of malachite. Flocks of sheep dot their surface, and on the heights around the deep blue tops of the regal pines mingle with the white trunks and light verdure of the tall mountain aspens. It is also the country of the bear and the panther, and the brooks team with mountain trout.*
>
> *The descent to the east towards Santa Clara is through a long and rugged gorge, over a trail which beasts of burden must tread with caution, while towards Cochiti the paths are still more difficult. On the west a huge mountain mass, the Sierra de la Jara, interposes itself between the principal valley, that of Toledo, and the Jemez country. Both north and south of this mountain the heights are much less considerable; still the clefts by which they are traversed are none the less narrow, and the traveler is compelled to make long detours in order to reach the Jemez River.*
>
> *The country inhabited by the Jemez tribe lies west of the Valles… (pp. 200–201)*

(See also entries by Akins 1993, and Lange and Riley 1966.)

Barker, Elliott

1970 Western Life and Adventures 1889–1970. Albuquerque: University of New Mexico, Calvin Horn Collection.

Barker describes the program of predator control instituted by the Forest Service in 1916. The Forest Service program of hunting and poisoning reduced or eliminated elk, mule deer, turkey, and prairie dogs in and around the Baca Location. Therefore, gray wolves, mountain lions, and coyotes increasingly preyed on cattle and sheep.

Basso, Keith H.

1996 Wisdom Sits in Places: Landscape and Language Among the Western Apache. Albuquerque: University of New Mexico Press.

This definitive work about Western Apache landscape ideas and relationships serves as a compelling example of how people interact with their physical and social environments and how these relationships resonate through the structure and organization of a group's social institutions. Basso embraces the premise that "what people think about the environment—how they perceive it, how they conceptualize it, or…how they 'actively construct' it" (p. 67) with meaning is relevant. Basso adds that people, not their social institutions, make and act on cultural meanings. He addresses the issue of landscape constructions as the nexus of the intersection of a group's senses of place and time.

Baxter, John O.

1987 *Las Carneradas*: Sheep Trade in New Mexico 1700–1860. Albuquerque: University of New Mexico Press.

Baxter describes the introduction of sheep into New Mexico in 1598 and the origins and growth of the sheep trade in the province, through the colonial and Mexican periods and

into the American (Territorial) period. Although he does not mention the Valles Caldera, his overview provides valuable background information for understanding sheep raising in our study area.

> *During the summer and fall of 1757 New Mexico's governor, Francisco Antonio Marín del Valle made an official visitation of the area within his jurisdiction. The inspection team included the region's most famous eighteenth-century cartographer, Bernardo Miera y Pacheco. Using information gathered during the tour, don Bernardo produced a detailed map of New Mexico…On the map's margins Miera y Pacheco appended supplementary data…According to his tabulation, 5,170 Spaniards residing in New Mexico possessed 2,543 horses, 7,832 cattle, and 47,621 ganado menor (sheep and goats). The Pueblo and Hopi Indians, who numbered almost 9,000, owned 4,813 horses, 8,325 cattle, and 64,561 ganado menor. Obviously, New Mexico livestock had thrived since the Reconquest and the industry rested on a solid foundation at mid-century. (p. 42)*
>
> *As sheep became increasingly acceptable as a means of exchange for imported consumer goods, a small clique of rancher-merchants began to dominate livestock marketing within the province and to control other aspects of the local economy. Another important development for New Mexico comerciantes was the emergence of Chihuahua as their leading trading point and the consequent decline of Parral. (p. 42)*

Bell, Willis H., and Edward F. Castetter

1941 The Utilization of Yucca, Sotol, and Beargrass by the Aborigines in the American Southwest. Ethnological Studies in the American Southwest 7. University of New Mexico Bulletin. Albuquerque: University of New Mexico.

The authors discuss the use of yucca in basketry among many ethnographic groups in the Four Corners region.

Benally, Clyde, with Andrew O. Wiget, John R. Alley, and Garry Blake

1982 Dinéjí Nákéé′ Nááhane′: A Utah Navajo History. Monticello, UT: San Juan School District.

Benally and others relate the creation of the Navajo mountains of cardinal direction in the creation of the Fourth World. Following his creation of the pairs of Holy People (*Diyin Dine′é*),

> *First Man took out the inner forms of the sacred mountains, which he had brought up from the Third World. In the east, he placed the White Mountain (Sis Naajinii). He covered it with Dawn, Dark Cloud, Male Rain, and Dark Water. He fixed it to the earth with a bolt of Lightning. He then sent Dawn Boy and Girl there… (p. 8)*

This tale establishes the special subjective quality of timelessness in the Navajo conceptualization of the Holy Mountains. That is, the mountains were created and re-created through the succession of worlds from the beginning of time to the present.

Benally and others (p. viii) further elaborate on the symbolic associations of the four principal cardinal mountains in a schematic diagram:

Benally and others follow Haile (1938) rather than Matthews (1897) (see also entry for Sleight 1950) in associating the Navajo Holy Mountain of the East with Blanca Peak in southern Colorado rather than with Redondo Peak in the VCNP.

Bernalillo County, New Mexico

1849–1903 Bernalillo County Clerk's Office Records. Accession No. 1974-034. Reels 1–33. Santa Fe: New Mexico State Records Center and Archives.

Grantor-Grantee and Grantee-Grantor indices on Reels 1–4 show acquisition of interests within the Baca Location by Maríano Sabine Otero and his son, Frederico J. (F. J.). For example, the deed for the sale of lands in the Baca Location by Leandro Sanchez and wife to Maríano Otero on April 7, 1890, indexed in reel 3, is in book 12, p. 509 (reel 20, frames 259–260). Numerous transactions show that the Baca heirs sold their land piecemeal and the Oteros eventually bought up these interests, finally forming the Valles Land Company in 1899. (Note: The corporate name "Valles Land Company" appears in the *Whitney v. Otero* trial record as early as 1894.)

Blake, Kevin

1999 Sacred and Secular Landscape Symbolism at Mount Taylor. Journal of the Southwest 41:487–509.

Blake examines the symbolic Native American beliefs about mountains. He maintains that the recognition and understanding of these ideas and values is necessary for the sustained management of any mountain region (p. 487). In this process, Blake contributes to the comprehension of landscape Pueblo and Navajo constructions and how these culturally diverse peoples maintain significant associations with mountainous settings within their traditional homelands. He also offers several useful observations about traditional Hispanic landscape ideas in framing comparisons that illustrate his argument.

Bloom, Lansing B.

1946 [1922] The West Jemez Culture Area. New Mexico Historical Review 21:120–126. Originally published in El Palacio 12:19–25.

Bloom offers a cogent description of the Valles Caldera region and recognizes the traditional use of this locality by Jémez Pueblo:

> *Cerro Conejo, Cerro Pino, Cerro Pelado, Cerro Redondo, and Cerra Venado, were all mountains of that early Jemez world which extended from the high mesa east of Vallecito westward to the Río Puerco, and from the region of the present pueblo of Jemez to the San Anton. It was a world of mountain and valley, of towering forest and living streams, of high majestic mesas which tapered into many a commanding potrero flanked by deep canyons. Even today the Jemez have community rabbit drives in the valley, and in the sierras they hunt the deer and bear, the wolf and fox, the gallina de tierra and the eagle of the sky. But gone is the buffalo which (if we may trust the maps of Miera y Pacheco) formerly ranged the prairie like meadows of the upper Valles and the San Anton. The streams still teem with trout; the bluebird still flashes in the sunlight which filters down through the royal pines; the bluebells and grasses, mariposa lilies and yellow flowers of countless species still wave waist deep in the sun drenched glades of the mountains. (p. 121)*

Bloom also states that Oñate passed through the Valles Caldera on his way from San Juan Pueblo to Jémez Pueblo:

> *He "descended" thro [sic] the Valles to the pueblos in the Vallecito drainage then working to the west over the high mesa land he "descended" from the potrero to the "last pueblo" of the province which he associates with the marvelous hot springs. Guiusewa is the pueblo meant beyond any reasonable doubt, and the trail from the Vallecito down into Hot Springs is still in daily use. (p. 123)*

Bloom, Lansing B., and Lynn B. Mitchell

1938 The Chapter Elections in 1672. New Mexico Historical Review 13:85–119.

This article discusses the establishment of the Jémez missions, events before 1680, the Pueblo Revolt, and subsequent resettlement of the remnant Jémez population. Bloom and Mitchell point out that early Spanish colonial contact with the Jémez Pueblos took place in the Vallecito Viejo and the upper Valles, where at least seven Jémez (Towa) Pueblos existed (p. 91). (See entry for Schroeder 1979.)

Bohrer, Vorsila L.

1960 Zuni Agriculture. El Palacio 67:181–202.

The author includes discussion of *Amaranthus* sp. use by the Zuni.

Bohrer, Vorsila L.

1975 The Prehistoric and Historic Role of Cool-Season Grasses in the Southwest. Economic Botany 29:199–207.

Bohrer reports on the uses of various grasses, which occur in the VCNP, by various pre-Columbian and Historic Pueblo groups, among others. Examples include bluegrass (*Poa* sp.) and needle-and-thread (*Stipa* sp.).

Bolton, Herbert Eugene

1930 Spanish Exploration in the Southwest 1542–1706. New York: Charles Scribner's Sons.

This is a standard reference work for early Spanish exploration in the North American Southwest. Bolton's history contains the narrative of the Espejo expedition of 1583. Espejo describes the Jémez Pueblos (the mountain Pueblo not visited may be Giusewa):

> *Having traveled one day's journey to the northwest, a distance of about six leagues, we found a province, with seven pueblos, called the Province of the Emexes, where there are very many people, apparently about thirty thousand souls. The natives indicated to us that one of the pueblos was very large and in the mountains, but it appeared to Fray Bernardino Beltrán and some of the soldiers that our numbers were too small to go to so large a settlement and so we did not visit it, in order not to become divided into two parties. It consists of people, like those already passed, with the same provisions, apparel, and government. They have idols, bows and arrows, and other arms, as the provinces heretofore mentioned. (p. 182)*

Bond and Son

1917 Correspondence. Item 96. Bond, Frank, and Son Records. Albuquerque: Center for Southwest Research, General Library, University of New Mexico.

This bound volume of copies of correspondence includes a June 28, 1917, letter (p. 216) to Ed Wetmore of the Redondo Development Company, Warren, Pennsylvania. A messenger charged $10.00 to contact Mr. Shelton (surveyor); Louis Nohl apologizes for this "exorbitant charge."

In a July 20, 1917, letter (p. 557) to Ed Wetmore, Frank Bond says he cannot find [L. D. W.] Shelton. He also is concerned that the Indians (evidently Santa Clara Pueblo) have asserted that the Bond interests have built a fence on their land and they intend to cut it. Superintendent P. T. Lonergan (Southern Pueblos Agency) states that the only official survey is the (Francis) Joy survey.

Bond and Son

1918–1919 Ledger. Item 103. Bond, Frank, and Son Records. Albuquerque: Center for Southwest Research, General Library, University of New Mexico.

In this collection are 273 items and cartons. Most documents are numbered single volumes or ledgers.

Volume 95 includes a letter, dated March 20, 1918, from Frank Bond to Edward Wetmore. In this correspondence, Bond writes that while he would like to purchase the Baca Location, his concerns over the ongoing, widespread conflict (World War I) being waged in Europe, tempered his appetite for making great investments at this time. Although he withdrew his offer to purchase the tract, Bond concludes, "I still want to own the property some day."

Volume 170 is specific to the Baca Location and details the sheep operations for the year 1918. Information in this volume reveals that Frank Bond leased the Baca Location in 1918 for $500 per month. His lease required him to make certain improvements; he spent $3,054.20 on fencing and other work in 1918.

A note opposite p. 1 explains the item "Baca Location expense $1221.68" in the first journal entry as follows. The Bond-Connell Sheep and Wool Company had an interest in the lease and paid one half of it: $1,527.10. Frank Bond paid the other half, prorated to $305.42 per year. "At the end of one year the Baca Location was turned over to the Quemado Sheep Co. and Mr. Bond's ½ or $1527.10 less one year's prorate or $305.42 leaving $1221.68 was assumed by the Quemado Sheep Co."

Ledger Volume 170 also details sheep operations for 1918. In this year Bond had 73 employees on the Baca Location. All but three were Hispanic and most were sheepherders (*pastores*), camp tenders (*camperos*), or camp suppliers (*caporales*). The Baca Location had 17 sheep camps and 1 cattle camp in the summer of 1918. The number of sheep per camp averaged 1,257.

In 1926 Bond bought the Baca Location and a half interest in the mineral rights. The Redondo Development Company (seller) retained a 99-year lease on the timber.

Bond and Son

1918–1919 Ledger. Item 103. Bond, Frank, and Son Records. Albuquerque: Center for Southwest Research, General Library, University of New Mexico.

Ledger Item 103 has entries from November 23, 1918, to September 8, 1919. Some entries refer to the Baca Location. These entries record individuals grazing small numbers of stock "35 cows and 8 horses" "6 cows and 1 horse" (p. 1) on the Location, fees paid to Bond and Nohl Company, and balances due. The base price for a horse or cow was $1.25 for the summer season.

Bond and Son

1918–1921 Quemado Sheep Company 1918–1921. Carton 181. Bond, Frank, and Son Records. Albuquerque: Center for Southwest Research, General Library, University of New Mexico.

Carton 181 contains some correspondence about the Baca Location. Herman Wertheim, writing for Vicente Armijo from Domingo, New Mexico, on June 19, 1918, encloses a voucher for $116 in payment for grazing 116 head of cattle taken to the Baca Location on June 12. Moses Abouselman sends payments of $17 for 17 head of cattle and $65 for 65 head of cattle grazing on the Baca Location. Another letter refers to 14 head.

A letter from Moses Abouselman dated June 14, 1918, is on behalf of José Antonio Pecos of Jémez, who wants to put his horses on "the grant." In a previous letter on June 10, 1918, Abouselman wrote that he understood that he was to pay 50 cents per head of cattle for the month of May, or $1.25 for the season (i.e., "through the summer"). Some correspondence is from the Quemado Sheep Company at Peña Blanca.

Bond and Son

ca. 1960 Extracts and Notes from Frank Bond Correspondence. Vol. 76a. Bond, Frank, and Son Records, Albuquerque: Center for Southwest Research, General Library, University of New Mexico.

These extensive excerpts illustrate Frank Bond's style and business methods. The notes contain material on the *partido* system, the New Mexico Sheep Sanitary Board, scab or scabies (mange), and many subjects relating to sheep raising. They discuss the Bond companies and numerous partnerships.

Frank H. Grubbs excerpted the items of correspondence contained in this ledger as background for his biography of Frank Bond (**see entry for Grubbs 1960–1962**).

Bowden, J. J.

1969 Private Land Claims in the Southwest. Masters thesis. Houston, TX: Southern Methodist University.

Bowden outlines the history of the Luis María Cabeza de Baca Grant and the five Baca Locations. Note, however, that Bowden mistakenly places L. M. Baca's death in 1833. (See also entries for U.S. Public Law 167 1860; U.S. Congress, House 1860; and U.S. Congress, Senate 1860.)

Boyd, Dick

1938 Jemez High Country. New Mexico Magazine 16 (9):14–15, 35–39.

Boyd notes the natural and geological features of the region. He mentions that the Civilian Conservation Corps (CCC) built the road from Los Alamos to Cuba through Valle Grande in 1935. At the time of the article, the CCC camp in Paliza Canyon was active. Boyd describes Sulphur Springs and notes that Maríano Sabine Otero established a plant for refining sulphur, but that prevailing prices were so low that the venture was not profitable.

Brandt, Elizabeth A.

1979 Sandia Pueblo. *In* Handbook of the North American Indians, vol. 9, Southwest. Alfonso Ortiz, ed. Pp. 343–350. Washington, DC: Smithsonian Institution.

This article provides a concise overview of the anthropology and history of Sandia Pueblo.

Brewer, Sallie Pierce

1937 The "Long Walk" to Bosque Redondo, as Told by Peshlakai Etsedi. Museum of Northern Arizona Museum Notes 9(11):55–62.

Brewer provides testimony offered by Peshlakai Etsedi, who recounts important details of a post–Bosque Redondo conference held at a new fort at Bear Spring, which Ellis (1974:159) associates with Fort Lyon and Fort Wingate. At this conference, Nah Zizii, Hosteen Iltsuee Etsosa (Marriano), Hostin Be Dah Gah, and Becenti (and possibly other unidentified Navajo headmen) climbed to the top of a hill south of Fort Lyon. From this summit:

> *These men decided that the Navajos would have the country between Sisnajinee ["Black Belt" or Pelado], Zoet Zilth [Mount Taylor], Nahtah Ah Say Ay ["Corn Stairs" or Mount Thomas], Do Ko-osteed ["Suspended by Yellow Shell" or San Francisco Peaks], Nahto Zilth ["Tobacco Mountain" or Buckskin Mountain near Grand Canyon], Nah Ah Tsees Ahn [Navajo Mountain] and Devehn Tsah ["Mountain Sheep" or San Juan Mountains]. (p. 61; comments in brackets are Brewer's additions from endnote 54.)*

Brown, Lorin W.

1978 Hispano Folklife of New Mexico: The Lorin W. Brown Federal Writers' Project Manuscripts. Albuquerque: University of New Mexico.

Brown details his visit to a *pastor* (shepherd), Basilico Garduño, at his camp "in the shadow of El Cerro Redondo ('Round Peak'), near Jemez Hot Springs" (p. 158). Brown describes Garduño's camp, flock, dogs, gear, camp routine, and cooking, and repeats Garduño's explanations of how he predicts the weather by the traditional method of *las cabañuelas* (p. 163).

Garduño tells Brown that he will graze his sheep toward El Rito de San Antonio. Brown mentions that Garduño works for a *patron* (a wealthy man who owns much land), who later visits the camp, but Brown offers no details concerning him.

Garduño talks about his former *patrón,* don Maríano (Otero):

> *My father and I both worked for Don Mariano, who first owned those springs, that is, the grant on which they are located. He was muy rico, a man of many sheep and much land. We used to lamb in the grassy valley just above the springs and dip the sheep in troughs built just below the main sulphur spring. We used nothing else except the very water from the spring to rid the sheep of scab and ticks. It was much better than this stuff we have to use nowadays. (p. 166)*

Brown describes the shearers who arrive once a year as "itinerants, shearing sheep on a commission basis all over the state and into Colorado" (p. 171).

Brugge, David M.

1983 Navajo Prehistory and History to 1850. *In* Southwest. Alfonso Ortiz, ed. Pp. 489–501. Vol. 10 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.

This article is a good summary of early Navajo history. Brugge's figure 1, "Approximate Navajo settlement areas," shows the Valles Caldera portion of the Jémez Mountains to the east of the core of the settled Navajo territory. This observation does not necessarily preclude temporary Navajo use of the VCNP, however (cf. entry for Douglass 1917).

Bryan, Nonabah G., and Stella Young

940 Navajo Native Dyes: Their Preparation and Use. Washington, DC: Office of Indian Affairs.

Bryan and Young's discussion of Navajo dyes includes mention of the following plant taxa found in the VCNP: *Artemisia* sp., *Castilleja* sp., *Eriogonum* sp., *Hymenoxys* sp., *Juniperus* sp., *Prunus* sp., *Pterospora* sp., and *Townsendia sp*.

Cabeza de Baca, Fabiola

1994 We Fed Them Cactus. 2nd ed. Albuquerque: University of New Mexico Press.

In her history of the renowned Cabeza de Baca family, the author offers a passage about her grandfather, Don Tomás Dolores Cabeza de Baca (a.k.a. Tomás D. Baca). This recollection, although lacking desired detail, sheds insight on how Maríano Sabine Otero eventually gained significant interest in the Baca Location, an interest that he shrewdly leveraged against Joel Parker Whitney who initiated the partition suit that eventually stripped all the

Luis Maria Cabeza de Baca heirs of any right in the land grant (**see entry for *Whitney v. Otero* 1893**):

My grandfather, Don Tomás Dolores Cabeza de Baca was running fifteen thousand head of sheep on the Plaza Larga country in 1875. In the Pajarito country, where Newkirk is now, he ran more than two thousand head of cattle. In those days there were no bonding companies. My grandfather was one of the bondsmen of the newly-elected San Miguel County sheriff-clerk-treasurer, which offices were held by one man. At the end of his term, the officer was short on county funds. Grandfather had to produce $40,000. Ewes were worth one dollar per head, cows seven dollars. He sold all his livestock and to make up the balance, he mortgaged 100,000 acres of his land grant, El Valle Grande in Sandoval county, to Don José Leandro Perea [Maríano Otero's father-in-law] for $10,000. (pp. 72–73)

Cabeza de Baca recalls elsewhere that Tomás D. Baca previously had moved to Las Vegas from Peña Blanca in 1865. He owned a mercantile business and ran freight wagons on the Santa Fe Trail (p. 80).

Cajete, Gregory

1994 Look to the Mountain: An Ecology of Indigenous Education. Durango, CO: Kivakí Press.

Cajete, a Santa Clara Tewa educator, is concerned with sustaining traditional cultural knowledge as a way for communities to maintain their cultural identity and sense of well-being. Cajete explores indigenous education as an attempt "to develop insights into the community of shared metaphors and understandings that are specific to Indian cultures, yet reflect the nature of human learning as a whole" (p. 21). Chapter 3, The Spiritual Ecology of Indigenous Education, and chapter 4, The Environmental Foundation of Indigenous Education, are especially relevant to understanding the importance of place held by traditional communities in their ethnographic landscape constructions.

To Cajete, indigenous education is an exploration of spiritual ecology. Traditionally, "the ultimate goal of Indigenous education was to be fully knowledgeable about one's innate spirituality" (p. 42). The medium for attaining this knowledge is the many-layered spiritual connections Indian people feel with special places in their lands and in their lives. These connections have roots in mythic times and do not necessarily require material use to sustain their validity. "By talking about those special places,…[Indian people] connected their spirit to them through their words, thoughts, and feelings" (p. 43). Cajete explains further,

> *American Indians believe it is the breath that represents the most tangible expression of the spirit in all living things. Language is an expression of the spirit because it contains the power to move people and to express human thought and feeling. It is also the breath, along with water and thought, that connects all living things in direct relationship. The interrelation of water, thought (wind), and breath personifies the elemental relationship emanating from "that place that the Indians talk about," that place of the Center where all things are created. (p. 42)*

By understanding themselves as part of a natural community and an ecological process, Indian people express their relationships to the natural world in ways "that only can be called 'ensoulment' " (p. 83). Cajete defines *ensoulment* as the projection of the human sense of soul on particular entities, phenomena, and places in their natural environments. Moreover, by tracing their respective communities' metaphorical journeys across their landscapes, whereby people learned about themselves in relation to their natural world, indigenous groups view the landscape as "a textbook of ecological understanding, interpreted through the traditional stories and activities of tribes" (p. 91). Disruptions of the intensity and intimacy of the relationship between the people of traditional Indian communities and their ethnographic landscapes historically resulted in the disastrous loss of meaning and identity for individuals, families, and communities as a whole (p. 85).

Cajete, Gregory

1999 "Look to the Mountain": Reflections on Indigenous Ecology. *In* A People's Ecology: Explorations in Sustainable Living. Gregory Cajete, ed. Pp. 1–20. Santa Fe, NM: Clear Light.

This essay is a condensation of Cajete's (1994) larger work, *Look to the Mountain: An Ecology of Indigenous Education*. He introduces essential principles about the spiritual ecology of Pueblo people, including the ideas of breath, center, emergence, and movement, in a clear and cogent manner.

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

1986 Ute. *In* Great Basin. Warren L. D'azevedo, ed. Pp. 336–367. Vol. 11 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.

This article provides a concise overview of Ute anthropology and history. The authors identify the Muache and Capote as the principal Ute bands that traveled seasonally into New Mexico's mountains, with the Muache ranging as far south as Santa Fe. Their map showing the geographic expanse of early nineteenth-century Ute territory, however, does not show the full extent of the people's occupation of New Mexico (Figure 1 (p. 337)).

The authors identify Ute uses of the following plants found in the VCNP: Rocky Mountain juniper (*Juniperus scopulorum*), chokecherry (*Prunus virginiana*), Gambel oak (*Quercus gambelii*), and elderberries (*Sambucus* sp.) for food. They also mention that the Ute use stinging nettle (*Urtica* sp.) for fiber and mountain mahogany (*Cercocarpus montanus*) for tools.

Camazine, Scott, and Robert Bye

1980 A Study of the Medical Ethnobotany of the Zuni Indians of New Mexico. Journal of Ethnopharmacology 2(4):365–388.

The list of Zuni medicinal plants includes the following Valles Caldera native plants, among others: milkweed (*Astragalus* sp.), thistle (*Cirsium* sp.), buckwheat (*Eriogonum* sp.), spurge (*Euphorbia* sp.), southwestern stoneseed (*Lithospermum multiflorum*), Wright's deervetch (*Lotus wrightii*), Bigelow's tansy-aster (*Machaeranthera bigelovii*), narrowleaf four-o'clock (*Mirabilis linearis*), primrose (*Oenothera* sp.), scorpionweed (*Phacelia sp.*), piñon (*Pinus edulis*), common plantain (*Plantago major*), curlyleaf dock (*Rumex crispus*), and willow (*Salix sp.*).

Carmichael, David L.

1994 Places of Power: Mescalero Apache Sacred Sites and Sensitive Areas. *In* Sacred Sites, Sacred Places. David L. Carmichael, Jane Hubert, Brian Reeves, and Audhild Schanche, eds. Pp. 89–98. London: Routledge.

In an insightful overview, Carmichael considers "some of the kinds of sites and places considered sacred or sensitive in traditional Mescalero thought" (p. 89). He observes,

> *A fundamental aspect of traditional Mescalero thought is the belief in the sacred character of specific geographical places. Some are important because of the roles they played in the mythic time of Mescalero tribal history. Others are sources of natural resources required in traditional ceremonies. Most appear to be important because they are places of power… (p. 89)*

Carmichael examines the thesis that the Apache believe the sacred character of specific landscape features from which the people draw power is an essential component of Apache self-identity. He explains the Apache idea of power as "a spiritual energy or life force that enables an individual to interact with the forces of the natural and supernatural worlds" (p. 91). His observation, "Belief in the sacred character of specific features of the landscape is an essential component of Mescalero self-identity" (p. 96), imparts to the reader the gist of how Apache people ensoul their physical worlds through their acquisition of power in accord with the structured order communicated through the base metaphor (see Farrer 1991). Carmichael similarly provides a framework for unpacking key aspects of the ideational organization of places of power within the landscape that structure how Apache people obtain the power they need for sustaining balance and harmony.

Carrillo, Charles M., Kurt F. Anschuetz, Richard D. Holmes, and Susan Perlman

1997 Historic Overview of the Project Area. *In* OLE, vol. 1. Context. John C. Acklen, ed. Pp. 119–138. Albuquerque: Public Service Company of New Mexico.

Of interest to the land use history of the VCNP is the report that Tewa populations in the seventeenth and eighteenth centuries used a trail that started in Santa Clara Canyon to reach Navajo and Hispanic communities to the west and north. Apparently used exclusively during the warm season, this upland route allowed travelers to avoid flooded areas along the Río Chama valley (p. 132).

> *The trail left Santa Clara and traveled up the Cañada de Santa Clara to the headwaters of the canyon near Tsichoma Peak. From here the western branch of the route briefly headed in a southwestern direction and then down the Río de los Indios*

to the Río San Antonio. The Río San Antonio is located in the Valle de San Antonio across the northern third of Baca Location Number 1. This creek continues in a western direction toward the western edge of the Jemez Range. At one point a traveler can turn off this western branch and head south toward San Diego Canyon at Jemez. The other branch of the trail continues northward to Río del Oso, passes San Antonio de los Vallecitos, and swings in a western direction toward Polvadera Creek where it continues in a northern direction along the creek until it reaches the Piedra Lumbre Valley. A traveler can branch off the trail at Vallecitos and travel in a northerly direction. (p. 133)

Chama Valley residents apparently ran sheep across the uplands and crossed into the Valle San Antonio locality:

During the summer months herdsmen often lived in small tipi-like structures which they frequently moved as they herded their animals. The structures were built of hides or canvas (Informant F, personal communication 1991). This seasonal movement of livestock ensured that fresh grazing land was available and that valuable agricultural land was undisturbed by livestock. Documentary data and the oral history of villagers in Abiquiu, Cañones, and Youngsville, indicates that the entire area of the OLE line was at one time or another used for grazing, with the exception of the steep canyon walls. (p. 135)

One Chama Valley resident remembers visiting the Valles Caldera to collect native plants:

I recall gathering piñon nuts, broom grass, and other things in the area of the [proposed OLE] power line, especially the Baca Location. Broom grass was a sacred plant found in the Baca Location. (p. 137, citing Informant I, personal communication 1991)

Castañeda, Pedro de

1907 Narrative of the Expedition of Coronado. *In* Spanish Explorers in the Southwestern United States 1528–1543. Frederick W. Hodge, ed. Pp. 273–387. New York: Charles Scribner's Sons.

This is a collection of chronicles of early Spanish exploration. Castañeda describes the visit of Captain Francisco de Barrionuevo to the Jémez province in the summer of 1542.

Castetter, Edward F.

1935 Uncultivated Native Plants Used as Sources of Food. Ethnobiological Studies in the American Southwest 1. Albuquerque: University of New Mexico.

Castetter reports on ethnographically documented food uses of many native flora species that are found in or have close relatives in the Valles Caldera. Examples include the Eastern Keres' use of field mint (*Mentha arvensis*), sorrel (*Rumex sp*.), and nightshade (*Solanum* sp.). He notes that the Western Keres eat the common plantain (*Plantago* major). The Zuni eat products from the ponderosa pine (*Pinus ponderosa*), while the Navajo consume the chokecherry (*Prunus* sp.).

Chamberlin, Ralph V.

1909 Some Plant Names of the Ute Indians. American Anthropologist 11:27–40.

Chamberlin identifies the medicinal uses of several species that grow in the VCNP. These plants include yarrow (*Achillea* sp.), buckwheat (*Eriogonum* sp.), and marsh elder (*Iva* sp.).

Chinle Curriculum Center

1995 Diné Bikeyahdóó Ch'il Nanise' Altaas'éí: The Purpose and Uses of Plants of Navajoland. Chinle, AZ: Chinle Unified School District.

The authors discuss several plants that grow in the Valles Caldera area. These species include golden aster (*Cicuta maculata*), which has medicinal properties. Western bracken (*Pteridium aquilinum*) is both a medicine and a fiber source.

Church, Peggy Pond

n.d. Peggy Pond Church Correspondence. Los Alamos, NM: Los Alamos Historical Museum.

Peggy Pond Church was the daughter of Ashley Pond, the founder of the Los Alamos Ranch School. She was a published author with a special interest in the history of the Los Alamos area. This collection contains items of her correspondence with friends and researchers.

In a letter dated March 22, 1979, to "Art," Church cites a letter, from Richard Boyd, Albuquerque, to Homer Pickens, that Boyd's widow showed her. A road "made by the Army when the Missouri volunteers were stationed at Fort Marcy" ran up Pajarito Canyon to a point below the Llano Largo, "alongside Water Canyon on the mesa top and on over the mountain from Water Canyon site." This road was the route used by the soldiers hauling hay for draft animals at Fort Marcy. The Army abandoned the road, however, because a four-mule team hauling hay would eat most of the hay on the way to Santa Fe. Then, according to Boyd, the U.S. Army established a hay camp "west of Water Canyon on the rim about a mile [1.6 km] from the old Ted Mather cabin. You can still find evidence of this camp (1964)…" (LAHM-M1991–31–1–39, box 29, folder 5). Church questions her correspondent about "the old Ted Mather cabin," whose location is uncertain.

The Church Papers also include two texts identified as being in the records of the Adjutant General (National Archives, Washington, DC). The first is a letter from Robert Nesbit and Hiram Parker, dated July 1851, to Colonel Munroe, Commander, 9th Military Detachment. Nesbit and Parker held the contract to supply hay to the quartermaster. They bought a train of mule wagons from a Mr. Tully, and were engaged in delivering hay from "from what is known as the Grande Bioh [*sic*] some forty miles [64 km] from here." The "Grande Bioh" was the only place where natural hay could be obtained, due to the dryness of the season. On the night of July 2, 1851, a large band of Navajos attacked their "substantial" log house and corral and stole over 100 horses and mules.

A letter dated July 17, 1851, from B. H. Robertson to 1st Lieutenant L. McLaws states that 11 Jémez Indians pursued the Navajos. The Jémez party killed 2 Navajos on the border of Navajo country and captured four mules. He describes the ranch [of Nesbit and Parker] as "built of bottom wood logs…the corral is constructed of large, green cottonwood logs…" "The entire number of animals stolen was forty-nine…" (LAHM-M1991–31–1–15, box 28, folder 8).

Church also compiled a set of notes that she labeled "Ramón Vigil Grant—Roads Etc." In this she repeats the information derived from the Boyd letter about the hay road and camp (LAHM-M1991–31–1–16, box 28, folder 6). 3(See also entry for Parkhurst n.d.)

Cleland, Robert Glass

1950 This Reckless Breed of Men: The Trappers and Fur Traders of the Southwest. Albuquerque: University of New Mexico Press.

In this study of the fur trade in the Southwest, Cleland mentions the death of Luis María Baca. On June 6, 1827, Governor Manuel Armijo reported that he had confiscated a valuable collection of furs belonging to Ewing Young. Armijo invoked an 1824 statute that prohibited citizens of the United States from trapping furs in Mexican territory. According to Armijo, Luis María Baca had hidden Young's furs in Baca's house; Baca shot first, and was shot and killed by soldiers of an auxiliary troop (p. 219).

Colton, Harold S.

1974 Hopi Ethnobotany and Archaeological History. New York: Garland Publishing.

Colton reports that Hopi use Mountain mahogany (*Cercocarpus montanus*), Gambel oak (*Quercus gambelii*), and Narrowleaf cottonwood (*Populus angustifolia*) for making tools. They eat western wallflower (*Erysimum capitatum*), sunflower (*Helianthus* sp.), and four-o'clock (*Mirabilis* sp.). Gilia (*Ipomopsis* sp.) is a dye. Each of these plants grows in the VCNP.

Colton, Mary-Russell Ferrell

1965 Hopi Dyes. Flagstaff: Museum of Northern Arizona.

Hopi dye plants found in the VCNP include Mountain mahogany (*Cercocarpus montanus*) and piñon (*Pinus edulis*).

Cook, Sarah Louise

1930 The Ethnobotany of the Jemez Indians. Masters thesis. University of New Mexico, Albuquerque.

Cook identifies 57 native plants, plus lichen, moss and algae, used by the people of Jémez Pueblo. She provides cursory information on how the people use each taxon.

Cook's inventory includes a variety of plants present in the VCNP. Examples include bearberry (*Arctostaphylos uva ursi*), ragweed (*Hymenopappus* sp.), Rocky Mountain juniper

(*Juniperus scopulorum*), New Mexico Locust (*Robinia neomexicana*), and ragwort (*Senecio* sp.), which produce edible products. Indian paintbrush (*Castilleja* sp.) keeps chili seeds from spoiling. Aster (*Machaeranthera* sp.) has medicinal properties, while junegrass (*Koeleria macrantha*) makes a broom and split geranium epidermis (*Geranium* sp.) yields a thread for sewing moccasins.

Coolidge, Dane, and Mary Roberts Coolidge

1930 The Navajo Indians. Boston, MA: Houghton Mifflin.

The authors report the appearance (but not the location) of the Navajo Holy Mountain of the East, as described by Long Mustache of Klagetoh in his account of the separation of the Diné from their Apache relatives:

> *In this large country between the Four Holy Mountains the Dineh´ lived, but the different branches of the tribe were always quarreling about what territory they should occupy. At that time, over near Zith-nah-jinni, the Holy Mountain of the East, there was another called Tramped-Down Mountain because it was flat on top. It was full of bushes bearing berries and nuts but Zith-nah-jinni was smooth and barren-looking, being covered with grass. There were horses there, and deer and other game… (p. 8)*

Corlett, Charles H.

1974 Cowboy Pete. Santa Fe, NM: Sunstone Press.

Corlett, a career Army officer who rose to the rank of Major General, was Frank Bond's son-in-law and was briefly the manager of the Baca Location when Bond leased it from Redondo Development Company.

> *Because of the severe winter of 1919 many cattle and sheep died of starvation. Frank Bond was beside himself with worry and nearly out of his mind. John Davenport, overworked and somewhat discouraged as a result of the dreary winter, did not object when Bond made me manager, but became my loyal and valued assistant. I resigned my commission as lieutenant colonel (temporary) in the Army of the United States and became a stockman…After about four months at La Jara, the headquarters of the Baca, Amy and I moved down into the valley and occupied my mother's house. (pp. 46–47)*

Curtis, Edward S.

1926 The North American Indian: Being a Series of Volumes Picturing and Describing the Indians of the United States, the Dominion of Canada, and Alaska, vol. 17. The Tewa, the Zuni, Mythology. Norwood, MA: Plimpton Press.

Curtis is often criticized today for staging many of his artistically acclaimed photographs. In contrast, the ethnographic observations contained in the volumes are often overlooked.

In this volume Curtis provides information that Tewa communities far from Sandia Mountain, such as San Ildefonso, apparently define physiographic analogues within their immediate home territories for purposes of most regular pilgrimages and prayers.

Curtis retells a San Ildefonso story about the Warrior Twins who now live on Sandia Mountain and protect the communities they watch over. The story, "The War-Gods Destroy Tsimayó" (p. 172), is of interest to the VCNP Land-Use History project because of its references to the Warrior Twins, giants, mountains, caves, and volcanism.

The Warrior Twins drove away to Shúma the giant that had been plaguing the people of San Ildefonso Pueblo. Shúma is the high volcanic mesa south of the village at the beginning of the Río Grande Gorge.

> *There they destroyed him, and smoke was belched forth from Shúma, from Tsimayó [Chimayo mountain northeast of the village], from a large cave in a northern Mountain, and from the cave in Tú"yo. (p. 172)*

Curtis adds that all these smoke-belching features are of volcanic origin. He infers that the tale points to the Tewas' presence in the region at the time these craters were active.

The story is also useful because it reveals the traditional understanding among the Tewa that lava rock was once a liquid that flowed from the earth. According to Curtis' informants, the Warrior Twins lived directly among the people. Giants terrorized the people, who sought the Warrior Twins' assistance. The warriors chased the giants and fought them. When they finally killed the evil beings, the people saw nearby volcanic peaks and their caves belch smoke, if not also lava and fire, which hardened the earth.

Cushing, Frank Hamilton

1896 Outlines of Zuni Creation Myths. *In* **Thirteenth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution. Pp. 321–447. Washington, DC: U.S. Government Printing Office.**

In this classic ethnography, Cushing provides Zuni Pueblo understandings of volcanism through the following poetic account:

That the earth be made safer for men, and more stable,
Let us shelter the land where our children be resting,
Yea! The depths and the valleys shall be sheltered
By the shade of our cloud-shield! Let us lay to its circle
Our firebolts of thunder, aimed to all the four regions,
Then smite with our arrows of lightning from under
Lo! Fire shall belch outward and burn the world over,
And floods of hot water shall seethe swift before it!
Lo! Smoke of earth—stenches shall blacken the daylight
And deaden the senses of them else escaping
And lesson the number of fierce preying monsters!
That the earth be made safer for men, and more stable. (p. 389)

Cushing continues the account in narrative:

Dread was the din and stir. The heights staggered and the mountains reeled, the plains boomed and cracked under the floods and fires, and the high hollow places, hugged of men and the creatures, were black and awful, so that these grew crazed with panic and strove alike to escape or to hide more deeply. But ere-while they grew deafened and deadened, forgetful and asleep! A tree lighted of lightning burns not long! Presently thick rain fell, quenching the fires; and waters washed the face of the world, cutting deep trails from the heights downward, and scattering abroad the wrecks and corpses of stricken things and beings, or burying them deeply. Lo! they are seen in the mountains to this day; and in the trails of those fierce waters cool rivers now run, and where monsters perished lime of their bones (áluwe—calcareous nodules in malpais or volcanic tuff) we find, and use in food stuff! Gigantic were they, for their forms little and great were often burned or shriveled and contorted into stone. See are these, also, along the depths of the world. Where they huddled together and were blasted thus, their blood gushed forth and flowed deeply, here in rivers, there in floods; but it was charred and blistered and blackened by the fires, into the black rocks of the lower mesas (ápkwina, lava or malpais). There were vast plains of dust, ashes and cinders, reddened as is the mud of a hearth-place. There were great banks of clay and soil burned to hardness—as clay is when baked in the kiln-mound,—blackened, bleached, or stained yellow, gray, red, or white, streaked and banded, bended or twisted. Worn and broken by the heavings of the under-world and by the waters and breaths of the ages, they are the mountain-terraces of the Earth-mother, "dividing country from country." Yet many were the places behind and between these—dark canyons, deep valleys, sunken plains—unharmed by the fires, where they swerved or rolled higher—as, close to the trace of a forest-fire, green grow trees and grasses, and even flowers continue to bloom. Therein, and in the land sheltered by the shield, tarried the people, awakened, as from fearful dreams. Dry and more stable was the world now, less fearsome its long places; since, changed to rock were so many monsters of prey (some shriveled to the size of insects; made precious as amulets for the hunter and warrior, as told in other talks of our ancient speech). (pp. 389–390)

Cushing, Frank Hamilton

1920 Zuni Breadstuff. Indian Notes and Monographs Vol. 8. New York: Museum of the American Indian.

Cushing presents a perspective on Zuni concepts of volcanism that restate the information in his "Outlines of Zuni Creation Myths" (see entry for Cushing 1896) in this classic monograph of Zuni ethnobotany:

Then said the twin brothers: "Men, our children are poorer than the beasts, their enemies; for each creature has a special gift of strength or sagacity, while to men has been given only the power of guessing. Nor would we that our children be webfooted like the beings that live over the waters and damp places."

Therefore, they sent all men and harmless beings to a place of security; then laid their water-shield on the ground. Upon it they placed four thunderbolts, one pointing north, another west, another south, and the other eastward. When all was ready they let fly the thunderbolts. Instantly the world was covered with lurid fire and shaken with rolling thunders, as is a forest today burned and blasted where the lightning

has fallen. Thus as the clay of vessels is burned to rock, and the mud of the hearth crackled and reddened by fire, so the earth was mottled and crackled and hardened where now we see mountains and masses of rock. Many of the great monsters and prey-beings were changed in a twinkling to enduring rock or shriveled into twisted idols which the hunter and priest-warrior know best how to prize. Behold! their forms along every mountainside and ravine and in the far western valleys and plains still endure the tracks of the fathers of men and beings, the children of earth. Yet some of the beings of prey were spared, that the world might not become over-filled with life and starvation follow, and that men might breathe of their spirits and be inspired with the hearts of warriors and hunters. (pp. 32–33)

Dondanville, R. F.

1971 The Hydrothermal Geology of the Valles Caldera, Jemez Mountains, New Mexico. Open file consultant report. Santa Rosa, CA: Union Oil Co.

This 36-page report describes the first geothermal well drilled in the Valles Caldera (1960). Intended as an oil test well, the Westates-Bond 1 struck superheated water (about 392 ºF [200 ºC]) at shallow depths. This discovery led to a testing program that was finally abandoned in 1982 when the thermal capacity proved smaller than expected.

Douglass, William Boone

1917 Notes on the Shrines of the Tewa and Other Pueblo Indians of New Mexico. *In* **Proceedings of the Nineteenth International Congress of Americanists. Frederick W. Hodge, ed. Pp. 344–378. Washington, DC: International Congress of Americanists.**

Douglass identifies the following locations in his summary map (Plate I): 91—Río Jémez, 105—Rito de las Indias, 107—Río San Antonio, 106—Shrine of La Sierra de la Bola (a.k.a. Cerro Redondo), 108—Sulphur Creek and Hot Springs, 207—Rito Jaramillo, 208—La Jara Creek, and 209—Old Fort. He provides a comprehensive description (pp. 357–362), two sketch maps (figs. 7 and 8), and two photographs of La Sierra de la Bola shrine (figs. 9 and 10).

Douglass reports that people from the pueblos of Jémez, Zía, Santo Domingo, Sandia, Cochití, San Ildefonso, Santa Clara, and San Juan are known to visit the shrine "every year during August" (p. 358). He describes finding a broken metate at the shrine during his visit and tells of a local Hispanic resident who found a heavy cast silver ornament (fig. 6), which apparently resembles styles made at the end of the seventeenth century, buried within the feature.

Douglass also provides comprehensive description and illustration of the shrine (figs. 1–5) located on the top of *Tsikumu* (a.k.a. Cerro Chicoma), which is just outside the northeast corner of the Baca Location (pp. 344–357). Douglass states that the directional orientation of the six trails (*awu-mu-waya* ["rain-roads"]) radiating from northeast to south from the shrine's center, suggest pilgrimages by the Pueblos of Taos, San Juan, Santa Clara, San Ildefonso, Jémez, and Cochití. The final opening, which leaves the shrine from the northwest, relates to Navajo visits to this holy place.

Douglass, William Boone, and Hugh M. Neighbour

n.d. Restorative Survey of the Baca Location No. 1. Microfiche on file: Santa Fe, NM: State Office, Bureau of Land Management.

U.S. Surveyor William Boone Douglass and transitman Hugh M. Neighbour conducted an examination survey of the Baca Location between September 7 and October 10, 1911, and then carried out a restorative survey between July 29 and October 10, 1912. Although their assignment was to find and reestablish the original surveyors' monuments (see entry for Sawyer and McBroom 1876), they determined that the Location contained 90,426 acres (36,593 ha)–8,844 acres (3,579 ha) less than found by the original survey. They could not find many of the original corners; they also noted that the first surveyors had marked many of the grant boundary lines by blazing trees.

Douglass' concluding "General Description" states:

The Baca Location No. 1 lies in the heart of the Jemez Mountains. In the main, it comprises three intermountain valleys, namely: Valle Grande, Valle Santa Rosa and Valle San Antonio. The mountain ridges towering above the valleys, from one to two thousand feet [305–915 m], wall in a quadrangle approximately twelve miles square [31 sq km], and roughly define the boundaries of the grant. The interspace is by no means level, but broken by lesser hills, is impassable for wagons, except along the

favored routes shown on the plat. Four important streams rise in this area. The Río Jemez drains the Valle Grande. The Río San Antonio with its tributaries, La Jara and Indian Creeks drain the other two valleys. At the South East corner of the grant, rises the Rito de los Frijoles; near the NE. Cor. Rises the Santa Clara Creek. All streams are tributaries of the Río Grande.

The soil of the valleys is a rich black loam, which may be classed as first rate. At many points in the higher lands the soil is almost as good. This coupled with a copious supply of moisture, produces a heavy growth of grass, making the grant ideal for grazing purposes. The lands, perhaps, have other agricultural values, especially that in the lower valleys, but the high altitude, a mean of about 9,000 ft. [2,744 m] above sea level, tends to prevent the maturing of crops.

The ridges, densely timbered with fir and spruce, and considerable pine, give good timber values.

The mineral values of the grant are unknown, with the exception of valuable mineral springs of sulphur, magnesia, alum and iron on the west boundary of the grant. Just west of the line is a mineral resort, known as Sulphur Springs. The outcropping stone indicated that gold, silver and copper may be found in these hills.

The grant is without permanent habitation. During the summer months, the owners maintain a cattle ranch, and near the SE. Cor. is a dairy ranch. The members of both ranches leave before winter sets in. In the valleys to the south and West without the bounds of the grant, permanent settlements are found, where the lands appear to be cultivated with a profit.

The grant may be reached from the following railway points: Buckman and Espanola on the D. and R. G. Ry., and Domingo and Bernalillo on the A. T. and S. F. Ry. The Espanola and Bernalillo routes are the most feasible for a wagon. (*p. 83)*

Dozier, Edward P.

1970 Pueblo Indians of North America. New York: Holt, Rinehart and Winston, Inc.

Dozier, a Santa Clara Pueblo native and trained anthropologist, provides an invaluable overview of Pueblo society, social organization, religion, history, and subsistence. Because he explains the historical record from the Pueblo point of view, his account makes it possible to understand the Pueblo reaction to and accommodation of the Spanish colonial invasion that began in the sixteenth century and led to the creation of contemporary New Mexican society.

Dozier discusses contact, the seventeenth century in New Mexico, the Pueblo Revolt, and its aftermath.

Dunmire, William W., and Gail D. Tierney

1995 Wild Plants of the Pueblo Province: Exploring Ancient and Enduring Uses. Santa Fe: Museum of New Mexico Press.

This volume is an invaluable summary of the ethnobotany of the 19 Pueblos (Ácoma, Cochití, Isleta, Jémez, Laguna, Nambé, Picurís, Pojoaque, San Felipe, Sandia, San Ildefonso, San Juan, Santa Ana, Santa Clara, Santo Domingo, Taos, Tesuque, Zía, and Zuni) of New Mexico. This study is an essential resource for evaluating the cultural significance of native plants in the VCNP.

The authors provide accessible discussions of the region's natural environmental diversity, the Pueblos' history and culture from pre-Columbian to contemporary times, the recognition of native flora as living cultural artifacts, and informative ethnobotanical overviews of commonly used tree, shrub, grass, grasslike, and herbaceous plant species.

Dunmire, William W., and Gail D. Tierney

1997 Wild Plants and Native Peoples of the Four Corners. Santa Fe: Museum of New Mexico Press.

As a complementary volume to their study, *Wild Plants of the Pueblo Province: Exploring Ancient and Enduring Uses* (see entry for Dunmire and Tierney 1995), the authors provide excellent introductions to the ethnobotany of the pre-Columbian Pueblo, and the Historic period Hopi, Navajo, Ute Mountain Ute, and Jicarilla peoples of the Four Corners region. They again provide readable, informative discussions of the region's natural environment, the Pueblos' pre-Columbian history, the recognition of native flora as living cultural artifacts, and informative ethnobotanical overviews of commonly used tree, shrub, grass, and herbaceous plant species.

Dutton, Bertha P.

1938 The Jemez Mountain Region. El Palacio 44:141–142.

In this travel guide, Dutton describes a trip from Coronado State Monument on Highway 44 to San Ysidro, then on Highway 12 through Jémez Pueblo and north and east into the Valle Grande. Boyd's Ranch is just outside the southeastern rim of the caldera. Dutton describes the caldera, formed by volcanic eruptions, as eighteen miles [29 km] long and twelve miles [19 km] across. She says that several permanent watercourses originate in the valley, and notes that "during the past century, when the U.S. Army had its headquarters in Santa Fe, they maintained a wagon road to El Valle Grande and there cut the hay necessary for their animal consumption" (p. 142).

Dutton, Bertha P.

1952 Highlights of the Jemez Region…With Notes on What To See and What To Do There... El Palacio 59:131–156.

This entry updates Dutton's (1938) article. Dutton now names the Triple H Ranch just outside the southeastern rim of the caldera. She also states that "hundreds of sheep and cattle are grazed" in the Valle Grande. Otherwise the entry has not changed from that of 1938.

Dutton describes the Valle Grande:

> *Past the Triple H Ranch a short distance, one skirts the southeastern rim of* **El Valle Grande***, also spoken of as the great Jémez Crater, where, according to some geologists, late Tertiary volcanic flows and tuffs were belched forth from the earth to extend down the slopes in every direction, in places thousands of feet thick. The eruption, or eruptions, caused a great basin or caldera to be formed, eighteen miles [29 km] in length and twelve miles [19 km] across. Several small streams derive their source from the waters which accumulate there. Stately trees outline the rim, and tall, luxuriant grasses grow in the basin, where hundreds of sheep and cattle are grazed. During the past century the U.S. Army, when it had its headquarters in Santa Fe, maintained a wagon road to El Valle Grande, and there cut the hay necessary for their animal consumption. (pp. 154–155; emphasis in the original]*

Elsewhere, Dutton describes the summits that bound the Valle Grande. Notably, she mistakenly identifies Pelado and Redondo as separate peaks. (Dutton seems to follow Harrington [1916:125] and Ellis [1974:166] in equating Pelado with Tsikumu [a.k.a. Cerro Chicoma], the Tewa Mountain of the West.)

> *Conspicuous are the rounded domes of* **Pelado, Redondo***, and other high peaks of the Jémez Mountains, ranging from 10,000 to 11,266 feet [3,049–3,435 m] in elevation. They are bald on the south sides and timbered on the north. (p. 154; emphasis in the original)*

Edleman, Sandra A.

1979 San Ildefonso Pueblo. ***In*** **Southwest. Alfonso Ortiz, ed. Pp. 278–295. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

This article provides a concise overview of the anthropology and history of San Ildefonso Pueblo.

Edleman, Sandra A., and Alfonso Ortiz

1979 Tesuque Pueblo. ***In*** **Southwest. Alfonso Ortiz, ed. Pp. 330–335. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

This article provides a concise overview of the anthropology and history of Tesuque Pueblo.

Ellis, Florence Hawley

1956 Anthropological Evidence Supporting the Land Claim of the Pueblos of Zia, Santa Ana, and Jemez. Santa Fe: Laboratory of Anthropology, Museum of New Mexico. Unpublished MS.

Ellis provides cultural-historical evidence that the Pueblos of Zía, Santa Ana, and Jémez traditionally occupied geographic territories that far exceeded their present-day land holdings. With respect to the Valles Caldera locality, Ellis writes,

> *The area around Mt. Pelado [a.k.a. Cerro Redondo], for example, formerly was a headquarters district for herding; there are evidences of old camps and corrals with potsherds. The area likewise was considered sacred for some distance around*

Mt. Pelado because on the peak was one of their most sacred shrines. The Baca location, nearby, was a shrine, a center of eagle and big game hunting, and later an area for herding horses. (p. 56)

More generally, Ellis adds,

There were specific places, miles from the present pueblos, from which to collect paint materials, red, blue, black, and yellow, as well as petrified wood, obsidian, basalt, sandstone, volcanic tuff, and the many types of stone and minerals used in making implements and pottery. There were springs, water holes, washes dammed with lines of stone to produce garden patch areas. And finally there were the many sacred spots, shrines to which groups must go for ceremonies especially pertinent to them, or where certain persons must go periodically to deposit prayer offerings. Many of these were springs, because water is especially sacred to these people. Some were caves, some prominent mesa-hills. (pp. 56–57)

Deer were hunted in the high country north and west of the pueblos; antelope were hunted in the plains east of Mesa Prieta; shrines involved with the ceremonies necessary for such activities were caves and springs within the areas. On such hunts the three pueblos customarily went together, each taking its turn at directing the hunting and conducting the requisite ceremonies in a cave in that area still marked with an eagle on its ceiling…When the Pueblos acquired flocks and herds, their officers exercised similar care in directing where they should be pastured, so that the grass would not be eaten down too far in any one spot. Their big hunting and grazing areas bear witness to this former land use in that large and small geographic features were given names, which people know still, so that districts within them might be designated by the war captains as hunting or herding spots for specific periods. (pp. 57–58)

Ellis, Florence Hawley

1964 A Reconstruction of the Basic Jemez Pattern of Social Organization, with Comparisons to Other Tanoan Social Structures. Publications in Anthropology 11. Albuquerque: University of New Mexico Press.

Ellis' study is concerned with what the social structure of the modern Pueblos can contribute to the problem of evaluating the relation between the archaeologically visible settlements in pre-Columbian culture areas and the contemporary communities. In her review of the organization of Jémez Pueblo societies and cults, she provides several useful observations for assessing the ethnographic significance of the Valles Caldera landscape.

The Underworld Chiefs Society, consisting ideally of 12 members, is a highly secretive organization that relies heavily on seclusion.

Their name refers to their relationships with the underworld. They use underground chambers, such as hidden caves beneath waterfalls or high in the mountains, for initiations, and shrines, although their meetings are held in the home of their chief in the village. Springs or lagoons, the home of their patron, the plumed serpent, also are used as places of initiation, for the society members are supposed to associate with the supernaturals of the underworld in springs and caves and to prophesy the future for the pueblo, on the basis of what they have seen below the water or on the walls or floors of caves, or of what they have heard in such underground contacts. (p. 32)

Ellis, Florence Hawley

1974 Navajo Indians I: An Anthropological Study of the Navajo Indians. New York: Garland Publishing.

In her discussion of Navajo holy places and shrines, Ellis states, "Mt. Pelado, highest peak in the Jemez range, is visited by Zia, Jemez, Santa Ana, San Felipe, Santo Domingo, Cochiti, and the Tewa Pueblos north of Santa Fe; all leave offerings here" (p. 157). She adds that some of the Pueblos' corpus mountains of cardinal direction, such as Mount Pelado,

claim one or the other of these mountains as boundary markers, and in some cases it is apparent that such a high peak, like any other outstanding natural feature, could well serve as a marker between two tribal territories or even as a corner indicating where more than two came together. But it is also apparent that all the tribes which deposit offerings on the top of such a mountain cannot possibly claim the <u>entire</u> mountain. A tribe might own the side closest to the rest of its own domain, or it might not lay claim to any more of the physical body of the mountain but only to a recognized right to deposit offerings upon it, that right presumably having come into being through permission of other users of the peak or simply through lack of prohibition of such use by other users. (pp. 157–158; emphasis in the original)

The Navajo claim that Mount Pelado, as well as Mount Taylor and the San Francisco Mountains, is holy to their people. Ellis observes that this belief apparently is not native to Navajo belief; rather, she states, "It definitely is a Pueblo concept and the presence of the concept among the Navajo and Jicarilla Apache presumably is the result of borrowing from the pueblos" (p. 158).

Ellis, Florence Hawley

1994 Pueblo Religious Patterns, Especially Types of Shrines and Areas for Collecting Herbs and Other Religious Necessities. Andrea Hawley Ellis, ed. ***In*** **Artifacts, Shrines, and Pueblos: Papers in Honor of Gordon Page. Meliha S. Duran and David T. Kirkpatrick, eds. Pp. 101–112. Archaeological Society of New Mexico 20. Albuquerque: Archaeological Society of New Mexico.**

This paper is a reiteration of a classified document bearing the same title that Florence Hawley Ellis and Andrea Ellis Dodge submitted at court on behalf of the Public Service Company and the Bureau of Indian Affairs. The published essay is a modified version of the introduction to a court document concerning specific areas identified by the Pueblos of San Juan, San Ildefonso, and Santa Clara that should be avoided during the construction of a proposed high-voltage power line across the Jémez Mountains. This work is important because it provides a variety of contextual information for understanding Pueblo statements regarding the sanctity of places on their ethnographic landscapes that community members identify as possessing special, fragile qualities.

The article is useful for its review of the topic of religious privacy. Ellis identifies the general Pueblo belief "that, if their religious concepts and rituals are divulged to outsiders, those facets lose power" (p. 101). In her discussion of the basic tenets of Pueblo religion, Ellis further explains the difficult situation posed when persons from outside a cultural community ask for explanations of religious belief and faith:

> *the old Pueblo concept contends that if one freely "gives away his religion" (lets it be known) to outsiders, it no longer holds as much strength. They recognize that, as any secret ceases to hold its mystery, it also becomes emasculated, losing its power, and thus becomes useless. (p. 103)*

In her discussion of shrines and other special power points on the Pueblos' ethnographic landscapes, Ellis offers several other observations that contribute greatly to the article's usefulness:

> *Shrines clearly are central to the practice of Pueblo religion, whether located within the village or at a distance. (p. 104)*
>
> *Communication with Earth Mothers and other types of…[supernatural beings]…is primarily through shrines. They are locations where the spirits are believed to be at hand, or possibly live, thus a shrine area may be small like a sipapu in a kiva or quite large. (p. 103)*
>
> *Shrines that have fallen out of present use remain sacred and revered, since each shrine is like a telephone receiver, whose line communicates with the supernatural switchboard even when rarely employed. Each shrine contains a sacred power to be respected and never desecrated. (p. 104)*

Ellis notes that desecration of shrines and other places of great cultural significance to Pueblo communities can occur even when a proposed land-altering activity is underlain by the best intentions. Modifications to improve a locality, such as the cementing of a spring to enhance the flow of water, might represent a profane contamination of a sacred locality that renders a place—and its resources—"entirely unusable in a ritual context" (p. 110).

Importantly, Ellis adds that within the Pueblos' views of their worlds, the physical visitation of places held with reverence on their ethnographic landscapes is not a precondition for maintaining the special, reverent quality of a place. She reports that shrines "may be directly addressed from afar by reverently placing ones [*sic*] thoughts in the location of the distant shrine or by visiting its…substitute" (p. 105) located closer to home or in a less public location. Moreover, buffer areas that are "necessarily and consistently" (p. 110) free from trespass are required to maintain the sanctity of power points on the Pueblos' ethnographic landscapes.

Elmore, Francis H.

1944 Ethnobotany of the Navajo. Monographs 8. Santa Fe, NM: School of American Research.

Elmore documents several plants found in the Valles Caldera area that have economic, social or cultural value to the Navajo. Examples include sorrel (*Rumex* sp.) and willow (*Salix* sp.) as foods, blue flag (*Iris missouriensis*) as a dye, piñon (*Pinus edulis*) and quaking aspen (*Populus tremuloides*) as fuelwoods, and woods rose (*Rosa woodsii*) and nightshade (*Solanum ptycanthum*) as medicines.

Farrer, Claire R.

1991 Living Life's Circle: Mescalero Apache Cosmovision. Albuquerque: University of New Mexico Press.

This volume gives the reader a remarkable and highly useful discussion of Mescalero Apache cosmology. Farrer shows how a seemingly simple metaphor—a quartered circle—represents the richly textured and multilayered idea of life in balance (pp. 26–32, 60–61). Farrer maintains that the base metaphor provides "an ever and predictable order that in its very existence speaks eloquently of the harmonious universe of Creation" (p. 69). Four fundamental themes—the number four, the complementarity inherent in the relationship between sound and silence, the dialectical correlation intrinsic in directionality, and the ideal of maintaining balance and harmony throughout the cosmos—help explicate the structure of Apache world view and the organization of people's behavior in their day-to-day lives. Farrer suggests further that to understand the genesis of the base metaphor in Mescalero Apache ideation, and the consequent value that the people place on this idea, illuminates aspects of highly patterned behavior among Athapaskan groups generally.

Farrer also includes an informative summary of Mescalero Apache history in an appendix.

Farrer, Claire R.

1992 "…By You They Will Know the Directions to Guide Them": Stars and Mescalero Apaches. *In* Earth and Sky: Visions of the Cosmos in Native American Folklore. Ray A. Williamson and Claire R. Farrer, eds. Pp. 67–74. Albuquerque: University of New Mexico Press.

Farrer uses this short, poetic article on Mescalero Apache ethnoastronomy to examine some of the potent ways in which the earth and sky are linked and how the people perceive and assign meanings in the patterns of the stars to structure their daily thought and to organize their activities. In so doing, Farrer provides the reader with additional examples of the power of the base metaphor (a seemingly simple quartered circle motif) in understanding key aspects of Apache cultural patterning.

Ferguson, T. J.

2002 Western Pueblos and the Petroglyph National Monument: A Preliminary Assessment of the Cultural Landscapes of Ácoma, Laguna, Zuni, and Hopi. *In* "That Place People Talk About": The Petroglyph National Monument Ethnographic Landscape Report, by Kurt F. Anschuetz, T. J. Ferguson, Harris Francis, Klara B. Kelley, and Cherie L. Scheick. Pp. 4.1–4.24. Community and Cultural Landscape Contribution VIII. Prepared for: National Park Service, Petroglyph National Monument, Albuquerque, New Mexico, NPS Contract No. 14431CX712098003 (RGF 109B). Santa Fe, NM: Río Grande Foundation for Communities and Cultural Landscapes.

Ferguson reviews some of the landscape features important to the Ácoma, Hopi, Laguna, and Zuni. He offers valuable discussion about the cultural context and importance of shrines, volcanoes and lava, trails, plants, animals, and vistas. He also addresses community concerns about the protection and management of these features.

Ferguson, T. J., and E. Richard Hart

1985 A Zuni Atlas. Norman: University of Oklahoma Press.

Ferguson and Hart compiled this atlas from anthropological and historical research undertaken for litigation of Zuni land claims. The atlas documents 234 land use sites, including shrines, ancestral villages, and resource collection areas. Most but not all occur within the Zuni claim area, which extends from Mount Taylor in the east to the San Francisco Peaks in the west, and from the Río Puerco of the East in the north to the Mogollon uplands in the south.

Three maps show four Zuni sites within or near the Valles Caldera. These are Map 15—Traditional Zuni Hunting Area (Site 31), Map 16—Traditional Zuni Plant Collection Area (Sites 31 and 93), and Map 18—Traditional Zuni Religious Use Area (sites 31, 48, 93, and 94). (Note: Additional Zuni cultural sites are on the east side of the Jémez Mountains where they are in proximity to the Río Grande Valley.

Site 31 (*He:mushina Yala:we*) is in the Jémez Mountains at the southwest margin of the Valles Caldera. The Zuni gathered medicinal herbs, collected white powder medicine, hunted, and obtained materials used in kiva initiations at this location. In addition, *He:mushina Yala:we* is a place name mentioned in medicine prayers (p. 127).

Site 48 (*K'ya:k'yałna' K'ya:kwayinna*) is near the southwest rim of the Valles Caldera. The Zuni traditionally collected mud and silt at this place, which also serves as a shrine area (p. 127).

Site 93 (*Dahna K'ohanna*) is near San Ysidro and represents a location where the Zuni harvested Apache plume and mountain mahogany and collected sand and clays. The Zuni also associate *Dahna K'ohanna* with the Nadir Kiva, with the Longhorn visiting this place annually (p. 129).

Site 94 (*Ts'iya'a:wa*) is along the southern edge of the Jémez Mountain range. The people visit this location as a ritual area for prayer offerings (p. 129).

Fewkes, J. Walter

1896 A Contribution to Ethnobotany. American Anthropologist 9:14–21.

Fewkes states that the Hopi eat several genera of milkweed (*Asclepias* sp. and *Astragalus* sp.), horsetail (*Equisetum* sp.), and currant (*Ribes cereum*) found growing in the VCNP. In addition, he notes that the Navajo use *Androsace* sp. for medicine.

Ford, Karen Cowan

1975 *Las Yerbas de la Gente***: A Study of Hispano-American Medicinal Plants. Anthropological Papers 50. Ann Arbor, MI: Museum of Anthropology, University of Michigan.**

This exhaustive compendium of 862 plants provides a baseline inventory of Hispanic medicinal folklore. Included are 62 genera that grow in the VCNP.

Ford, Richard I.

1992 An Ecological Analysis Involving the Population of San Juan Pueblo. New York: Garland Publishing.

This classic study in Pueblo ethnobotany examines the web of interrelationships that the San Juan Tewa maintain with the broad suite of domestic cultigens and native plants that they recognize as possessing economic, social, and cultural value. Plants growing in the VCNP that the San Juan use exclusively for food include parsley (*Cymopterus* sp.), peavine (*Lathyrus* sp.), mallow (*Malva* sp.), and penstemon (*Penstemon* sp.). The inventory of plants with varied food and medicinal uses include native onion (*Allium* sp.), bearberry (*Arctostaphylos uva*), milkweed (*Asclepias* sp.), and goosefoot (*Chenopodium* sp.). Other plants with medicinal properties include thistle (*Cirsium* sp.), buckweat (*Eriogonum* sp.), many-flowered stickseed (*Hackelia floribunda*), native mint (*Mentha* sp.), ponderosa pine (*Pinus ponderosa*), Gambel oak (*Quercus gambelii*), native rose (*Rosa* sp.), and several dock and sorrel species (*Rumex* sp.). Ford also reports the San Juan Tewa use of New Mexico locust (*Robinia neomexicana*) for making wood tools and use of quaking aspen (*Populus tremuloides*) for construction and fuel.

Ford, Richard I., Albert H. Schroeder, and Stewart L. Peckham

1972 Three Perspectives on Puebloan Prehistory. *In* **New Perspectives on the Pueblos. Alfonso Ortiz, ed. Pp. 19–39. Albuquerque: University of New Mexico Press.**

The authors use archaeological evidence to argue that Towa peoples ancestral to Jémez Pueblo first "moved into the mountainous Jemez country" (p. 25) from the Gallina region by A.D. 1250. They state, "Jemez B/W pottery is a direct descendant of the carbon painted Gallina B/W pottery, and where lithic artifacts and similarities in burial practice further support the connection" (p. 25).

Fowler, Catherine S.

1986 Subsistence. *In* Great Basin. Warren L. D'azevedo, ed. Pp. 64–97. Vol. 11 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.

Fowler reports that the Ute use Woods rose (*Rosa woodsii*), which grows in the VCNP, as a medicine.

Friedlander, Eva, and Pamela J. Pinyan

1980 Indian Use of the Santa Fe National Forest: A Determination From Ethnographic Sources. Ethnohistorical Report Series 1. Albuquerque, NM: Center for Anthropological Studies.

This small publication provides an introductory overview of documentary sources discussing the use of the Santa Fe National Forest by the culturally diverse Indian communities of the region. In their introduction, the authors note, "In addition to a general reluctance on the part of the Indians to reveal information considered private, including often sacred and secret place names, ethnographic research for the most part does not necessarily concern itself with the exact location of hunting, fishing, and gathering spots or ritual sites" (p. 2).

Friedlander and Pinyan identify two Pueblo uses of the Valles Caldera in figure 9 ("Known use areas of major resources in the study area"); they identify Redondo Peak as a "Religious Use Area" and identify a San Ildefonso Pueblo pigment resource area at the northeast margin of the Valles. Without citing any source, they state, "One of the most important shrines of the Jemez Indians is located on the Peak of Mount Pelado [a.k.a. Cerro Redondo]. The mountain and its surrounding area are considered highly sacred. At one time this used to be a favorite area for herding" (p. 28). Friedlander and Pinyan (pp. 20, 23) cite Guthe's (1925) study of San Ildefonso pottery as their source for their identification of a site for the procurement of a "rare yellow stone" (p. 23) used for making blackware paint. They do not mention Guthe's statement that San Ildefonso potters also obtained an orange-red slip from the same Valles Caldera vicinity.

Although they do not specifically mention the Valles Caldera and its mountain peaks, Friedlander and Pinyan offer valuable insights into how the Jémez and Zía pueblos incorporated the nearby high-altitude settings into their ceremonial lives.

> *Retreats into the mountains are an important part of ritual life here as well. In 1930, initiation into one of the societies required the shamans from several pueblos to go into the mountains and gather soapweed (yucca) whips, different kinds of grass, and oak for use in the ceremony. For their summer retreats the societies go to collect decorative material for the ceremonial chamber: spruce or pinon tree boughs, willow branches for prayersticks, oak for kicksticks, if a race is involved, and waterworn pebbles to be placed on sand paintings. (White 1962:172, 232)*
>
> *Water is especially sacred and many of the shrines are springs where groups go for ceremonies or where individuals visit periodically to deposit prayer offerings. Other shrines are caves or mesa hills. Although most of these are off reservation territory, they are visited secretly and people lament having lost them. (p. 28)*

Lastly, Friedlander and Pinyan make the important observation that the locations of shrines and gathering areas among the Zía, Jémez, and Santa Ana Pueblos often overlapped and that the people of these communities together conducted many activities, such as hunting (p. 28; see entry for Ellis 1956).

Fry, Gary F., and H. Johnson Hall

1986 Human Coprolites. *In* Archaeological Investigations at Antelope House. Don P. Morris, ed. Pp. 165–188. Washington, DC: U.S. Department of the Interior, National Park Service.

Fry and Hall offer archaeological evidence of the pre-Columbian Pueblo use of broadleaf yucca (*Yucca baccata*), a species that grows in the VCNP, for food.

Gill, Sam D.

1983 Navajo Views of Their Origin. *In* Southwest. Alfonso Ortiz, ed. Pp. 502–505. Vol. 10 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.

Gill provides a useful general summary of Navajo origin mythology. He argues that while there are numerous, widely varying stories of cosmic creation and the origin of the Navajo,

the accounts in his article are central to understanding the world view of the people. "The order and character of the world and of the place of human beings in that world, including their relationships with one another and with all other living things, is defined in these stories" (p. 505). By extension, these stories also establish the principles by which the Navajo define their relationship with the physical geography, including the VCNP, of the world in which they live.

Gill provides an illustration of the Navajo Holy Mountain of the East. Rendered by Harrison Begay, a Navajo artist, the work, titled "East Mountain," is one of a set of four paintings, each of which represents a cardinal mountain of direction. Drawing on traditional mythologies similar to those recorded by Matthews (1897:78–79), Begay depicts the male and female inner forms of the mountain (p. 503). These supernatural beings are sprinkling pollen on the two pigeon eggs placed on the peak's summit by First Man and First Woman. White shells, corn, and lightning decorate the mountain. A bolt of lightning, represented by a black band motif common in sandpaintings, fastens the peak to the earth.

Glasock, Michael D., Raymond Kunselman, and Daniel Wolfman

1999 Intrasource Chemical Differentiation of Obsidian in the Jemez Mountains and Taos Plateau, New Mexico. Journal of Archaeological Science 26:861–868.

This study reports the findings of instrumental neutron activation and X-ray fluorescence analyses for sourcing obsidian from northern New Mexico, including the Valles Caldera of the Jémez Mountains. The authors undertook this study because of the long recognition that northern New Mexican obsidian was "one of the most important sources of lithic resources for the prehistoric [and possibly also the early historic] peoples of the American Southwest and the Southern Great Plains" (p. 861). The article provides some references for discussions of pre-Columbian trade networks.

Goddard, Pliny Earle

1933 Navajo Texts. Anthropological Papers of the American Museum of Natural History 34(1):1–179. New York: American Museum of Natural History.

Goddard, in his retelling of the Navajo story *The Emergence*, identifies "sisnadjinne," the Holy Mountain of the East, as Pelado Peak (p. 11). He translates this name as "Blackbelt."

Goff, Fraser

2002 Geothermal Potential of Valles Caldera, New Mexico. Geo-Heat Center Bulletin 23(4):7-12. Klamath Falls: Oregon Institute of Technology.

After years of work and expense, investigators have proven only 20 Mwe of geothermal reservoir capacity in the Valles Caldera. Estimates of undeveloped capacity range as high as 1,000 Mwe, but these approximations remain unsubstantiated. The shallow heat with the Valles rocks is vast; however, extraction of large quantities of hot fluids from these rocks has proven difficult (p. 10).

Goff, Fraser E., and Stephen L. Bolivar

1983 Field Trip Guide to the Valles Caldera and Its Geothermal Systems. Tech. Rep. LA-9963-OBES. Los Alamos, NM: Los Alamos National Laboratory.

This guide is based on field trips led by the authors. The original guide was created to accompany a workshop held in Los Alamos in 1982 for the Continental Scientific Drilling Program. The guide describes a one-way trip of about 90 miles (144 km).

The guide discusses the volcanic geology of the Valles Caldera. A few notes on recent historic events include the drilling of some 20 geothermal wells in the Redondo Creek area in the period 1970–1982 (p. 30), the destruction of the Sulphur Springs resort by fire "several years ago" (p. 32), and the Fenton Hill Hot Dry Rock demonstration project designed and built by Los Alamos National Laboratory (p. 39).

The report notes heavy logging on Cerro Santa Rosa, Cerro del Abrigo, and Cerro del Medio (p. 22).

Goff, Fraser, and Jamie N. Gardner

1988 Valles Caldera Region, New Mexico, and the Emerging Continental Scientific Drilling Program. Journal of Geophysical Research 93(B6):5997–5999.

This article briefly summarizes early research activities.

John Wesley Powell first described the rocks of the Jémez Mountains region during reconnaissance work performed in the 1880s (**see entry for Powell 1961 below**). The region was known at the time as the Tewan Plateau. Powell recognized it as an extensive volcanic field that had erupted many types of volcanic rocks, including voluminous deposits of ash.

Iddings (1890) presented petrographic and chemical data for some of Powell's samples including Bandelier Tuff and some quartz-bearing basalts.

Gold claims were first staked in the Cochití Mining District in the southeast Jémez Mountains in 1893. The two largest mines, the Lone Star and Albemarle, produced ore from quartz veins in altered volcanic rocks primarily from 1897 to 1903 and from 1914 to 1916 (see entry for L. C. Graton 1910). About 185,000 tons (187,968,678 kg) of ore grading about 0.2 ounce per ton (6 mg/kg) gold and 4 ounces per ton (124 mg/kg) silver have been mined from the district, "but only recently have workers realized that the deposit was formed in an earlier hydrothermal system of the Jemez Mountains volcanic field" (p. 5997).

C. S. Ross of the U.S. Geological Survey first began surveys in the Jémez Mountains in the 1920s (p. 5997; see entry for Ross 1931).

In the mid-1940s, Ross returned to the area to continue geologic mapping and volcanic studies with R. L. Smith, and again in 1954 with R. A. Bailey (p. 5997). These investigations resulted in a series of papers on ash flow tuffs, eruption mechanisms, ring dikes, resurgent cauldrons, and ash flow magmatism (see also entries by Ross and Smith 1961; Smith et al. 1961; Smith and Bailey 1966, 1968; and Smith 1979).

The first geothermal well to be drilled in the Valles Caldera (in 1960) was not intended as such; it was an oil test on the west flank of the resurgent dome. The Westates–Bond 1 well struck superheated water (about 392 °F or 200 °C) at shallow depths (see entry for Dondanville 1971). Three more wells were drilled in the 1960s in the same general area. Unocal drilled its first well (Baca 4) in the resurgent dome in 1970. Twenty more wells were drilled before the project ended in 1984. Because the Department of Energy (DOE) provided funding to the project, its results are public, forming "one of the most extensive, publicly available data bases of any drilled caldera system in the world" (p. 5997).

The first hot dry rock (HDR) geothermal experiments were performed on the west margin of the Valles Caldera (see also entry for Goff and Janik 2002:300). Four deep wells were drilled to depths as great as 7.2 miles (4.5 km) to determine whether electricity could be generated commercially from a built reservoir. High development costs and continuing low prices for fossil fuels finally ended this project in 1998 (see also entry for Goff and Janik 2002:300).

In the 1980s the Valles Caldera became a locus of investigations of processes in magmatism, hydrothermal systems, and ore deposit mechanisms. The DOE's Office of Basic Energy Sciences sponsored investigations that led to papers describing the hydrothermal system; the collapse, resurgence, and location of calderas; the evolution of volcanism and tectonics; and the geophysical structure of the caldera (pp. 5997–5998).

Goff, Fraser, and Cathy J. Janik

2002 Gas Geochemistry of the Valles Caldera Region, New Mexico and Comparisons with Gases at Yellowstone, Long Valley and Other Geothermal Systems. Journal of Volcanology and Geothermal Research 116:299–323.

Approximately 40 deep exploration and research wells were drilled in the Valles Caldera in the period 1959–1983, defining a small, but hot (572 °F [300 °C]), neutral-chloride, liquid-dominated geothermal system (p. 300). "The system proved to be too small in volume for economic development" (p. 301).

The first hot dry rock (HDR) geothermal experiments were performed on the west margin of the Valles Caldera (p. 300). Four deep wells were drilled to depths as great as 7.2 miles (4.5 km) to determine whether electricity could be generated commercially from a built reservoir. High development costs and continuing low prices for fossil fuels finally ended this project in 1998 (p. 300).

"The HDR concept was developed and tested in Precambrian crystalline rocks beneath the west margin of the caldera from 1972 to 1998" (p. 302). Cold water was pumped down an injection well, forced through artificially fractured reservoir rocks, and extracted from a nearby production well. The cold water dissolved minerals lining the fractured rocks and absorbed CO_2 and other gases while reaching thermal equilibrium between –256 and 320 °F (±160 °C). Depth of circulation was greater than 8,200 feet (2.5 km) (pp. 304–305).

Acid-sulfate springs, mud pots, and fumaroles at Sulphur Springs issue from the west side of the central resurgent dome of Valles Caldera (p. 301).

Goff, Fraser, Lisa Shevenell, Jamie N. Gardner, Francois-D. Vuataz, and Charles O. Grigsby

1988 The Hydrothermal Outflow Plume of Valles Caldera, New Mexico, and a Comparison with Other Outflow Plumes. Journal of Geophysical Research 93 (B6):6041–6058.

Two reservoirs have been drilled in the Valles hydrothermal system: the Redondo Creek reservoir and the Sulphur Springs reservoir. The deep reservoir fluids are described as neutral-chloride; they contain about 16 to 58 ounces per ton (500–1,800 mg/kg) total dissolved solids (TDS). About 6.3 miles (10 km) from the Valles Caldera, two sets of neutral-chloride hot springs discharge along the pre-caldera Jémez fault zone at Soda Dam and Jémez Springs. These springs have strong chemical similarities to the deep fluids within the caldera. The conclusion generally drawn from this is that a hydrothermal outflow plume travels out of the caldera in the subsurface along the Jémez fault zone and within adjacent sedimentary rocks toward the springs (p. 6041).

Gregg, Josiah

1954 [1844] Commerce of the Prairies 2 vols. Max L. Moorhead ed. Norman: University of Oklahoma Press. (Originally published Philadelphia: J. B. Lippincott).

Based on Gregg's travels on the Great Plains, this is the best known of the hundreds of eyewitness descriptions of the Santa Fe Trail. Between 1831 and 1840 Gregg traveled from Missouri to New Mexico and back four times, and also visited the Mexican interior states. Gregg pioneered the shorter Santa Fe Trail route on the Canadian River in 1839.

Gregg offers this description of the original Luis María Baca Grant as he saw it in 1832:

> *At Gallinas creek, we found a large flock of sheep grazing upon the adjacent plain; while a little hovel at the foot of a cliff showed it to be a rancho. A swarthy ranchero soon made his appearance, from whom we procured a treat of goat's milk, with some dirty ewe's milk 'curdle cheese' to supply the place of bread. (pp. 76–77)*

The ranchero was a Baca, possibly Tomás, Luis María's son. This ranch is on the Río Gallinas 20 miles (32 km) from Mora Creek. Moorhead notes that the house described here was the first structure in what became Las Vegas (Old Town).

Grubbs, Frank H.

1960–1962 Frank Bond: Gentleman Sheepherder of Northern New Mexico. New Mexico Historical Review 35:168–99; 35:293–309; 36:128–58, 230–243, 274–345; 37:43–71.

Grubbs describes the 1906 organization of the G. W. Bond and Brothers Mercantile Company and the Bond and Nohl Company, both of which operated out of Española. Their highest profits in wool and sheep were achieved in 1909 and 1912. G. W. Bond and Brothers Company established *partido* arrangements throughout the region. They sustained heavy losses of sheep in the severe winter of 1914–1915.

Guthe, Carl E.

1925 Pueblo Pottery Making: A Study at the Village of San Ildefonso. Papers of the Phillips Academy Southwestern Expedition 2. New Haven, CT: Yale University Press.

Guthe identifies the Valles Caldera as a source for orange-red slip and black ware paint made at San Ildefonso. He identifies the location, procurement, and use of these resources:

> **Orange Red Slip**
>
> *This substance is a yellow clayey earth, in texture somewhat like the two white slips. It occurs in the "Valle" to the west, beyond the first Jemez range, near Ojo Caliente. It was dug with a stick…and is carried home in shawls and bags. Before being stored it is put out into the sun to dry thoroughly, then placed in ollas and kept until needed. Like the other slips, it is prepared for use by being mixed with water. A saturated solution is made, but the consistency remains that of water.*
>
> *This material, which in solution is a brilliant yellow, is used for two purposes—as a slip to color the bases of bowls and ollas, and as a paint to supply the red elements of polychrome designs. After being fired it assumes an orange-red or burnt-sienna color…*
>
> **Black Ware Paint**
>
> *This is a paint used for making matte designs on polished black ware, a new departure in decorative technique first used by Maria and Julian Martinez of San Ildefonso, in June, 1921. The substance is a hard yellow stone, said to occur in the "Valle," west of the Jemez range, near Ojo Caliente, in the same district as the orange-red paint.*

The first step in preparing the paint for use is to scrape the stone with a knife. The resulting powder is mixed with water, and there is then added about one-fourth as much dissolved "guaco"…as there is paint. It is said that the purpose of the guaco is to make the paint "stick" to the polished surface. This paint, when ready for use, is kept in a small earthenware or china dish. The consistency of the mixture, like the other paints, is that of water. (pp. 24–25)

Gutiérrez, Ramón A.

1991 When Jesus Came, the Corn Mothers Went Away: Marriage, Sexuality and Power in New Mexico 1500–1846. Stanford, CA: Stanford University Press.

This social history of New Mexico between 1500 and 1846 analyzes marriage as a means to a more general understanding of social relations. The discussion of social, legal, and ethnic relations in the colonial and Mexican periods has general interest.

Gutiérrez' discussion of economic reform in the period of the Bourbon Reforms (1770s–1790s) describes the expansion of livestock raising and the livestock trade (Gutiérrez 1991:319–320).

Haile, Father Berard

1938 Origin Legend of the Navajo Enemy Way: Text and Translation. Yale University Publications in Anthropology 1. New Haven, CT: Yale University Press.

Haile, a renowned student of Navajo ceremonialism and language, defines "sisna·žiní" as "Horizontal black belt" and states that this translation "is apparently more in harmony with the true appearance of this mountain, than 'vertical or downward black belt'" (p. 66). Haile contends that Blanca Peak of Colorado is the Navajo Holy Mountain of the East, which normally would place his study outside the geographic scope of interest for the VCNP. In Sleight's critical review of the controversy surrounding the identification of the Navajo Holy Mountain of the East, Sleight (1950) rebuffs this claim, in part, by using Haile's own careful translation of the Navajo name for the Holy Mountain of the East.

On September 8, 1912, Haile visited Blanca Peak, accompanied by his Navajo collaborators, Slim Curly and River Junction Curly, both of whom were singers from the Leupp, Arizona area, and his translator, Albert Sandoval. The singers spent the entire day exploring the peak and gathered soils, various herbs, and stones for later use in ceremonies in the Navajo homeland. This observation suggests that Navajos making pilgrimages to Redondo Peak would have gathered similar materials for rituals back home.

Haile, Father Berard

1947 Prayer Stick Cutting in a Five Night Navajo Ceremonial of the Male Branch of Shootingway. Chicago, IL: University of Chicago Press.

Haile reports that toward the end of the third day of the Shootingway ceremonial, the singer recites a prayer for each of the eight sticks that he makes. He recounts the basic prayer and provides a synoptic summary of additions, including mention of the Jémez Mountains:

Additions to this prayer are concerned with place names of Shootingway and holy young man: may good conditions come to me from jarring mountain; from rock extending to the skies…from trees extending up the mountain side…from floating feather, Jemez range and other Shootingway localities. (p. 170)

Haile, Father Berard

1950 Part One: Legend of the Ghostway Ritual in the Male Branch of Shootingway. Saint Michaels, AZ: St. Michaels Press.

Haile continues to identify "sisna·žiní" with Blanca Peak in his retelling of the Ghostway ritual (pp. 112, 114).

Halmo, David B., Richard W. Stoffle, and Michael J. Evans

Paitu Nanasuagaindu Pahonupi (*Three Sacred Valleys*): Cultural Significance of Gosiute, Paiute, and Ute Plants. Human Organization 52(2):142–150.

Halmo and others provide information about the cultural significance of six plant taxa traditionally used by the Ute. These species are *Juniperus osteosperma* (juniper/cedar), *Opuntia erinacea* (Mojave prickly pear), *Chrysothamnus nauseosus* (rabbitbrush), *Artemisia nova* (sagebrush), *Ephedra nevadensis* (Indian tea), and *Artemisia spinescens* (budsage). This discussion provides a basis for building a critical evaluation of the cultural significance that Ute peoples assign to native plants growing within the VCNP.

Harper, Blanche Wurdack

1929 Notes on Documentary History, the Language, and the Rituals and Customs of the Jemez Pueblo. Masters Thesis. University of New Mexico, Albuquerque.

This unpublished Masters thesis includes a section on the documentary history of Jémez Pueblo, a fairly extensive Towa vocabulary, and notes on rituals and customs.

The history section (Section 1) does not mention the Baca Location. Harper states that the Navajo and Ute, among others, waged "ceaseless war" (Section 1, p. 5) on Jémez Pueblo after the Pueblo Revolt of 1680.

Harper notes that Jémez Pueblo recognizes holy waters and mountains of direction, but the people do not have an inventory of cardinal shells, trees, birds, snakes, or Corn Maidens (Section 2, p. 9). She gives Jémez Pueblo's Holy North Mountain as Wä́ v ā mä, which she translates as "Father of All North Mountains" (Section 2, p. 30). Dā́ lā shĭng, "Chicken Mountain," is just to the north (section 2, p. 31).

The vocabulary includes a name for Vallecito Creek (Wä lă̄ tō pă̄ wä) and the entry:

> *The 'Sulphurs' 10 miles [16 km] above Jemez Springs: Pă̄ gē ā shō lū nūng ("Place of the boiling water." Pă̄: water, Gē ō shō lū: boiling, nūng: place). [Section 2, p. 33)*

The Jémez term for "spring" is Pä́ tē ā shē ō la nūng. (Section 2, p. 39)

Harrington, John Peabody.

1916 The Ethnogeography of the Tewa Indians. *In* Twenty-Ninth Annual Report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution, 1907–1908. W. H. Holmes, ed. Pp. 29–636. Washington, DC: U.S. Government Printing Office.

This volume remains the quintessential work about how Tewa people construct and assign meaning to their ethnographic landscapes. Because Harrington's study is a general review of Tewa ethnogeography, the reader needs to be careful not to apply his findings uncritically among the different Pueblo linguistic communities; Pueblo landscape constructions are not uniform cross-culturally. In fact, some contemporary Tewas believe Harrington obscures important variability in place-name terminology and meaning still exhibited among the six contemporary Tewa communities.

Yet Harrington's work gives many valuable insights into the cosmological and cognitive grammars that organize the Tewas' view of their natural world and helps structure how they assign meaning to places in the physical environments contained within their traditional homelands. This framework, in turn, is useful in evaluating how non-Tewa communities construct their ethnographic landscapes.

When considered in terms of Tewa cosmography (see pp. 41–52) and meteorology (see pp. 53–60), Harrington's study illustrates a highly sophisticated system of interconnected metaphorical references about the movement of water between the supernatural and natural worlds of the Tewas' cosmos. Powerful lessons underlying Harrington's work include the ideas that Tewa landscape constructions (1) do not represent disparate spaces that can be understood in isolation of one another and (2) places are not defined easily by metrical metes and bounds.

Within this expansive discussion, Harrington documents the Tewa people's inclusion of the Valles Caldera within their cultural geographies and landscapes. He reports that the Tewa gloss the four principal valles, which are known generally to area populations by the Spanish names of Valle de los Posos [16:45 (p. 264)], Valle de Santa Rosa [16:45 (pp. 264–265)], Valle Grande [16:131 (p. 276)], and Valle de San Antonio [27:6 (p. 391)], using the terms (in English translation) "beyond the mountains," "beyond the western mountains," and "the Jemez Mountains."

Harrington provides some additional detail in his presentation of place names for the Jémez Region (map 27). Of interest are eight places within the Valles Caldera known to the Tewa:

Wavema [27:4], a very large mountain north of the Valle de San Antonio (p. 391)
Valle de Santa Rosa [27:5] (p. 391)
Valle de San Antonio [27:6], a high grassy meadow (p. 391)
Valle Grande [27:7], the principal grassy meadow (p. 391)
Sulphur Springs [27:8], which is known by both the Tewa and the Jémez as the "place of the boiling water" (p. 391)

A peak north of Cerro Redondo known by its Jémez name of "chicken hawk mountain" [27:9] (p. 391)
Cerro Redondo (a.k.a., Cerro Pelado) [27:10], whose Jémez and Cochití names are variants of "butterfly mountain") (pp. 391–392)
San Antonio Creek [27:11) (pp. 392–393)

Hewett, Edgar J., and Bertha P. Dutton, eds.

1945 The Pueblo Indian World: Studies on the Natural History of the Río Grande Valley in Relation to Pueblo Indian Culture. Albuquerque: University of New Mexico and School of American Research.

This useful study discusses the various Pueblo communities' conceptualizations of the earth, sky, and world (pp. 20–51). Hewett and Dutton consider the features of Pueblo life common among all the groups, as well as selected understandings unique to one group. This accessible work offers much ethnographic detail about how Pueblo communities perceive and maintain affiliations with their traditional landscapes.

Hill, W. W.

1940 Some Aspects of Navajo Political Structure. Plateau 13(1):23–28.

Hill discusses ritual actions associated with the induction of a headman into office during the Chief Blessingway:

> *According to Slim Gambler, it was customary for the newly elected man to journey to the four sacred mountains and plant corn at each one. White corn was planted at Pelado Peak (Blanco Peak) in the east, yellow corn at Mt. Taylor in the south, blue corn at the San Francisco Peaks in the west, and variegated corn at the San Juan Mountains (La Plata Mountains) in the north. (p. 27)*

Hill implies that some headman initiates from Navajo communities, which recognized Redondo Peak as the Holy Mountain of the East, might have ritually planted corn in the VCNP.

Hill, W. W.

1982 An Ethnology of Santa Clara Pueblo, New Mexico. Charles H. Lange, ed. Albuquerque: University of New Mexico Press.

Hill reports that three plants growing in the VCNP have use to the Tewa of Santa Clara Pueblo: Native parsley (*Cymopterus* sp.) is a medicine, mock-orange (*Philadelphus microphyllus*) provides dye, and piñon (*Pinus edulis*) has medicinal uses.

Hillstrom, Laurie Collier

1998 Ute. ***In*** **The Gale Encyclopedia of Native American Tribes, vol. 2. Sharon Malinowski and Anna Sheets, eds. Pp. 38–43. Detroit, IL: Gale.**

This article is a brief summary of Ute culture and history. Hillstrom includes a Ute oral tradition story titled "Smoking Waters" that provides valuable insights into Ute cosmology and the origins of hot springs.

> *A long time ago, the people of the mountains lived in peace. The forests and streams fed them so that they never slept hungry. They were content with their brothers and sisters. They were safe in the shelter of the mountains.*
>
> *In time, a restless young man named Many Feathers became chief and things began to change. Many Feathers fished the streams he had fished before and wished for new ones. He looked at the sheltering mountain slopes and felt imprisoned. Then when the old ones told tales of people beyond the mountains, Many Feathers dreamed he wore the robe of a great chief, a leader of many warriors.*
>
> *"Our elders say the people beyond the mountains have more horses than they have children," Many Feathers exclaimed one day. "If we fight them, their horses can be ours."*
>
> *Some listened.*
>
> *"Great battles make great heroes. A brave warrior walks in honor on every path," he said.*
>
> *And others listened.*
>
> *So Many Feathers called a council in the shadow of the mountains and told the old ones to teach them the war dances of their ancestors. One of the old ones, a medicine man named Smoking Waters, refused.*

"We are happy here," said the old man, and his arm swept for-ward, tracing the circle of surrounding mountains. "The birds of the sky and creatures of the land are our brothers here," he said. "We have what we need. We need nothing more."

"You are afraid, old man!" laughed Many Feathers, mocking him. "Stay in the lodge with the women and children."

"My brother speaks with the voice of the North Wind," responded Smoking Waters gravely. "As the North Wind brings snow and winter's death, so you will bring sorrow and death to our people."

"I will bring power to our people!" shouted Many Feathers.

Then Many Feathers turned to face his people. "This old man is like the timid rabbit who runs before he looks," he cried. "Beat the drums! Dance the war dances! We shall make ourselves heroes!"

Many Feathers' words made the hearts of his people proud. They cheered and beat the drums. When they left the council, the people laughed at the old medicine man and drove him from the tribe.

The people danced the forgotten war dances. They tightened their bows. They painted their faces and dressed their hair with feathers, bone, and thongs of hide. Then the fathers, sons, and brothers marched beyond the mountains to war.

Many of them died.

Later, deep in the mountains, where his lonely campfire burned on the bank of a stream, Smoking Waters saw his people in a vision. But where were the hunters, he wondered. Where had the fathers gone? Children were crying for food. The women were thin and bent with sickness. Drums beat out the death chants. The people of the mountains no longer sang their joyful songs.

As Smoking Waters wept for his people, his tears mingled with the waters of the mountain stream. He cried for the ones who had died and for those who suffered. He grieved until the sadness was bigger than life, and then the old medicine man died.

But Smoking Waters' love for his people lived on in the fire he had built. It burned on without dying through the nights and the years. It burns even today, warming the waters of the streams that flow within the mountains. Now, as it was then, the mountain hot springs soothe the sick and the weary and heal the wounded. They are Smoking Waters' gift of love and peace to all the people. (pp. 39–41)

Hoebel, E. Adamson

1979 Zia Pueblo. *In* **Southwest. Alfonso Ortiz, ed. Pp. 407–417. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

This article provides a concise overview of the anthropology and history of Zía Pueblo.

Hucko, Bruce

1996 Where There Is No Name for Art: The Art of Tewa Pueblo Children. Santa Fe, NM: School of American Research.

Hucko, a self-described "art coach," introduces the reader to some of the Tewa students he worked with at the Santa Clara, San Ildefonso, San Juan, Pojoaque, and Nambé Pueblo day schools. The children, who were involved in every step of the book's publishing process, talk about their histories, families, and communities, share insights into their culture and heritage, and discuss the process of making art. In talking about petroglyphs and about their communities' cultural landscapes, the children show that the meaningfulness referred to by their elders transcends the generations.

Hudspeth, William B.

1997 Environmental Setting. *In* **OLE, vol. 1. Context. John C. Acklen, ed. Pp. 9–42. Albuquerque: Public Service Company of New Mexico.**

In table 2.1 Hudspeth identifies the edible parts, seasonality and distribution of more than 125 plant species that grow in the VCNP.

Huning, Franz

1973 Trader on the Santa Fe Trail: Memoirs of Franz Huning, with Notes by His Granddaughter, Lina Fergusson Browne. Albuquerque: University of New Mexico, Calvin Horne Collection.

Huning notes (pp. 63–64) that when he was at Jémez Springs for about three weeks in 1856, he saw Manuel Abrego, whom he already knew. Abrego's ranch at Sulphur Springs may have been the first Anglo-European settlement near Redondo Creek.

Iddings, J. P.

1890 On a Group of Rocks from the Tewan Mountains, New Mexico, and on the Occurrence of Primary Quartz in Certain Basalts. U.S. Geological Survey Bulletin 66.

In this article Iddings presents petrographic and chemical data for some of the samples taken by J. W. Powell (see entry for Powell 1961 [1885]). The samples included Bandelier Tuff and some quartz-bearing basalts.

Indian Claims Commission

1974 Commission Findings on the Pueblo Indians. New York: Garland Publishing.

This volume contains the Findings of Fact and Opinions pertaining to Pueblo land claims decided by the Indian Claims Commission (ICC). Since no Pueblo community claimed exclusive use of the Valles Caldera, this book contains little information pertinent to the VCNP. The ICC heard claims only for land exclusively used and occupied as of February 2, 1848, the date of the Treaty of Guadalupe Hidalgo. Claims for areas used in earlier periods and for areas used by more than one tribe were not allowed. The ICC also determined that all valid Spanish and Mexican land grants were private property and not part of the United States public domain. This decision meant that any Pueblo uses of areas within Spanish and Mexican land grants were not subject to claims litigation "even though the particular tribe may have used and occupied parts of them from aboriginal time" (17 ICC 615, p. 618). The Commission found that some land use activities (e.g., hunting) took place "at great distance to points outside the claimed area" (p. 629).

Jefferson, James, Robert W. Delaney, and Gregory C. Thompson

1972 The Southern Utes: A Tribal History. Floyd A. O'Neil, ed. Ignacio, CO: Southern Ute Tribe.

This scholarly summary of Ute history provides documentary information about Ute material culture during the early Historic period (e.g., see p. 2).

Of relevance to the VCNP is an unlabeled figure (p. xi) illustrating the Ute's aboriginal domain. This diagram shows the Ute's hunting territories extending farther into northern New Mexico than many maps accompanying Ute historical reviews (e.g., see entry for Callaway et al. 1986). This common-place omission of the Utes traveling into New Mexico as far as Santa Fe is surprising given that documentary sources commonly cite these seasonal rounds into the Jémez Mountains and the Chama Valley.

Johnson, George

1996 Fire in the Mind: Science, Faith, and the Search for Order. New York: Vintage Books.

In this provocative essay, Johnson juxtaposes systems of traditional community belief and understandings obtained through science to explore the question of where religion ends and science begins. Johnson compares recent contributions by New Mexican scientists in quantum physics, information science, and complexity with the traditional cosmologies of the region's Tewa Pueblo people and Nuevomexicano Catholic Penitentes. More immediately relevant to the VCNP Land-Use History project, Johnson confirms that the Río Grande Pueblo people, just as their Western Pueblo counterparts, traditionally conceptualized flowing lava as "hot water" (p. 300).

Jones, Volney H.

1931 The Ethnobotany of the Isleta Indians. Masters thesis. University of New Mexico, Albuquerque.

Jones identifies the Isleta Pueblo consumption of mock-orange (*Philadelphus microphyllus*) for food.

Jones, Volney H., and Robert E. Fonner

1954 Plant Materials from Sites in the Durango and La Plata Areas, Colorado. *In* **Basketmaker Sites near Durango, Colorado, by Earl H. Morris and Robert F. Burgh. Pp. 93–115. Publication 604. Washington, DC: Carnegie Institute.**

Jones and Fonner identify the pre-Columbian uses of several plant species found in the VCNP. Examples include bur-reed (*Sparganium* sp.), which is a food, and American vetch (*Vicia americana*), which has medicinal value.

Jordan, Terry G.

1993 North American Cattle Ranching Frontiers: Origins, Diffusion and Differentiation. Albuquerque: University of New Mexico Press.

Jordan discusses Old World cattle ranching in Europe and Africa, and how its patterns and practices explain ranching in the New World. He notes that ranching is not specific to open grasslands:

> *Cattle ranching...thrived in a great variety of New World physical environments, from tropical savannas to subtropical pine barrens and midlatitude prairies, from fertile lowland plains to rugged mountain ranges, from rainy districts to semideserts. (p. 9)*
>
> *By the time of the discovery of America, range cattle raising occupied a broken belt of land on the Atlantic rim from Scandinavia and the British Isles down to Angola in Africa.*
>
> *Range cattle raising was to be found in highlands, islands, marshes, moors, savannas and semideserts, having been forced to the edges of two continents by more intensive farming practices. Ranching would similarly become established in a wide variety of coastal, marsh, plains and highland environments in the New World.*
>
> *Permanent Hispanic settlement began in New Mexico in 1598 with the colonizer Juan de Oñate, but Hispanic New Mexico never became a center of cattle ranching. Perhaps the single greatest retarding factor was the presence of a substantial established population of Pueblo Indian irrigation farmers. (p. 146)*

Jordan contends the mission fathers blocked development of a large-scale cattle industry in order to protect the Indians' fields and crops. Oñate introduced breeder flocks of sheep, which dominated even after the 1690s Reconquest of New Mexico. For example, Diego Padilla south of Albuquerque owned 1,700 sheep but only 141 cattle in 1740.

By 1757 all the Hispanics of the province combined owned fewer than 8,000 cattle and fewer than 2,500 horses. In 1832, 240,000 sheep were in the department but only 5,000 cattle and 850 horses. Sheep became "the economic hallmark of the regional Euroamerican culture" (p. 147) and also were adopted by the Navajos and Utes.

Although the book is about cattle, not sheep, and does not mention the Valles Caldera, it provides valuable background for the VCNP Land-Use study.

Keleher, William A.

1982 [1952] Turmoil in New Mexico, 1846–1868. Albuquerque: University of New Mexico Press.

The author mentions the Valles Caldera in a discussion of actions taken by the U.S. Army to deter Navajo and Apache movement through the locality during the final Navajo Wars of 1863. Under orders from General James A. Carleton Lieutenant Erastus W. Wood, 5 non-commissioned officers, and 31 privates from Company A, 1st Infantry, California Volunteers, manned the Old Fort encampment, which Nesbit and Parker had occupied a decade earlier as a hay camp (see entry for Church n.d.; and McNitt 1972). General Carleton's instructed Lieutenant Wood and his men:

> *. . . to lie in wait for thirty days to kill every Navajo or Apache Indian who attempts to go through that noted thoroughfare. No women and children will be harmed; these will be captured. (quoted on p. 314).*

Keleher notes that on September 27, 1863, five weeks after General Carleton's orders to Lieutenant Wood to set up a month-long post at Old Fort in the Valles Caldera, Lieutenant P. A. J. Russell led four mounted men and a group of Pueblo warriors from the Valle Grande. They rode in pursuit of a band of Navajo raiders who had stolen livestock from nearby Río Grande Pueblo villages. This contingent surprised the raiders at Jémez Springs, killing 8 men, capturing 20 women and children, and recovering 125 sheep and 2 horses (Keleher 1982:314).

Kelley, Klara Bonsack, and Harris Francis

Navajo Sacred Places. Bloomington: Indiana University Press.

Although Kelley and Francis do not specifically discuss places important to the Navajo within the VCNP, their study offers important background information and perspectives for examining and comprehending the significance of the people's cultural landscapes through careful consideration of selected examples. For example, Kelley and Francis (p. 125) state that volcanic calderas "are important in the songs, prayers, and stories of many ceremonial repertoires that involve the power of thunder and lightning (which seeks depressions and lava rock) and wind" (p. 125).

Kelley, Klara Bonsack, and Harris Francis

2002 *Chézhin Sinil* **(***Rock-That-Defends***): Navajo Cultural Landscapes and the Petroglyph National Monument.** *In* **"That Place People Talk About": The Petroglyph National Monument Ethnographic Landscape Report, by Kurt F. Anschuetz, T. J. Ferguson, Harris Francis, Klara B. Kelley, and Cherie L. Scheick. Pp. 5.1–5.30. Community and Cultural Landscape Contribution VIII. Prepared for: National Park Service, Petroglyph National Monument, Albuquerque, New Mexico, NPS Contract No. 14431CX712098003 (RGF 109B). Santa Fe: Río Grande Foundation for Communities and Cultural Landscapes.**

Kelley and Francis use published accounts of Navajo oral tradition to establish principles and themes concerning the importance of the landscape in sustaining community heritage and identity. The authors demonstrate how oral traditions, in combination with contemporary ethnographic study, can be used effectively to establish the existence of essential community relationships with places and provide informed contexts for the responsible management of culturally sensitive landscape features and other kinds of traditional cultural properties.

Kelley and Francis address several kinds of landscape features found within the VCNP, including shrines, lava rocks, plants, animals, minerals, and vistas. They include Navajo community concerns about the management of these landscape features as cultural resources.

Kelly, Daniel T., and Beatrice Chauvenet

1972 The Buffalo Head: A Century of Mercantile Pioneering in the Southwest. Santa Fe, NM: Vergara Publishing.

The author was the son of Harry Kelly, cofounder of Gross, Kelly and Company, a major New Mexico corporation dealing mainly in sheep and wool and, as Kelly explains, a direct competitor of the Bond brothers.

Although Kelly does not deal with the Baca Location, his discussion of the Bonds (pp. 96–97) and his explanation of *partido* (pp. 190–191) are useful in understanding how the Location entered into a regional and national mercantile system.

Kent, Kate Peck

1983 Prehistoric Textiles of the Southwest. Santa Fe: School of American Research, and Albuquerque: University of New Mexico Press.

Kent notes that pre-Columbian peoples used milkweed (*Asclepias* sp.), which grows in the Valles Caldera area, for making dye.

Keur, Dorothy Louise

1941 Big Bead Mesa: An Archaeological Study of Navajo Acculturation, 1745–1812. Memoirs of the Society for American Archaeology, 1. Menasha, WI. (Reprinted Millwood, NY: Kraus Publishing Company, 1974).

Keur follows Matthews (1897) in retelling the Navajo story of emergence. In her discussion of the Navajo Holy Mountains of Direction, she states, "The name for the sacred mountain to the east probably means Dark Horizontal Belt, and it is situated somewhere near the Pueblo of Jemez, in Bernalillo county, New Mexico; probably Pelado Peak, twenty miles [32 km] north-northeast of the pueblo" (p. 8).

Kirk, Donald R.

1970 Wild Edible Plants of the Western United States. Heraldsburg, CA: Naturegraph.

Kirk provides information on the preparation and uses, habitat and distribution, and physical appearance of many different edible plants found throughout the West. His sample includes 89 plant families found in the VCNP.

Klah, Hasteen

1942 Navajo Creation Myth: The Story of the Emergence. Recorded by Mary C. Wheelwright. Navajo Religion Series, Vol. 1. Santa Fe: Museum of Navajo Ceremonial Art.

Klah refers to Nehochee-otso, a large hollow place on the top of the Jémez Mountains where Tseh-nagi (Rolling Rock) lived. This monster was "a great striped rock which could roll very quickly in any direction, and killed people by rolling on them" (p. 71). The story of the destruction of Rolling Rock establishes that the Navajo view the Jémez Mountains as a portal between the natural and supernatural worlds of the cosmos:

> *Nayenezgani, the Hero Twin Monster Slayer, traveled to the Jemez Mountains to kill Tseh-nagi in his quest to rid the world of the monsters that plagued the people. When Nayenezgani tried to approach Tseh-nagi, the Rock began to roll towards him and he shot his lightning arrow at the Rock from the east, but could not hit it, and the Rock then rolled back to its den. Then Nayenezgani shot at it from the south and managed to knock a little splinter from it while the Rock pursued him. He then approached the Rock from the west and the same thing happened, and also from the north, and at the end he only managed to knock off a few pieces and could not injure it, and meanwhile it kept chasing him while he was barely able to avoid it.*
>
> *At his home at Huefano the magic kehtahn began to burn very brightly, which showed that Nayenezgani was in great danger. So they [other immortals] sent hail, big rain, and cyclones to attack the Rock. And the water soaked it, and Hashjeshjin [the Fire God] burnt it with his fire, and then hit it with a stone knife, and large pieces were broken off it. The Rock tried to escape them, but they chased it into a mountain from which it burst out as though from a volcano, and finally they chased the Rock four times around the earth, while it grew smaller and smaller, until at last it fell into the Grand Canyon, where it is now. (pp. 93–94)*

In his telling of the Navajo Story of the Emergence, we learn that Begochiddy, "the great creating God, fair-haired and blue-eyed" (p. 212), lives on Síss-nah-jíni, the Holy Mountain of the East (p. 228). Moreover, in the succession of four worlds in the Navajo creation story, Begochiddy took earth from the previous world and created the mountains of the east, south, west, and north, as well as the plants that grew on and between these summits and the clouds that gathered over them (cf. pp. 29, 41, 43, 62).

Krenetsky, John C.

1964 Phytosociological Study of the Picuris Grant and Ethnobotanical Study of the Picuris Indians. Masters thesis. University of New Mexico, Albuquerque.

In his study of Picurís Pueblo ethnobotany, Krenetsky reports on the uses of several plants that grow also in the VCNP. Foods include Yarrow (*Achillea* sp.), Milkweed (*Asclepias* sp.), and Aster (*Aster* sp.). Medicine plants include white fire (*Abies concolor*), buckwheat (*Eriogonum* sp.), geranium (*Geranium* sp.), sneezeweed (*Hymenoxys* sp.), common plantain (*Plantago major*), native rose (*Rosa* sp.), and prairie coneflower (*Ratibida columnifera*).

Lambert, Marjorie

1979 Pojoaque Pueblo. *In* Southwest. Alfonso Ortiz, ed. Pp. 324–329. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.

This article provides a concise overview of the anthropology and history of Pojoaque Pueblo.

Lang, Richard W.

1986 Artifacts of Woody Materials from Arroyo Hondo Pueblo. *In* Food, Diet, and Population at Prehistoric Arroyo Hondo Pueblo. Wilma Wetterstrom, ed. Arroyo Hondo Archaeological Series, 6. Pp. 251–276. Santa Fe, NM: School of American Research Press.

Lang presents the archaeological use of narrow-leaf cattail (*Typha angustifolia*) in basketry at this major village outside Santa Fe.

Lange, Charles H.

1959 Cochiti: A New Mexico Pueblo, Past and Present. Austin: University of Texas Press.

Lange documents the varied ethnographic uses of six plant families at Cochití Pueblo that grow also in the VCNP: grama grass (*Bouteloua* sp.), throughwort (*Eupatorium* sp.), spurge

(*Euphorbia* sp.), piñon (*Pinus edulis* sp.), narrowleaf cottonwood (*Populus angustifolia*), and nightshade (*Solanum* sp.).

Lange, Charles H.
1978 The Spanish-Mexican Presence in the Cochiti-Bandelier Area, New Mexico. ***In*** **Across the Chichimec Sea. Carroll L. Riley and Basil C. Hedrick, eds. Pp. 34–52. Carbondale: Southern Illinois University Press.**

Lange summarizes contacts between the Coronado (1540–1542), Chamuscado-Rodríguez (1581–1582), Espejo (1582), and Castaño de Sosa (1590) expeditions and the Río Grande Pueblos. He describes the *entrada* of Juan de Oñate and his colonists. Lange notes that the missionary friars were assigned to their respective pueblos on September 9, 1598, and that Father Juan de Rozas was sent to the Keresans. "Thus, it appears likely that the summer and autumn of 1598 marked the first sustained and substantial [Hispanic] influence on the Cochiti-Bandelier area" (p. 43). Lange reviews the events of the Pueblo Revolt and the Reconquest.

Lange notes a "virtually unique" characteristic of Cochití Pueblo: "As indicated in the 1765 census notes of Father Morfi and continuing into the present time, Cochiti has had a resident Spanish population" (p. 48).

Lange, Charles H.
1979a Cochiti Pueblo. ***In*** **Southwest. Alfonso Ortiz, ed. Pp. 366–378. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

This article provides a concise overview of the anthropology and history of Cochití Pueblo.

Lange, Charles H.
1979b Santo Domingo Pueblo. ***In*** **Southwest. Alfonso Ortiz, ed. Pp. 379–389. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

This article provides a concise overview of the anthropology and history of Santo Domingo Pueblo.

Lange, Charles H., and Carroll L. Riley, eds.
1966 The Southwestern Journals of Adolph F. Bandelier 1880–1882. Albuquerque: University of New Mexico Press.

Bandelier notes that there are otters (known locally as "perritos de agua") in the Valle Grande (p. 214).

Lange, Charles H., and Carroll L. Riley, eds.
1984 The Southwestern Journals of Adolph F. Bandelier 1889–1892. Albuquerque: University of New Mexico Press.

Bandelier notes that on June 5, 1890, "several fires" were burning in the Valle Grande (p 108). The editors note, "The Valle Grande is a distinctive landmark and, once located, the several peaks surrounding it can be easily sighted from Santa Fe and much of the surrounding area" (p. 413, 474n).

Lange, Charles H., Carroll L. Riley, and Elizabeth M. Lange, eds.
1975 The Southwestern Journals of Adolph F. Bandelier 1885–1888. Albuquerque: University of New Mexico Press.

Bandelier describes a trip to the Valle Grande on July 19–20, 1888 (pp. 270–271). He reached it from Espanola, passing the ruin of Shu-finne, through the Santa Clara Canyon, to the source of the Río de la Jara, the Valle Grande (which he also calls Valle de Toledo), across the Valle de Santa Rosa and the Valle San Antonio, to the Ojos de San Antonio. He spent a day at the Ojos de San Antonio, then walked down to Jémez Springs.

"The sheep herds are out of the Valles and grazing in the adjacent timbered slopes" (p. 271; see also his sketch map that accompanies this excerpt).

Laughlin Papers

1907 Unsigned letter to L. W. Dennis, Chicago, Illinois, August 14, 1907. Napoleon B. Laughlin Papers, Accession No. 1959–131, Box 10, Folder 145. Santa Fe, NM: State Records Center and Archives.

L. D. W. Shelton, a land surveyor also referred to in the Bond, Frank, and Son records (see entry for Bond and Son 1917), might have written this unsigned letter. It is part of the voluminous correspondence sent, received, and collected by New Mexico Judge Napoleon B. Laughlin on issues relating to land grants.

This letter, postmarked Santa Fe, responds to an inquiry from L. W. Dennis of Chicago. Most of the letter consists of quotations attributed to two different "cruisers on the property," also referred to as "cruisers who were sent upon the ground…by prospective purchasers." The writer states, "I am not advised as to the name of either of these men." The second informant repeats some mining data supplied to him by "Mr. Woodward of Bland, N.M."

The timber on the Baca Location is estimated by one of the cruisers at 425 million board feet of white pine and from 15 to 25 million board feet of spruce. The writer says there are also "telegraph poles, ties, piling, mine props and stulls in large quantities," on the Baca Location. The other informant estimates 403 million board feet of merchantable timber on the property.

The title is described as "perfect" because it rests on a government deed "to the present owners in exchange for one of the Spanish Land Grants."

One cruiser says the valley and agricultural land are "excellent meadow…there is not a stump and very few stones. One valley is about eight miles [12.8 km] long and from two to three miles [3.2–4.8 km] wide, and contains about ten thousand (10,000) acres [4,047 ha], with a stream with a good flow of water running through it." The writer or writers describe "many fine springs" and "grazing…of the best to be found."

Liljeblad, Sven

1986 Oral Tradition: Content and Style of Verbal Arts. ***In*** **Great Basin. Warren L. D'azevedo, ed. Pp. 641–659. Vol. 11 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

Liljeblad presents additional insights that complement and illustrate Goth's commentary (see entry for Wright 2000) about how the Ute construct their landscape traditions through language.

Lindgren, Waldemar, Louis C. Graton, and Charles H. Gordon

1910 The Ore Deposits of New Mexico. Professional Paper 68. U.S. Department of the Interior, Geological Survey.

This reference work describes all metal mines developed up to ca. 1905 in New Mexico. The description of the "Cochiti or Bland District" explains,

> *The opposition of Mexicans, who claimed possession of the region under private grant, impeded development, and it was not till 1889 that prospecting began in earnest. In 1893 much activity was manifested in the district and many claims were located. Early in 1894 the Albemarle group was located. This proved to be the most important group in the district. In 1896 a mill, known as the Woodbury mill, was built in the valley about 7 miles [11 km] below Bland, for the purpose of treating the ores of the Iron King mine, but it was never a success. Late in 1899 the Albemarle cyanide mill was completed. This was closed in the spring of 1902 and was later dismantled. In the eleven years from the opening of 1894, when production began, to the close of 1904 the district had produced slightly over a million dollars. The greatest production in any one year was $359,135, in 1900. No production was reported in 1905. At present very little mining is being done in the district, and the prospects for resumption of work in the immediate future are not bright. (p. 150)*

The Albemarle, Washington, Lone Star, Iron King, and Crown Point mines had been developed in the Cochití District by 1905 (the year in which the authors did their fieldwork in the district). Lindgren, Graton, and Gordon describe these enterprises.

> *The authors did not visit the Washington mine. It was on the slope just west of Bland and was not active in 1905, the year of their survey. The authors estimated production up to that time at about $75,000.*
>
> *The Albemarle mine, situated on South Fork of Cholla Canyon, is owned by the Navajo Gold Mining Company, of Boston. Ore is said to have been discovered on this*

property early in 1894 as a result of prospecting along the prominent outcrop. The mine, which was sometimes called the Altoona, passed into the hands of the Cochiti Gold Mining Company, which afterward became the Navajo Company. From the time of its discovery the mine was conceded to be the most important in the district, and from 1899, when its mill was put into operation, till the closing of the mill in the spring of 1902, it is said to have produced $667,500. Since the latter date the property has not produced. (p. 158)

The Lone Star mine is situated a little north of the Washington, on the southeast slope of a side gulch which joins Pino Canyon just above Bland. It is on the same vein as and lies just south of the Iron King, the first discovery in the district. The present owner is the Navajo Gold Mining Company. A considerable amount of ore was shipped in the early history of the mine. Not very much ore has been taken out since the last sale of the property. Actual figures of production were not obtainable, but it is probable that between $50,000 and $100,000 has been taken out. (p. 159)

The Iron King, the first mine discovered in the district, lies just north of the Lone Star, close to Pino Canyon. It is reported that the ore extracted amounted to $50,000. The development includes a small shaft and a short adit from which a winze was sunk, the greatest depth attained being 136 feet [41.5 m]. An amalgamation mill was built in 1896, 7 miles [11 km] below Bland. In 1902 it was replaced by a 10-stamp mill, with ten cyanide tanks, but this was operated only a short time. The vein is the continuation of the Lone Star vein. (p. 160)

The Crown Point mine is situated on the northeast side of Pino Canyon, about three-quarters of a mile [1.2 km] above Bland. It is one of the early locations in the district and is commonly credited with the production of about $50,000, being said to have sent out 1,500 tons of shipping ore. The workings are on a vein which strikes N. 10º W. and dips 70º W. but steepens in the bottom. The vein has been regarded as the same as the Lone Star vein, or at least a spur from it. (p. 161)

Lindgren, Graton, and Gordon also describe several smaller mines and claims: the Tip Top mine, the Laura S. claim, and the Little Casino claim; the Black Girl, Hopewell, Good Hope, Allerton, Posey, Union and others on the southwest side of Pino Canyon; and the Little Mollie and Puzzle claims. Many others that never produced paying quantities of ore are not named. They mention a copper prospect "at the junction of Medio Dia and Cochiti canyons" where "some work was being done" (p. 162).

Linford, Laurance D.

2000 Navajo Places: History, Legend, Landscape: A Narrative of Important Places on and near the Navajo Reservation, with Notes on Their Significance to Navajo Culture and History. Salt Lake City: University of Utah Press.

This compendium is an essential resource for beginning studies of Navajo cultural geography within particular localities. It provides annotated entries for several areas in and around the VCNP, including the Jémez Mountains (pp. 221–222), Pelado Peak (pp. 242–243), and the Valle Grande (p. 278).

Los Alamos [NM] Monitor

1970 Baca Location to Change. Los Alamos Monitor, December 17:1.

This article reports on the cumulative impacts that New Mexico Timber, Inc.'s cable logging operations had already had in the Valles Caldera and the prospect that major damage would continue over the next seven years. The article opens with the statement that New Mexico Timber, Inc., was "cutting trees on the property at a ferocious rate, 24 million board feet of lumber per year" (p. 1). Elsewhere, it reports that the company employed 175 men and operated 2 mills to achieve these production levels.

At the present rates of timber harvesting, the Los Alamos Monitor offers the grim assessment that:

Virtually every tree on the ranch that can be sawed into two by fours will have been cut down. And it will take nature 40 to 50 years to restore in main the appearance of the ranch. (p. 1)

Worse for environmentalists and recreationalists still, the newspaper noted in a sidebar accompanying this article that the harvesting of the Baca Location's timber stands could be completed "within three years by going to two or three shifts a day at New Mexico Timber's mills" (p. 1).

The article is valuable because it provides an interview with Sam Bailey, who was New Mexico Timber, Inc.'s forester. In response to questions about the severity of the damage that cable-logging and clear-cutting were causing to the scenic values of the Valles Caldera, Bailey reported that New Mexico Timber, Inc., had harvested the majority of the Baca Location's original 68,000 wooded acres (27,200 ha) since 1935. Nevertheless, Bailey maintained that only half of the harvested acreage had "been subjected to the present 'clear cutting' techniques" (p. 1). He acknowledged further,

> *That a freshly clear cut area looks pretty bad, but he claimed that time, even a few years, quickly heals the scars…He said that the slash, which is obviously ugly in the newly logged regions, is soon covered by secondary growth if it is left alone. He said that an attempt to gather and haul off the limbs and tops would be wholly impractical. "There just aren't enough trucks." Burning the slash, Bailey noted, would simply kill the secondary growth. (p. 1)*

As a consequence of these damages, the Los Alamos Monitor notes that the State of New Mexico had begun considering

> *a new set of regulations, apparently aimed at logging, on the Baca. These regulations would cause drastic changes in the handling of slash and formalize a requirement for seeding and water barring roads. (p. 1)*

The article also provides a summary of Dunigan's legal suit against New Mexico Timber, Inc. It also reports in the sidebar that the Los Alamos Boy Scouts cut thousands of trees each holiday season for sale primarily to residents of Los Alamos in the late 1960s (p. 1).

Los Alamos [NM] Monitor

1972 Baca Location Timber Is Sold to Ranch Owner. Los Alamos Monitor, June 30:1.

This brief article reports the sale of the Baca Location's timber rights by New Mexico Timber, Inc., to the Baca Land and Cattle Company. In a joint statement announcing the sale of the timber rights and the cessation of logging, James Patrick Dunigan and T. P. Gallagher, Jr., stated, "The transaction settles all litigation between the parties" (p. 1). A representative for New Mexico Timber, Inc., notes further that half of the company's 300 employees might be laid off, although some crews would be kept active "hauling already cut logs from the area, reseeding the logging roads and cleaning up the slash" (p. 1).

Clear-cutting operations had focused on the slopes bordering the Valle San Antonio and the Valle Toledo. Timbering had moved into the Valle Grande during 1971.

Magers, Pamela C.

1986a Miscellaneous Wooden and Vegetal Artifacts. *In* **Archaeological Investigations at Antelope House. Don P. Morris, ed. Pp. 277–305. U.S. Department of the Interior, National Park Service.**

Plants found in the VCNP include alder (*Alnus* sp.), sagebrush (*Artemisia* sp.), birch (*Betula* sp.), sunflower (*Helianthus* sp.), and dropseed (*Sporobolus* sp.).

Magers, Pamela C.

1986b Weaving at Antelope House. *In* **Archaeological Investigations at Antelope House. Don P. Morris, ed. Pp. 224–276. U.S. Department of the Interior, National Park Service.**

Plant species in Mager's sample that grow in the VCNP include goosefoot (*Chenopodium* sp.), Rocky Mountain juniper (*Juniperus scopulorum*), Gambel oak (*Quercus gambelii*), and ragwort (*Senecio* sp.).

Marsh, Charles S.

1982 People of the Shining Mountains: The Utes of Colorado. Boulder, CO: Pruett Publishing.

This volume provides an overview of Ute history and culture from time immemorial. While Marsh does not specifically mention the use of the Valles Caldera by Ute bands, he states, "Ute lands extended from Shoshone country on the north along the Green River in Wyoming, southward across all of Colorado, and well into northern New Mexico. There was a time when Utes were commonly seen at Santa Fe" (p. 3).

In discussing the Ute Bands, Marsh notes, "The Mouache band of southern Utes lived in south central Colorado and northern New Mexico. They had very early contact with the Spanish near Taos and Santa Fe, along with the Capote Ute band who lived close by" (p. 19).

The map that follows of the geographic expanse of Ute aboriginal lands (p. 20) encompasses the VCNP, as well as the northern part of the Jémez Mountain range.

Marsh includes a discussion of selected aspects of Ute cosmology (e.g., see pp. 129–132). These ideas underlie the people's essential landscape constructions (see also entry for Wright 2000).

Martin, Craig

2003 Valle Grande: A History of the Baca Location No. 1. Los Alamos, NM: All Seasons Publishing.

This well-written, informative, and entertaining volume is an indispensable resource for all individuals interested in the history of the Baca Location and the VCNP. In its 11 chapters, Martin traces this locality from its early volcanic history through the 2.5 years of the VCNP as a working ranch owned by the people of the United States. The author provides many useful illustrations, maps, and photographs that help make this account an enjoyable read.

While Martin's volume and the present land-use history of the VCNP share much common ground, the two works have contrasting foci and voices. Martin's account is exceptional and invaluable for its emphasis on the social history of the individuals, including Luis María Cabeza de Baca, his grandsons Francisco Tomás and Tomás Dolores Baca, and entrepreneurs Maríano Sabine Otero, James Greenwood Whitney, Joel Parker Whitney, Frank Bond, and Patrick Dunigan. Each of these individuals played a key role in shaping the ownership and/or development of the Baca Location during the nineteenth and twentieth centuries. By sharing information about who these people were, what they valued, and how they interacted with their contemporaries, Martin helps put a living face on the land grant's history.

Matthews, Meridith H.

1992 Macrobotanical Analysis. ***In*** **Bandelier Archeological Excavation Project: Summer Excavations at Burnt Mesa Pueblo and Casa del Río. Timothy A. Kohler and Matthew J. Root, eds. Reports of Investigations 64. Pullman: Washington State University.**

Matthews identifies the Eastern Keres' medicinal use of Apache plume (*Fallugia paradoxa*), a plant found in the VCNP.

Matthews, Washington

1887 The Mountain Chant: A Navajo Ceremony. Fifth Annual Report, Bureau of American Ethnology. Washington, DC: Smithsonian Institution.

Matthews describes prayer sticks used as offerings in the Navajo Mountain Chant (and various other ceremonies):

> *The sacrifices made to the gods during these ceremonies…consist of nothing more than a few sticks and feathers, with the occasional addition of strings and beads—a form of sacrificial offering common among various tribes of the Southwest, including the sedentary pueblos. (p. 451)*

Matthews includes an illustration (fig. 58) of a prayer stick (*kethàwn* or *keçàn* {Matthews used these terms interchangeably, with the former representing an Anglicized version of the latter) "belonging, not to the Mountain Chant, but to klèdji-qaçàl, or chant of the night. It is sacred to the Youth and the Maiden of the Rock Crystal, divine beings who dwell in Tsisnàtcini, a great mountain north of the Pueblo of Jemez" (p. 452). The figure 58 caption explains:

> *The original is in the National Museum at Washington. It consists of two sticks coated with white earth and joined by a cotton string a yard long, which is tied to each stick by a clove hitch. A black bead is in the center of the string; a turkey feather and eagle feather are secured with the clove hitch to one of the strings. (p. 452)*

Matthews, Washington

1897 Navajo Legends. Memoirs of the American Folk-Lore Society 5. Menasha, WI: American Folk-Lore Society.

Matthews introduces the creation of the Navajo Holy Mountains of Direction:

> *190. …First Man and First Woman, Black Body and Blue Body, set out to build the seven sacred mountains of the present Navajo land. They made them all of earth which they had brought from similar mountains in the fourth world. The mountains they made were Tsĭsnadzĭ́ni in the east, Tsotsĭl (Taylor, San Mateo) in the south,*

Dokoslíd (San Francisco) in the west, Depĕ́ntsa (San Juan) in the north, with Dsĭlnáotĭl, Tsolíhi, and Akĭdanastáni (Hosta Butte) in the middle of the land.

191. Through Tsĭsnadzĭ́ni, in the east, they ran a bolt of lightning to fasten it to the earth. They decorated it with white shells, white lightning, white corn, white clouds, and he-rain. They set a big dish or bowl of shell on its summit, and in it they put two eggs of the Pigeon to make feathers for the mountain. The eggs they covered with a sacred buckskin to make them hatch (there are many wild pigeons in this mountain now). All these things they covered with a sheet of daylight, and they put Rock Crystal Boy and Rock Crystal Girl into the mountain to dwell. (pp. 78–79)

Matthews recounts more fully the story of the making of the sacred mountains in note 51.

Soon after the arrival of the people in the fifth world…, some one said: "It would be well if we had in this world such mountains as we had in the world below." "I have brought them with me," said First Man. He did not mean to say he had brought the whole of the mountains with him, but only a little earth from each, with which to start new mountains here. The people laid down four sacred buckskins and two sacred baskets for him to make his mountains on, for there were six sacred mountains in the lower world, just as there are six in this, and they were named the same there as they now are here. The mountain in the east, Tsĭsnadzĭ́ni, he made of clay from the mountain of the east below, mixed with white shell. The mountain of the south, Tsotsĭl, he made of earth below mixed with turquoise. The mountain of the west he made of earth mixed with haliotis or abalone shell. The mountain of the north he made of earth mixed with cannel coal. Dsĭlnáotĭl he made of earth from the similar mountain in the lower world, mixed with goods of all kinds…Tsolíhi he made of earth below, mixed with shells and precious stones of all kinds…While they were still on the buckskins and baskets, ten songs were sung which now belong to the rites of hozóni hatál…

When the people came up from the lower world they were under twelve chiefs, but only six of them joined in the singing of these songs, and to-day six men sing them. When the mountains were made, the god of each of the four quarters of the world carried one away and placed it where it now stands. The other two were left in the middle of the world and are there still. A pair of gods were then put to live in each mountain, as follows: East, Dawn Boy and Dawn Girl, called also White Shell Boy and White Shell Girl; south, Turquoise Boy and Turquoise Girl; west, Twilight Boy and Haliotis Girl; north, Darkness (or Cannel Coal) Boy and Darkness Girl; at Dsĭlnáotĭl, All-goods…Boy and All-goods Girl; at Tsolíhi, All-jewels …Boy and All-jewels Girl. (pp. 220–221)

Matthews, following his two principal Navajo collaborators, Tall Singer and Laughing Doctor, tentatively identifies the Navajo Holy Mountain of the East as Pelado Peak.

Tsĭsnadzĭ́ni is the name of the sacred mountain which the Navahoes regard as bounding their country on the east. It probably means Dark Horizontal Belt. The mountain is somewhere near the pueblo of Jemez, in Bernalillo County, New Mexico. It is probably Pelado Peak, 11,260 feet [3,433 m] high, 20 miles [32 km] N.E. of the pueblo. White shell and various other objects of white—the color of the east—belong to the mountain. (p. 221n52)

Mayes, Vernon O., and Barbara Bayless Lacy

1989 Nanise': A Navajo Herbal. Tsaile, AZ: Navajo Community College Press.

Mayes and Lacy mention three plant species found in the VCNP that Navajos use as medicines (rush [*Juncus* sp.] and common mallow [*Malva neglecta*]) or for use in making curing implements (ponderosa pine [*Pinus ponderosa*]).

McNitt, Frank

1972 Navajo Wars: Military Campaigns, Slave Raids, and Reprisals. Albuquerque: University of New Mexico Press.

McNitt summarizes Navajo hostilities with other tribes, Hispanics, and Anglos in historic times. Of interest to the VCNP is his comprehensive account of Governor José Antonio Vizcarra's 1823 punitive expedition against Navajo raiders, who at that time clearly held the upper hand in their ongoing war with the Mexican colony. At the end of Vizcarra's expedition in the Four Corners region, he passed through the Valle Grande on his return to Santa Fe.

On August 24, after negotiating the pass through the Chuska Mountains and reaching the valley below, Vizcarra discharged two regiments of militia to make their separate ways home to Río Arriba and Río Abajo. With the balance of the command he proceeded directly eastward for fifteen leagues until meeting the Chaco Wash at

> *Fajada Butte. For the next two days he followed his outward route, resting briefly at Pueblo Pintado before continuing past the Chacra Mesa and down Torreon Wash. Below the present town of Cuba the command turned east on a trail leading across the Jemez Mountains by way of the Valle Grande. At sunset on August 31, after an absence of seventy-four days, the troops arrived in Santa Fe. The expedition was over. (p. 65)*

Vizcarra's action did not resolve the colony's troubles with Navajo raiders. For example, between 1826 and 1829, during Governor Antonio Narbona's administration,

> *Navajos raided along the Río Grande, striking repeatedly at Jemez but ranging from Abiquiu and the Valle Grande southward to Belen. Thousands of sheep and other livestock were run off; some of the pastors were carried away as slaves and others were killed. A token force of fifteen soldiers was sent in March 1829 to patrol the frontier at Jemez. (p. 70)*

McNitt reports that a party of Utes arrived at Jémez Pueblo in early 1835 to trade (p. 73). After their departure, a delegation of Navajo traders arrived. When they left, the Navajo traders drove off 50 of the Pueblo's herd animals. The Pueblo pursued them, recovered 18 head of livestock, and killed 1 member of the Navajo party.

Blas de Hinojos led another punitive expedition into Navajo country following this raid. McNitt implies that Vizcarra's route of 1823, which crossed the Valle Grande, might have become a familiar military road to Casafuerte in the Four Corners region (p. 73).

A fight between U.S. Army contractors, under the leadership of Robert Nesbit and Hiram R. Parker, and Navajo raiders occurred in the Valles Caldera during the summer of 1851 (pp. 184–186). The Nesbit-Parker party was cutting hay for the U.S. Army quartermaster stationed in Santa Fe. Although McNitt does not identify the hay camp by name, this station later became known as Old Fort. Given its many useful details, McNitt's summary of this episode deserves retelling in its entirety.

> *A scarcity of spring rain had left the ground cover of the lower valleys short and brown; for lush grass the partners had been forced to a higher elevation in the Jemez Mountains. At the Valle Grande, an emerald swatch surrounded by tall timber some forty miles [64 km] from Santa Fe, a blockhouse of green cottonwood logs had been built. Connected to it at the rear was a corral of the same logs laid one on top of the other to a height of four or five feet [1.2–1.5 m]. Here with a train of mule wagons purchased from Henry Dodge's associate, Pinckney Tully, the Nesbit-Parker outfit had been cutting a rich harvest.*
>
> *A soaking rain fell on the mountain meadows through the afternoon of July 2, turning to a steady drizzle after nightfall. Because of rain and darkness, Nesbit said later, a man posted on guard at the coral failed to detect any sign of danger until a Navajo's arrow pierced his neck. Almost at the same instant the guard pressed the trigger of his gun, the shot being enough to rouse the men asleep in the house. For two hours, Nesbit and Parker said, they and their beleaguered men "kept up a continued fight… on three sides of the house, while another portion of the Indians were endeavoring to pull down the corral to get the animals out, which they succeeded in doing after three o'clock—when they drove off all the animals, consisting of over one hundred in all."*
>
> *Navajos in the attacking party, they informed Colonel Munroe, numbered between 250 and 300 warriors. Affidavits were to be furnished, and in the circumstances they would request Munroe to inform them how to recover their animals or, failing that, apply for cash indemnification, as the loss was so great that it might ruin them.*
>
> *Another version of the incident was related shortly afterward by a party of eleven Pueblos of Jemez who by mere chance encountered a detachment of dragoons patrolling southward through the mountains from Abiquiu. They had been herding cattle in the vicinity the night of the attack, the Pueblos said. As the Navajos had withdrawn with the stolen horses and mules the Jemez had followed quietly, keeping themselves hidden. Finally, at a place where the Navajos had to descend a steep hill that left them exposed and at a disadvantage, the Jemez killed two of them and captured five mules. Two of the mules had been left on the road back to the Valle Grande; the other three had been restored to Nesbit and Parker. Lieutenant Beverly H. Robertson felt the matter worth investigating and persuaded one of the Pueblos to accompany his detachment back to the hay camp.*
>
> *He reported later that he found the blockhouse situated on a hill of gentle declivity, within fifty yards of a piece of woodland, the corral, which joined the house, being on that side. He spoke with the guard who had been wounded at the start of the attack, examined a part of the corral that the Navajos had torn down, and was shown where forty to fifty arrows had been fired at the blockhouse door to discourage an effort*

by the men inside to break out. There were no loopholes in the house, Robertson observed thoughtfully, and the only opening toward the corral (through which Parker had fired two shots from his revolver) was so high in the wall that one ball struck the topmost log on the opposite side of the corral.

"There were no guns fired at the Indians, except by the sentinel on Post," Robertson reported. "The sentinel said it was impossible from the darkness of the night, to tell their exact number, but he believed there could not have been less than forty."

The guard's story, Robertson believed, fitted rather well with what the Jemez had told him—that the Navajos numbered perhaps thirty or forty warriors. Men employed by Nesbit and Parker at the hay camp also confirmed the Pueblo's accounting for stolen livestock: the Navajos had driven off six horses and forty-three mules, of which five had been recovered. (pp. 184–185)

In a separate note, McNitt reports that Colonel Munroe stated that Nesbit and Parker never submitted affidavits in support of their claimed losses because of the raid (p. 185n4).

Lastly, McNitt (p. 278) mentions a raid by four Navajos on Peña Blanca in 1856. New Mexican militiamen pursued the raiders and engaged them in the Valle Grande, killing two of the Navajo.

Miera y Pacheco, Bernardo

1779 Plano de la Provincia Interna de Nuebo Mexico que hizo por mandado de el Tnte. Coronel de Caballeria, Gobernador y Comte. General de dha Prov.a Don Juan Bap.ta de Ansa. On file. Santa Fe: Map Room, Angélico Chávez History Library, Palace of the Governors, Museum of New Mexico.

As the title indicates, cartographer Bernardo Miera y Pacheco (who originally came to Santa Fe from El Paso ca. 1759 at the behest of his cousin, then Governor Marín del Valle), who identifies himself as "exempt soldier of the royal presidio of Santa Fe," drew this map at the request of Governor Juan Bautista de Anza. The Valle Grande is labeled "*Valle de los Bacas* (Valley of the Cows)." The map is not to scale, and the valley appears many times its actual size. This fact suggests that, although travelers and herders had admired the Valle Grande's majesty, no one had ever measured it.

Minnis, Paul E., and Richard I. Ford

1977 Appendix C: Analysis of Plant Remains from Chimney Rock Mesa, 1970–1972. *In* **Archaeological Investigations at Chimney Rock Mesa, 1970–1972. Frank W. Eddy, ed. Pp. 81–91. Memoirs of the Colorado Archaeological Society. Boulder: Colorado Archaeological Society.**

Minnis and Ford identify the food use of snowberry (*Symphoricarpos* sp.), a plant that grows in the VCNP, in the pre-Columbian Pueblo archaeological record of Chimney Rock.

Moore, Michael, compiler

1977 *Los Remedios de la Gente***: A Compilation of Traditional New Mexican Herbal Medicines and Their Use: 134 Different Leaves, Flowers, Roots, Barks & Gums in Spanish, English & Latin. Santa Fe, NM: Herbs Etcetera.**

Of the 134 Hispanic medicinal species reported by Moore, 57 genera grow in the Valles Caldera area. Of these, three Arnica (*Arnica* sp.), native hops (*Humulus lupulus*), and creeping barberry (*Mahonia repens*) are unique to Moore's compilation.

Morley, Sylvanus

1938 Appendix II: The Rito de los Frijoles in the Spanish Archives. *In* **Pajarito Plateau and Its Ancient People. Edgar L. Hewett, ed. Pp. 149–154. Albuquerque: University of New Mexico Press.**

In this article, Morley states that Hispanics first occupied the Rito de los Frijoles in 1780, when Governor Juan Bautista de Anza received a petition from Andres Montoya having to do with a grant made to Montoya by former Governor Tomás Velles Cachupin. Montoya had never occupied the tract. He asked Governor Anza to make it over to his son-in-law, Juan Antonio Lujan. This being done "said Lujan commenced to work said farm in which he labored very much in clearing it off, it being virgin land" (p. 150).

The Court of Private Land Claims dismissed a petition for confirmation of the Rito de los Frijoles Grant. By this decision, the boundary of the Ramón Vigil Grant was extended south

to the northern edge of the Rito de los Frijoles Canyon and the Cochití Pueblo Grant was extended north to the southern boundary of the Ramón Vigil Grant.

Naranjo, Tessie

1995 Thoughts on Migration by Santa Clara Pueblo. Journal of Anthropological Archaeology 14:247–250.

A sociologist from Santa Clara Pueblo, Naranjo helps explain the primacy of the concept of movement in Pueblo cosmology and landscape-making. Movement of people across the land, just as movement of life force through all the realms of the Pueblos' cosmos, means transformation and renewal. The European idea of abandonment is neither applicable nor appropriate.

In terms of movement specifically, Naranjo explains,

> *Movement is one of the big ideological concepts of Pueblo thought because it is necessary for the perpetuation of life. Movement, clouds, wind and rain are one. Movement must be emulated by the people. (p. 248)*

She adds, "The idea was to have boundaries to create a place—to fix a place—temporarily within the larger idea of movement" (p. 249).

Naranjo, Tito, and Rina Swentzell

1989 Healing Spaces in the Pueblo World. American Indian Culture and Research Journal 13(3–4):257–265.

Naranjo and Swentzell, both members of the Santa Clara Pueblo and educators, consider the Pueblos' concepts of center, periphery, movement, process, and connectedness in their understandings of landscape, place, time, and tradition. In their consideration of healing places, which are where a state of balance is maintained between human and natural environments (p. 257), they examine the importance of negative spaces, whether formally constructed (as in village plazas) or naturally occurring (as in caves), through which the energy of all life forces moves to unite all parts of the Pueblos' cosmos.

> *The symbolic openings are found in the plaza area, within the kiva, and in the enclosing hills as well as in the far mountains. These openings represent, again, an effort to connect this level of existence with that below. Each of the openings (nan-sipu and shrines) is a special healing space. Each is the primary point of energy flow between the simultaneous levels of the Pueblo world—it is where the movement of the universe is most intense. Those points were centering places of the Pueblo world, and human life can be in the connective flow of the universe. They are, however, inconspicuous points in the flow of the universe. (p. 262)*

Nichols, Robert F.

n.d. Wetherill Mesa Excavations: Step House, Mesa Verde National Park, Colorado. Manuscript on file: Mesa Verde, CO: U.S. Department of the Interior, National Park Service.

Nichols reports the use of wood from the common chokecherry (*Prunus virginiana*), the currant (*Ribes* sp.), and the elderberry (*Sambucus* sp.) in pre-Columbian Pueblo tool manufacture at Mesa Verde. All three of these plants occur in the VCNP.

O'Bryan, Aileen

1956 The Dîné: Origin Myths of the Navaho Indians. Bureau of American Ethnology Bulletin 163. Washington, DC: Smithsonian Institution.

In figure 3 O'Bryan provides an illustration of a Navajo sandpainting that represents the earth (p. 23). *Sisnádjini*, the Holy Mountain of the East, appears as a circle below the figure's left shoulder.

O'Bryan's retelling of the creation of the Holy Mountains in the present world largely follows that provided by Matthews (1897). In her account, O'Bryan relates that First Man and First Woman ask the Holy Beings, White Bead Boy and Rock Crystal Girl, to go inside the Mountain of the East. First Man and First Woman

> *then fastened Sis na´ jin to the earth with a bolt of lightning. They covered the mountain with a blanket of daylight, and they decorated it with white shells, white lightning, black clouds, and male rain. They placed the white shell basket on the summit; and in this basket two eggs of the…pigeon. They said that the pigeons were to be the mountain's feather; and that is why there are many wild pigeons in this*

mountain today. And lastly they sent the bear to guard the doorway of the White Bead Boy in the East. (p. 24)

O'Bryan continues the story by recounting that First Man and First Woman told the people:

. . . that they were to use the six sacred mountains indicated as their chief mountains. The place of emergence from the lower worlds was where it is now. The people could always see their great mountains above the lower mesa lands. When everything was finished a smoke was prepared for the mountains and the chants were sung. (p. 26)

O'Bryan notes further:

All the mountains have their prayers and chants which are called Dressing the Mountains. All the corner posts have their prayers and chants, as have the stars and markings in the sky and on the earth. It is their custom to keep the sky and the earth and the day and the night beautiful. The belief is that if this is done, living among the people of the earth will be good. (p. 24)

O'Bryan provides several of the Mountain chants (pp. 25, 27–30). In this ceremonial repertoire, the songs "tell of the mountain people: the bear, the deer, the squirrel, and of all the others" (p. 26). They also reinforce the many-tiered relationships among the people and the mountains that crosscut the dimensions of space and time.

Olson, Gilbert V.

1973 Field Notes of the Dependent Resurvey of a Portion of the North Boundary of the Baca Location No. 1 Grant, Portions of the East Boundary and Subdivisional Lines with the Subdivision of Certain Sections Township 18 North, Range 3 East. Microfiche. Santa Fe, NM: State Office, Bureau of Land Management.

This survey was carried out between October 15, 1970, and September 23, 1971, by Cadastral Surveyor Gilbert V. Olson, and was approved by the Chief, Division of Cadastral Survey, Bureau of Land Management, on November 21, 1973.

Olson tabulates earlier surveys including Sawyer and McBroom in 1876 (see entry for Sawyer and McBroom 1876); a survey of parts of the north, east and south boundaries by Albert F. Easley in 1883; Douglass and Neighbour in 1912 (see entry for Douglass and Neighbour n.d.); Osterhoudt, Hall and, Devendorf in 1920–1921; and a survey of some subdivision lines by Oscar B. Walsh in 1927.

This is a reestablishment of the survey performed by Easley in 1883 and of the resurvey performed by Osterhoudt, Hall and Devendorf in 1920-1921.

Opler, Morris E.

1936 A Summary of Jicarilla Apache Culture. American Anthropologist 38(2):202–223.

The author describes the Jicarilla use of the common chokecherry (*Prunus virginiana*) and acorns (*Quercus* sp.) for food. Both species occur in the VCNP.

Opler, Morris E.

1983a The Apachean Culture Pattern and Its Origins. ***In*** **Southwest. Alfonso Ortiz, ed. Pp. 368–392. Vol. 10 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

In this informative article, Opler provides practical general discussion of central tendencies and variations in the early culture-history of Apachean cultures.

Opler, Morris E.

1983b Mescalero Apache. ***In*** **Southwest. Alfonso Ortiz, ed. Pp. 419–439. Vol. 10 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

This article provides a concise overview of the anthropology and history of the Mescalero Apache Tribe.

Ortiz, Alfonso

1969 The Tewa World: Space, Time, Being, and Becoming in a Pueblo Society. Chicago: University of Chicago Press.

This now-classic ethnographic monograph provides a comprehensive symbolic analysis of Tewa culture, with the fundamental principles that structure the Tewa people's understandings of their cosmos. While this work offers no information directly related to the VCNP, Ortiz's study is an essential reference because it helps explain significant aspects of the conceptual Tewa world.

This book, like all of Ortiz's work, must be considered with care and respect. Now deceased, Ortiz was of mixed Tewa and Nuevomexicano descent, but he identified himself mainly with San Juan Pueblo. He became a source of controversy within San Juan Pueblo society because he divulged information about San Juan Tewa society and culture that some community members felt should not be shared with outsiders.

Ortiz offers a general understanding of the Tewa ethnographic landscape. He examines the relationships and meanings between the natural and supernatural worlds of the Tewas' cosmos to permit a cogent definition of Tewa ethnographic landscape structure and boundaries. He specifically considers questions concerning how the Tewa simultaneously divide and unite their world through a system of social and symbolic dualism, with the whole greater than the sum of its parts. As Fred Eggan notes in the book's forward:

> *. . . dualism is only part of the Tewa picture, though a fundamental part; the way in which the dual organization ties the human categories together into a larger structure is an important part of the author's contribution. (p. xii)*

Ortiz's analysis suggests that places on the Tewa's ethnographic landscape cannot be understood in isolation or as having discrete, impermeable spatial or temporal boundaries. His discussion of mountains in Tewa cultural geography is important in this regard:

> *The mountains are understood by the Tewa to be endowed with sacredness in several ways. First, a lake or pond is associated with each, and within this body of water live the "Dry Food Who Never Did Become," of the appropriate directional color. Secondly, there is a nan sipu or earth navel on top of each mountain, and within these live the Towa é who stand watch over the Tewa world. The color classification is again replicated. (p. 19; emphasis added)*

The identification of Sandia Mountain as the cardinal south summit with water, directional color association, a *nan sipu*, and the Towa é embodies many-layered and interrelated metaphorical referents. Used in conjunction with other Tewa ethnographical accounts, Ortiz's analysis provides guidelines for considering aspects of relationships among (1) mountains; (2) volcanoes and caves; and (3) the centers of the Tewa communities.

Ortiz, Alfonso

1972 Ritual Drama and the Pueblo World View. ***In*** **New Perspectives on the Pueblos. Alfonso Ortiz, ed. Pp. 135–161. Albuquerque: University of New Mexico Press.**

Ortiz distinguishes world view from religion:

> *A world view provides a people with a structure of reality; it defines, classifies, and orders the "really real" in the universe, in their world, and in their society….If world view provides an intellectually satisfying picture of reality, religion provides both an intellectually and emotionally satisfying picture of, and orientation toward, that reality. (p. 136; emphasis added]*

Ortiz adds:

> *A world view, then, is paramount in a cultural system in the sense that it denotes a system of symbols by means of which a people impose meaning and order on their world. This being so, the initial and most important question to ask of a people or a body of data is: What are the symbolic resources in terms of which they think and act? (p. 137)*

This essay documents the precision among Pueblo people in bringing their definitions of community space and time into line with their cosmologies. These constructions all are based on the premises that (1) all space is sacred, (2) sacred space is inexhaustible, and (3) everything—animate and inanimate—has its place in the cosmos.

Ortiz traces the relationship between boundary and center. Boundaries demarcate things between the living world and the underworld (i.e., a vertical dimension), while centers, such as a village plaza, occupy the middle of the world (i.e., a horizontal dimension). Ortiz notes

that in their attempt to reconcile their understandings of vertical and horizontal space in reference to the supernatural beings, the Pueblos characteristically place these beings just at, or just outside, their constructions of the living world. He argues:

One of the greater challenges in the study of the Pueblo world view is still that of determining the boundaries of particular Pueblo worlds, then working backward toward the center and filling them in. With their markedly centripetal point of view, this is the way the Pueblos think, too. (p. 154)

Ortiz, Alfonso

1979 San Juan Pueblo. *In* Southwest. Alfonso Ortiz, ed. Pp. 278–295. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.

This article provides a concise overview of the anthropology and history of San Juan Pueblo.

Ortiz, Alfonso

1991 Through Tewa Eyes: Origins. National Geographic 180(4):6–13.

In this short article written for a general audience, Ortiz uses birth, naming, and death rituals to trace Tewa history from time immemorial. Ortiz outlines key principles of temporal and spatial relationship among the many places that make up the Tewas' ethnographic landscape and sustain the framework of community tradition. An illustration (pp. 12–13) conveys many aspects of the complex system of symbols that Ortiz evaluates comprehensively in his formal ethnographic study (1969).

Ortiz, Simon J.

1992 Woven Stone. Tucson: University of Arizona Press.

In this collection of poetic work derived from three previous volumes—*Going for the Rain*, *A Good Journey*, and *Fight Back: For the Sake of the People, For the Sake of the Land*—Ortiz, who is from Ácoma Pueblo, shares many insightful thoughts and stories about his life experiences and his views of the world in which he lives. Two poems, "That's the Place Indians Talk About" (pp. 321–324) and "We Have Been Told Many Things but We Know This To Be True" (pp. 324–325), richly illustrate the discussion Cajete (1994 [*see entry above*]) develops for Native American people's relationships with land and place.

Ortiz provides a thoughtful biographical essay as this volume's introduction. He offers a compelling observation about the many difficulties of expressing Pueblo ideas, which derive from his Keresan birth language, into English. This commentary deserves consideration when cultural resources planners, managers, and consultants confer with Pueblo people about their landscape constructions and meanings, which similarly derive from languages other than English.

[W]hen I learned English well and began to use it fluently, at least technically and intellectually, I found myself "objectifying" my native language, that is, in translation. And it felt awkward, almost like I was doing something I was forbidden but doing it anyway. I've posed myself the frequent question: Is it possible to translate from the Acoma language to another? Yes, I've insisted, but I'm not sure I am convinced of it or how complete the translation is. Since we're all human with the same human feelings and responses to feelings, we understand and share hurt, love, anger, joy, sadness, elation, a gamut of emotions. However, human languages are different from each other, and unique, and we have different and unique languages; it is not easy to translate from one language to another though we egotistically believe and *think* we can. And that is when I found myself objectifying my Acoma language and at emotional odds with myself. (p. 6; emphasis added]

Osterhoudt, L. A., W. V. Hall, and Charles W. Devendorf

1921 Independent Resurvey of the Baca Location No. 1. Microfiche. Santa Fe, NM: State Office, Bureau of Land Management.

U.S. Cadastral Engineers Osterhoudt, Hall, and Devendorf resurveyed the Baca Location between June 30, 1920, and August 24, 1921. This survey determined that the Location contained 99,289.37 acres (40,180.23 ha)—less than half an acre's (.2 ha) variance from the original 1876 survey by Sawyer and McBroom (see entry).

The "General Description" by Devendorf states:

> *This grant lies on the highest portion of the Jemez Range of mountains. The second highest mountain of the range, Pelado, about 11,700 ft. [3,567 m], is in the SW. corner of the grant. The highest mountain, Santa Clara Peak is in the section rendered fractional by the NE. cor. of the grant. Nearly all the grant is drained by the Jemez River, the 2 forks of which unite about a mile [1.6 km] SW. of the SW. cor. of the grant. The divide bet. the N. and S. drainage of the range lies just outside the grant at the NW. and NE. cors. And inside for a few miles near the middle of the N. side. The divide bet. the E. and SE. drainage lies entirely inside the grant but never far from the bdy. I estimate Santa Clara Peak to be about 12,600 ft. [3,841 m] high. There are numerous springs and swamps, giving rise to many streams on the grant. In the western portion, many of these springs contain sulphur or other mineral and many are warm to moderately hot. Sulphur Springs, a small but noted health resort is inside the W. body. of the grant, several sulphur springs being hot as desired for baths, and several springs of other kinds occurring in the same small tract.*

There are large open valleys and benches inside the grant, making about ¼ of the total area. This land and part of the mountain slopes is covered with a dense growth of grass, which reaches in many places any where from knee high to the height of the shoulders. A large proportion of these open places is swampy, but not too wet for grass. The remainder of the grant is covered with timber, the bulk of which is spruce, fir and aspen. Some of the lower elevations and southerly slopes, contain considerable valuable pine timber. Oak undergrowth occurs most in the higher pine levels.

The soil is generally a very rich black loam, but in some of the valleys it is a gravelly brown loam, and in much of the mountain country is more or less thin and stony. In the rougher mountainous portions the soil is largely bare, broken lava rock and huge boulders.

At this high elevation, 8,000 to 12,000 ft. [2,439–3,659 m], the rainfall is very heavy, also the snow fall. During the summer in the higher, rainier portion, I estimate that it rains at least one-fourth of the time, possibly one-half of the time. The rainfall along the lower S. side is considerably less than in the North and West portions, while it decreases rapidly in the to the S., E. and N., after leaving the grant. There is land with good soil and abundant rainfall N. of the grant. In the spring of 1921 the period between spring and autumn frosts at my camp was about 60 days. It is probably shorter on the higher mountains. (pp. 97–99)

Devendorf discusses the survey itself, noting that the chaining of the boundaries "is not as good as that of the center lines" (p. 99). He notes that the unofficial survey by L. D. W. Shelton was the basis for the grant line fences and that none of these is entirely on the true boundary but that the south fence "practically agrees" with the true boundary. He also notes that the grant conflicts with several homestead entries and cuts off certain lands surveyed for Santa Clara Pueblo.

Otero, Miguel Antonio

1935 My Life on the Frontier. Albuquerque, NM: Press of the Pioneers.

In 1881 Maríano Sabine Otero owned the Sulphur Springs, just outside the west boundary of the Baca Location as defined by the 1876 survey, and he and his uncle, Miguel Antonio Otero, jointly owned the Jémez Springs. Otero describes the creation of a commercial spring and bathhouses at Jémez Springs in 1882 (pp. 237–238; 241–277). The 1911 resurvey (see entry for USDA, Forest Service, 1915) established that Sulphur Springs is within the Baca Location boundary.

Page, Suzanne, and Jake Page

1982 Hopi. New York: Abradale Press.

The Pages portray many aspects of Hopi life rarely conveyed in academic ethnological monographs. One passage in particular captures the Hopis' conceptualization of their bipartite world and helps outsiders grasp the significance that Pueblo people attach to places, especially caves that connect the complementary parts of their world, on their ethnographic landscapes.

The Hopi land, the Hopi world, is completely peopled with spirits as real as—in fact, part of—the rocks. The sun rises from its house to the east and sets in its house to the west. Then from west to east it travels at night, making it day in the Underworld. The two worlds alternate but are not really separate: they are a continuum. (p. 187)

Parkhurst, T. Harmon

1920–1951 Photographs on file: Los Alamos, NM: Los Alamos Historical Museum.

T. Harmon Parkhurst (1883–1952), a native of upstate New York, came to Santa Fe about 1910 to participate in an archaeological reconnaissance in Frijoles Canyon. He then worked at the new Museum of New Mexico from 1910 to 1915 as museum photographer under the supervision of Jesse L. Nusbaum. Parkhurst opened a studio in Santa Fe about 1915, doing extensive regional photography on glass plate negatives. From 1920 through 1945 he worked with a 7- by 11-inch camera. Parkhurst was the official photographer of the Los Alamos Ranch School for most of its history. He retired in 1951 and lived his last years in Los Angeles.

Photographs on file at the Los Alamos Historical Museum include the following:

Fishing in the Valle Grande 1939 (LAHM-P1993-053–5520, box 3)
Ranch School students camping in Valle Grande (LAHM-P1977–323–1–4239, box 3)
Los Alamos Ranch School students at camp kitchen in Valle Grande (LAHM-P1981–585–1–4198, box 3)
Los Alamos Ranch School students at campsite in Valle de los Posos (LAHM-P–1981–585–1–4197, box 3)
Los Alamos Ranch School students at campsite in Valle Grande (LAHM-P–1981–585–1–4194, box 3)

Parsons, Elsie Clews

1925 The Pueblo of Jemez. Papers of the Phillips Academy Southwestern Expedition 3. New Haven, CT: Published for the Phillips Academy by Yale University Press.

Considered an essential and classic ethnographic study, this work is controversial because Parsons disclosed much traditional cultural knowledge held as sensitive by the people of Jémez Pueblo. As such, use of this work should be approached with care.

Parsons offers some information about the traditional associations that the Jémez maintain with the VCNP. For example, she reports that the Underworld Chief's Society makes a pilgrimage to Redondo Peak every summer (p. 63) and that community members go into the Jémez Mountains (presumably including the Valles Caldera) to harvest aspen trunks for making drums and *wati* grass from around springs for use in preparing prayer sticks (p. 104).

Parsons lists the mountains of cardinal directions as follows: "Yellow-Flint Mountain" to the east, "Blue-Flint Mountain" (i.e., *Wavema* [a.k.a. Redondo Peak]) to the north, "Red-Flint Mountain" to the west, and "Black-Flint Mountain" to the south (p. 137). She adds that the Jémez Mountains generally and Redondo Peak specifically recall the origins and ends of natural life and the eternity of all spiritual life. The Jémez Mountains represent "the place from which the people came and whence the newborn still come" (p. 125).

Parsons, Elsie Clews

1996 [1939] Pueblo Indian Religion. 2 vols. Lincoln: University of Nebraska. (Originally published Chicago, IL: University of Chicago Press.)

This monumental work is renowned both for its contributions to comparative Pueblo ethnography and the controversy that arises from their disclosure of substantive, secretive detail about Pueblo ceremonial practice and religious belief. Parsons was fully aware that she trespassed, both physically into areas where she did not have ritual empowerment and as an anthropologist interviewing people. She also was aware that she placed her consultants in personal and social risk through use of an unethical "secretive method" to record sensitive information (Strong, in Parsons 1996:x–xi). To many traditional people, Parsons' work was sacrilegious, desecrated the special qualities of places and personal relationships, and threatened to undermine the power of what she reported.

The information allows the reader to grasp certain elements of meaning embedded in statements by community scholars about the Pueblos' ethnographic landscapes in general and by community representatives about their village's traditional associations with the monument in particular. More importantly, Parson's work permits the identification of a coherent, layered system of belief and referent that guides how Pueblo communities construct and occupy their landscapes.

Peckham, Stewart

1990 From this Earth: The Ancient Art of Pueblo Pottery. Santa Fe: Museum of New Mexico Press.

In his introductory essay, Peckham (pp. 1–5) defines the concept of tradition in a manner that is both comprehensive and accessible to the layperson. In casting traditions as media through which people explain how "they became who they are" (p. 2), Peckham helps the reader understand how traditions are part of a living cultural and historical process that links the past with the present and provides continuity for preparing for the future. Peckham uses the following major points to organize his thoughtful discussion:

Traditions are persistent.
Traditions help to maintain order.
Traditions have continuity.
Traditions change through time.
Traditions occupy definable space.
Individuals may alter traditions.
Similar traditions rarely are identical.
Extinct traditions never really are revived.
A tradition is a thing of value.

Peckham also discusses the pre-Columbian Pueblo use of tansy mustard (*Descurainia pinnata*) in making paint for decorating pottery. This plant grows in the Valles Caldera area.

Photo Archives, Palace of the Governors

ca. 1935 Selected Photographs of the Valles Grandes by T. Harmon Parkhurst and Unattributed Photographs of Ranching Activity on the Baca Location No. 1. Santa Fe: Museum of New Mexico.

The photo collection includes views of the Valle Grande by T. Harmon Parkhurst ca. 1935. Negative numbers 50805–50808, 51455, 51459, 51461, 51462, 68912–68914, 57974, 57975, 88854, and 127488 are images of the Valles Caldera. An enclosed note refers to the Valles Grande, San Antonio, Telledo [*sic*], Rincon, Poso, Jaramillo, Seco and San Luis, but the photos themselves are not labeled by valley.

Several unattributed photographs are: a flock of sheep, a shepherd, and a dog (NN 5454); a flock of sheep and a Hispanic boy (NN 51461); a flock of sheep, a shepherd and a dog (NN 22701); a photo of several cattle grazing in the Valle Grande (NN 51455); and a flock of sheep grazing (NN 51457).

Powell, J. W.

1961 [1885] The Exploration of the Colorado River and Its Canyons. New York: Dover Publications. (Originally published as Exploration of the Colorado River of the West and Its Tributaries: Explored in 1869, 1870, 1871, and 1872, Under the Direction of the Secretary of the Smithsonian Institution. Washington, DC: U.S. Government Printing Office.)

The rocks of the Jémez Mountains region were first described by J. W. Powell during his 1880s reconnaissance work. The region was known then as the Tewan Plateau. Powell recognized it as an extensive volcanic field of many types of volcanic rocks and voluminous ash deposits.

Redondo Development Company

1915 Deed of Trust, Redondo Development Company to Warren Savings Bank, April 1, 1915. Sandoval County, New Mexico, Records, Deed Record No. 2 (1911–1922). Accession No. 1959-042. Santa Fe, NM: State Records Center and Archives.

The Redondo Development Company (with its principal office in Albuquerque, New Mexico) executed this mortgage to the Warren Savings Bank of Pennsylvania. The Redondo Development Company authorized the issuance of bonds in the value of $175,000, securing the payment of principal and interest (at 6 %) by this mortgage to Warren Savings Bank. The bonds were to mature on April 1, 1925. This mortgage is on "all that certain tract of land cummunly [*sic*] known as Baca Location No. One, situated in the counties of Sandoval and Río Arriba in the Territory of Mexico [*sic*], the same being one of the tracts of land located by the heirs of Luis Maria C. de Baca under the authority conffered [*sic*] by section 8 of an act of congress of the United States, approved June 21, 1860…" The Redondo Development

Company had the right to sell the timber on the lands, provided such sale or sales were not made for a price less than $175,000.

The mortgage instrument was signed by E. D. Wetmore, President, Redondo Development Company, and A. J. Haseltine, President, Warren Savings Bank.

Reichard, Gladys Amanda

1963 Navajo Religion: A Study of Symbolism. Bollingen Series 18. Princeton, NJ: Princeton University Press.

Reichard's insightful discussion of the Navajo's conceptualization of mountains warrants full reiteration:

> *Mountains, though places, are so personalized that I have classified them as deities. They may be included in lists of Holy People mentioned in formula and prayer; they have an "inner form," "something which lies inside"…, and stabilizes them, doubtless a counterpart of the Agate or Turquoise Man which makes a man invincible. When people in the lower worlds were forced by floods to leave, they took special care to bring tokens of the mountains with them. No Navajo conception of the world, whether in the past or the future, is conceivable without the contemporary arrangement of mountains. The mountain symbolism is due no doubt to the belief that they are homes of the gods, associated with hogans. (p. 452)*

Reichard next summarizes the difficulty, if not the outright impossibility, of identifying the precise geography for the Navajo Holy Mountain of the East. In her evaluation, she describes the traditional Navajo practices of variously collecting soil and water from these holy summits for later use in rituals closer to home.

> *The provenience of the "eastern mountain" is much discussed by Navaho chanters, but there is no agreement. sisnádjini, "the-particular-one-that-is-black-belted," is its name. Matthews [see entry for Matthews 1897] said it was Abiquiu Peak or the one next to Abiquiu, which might be Pedernal Peak. [In a footnote, Reichard notes that Matthews and others refer to "Belted Mountain" as Pelado Peak.] Father Berard accepts for the Navajo the mountain identified by the Jicarilla Apache as Blanca Peak in Colorado, and Sapier-Hojier, doubtless following his lead, also translate sisnáˈdjiní (their recording) as Blanca Peak. Father Berard's Navajo authorities, convinced that it was the Holy Mountain of the east [see entry for Haile 1938], collected soil to be ritualistically employed later.*
>
> *On the other hand, when in 1933 the Navaho decided to have the Rain Ceremony preformed, the Rain Singer conducted a pilgrimage to Wheeler Peak (sisnádjiniˈ), where they ceremonially collected waters. They explained, however, that "although Wheeler Peak is, as we know, pretty far east, it is the right mountain." From this and other conflicting remarks, we may well exercise caution in accepting any one as "the right" mountain. From the Rain Singer's qualification I infer that "too far east" indicates Pedernal or Pelado Peak as the nearest mythical location; Blanca Peak seems much too far north. Evidence of men who started out on a ritualistic quest without suggestion of whites is a bit more convincing than that of Navaho taken on a "scientific" field trip. I do not by these remarks mean to imply that anyone was insincere—I mean merely to demonstrate that mythical places may be easily rationalized as "scientifically" correct, even though one name be assigned to several. (pp. 452–453)*

In her chart 1, Reichard provides the following symbols that the Navajo associate with the Holy Mountain of the East:

color:	white
mountain:	sisnádjiniˈ
fastened by:	lightning
covered by:	daylight, dawn
jewel:	whiteshell, whiteshell with belt of dark cloud
bird:	pigeon, white thunder
vegetation:	spotted, white corn
sound:	thunder in young eagle's mouth
people by:	Rock Crystal Boy, Rock Crystal Girl, Whiteshell Boy, Whiteshell Girl, Dawn Boy, Dawn Girl
moved by:	spotted wind
extra gifts:	white lightning, dark cloud, male rain, white corn
tutelary:	xaˈctc′é′δγan

Reiter, Paul

1938 The Jemez Pueblo of Unshagi, New Mexico. University of New Mexico Bulletin 4(1). Monograph of the University of New Mexico and School of American Research. Albuquerque: University of New Mexico Press.

This report mainly concerns excavations at the Jémez village of Unshagi carried out by the University of New Mexico and School of American Research from 1928 to 1934.

Chapter II ("History") summarizes early history (1540 to the Reconquest and early eighteenth century). Reiter quotes Bustamante's description, in his narrative of the 1581 Rodríguez-Chamuscado expedition, of the Jémez pueblos; Espejo's account of the "province of the Emexes"; and Juan de Oñate's visit to the Jémez province in August 1598. He discusses fray Gerónimo de Zárate Salmerón's mission to the Jémez province in the period 1621–1626 (Reiter believes that Zárate arrived in New Mexico in 1621 rather than 1617 or 1618 as suggested by other sources) and his prospecting in the Jémez Mountains.

Robbins, W. W., J. P. Harrington, and Barbara Freire-Marreco.

1916 Ethnobotany of the Tewa Indians. Bureau of American Ethnology Bulletin 55. Washington, DC: Smithsonian Institution.

In this essential publication, Robbins and others provide a wealth of information on more than 100 plants used by the Tewa communities (Nambé, Pojoaque, San Ildefonso, San Juan, Santa Clara and Tesuque pueblos) of the northern Río Grande. Besides listing economically, socially, or useful plant taxa, they often provide cogent discussion of how the Tewa and some of their neighbors, including other Pueblos, the Navajo and the Jicarilla, name and use these materials. Several dozen of these plants grow in the VCNP. Examples include White fir (*Abies concolor*), which has medicinal applications and provides twigs suitable for making pipe stems. The authors note that one-seed juniper (*Juniperus monosperma*) provides food; fuelwood; bark for torches; leaves; twigs and berries for a variety of medicines; and boughs for making bows. Another all-purpose plant is broad-leaf yucca (*Yucca baccata*), whose uses include soap for personal hygiene and washing clothes, fiber for cord and rope, edible fruits, and brushes for painting pottery.

Romeo, Stephanie

1985 Concepts of Nature and Power: Environmental Ethics of the Northern Ute. Environmental Review 9(2):150–170.

Romeo shares perspectives of traditional Ute ideology about their environment, which, in turn, inform their landscape constructions. Ute traditionalists discuss community beliefs about water, land, mountains, plants, and wildlife.

Ross, Clarence S.

1931 The Valles Mountain Volcanic Center of New Mexico. Transactions of the American Geophysical Union 12:185–186.

Ross, a federal geologist with the U.S. Geological Survey, first began surveys in the Jémez Mountains in the 1920s. Although more recent investigations supersede this early discussion of the history of volcanism in northern New Mexico, it still offers useful insights. For example, Ross explains that explosive rhyolitic eruptions blasted a great crater out of older andesite-latite volcanics.

> *This was 16 to 18 miles [26–29 km] in diameter, over 50 miles [80 km] in circumference, and 600 to 800 feet [183–244 m] deep. The materials ejected were almost exclusively tuffs, which were deposited in even beds sloping from an elevation of about 9,000 feet [2,744 m] at the crater-rim to about 6,000 feet [1,829 m] at 12 to 14 miles [19–46 km] to the east at the Río Grande. This is the largest crater known, being even larger that the great Ngorongoro crater of Africa. (p. 185)*

Ross mistakenly states that the crater is not a caldera because there is no subsidence, a conclusion corrected in later work (see entry for Smith and Bailey 1968). Ross believed at this time that the Redondo Dome was made up of older volcanics that had not been blasted out of the crater; he did not recognize it as a resurgent dome.

Ross, Clarence S.

1938 The Valles Volcano, New Mexico. Washington Academy of Sciences Journal 28:417.

This description of the Valles Caldera is a continuation of Ross' earlier observations.

Ross, Clarence S., and Robert L. Smith

1960 Ash-Flow Tuffs: Their Origin, Geologic Relations and Identification. Professional Paper 366. Washington, DC: Geological Survey.

This discussion of ash flows, a volcanic phenomenon, is based on fieldwork in the Valles Mountains of northern New Mexico, as well as observations in Mexico, New Zealand, and Iceland. The authors observe that ash-flow deposits in the Valles Mountains reach a maximum thickness of nearly 1,000 feet (305 m) and an extent of more than 350 square miles (890 sq km) (p. 17).

The report includes an illustration of Battleship Rock in Cañon de San Diego. The authors note that this illustration shows the columnar structure of many characteristic ash-flow tuffs, ash-fall tuffs near the junction of Colle and Peralta Cañones, a welded-tuff scarp in Cañon Medio Día, an ash-flow tuff scarp below the Puye Ruins, the ash-flow tuff scarp of Capulin Canyon, and another ash-flow tuff scarp in the Valles Mountains.

Rothman, Hal

1989 Industrial Values and Marginal Land: Cultural and Environmental Change on the Pajarito Plateau 1880–1910. New Mexico Historical Review 64:185–211.

Rothman discusses environmental change and degradation on and around the Pajarito Plateau after the coming of the railroad in 1880. He states that American [Anglo] influence "telescoped into a few years much more environmental and cultural change than Spanish practices had produced in nearly three hundred years" (p. 188). The Anglos saw the commercial grazing and timber potential of the Plateau (p. 198). Rothman's emphasis is on the Ramón Vigil Grant, but his general explanation of environmental degradation and the growth of the cash economy and of creditor-borrower arrangements serves to explain how the Valles Caldera was incorporated into the national economy.

Rothman notes that the Anglo owners leased the timber rights on the Vigil Grant to H. S. Buckman, a lumberman from Oregon, in 1898. Buckman began cutting timber on the Plateau, and "Buckman's timber enterprise destroyed what remained of the native ecosystem on the Vigil Grant" (p. 203).

> *[C]hanging patterns of land use in the region ignited a complicated process of economic, social, political, and environmental change. This change was incremental. Each stage pushed the people of the area closer toward dependency on outside markets. Native American and Hispanic populations found themselves with less and less of the plateau at their disposal. The Vigil Grant, its productivity demolished by Bishop and Buckman, was no longer available. The density of Hispanic and Native American stock outside the Vigil Grant increased, and more animals competed for less grazing land. Anglo overgrazing extended the impact of earlier limited overgrazing by Hispanics and Native Americans; cattle and sheep trails were no longer centralized around water sources. Larger herds also drove game higher into the Jémez Mountains, and the black bear, wild turkeys, and pumas that characterized the pre-1800 plateau became more scarce. The advantages of the plateau as a subsistence environment quickly disappeared, and the people that depended on it had to find new sources of sustenance. Prior to the lumber camps and tie-gangs, few Hispanics or Native Americans worked for anyone else. Instead, they grew foodstuffs, tended animals, and traded for items that they could not produce themselves. Cash money was scarce, and labor was a commodity to be bartered, not sold. Buckman's crews received cash for their labor, and the influx of money made the goods in the stores by the railroad in Española more available to the people of the region. With motives born of desire and necessity, Hispanics and Native Americans began to participate in the cash economy. As their base of subsistence became less fruitful, many Hispanics entered the market to trade for foodstuffs. Many also sought to acquire the tools and implements of industrial America. These were expensive, and often required credit—the final step in becoming a part of the cash economy…the need for credit and its availability dramatically changed both farming and grazing in the Pajarito Plateau area. Cash crop farming became prevalent, and new patterns of land use emerged. (pp. 205–206)*

Rothman explains that decline in the quality of forage, the extension of the National Forests and the loss of open land forced many Hispanics to run sheep on shares, a business dominated by Frank Bond.

> *Bond acquired so much public and private grazing land that small herders, who could not find enough pasture for their stock, had to sign on with him. Bond's system tended to impoverish these small herdsmen. Partidarios took his sheep along with their own, and Bond made the herders fully responsible for the animals in their care. Their own*

stock served as collateral. Bond collected a fee for range use from the partidarios, who also had to outfit themselves from his store, where a flat 10 percent interest rate was charged. With expenses mounting, most partidarios were lucky to keep their own sheep at the end of a contract period. As Bond's empire grew he became the most influential man in the Española Valley. (pp. 209–210)

Saile, David G.

1977 Making a House: Building Rituals and Spatial Concepts in the Pueblo Indian World. Architectural Association Quarterly 9(2–3):72–81.

Saile provides a brief review of the conceptual underpinnings of Pueblo world view in relation to habitation architecture. Saile emphasizes that houses were "not solely a place of residence" but also were places "of potential communication with the spirit world" (p. 77). Figure 4, titled "Section through Pueblo world levels indicating places of potential communication with the spirits" (p. 4), illustrates both aspects of the understood relationships that unify the center and periphery of the Pueblos' natural world and the connections among the natural world and the upper and lower levels of the cosmos. He also explains,

> *At the centre was great potential power in a controlled form. With proper prescribed ritual and prayer the power would benefit and ensure the survival of the village and at greater depths [or] heights the power was potentially more dangerous and uncontrollable. Ortiz notes that the "further one ranges outward from a particular village or groups of villages, the greater is the tendency to attribute characteristics opposite of normal to anything of symbolic value, even if only by surrounding it with an aura of sacredness and mystery" (1972, p. 157). He refers to societies holding such ideas as centripetal. (p. 77)*

Saile adds that in the Pueblos' understandings of their world,

> *power appears to have been derived from that which existed within the structure of the world and within its related phenomena (weather, astronomical observances). This power in turn, ultimately came from the creators of the world.*
>
> *The structure of the world had to be reconstructed, or at least restated, periodically. Any "new" or altered thing, plant, animal, human, or architectural had to take its proper place in that framework…it is clear that spatial and formal organization did complement "becoming" or changes of state in human existence; for example at birth, naming, or during initiation. Places became "protected," set apart, or sanctified as a point of communication with spirits, in co-operation with "rights of passage" or changes in the life stages of Pueblo residents… (p. 79)*

Sando, Joe S.

1979 Jemez Pueblo. *In* **Southwest. Alfonso Ortiz, ed. Pp. 418–429. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

This article provides a concise overview of the anthropology and history of Jémez Pueblo.

Sando, Joe S.

1982 Nee Hemish: A History of Jemez Pueblo. Albuquerque: University of New Mexico Press.

As Alfonso Ortiz writes in the foreword, this volume consists of an "intimate account of Jémez Pueblo from distant times to the modern era" (p. xi). Sando, a member of Jémez Pueblo, writes about history with a focus on the concerns of the people about their past, present, and future. The theme of continuous occupation and stewardship of the land that the Jémez inherited in time immemorial underlies Sando's discussion.

As the people came into the Jémez Valley region, they established shrines to document their occupation and to request protection by the supernatural beings "from the vicissitudes of nature—floods, lightening, tornadoes, and drought" (p. 11). In this way they established the essential relationships between themselves and the natural environment defining Jémez Pueblo's landscape.

> *In the new home area shrines were also placed at Tsung-paa-gi ("sad spring"), Wa-ha-bela-wa ("butterfly place"), both below Tu-va-kwa, and along the two creeks mentioned above [i.e., Río de las Vacas and the Río Cebolla]. The others were farther east, in San Diego Canyon: Guisewa ("soda dam"), Daha-enu ("battleship rock"), at Jemez Falls, and on top of Wa-ve-ma (Redondo Peak), and the northeast-corner boundary mark at Pa-shum-mu ("flower mountain"), now known as Chicoma Peak.*

> *Unfortunately, most of these places, though in use today, are no longer in Jemez ownership so, again, permission has to be obtained before visiting these places ceremonially. The only known spot owned by Jemez is on top of Redondo Peak, where a "generous" area, four feet by four feet, [1.2 x 1.2 m] is set aside by the "benevolent" owner of the surrounding timber and grazing area. The only reason it is set aside is that it contains a visible shrine. The most important shrines in use currently are Tu-va-kwa, Wa-ve-ma, and Pe-kwile-gi. (p. 11)*

The author maintains that this ancient homeland remains a major part of Jémez tradition, even though the USDA Forest Service administers most of these lands today (pp. 15–16).

Sando also notes that Jémez men went into upland forested areas, including Valle Grande, to herd horses during the months of June and July (pp. 11, 16, 50). In late summer, the men brought back the horses of the pueblo for threshing wheat. These practices persisted until about 1927, as shown by dates that the herdsmen carved into aspen trees (p. 11).

Sando retells the story of a battle waged by the Jémez upon the Navajo raiders in the Valles Caldera.

> *There are many stories of the experiences of young Jemez men while they were out herding horses. In a particularly popular story told to the grandchildren, during the late 1800s a raiding Navajo group was discovered unaware in the Valles Grande, camped on the west edge near a thick grove of scrub oak. The Jemez men were camped on the southeast side of the large, grassy meadow of Valle Grande. Since the Jemez men had spotted the Navajos first, they had the advantage; individual assignments and instructions were given, including the method of communications (whistling in different tones and length, plus imitating different bird calls for different situations). Cristobal Sando, grandfather and great-grandfather of the present-day Sandos, was selected to shoot the Navajo purported to be the leader. With their bows and arrows three men penetrated the thick brush surrounding the Navajo camp; the others were stationed at different distances, to prevent the raiders from reaching the herd and from inflicting damage to the men. After patiently waiting for the right situation and position of the Navajo leader, Grandpa Sando let fly an arrow. The fatal shot reached its mark and caused great excitement, confusion, and furor among the raiders. They took off toward the west, with more Jemez arrows flying after them—intended more as scare tactics than to kill the raiders. In their haste the raiders left twisted strips of cowhide and some strips of tanned deerhide. (pp. 11–12)*

Sando shares some information about the how Jémez Pueblo's people earned their livelihood, in part, by using the Valles Caldera's resources. Valle Grande was the pueblo's traditional pasture during the summer (p. 16). "The forested areas near the natural bowl [of the Valle Grande] were also used by the eagle catchers [of the Eagle Catching Society] in the late fall, following the harvest" (p. 16). Sando reports further that the area where the Jémez quarried the flagstone needed for making paper bread was just south of Pa-shun (a.k.a. Tsikumu and Cerro Chicoma) (p. 16).

Lastly, Sando provides a brief discussion of the Pueblo's relationship to and subsequent loss of the Valle Grande.

> *After the ancient homeland was granted to the Spaniards in 1798, under a grant known as the Cañón de San Diego de Jémez Land Grant, the Jémez people began to depend on the forested area farther east for religious activities, herb collecting, hunting, eagle catching, grazing community horse herds, and collecting fir branches for ceremonial dances. They had free access and use, along with neighboring Pueblo Indian tribes, until 1905.*
>
> *On October 12, 1905, President Theodore Roosevelt declared 34,900.27 acres [14,123.37 ha] of aboriginal land to be the Jemez National Forest Reserve. This occurred in spite of Article 1, Section 8 of the Constitution of the United States, which states that Indian tribes, like foreign nations and states, will be consulted on important transactions. No records have been found to indicate that the United States Indian Service was consulted on this matter.*
>
> *Further loss of aboriginal land in Valle Grande, amounting to 16,811.74 acres [6,863.34 ha], took place in the 1920s under the Homestead Act. This land was listed as Tract B before the Indian Claims Commission in Docket 137…The rest, Tract C, was taken over by the government under the Taylor Grazing Act of April 4, 1936. The total losses, as presented before the Indians Claims commission, were 282,415.73 acres [114,287.45 ha]… (pp. 49–50)*

Sauer, Carl O.

1925 The Morphology of Landscape. University of California Publications in Geography 2:19–54.

More than 75 years ago, Sauer defined landscape in a way that remains relevant today because it recognizes people's interactions with their environments as a uniquely evolving cultural-historical process:

> *The cultural landscape is fashioned from a natural landscape by a culture group. Culture is the agent, the natural area is the medium, the cultural landscape is the result. Under the influence of a given culture, itself changing through time, the landscape undergoes development, passing through phases, and probably reaching ultimately the end of its cycle of development. With the introduction of a different—that is, alien-culture, a rejuvenation of the cultural landscape sets in, or a new landscape is superimposed on the remnants of an older one. (p. 46)*

Sawyer, Daniel and McBroom, William H.

1876 Field Notes of the Survey of Baca Location No. One, in New Mexico, being Grant made to the heirs of Luis Maria Baca by act of Congress approved June 21, 1860. Surveyed by Daniel Sawyer and William H. McBroom, U.S. Dep. Surs., under their Contract No. 68, of April 15, 1876. Microfiche on file: Santa Fe, NM: State Office, Bureau of Land Management.

This is the original survey of the Baca Location, carried out between June 12 and 16, 1876. Sawyer and McBroom determined that the Location contained 99,289 acres (40,180 ha). Later resurveys (the restorative survey by W. B. Douglass and Hugh M. Neighbour in 1911–1912; and the independent resurvey by Osterhoudt, Hall, and Devendorf in 1920–1921 examined and corrected the errors in this survey. Douglass concluded that Sawyer and McBroom had in fact surveyed the boundaries—an open question considering the methods and standards of surveys performed in the 1860s and 1870s, and the fact that this survey was done in four days.

In the concluding "General Description" signed by Surveyor General H. W. Atkinson, the Baca Locationis described as:

> *. . . finely adapted for stock growing, raising a fine rank growth of grass especially in the interior which is filled with several small valleys and fine streams containing myriads of trout. The soil in the valley is rich but on account of its Altitude is too cold to raise any kind of grain or vegetables. There are no settlers living upon the Grant. Large herds of sheep are kept here during the summer, but not during winter as the cold is too severe. The east and north boundaries run along the summit of the Valles mountains and are high and slightly broken. The grant contains an abundance of pine and aspen timber. (pp. 14–15)*

Schroeder, Albert H.

1979 Pueblos Abandoned in Historic Times. ***In*** **Southwest. Alfonso Ortiz, ed. Pp. 236–254. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

Schroeder provides a discussion of the Southern Tiwa pueblos at European contact. He notes that the Tiwa abandoned the village of Alcanfor or Coofor in 1540 for the use of the Coronado expedition (p. 242). Schroeder also discusses the Rodríguez-Chamuscado expedition of 1581–1582, that of Gaspar Castaño de Sosa in 1591, and the colonizing expedition of Juan de Oñate in 1598. Schroeder summarizes the available historical evidence to determine the identity of the pueblos named by early Spanish explorers.

Scurlock, Dan

1981 Euro-American History of the Study Area. ***In*** **High Altitude Adaptations along Redondo Creek: The Baca Geothermal Anthropological Project. Craig Baker and Joseph C. Winter, eds. Pp. 131–160. Albuquerque: Office of Contract Archeology, University of New Mexico.**

Scurlock describes documentary research and interviews with 10 informants. He discusses the early Spanish Colonial period (1540–1679) exploration and settlement of the area, the Pueblo Revolt (1680), and the Reconquest (1692–1696). Jémez and other northern pueblos received formal land grants late in the seventeenth century, according to Scurlock. After the Reconquest of New Mexico, the governor of New Mexico began to make colonial land grants north of Jémez Pueblo and west of the Río Grande. Governor Fernando Chacón made the Cañon de San Diego Grant in 1798. The first European settlement on it was probably

Cañon, at the confluence of the Jémez and Guadalupe rivers. By 1821 the Jémez Valley had a Hispanic population of 864 (p. 135).

In 1851 Navajos raided a hay camp established by a civilian contractor to cut hay for the U.S. Army. This camp was on the East Fork of the Jémez River and "was apparently later the site of Camp Valles Grandes, established by the United States Army as a deterrent to Navajo and Apache movement through the area during the final Navajo Wars of 1863" (p. 137).

Scurlock notes (p. 137) that the development of large single-owner herds of sheep, increased military protection, and the subjugation of the Navajos and other nomadic Indians in the 1860s and 1870s caused expansion into previously little-known areas adjacent to the Río Grande Valley.

Two land grants of the Mexican Period, the Luis María Cabeza de Baca Grant (1821) and the Town of Las Vegas Grant (1835) embraced the same lands on the Gallinas River. To settle this conflict, the Baca heirs eventually relinquished their claim, in exchange for Congressional authorization (1860) to select an equal amount of land in five square blocks elsewhere in New Mexico. The first block they chose was the Baca Location. They did not, however, receive title until 1876, when the New Mexico Surveyor General completed the survey of the location.

Two homesteads were established near the Baca Location by about 1883 (p. 140). Maríano Sabine Otero and his uncle, Miguel Antonio Otero, developed Jémez Springs as a commercial resort (with the backing of officials of the Atchison, Topeka and Santa Fe Railroad) and built a hotel and bathhouses in 1882. Gold and silver were discovered about five miles [8 km] south of the Baca Location in 1889; major mines and the boomtowns of Albemarle, Allerton, and Bland followed about 1894. The demand for lumber led to the establishment of several sawmills (p. 140). Maríano Otero and his son, Frederico J. (F. J.), bought the Baca Location in 1899. F. J. Otero became president of the Valles Land Company and used the Baca Location as summer range.

In 1909 F. J. Otero sold the Baca Location to the Redondo Development Company (with headquarters in Pennsylvania) but kept the grazing rights and leased the Baca for grazing sheep up until 1918 when Frank Bond acquired the grazing rights. Bond, one of New Mexico's most important general merchants in the late Territorial and early statehood period, leased the Baca Location from the Redondo Development Company for $500 a month and used it for summer grazing, wintering his sheep on the Ramón Vigil Grant (which he bought in 1919) and the Alamo Ranch northwest of Bernalillo. Despite losses on the Baca in the severe winter of 1918–1919, Bond continued to develop his operations there. He bought the Baca in 1926, but the Redondo Development Company retained the timber for 99 years (p. 144).

Scurlock notes (p. 144, 147) that 73 Bond employees were on the Baca Location in the summer of 1918. He lists the employees identified by informants or found in the Bond and Son business records (see entry for Bond and Son 1918).

Guy H. Porter and his son, Frank H., formed the White Pine Lumber Company in 1922. In 1924 they began to ship timber from the San Diego Grant over the line to Bernalillo. (Note: This required the condemnation of a right-of-way across Jémez Pueblo, authorized by the [federal] Pueblo Lands Condemnation Act of 1926, subsequently reenacted in 1928.) The White Pine Lumber Company cut about 100 million board feet of lumber from 1924 to 1931. With the onset of the Depression and a drop in demand for lumber, the company ceased operations in 1931. T. P. Gallagher, Jr., president of the New Mexico Lumber and Timber Company, bought the White Pine Lumber Company and resumed logging on the upper San Diego Grant. In 1935, the Redondo Development Company sold the logging rights on the Baca to the Firesteel Lumber Company. Under agreement with Firesteel, New Mexico Timber began logging near Redondo Creek and built a logging camp on Redondo Creek ("Redondo Camp") (p. 148).

The timber rights were transferred to New Mexico Timber in 1939 (p. 148). Redondo Camp was abandoned in 1939, and most of the logging moved to the northwest part of the Baca. Logging continued into the war years and included cutting on Redondo Peak, at El Cajete, and along the Jaramillo drainage.

Because of a decline in wool prices in 1939–1940, Bond added cattle to his operation. After his death in 1945, the Bond family leased the Baca to various cattle ranchers. James Patrick Dunigan bought the Baca in 1962. He ran cattle, bought back the timber rights in 1971, and ended logging on the Baca (after suing New Mexico Timber in 1964 in federal district court to obtain recognition of his successor interest in the 99-year lease, and appealing his case to

the 10th Circuit Court of Appeals in 1967 [see entry for *Baca Co. v. NM Timber, Inc.*]). An experimental steam well was drilled in 1963. Dunigan made elk hunts a major part of the operation. In 1976 the National Park Service bought 3,076 acres (1,245 ha) of the southeast corner of the grant as an addition to Bandelier National Monument. The Park Service, Forest Service, and Fish and Wildlife Service began studies in 1979 with a view to acquiring the Baca for the public.

Scurlock, Dan

1982 Pastores of the Valles Caldera: Documenting a Vanishing Way of Life. El Palacio 88(1):3–11.

Clyde Smith, who was born on a homestead at Battleship Rock in1899 and worked for Maríano S. Otero as a young man, estimated that there were over 100,000 sheep on Baca Location pastures during the summers of 1917 and 1918 (p. 4). In a series of taped interviews with Scurlock, Smith described the lives of early twentieth-century Valles Caldera shepherds (*pastores*) and camp tenders (*camperos*) with invaluable detail. Major portions of Scurlock's summary of these interviews follows.

> *Herd sizes ranged from 1,000 to 1,500 head and came from winter pastures and ranches at or near towns such as Peña Blanca, Bernalillo, Cuba, Jemez Springs, Española, Santa Fe, Algodones, and Cordova. The pastores and camperos, on foot or mounted on saddle horses, herded their sheep with the aid of dogs that…usually were collies...Burros and mules carried the camp equipment and supplies in wooden boxes and water in five-gallon wooden kegs.*
>
> *Camps were moved on the average of once a week following depletion of available grass for the flocks. Herders often would burn off pasture to promote rapid new growth of grasses and forbs.*
>
> *Camps were set up in areas protected from predominant winds but away from solitary trees or small groves of trees that sometimes were struck y lightning during frequent afternoon thunderstorms. The sites were picked for proximity to good pasture and water for the stock. Tents were erected on a slight grade for drainage of runoff during rains. A ridgepole tent was used to store supplies of food and equipment, and a single, center-pole, tepee tent, about seven by seven feet, served as sleeping quarters for two men. Eight wooden stakes secured the bottom of the canvas tents. Shallow trenches, dug with shovels around each tent, prevented flooding of the interior.*
>
> *The doors of the tents were oriented either to the east or west, and a firepit for cooking meals was dug about two meters from the door of the sleeping tent. The firepit was about a foot deep, rectangular in shape (two by three feet) with dirt mounded along one side as a windbreak. Rocks were sometimes placed around the interior of the pit on which the coffee pot, skillet or dutch oven rested during cooking. The pack burros, mules and saddlehorses were tethered or hobbled close by. Scattered around the majada (bedding ground of the sheep) near the camp were canoas (troughs) of salt. These canoas were handmade from aspen logs; the salt was brought from natural deposits in the Estancia Valley or, in later years, from Bond's store at Española.*
>
> *The camperos generally took care of the camps, and their work included tending to the stock and preparing meals. Food was stored in wooden pack boxes in the supply tent. Basic foodstuffs included beans, canned tomatoes, potatoes, onions, rice, oatmeal, coffee (Arbuckle's was a favorite), canned condensed milk, flour, salt, pepper, lard, baking powder, and sugar. Potatoes were sometimes buried under the bedding in the herder's tent to prevent their freezing in the early spring and fall.*
>
> *Fresh beef, when available, was used in stews or cut into small chunks with gravy poured over it. Meat was preserved by jerking—cutting into long strips and drying in the sun. Mutton, trout caught from the numerous streams in the Valles region supplemented the pastores' diet…native plants gathered for food: cebollita del campo (onions), cota (Indian tea) used to make tea, and verduras (greens) used in salads.*
>
> *Beans were cooked in a small bucket with holes in the lid to emit steam as they baked slowly in the coals. These "bean pots" could be purchased, but they were also easily made by punching holes with a nail in the lid of a ten-pound lard pail. Two basic types of bread were made: a large loaf known as shepherd's bread, which was baked in dutch ovens, and gordas, thick, round cakes cooked in lard in a small pan.*
>
> *Other cooking equipment in the pastores' camps included a cast iron skillet, sheet iron skillet, metal coffee pot (sometimes graniteware or enamelware), and a small bread pan. Items used in food preparation include a butcher knife, metal spatula, cooking fork, stirring spoon, and coffee mill. Metal eating utensils, plates and cups completed the culinary array. Wooden matches for starting the fire were kept in a glass jar with a screw lid. Empty tin cans with other trash were buried near the camp.*

A water bucket, axe, extra handles, claw hammer, pliers, and sheepmarking stamps completed the inventory of camp equipment. The latter item was the owner's brand, carved from wood, which was dipped into dark paint and then pressed against the flank or back of the sheep after it was sheared. The caporals from each home ranch traveled on horseback from camp to camp once or twice a week to bring needed supplies on pack mules or horses and to count sheep in each flock…

The pastores hunted with .44 caliber rifles and pistols, popular weapons of the time; .32–.20 caliber pistols also were used but were less preferred. The weapons also provided protection of the sheep from coyotes, bears and gray wolves; the latter were exterminated in the Jemez Mountains by 1928. Other personal items usually carried by the pastores or camperos or kept at camp included a canteen, clasp (pocket) knife, walking stick, reata (Rope for pulling sheep out of a flock), honda (a slingshot for turning leaders of the flock or driving stragglers back to it), cigarette tobacco (Prince Albert was the most popular) and papers, and chewing tobacco (usually Star Brand). Most herders carried a small bag containing scissors, needle and thread, toothbrush, and salt or soda for cleaning teeth. The viejos (old ones) had a chispa (strike-a-light), flint and a cloth saturated with black powder used to catch sparks and start the fire.

For evening recreation, guitars, harmonicas and a deck of cards were necessities. Story and joke telling also frequently provided amusement around the campfires. The men slept on sheep skins placed on the canvas floor of their tent, and quilts made of patches of cloth sewn together or wool blankets provided warmth on the cold nights at the high altitude.

The pastores devoted leisure hours to various crafts: braiding horsehair or leather reatas and headstalls, making rawhide moccasins called leguas (although store-bought work shoes or boots eventually replaced this traditional footwear), and carving on the bark of aspen trees. Names, dates, place of residence, refranes (sayings), and portraits of horses, dogs, female figures, cattle, deer, and religious crosses were commonly carved subjects.

The lambing season in the Valles was from May to early June. In the early twentieth century, several sites on the Baca Location were used for lambing camps, which were located near a permanent water supply. Corrals were constructed from aspen or conifer logs in the early part of the period; while milled lumber was more commonly used as 1920. Sheds with tin roofs were built within the corrals to protect the ewes and lambs from inclement weather. Whole logs, or sometimes logs split in half, were laid with ends overlapping between two upright vertical posts to form corrals five to six feet high. The corral designs were round or rectangular.

Lambing camps were located on Redondo Creek and on Jaramillo Creek, at San Antonio hot springs, at El Cajete, at the Rincon de los Soldados on the northwest side of the Valle Grande, and at Paseo del Norte on the south boundary of the Baca grant near the present main entrance to the Baca Land and Cattle Company headquarters. The Paseo del Norte camp was established by Frank Bond in 1935, the year the road (now Highway 4) connecting Los Alamos to Cuba was completed by the Civilian Conservation Corps.

After lambing, the ewes were sheared at these same camps by trasquiladores (shearers) who came from various villages in northern New Mexico. These men could shear 50 to 100 animals a day and were paid twenty-five cents a head for their work. The sheared wool was stuffed into large burlap bags and hung from a wooden support. Ten to twelve full bags, each weighing approximately 500 pounds, were loaded into a freight wagon drawn by four mules or horses and hauled to Española, Bernalillo or Albuquerque.

The sheared animals were stamped with the owner's brand or marked with ear notches. To prevent scabies and eliminate ticks, the sheep were dipped in concrete vats or in pits dug in the ground and filled with such mixtures as Blackleaf 40 combined with sulphur and water. The main dipping camp was located at Sulphur Springs on the west edge of the Baca Location. (pp. 5–9; emphasis in original]

Sherman, James E., and Barbara H.

1975 Ghost Towns and Mining Camps of New Mexico. Norman: University of Oklahoma Press.

Gold and silver were discovered about five miles (8 km) south of the Baca Location in 1889 (see pp. 2–3; 13). The "Cochiti Mining District" was the general designation for the mines around the boomtowns of Albermarle, Allerton, and Bland. Sandoval County was created in 1903 from this part of Bernalillo County.

Silko, Leslie Marmon

1995 Interior and Exterior Landscapes: The Pueblo Migration Stories. *In* Landscape in America. George F. Thompson, ed. Pp. 155–169. Austin: University of Texas Press.

Silko, who is from Laguna Pueblo, argues that that Pueblo people are an inseparable part of the land.

> *Pueblo potters, and the creators of petroglyphs and oral narratives, never conceived of removing themselves from the earth and sky. So long as the human consciousness remains within the hills, canyons, cliffs, and the plants, clouds, and sky, the term landscape, as it has entered the English language is misleading. "A portion of territory the eye can comprehend in a single view" does not correctly describe the relationship between the human being and his or her surroundings. This assumes the viewer is somehow outside or separate from the territory he or she surveys. Viewers are as much a part of the landscape as the boulder they stand on. (p. 156; emphasis in the original]*

> *The land, the sky, and all that is within them—the landscape—includes human beings. Interrelationships in the Pueblo landscape are complex and fragile. The unpredictability of the weather, the aridity and harshness of much of the terrain in the high plateau country explain in large part the relentless attention the ancient Pueblo people gave to the sky and the earth around them. Survival depended upon harmony and cooperation not only among human beings, but also among all things—the animate and the less animate, since rocks and mountains were known on occasion to move. (p. 157)*

Sleight, Frederick W.

1950 The Navajo Sacred Mountain of the East: A Controversy. El Palacio 58:379–397.

Sleight builds his argument from the premise that Navajo traditional knowledge embodies "a broad manifestation of geographical understanding" (p. 379) and includes places-names that are known locales within the Navajo world. In this essay, Sleight summarizes his examination of 34 documentary sources and supplementary original fieldwork to identify, when possible, the geographic locations of the principal four Navajo mountains of direction: *Sisnádjini* (Holy Mountain of the East), *Tsodził* (Holy Mountain of the South), *Doko'osłi'd* (Holy Mountain of the West), and *Dibéntsah* (Holy Mountain of the North).

Sleight provides important context in his consideration whether the idea of a holy cardinal mountain, which can be identified with a particular geographic feature within the Navajo landscape, even exists:

> *One must acknowledge from the onset that the holy mountain concept is found first in mythic stories concerning the origin of things on the earth. The mountains are even personified and figure in numerous legends setting forth exploits of the Holy Ones. In such legends their names are listed among many places that are purely mythical and non-existent. Nevertheless, the cardinal mountains have emerged in the minds of the medicine men as the holiest of sacred places. Consequently, the Navajo, with his religion of symbolism, finds it necessary to identify certain concepts with things and places that are observable, tangible, and usable. Thus, the four (sometimes seven) holy mountains transcend the mythical realm and are considered by the Navajo medicine men as actual places that may be viewed, visited, and utilized for ritualistic purposes...*

> *The demonstration of feats of the Holy People through physiographic phenomena stands as a powerful force in the bringing of supernatural assurance to a people beset with the multiple forces of nature. The legends prescribe the collection and assemblage of numerous forms of ritualistic paraphernalia, and, on occasion, the place or source is given. Thus, through the need for a place from which to obtain such sacred materials, has developed the localization of actual geographic spots that subscribe to the legendary place description. Sacred soil, plants, and waters from the four holy mountains must be obtained if certain prerequisites of various ceremonials are to be realized, and if these ritual items are collected from the places prescribed by the Holy Ones, it is necessary that places be identified and recognized as sacred spots long ago sanctioned by the interpreters of the legends. (pp. 380–381)*

Sleight reports finding unanimity among his consultants in the identification of the south (Mount Taylor in western New Mexico), west (San Francisco Peaks in northern Arizona), and north (La Plata Range in southwestern Colorado) mountains. He offers reasoned explanations for why several earlier researchers misidentified some of these summits in their work.

The identification of the Navajo Holy Mountain of the East, however, has long been a subject of scholarly debate given the many contrasting statements offered by Navajo consultants on the matter. Sleight offers a comprehensive critical review of these varying opinions, including a number of other entries contained within this bibliography (see entries by Amsden 1934; Brewer 1937; Haile 1938; Matthews 1897).

Sleight concludes that Blanca Peak of Colorado, Wheeler Peak near Taos, and Pelado (a.k.a. Redondo) Peak in the VCNP are the three most likely candidates for the Navajo Holy Mountain of the East. He then offers an argument to show that the available historical and physiographic evidence favors the identification of Pelado Peak.

First, Sleight maintains that the geographic location of the Jémez Mountains is congruent with both the physiography and culture history of the Navajo homeland. Sleight states, "the Jémez Mountains presented an obvious, observable and impressive eastern limit to Navajo life and culture" (p. 391).

Second, Sleight, who relies on translation of the place-name *sisnádjini* as "Horizontal black belt" (see entry for Hale 1938), states that the description embodied in this term could easily be applied to the Jémez Mountains in general and Redondo Peak in particular. "When viewed from deep within the old Navajo country, the Jémez Range appears as an extended, level, black belt on the eastern horizon, and is the only mountain mass on the eastern side of the Navajo domain with this appearance" (p. 391). Sleight notes further that although several individual mountains fit the description embodied by the name "Horizontal black belt," "Redondo Peak…has an outstanding 'belt" on its western side in such a position that Navajos, approaching from their country, could not help but see it" (pp. 391–392). Nevertheless, acknowledging that Santa Fe Baldy Peak similarly has an impressive "black belt," he adds, "it is not difficult to rationalize the translation of *sisnádjini* to one of several peaks of the Jémez or Sangre de Cristo Ranges" (p. 392).

Third, citing the vivid geographical description associated with the place-name *sisnádjini* in a traditional community story about the division of the Navajo (see entry for Coolidge 1930), Sleight suggests that Redondo Peak is the strongest candidate for recognition as the Holy Mountain of the East:

> *The only one of the three mountains presently being considered that might fit this description is Redondo (Pelado) Peak of the Jémez Range, for it is smooth, barren looking on its summit, and covered with wide stretches of grass. Blanca Peak and Wheeler Peak, on the other hand, with their angular and rugged summits, could hardly conform to this native description. (p. 392)*

Fourth, Sleight says the inability of some Navajo consultants to identify a geographic location of *sisnádjini,* as well as the often contradictory designations provided by some individuals who do, are a product of (1) acculturation and (2) the restriction of the people's geographical domain since the mid-nineteenth century. He states that reservation life and limits "divorced Navajo thinking from a section of country that had been considered theirs for many generations" (pp. 392–393).

In concluding his essay, Sleight presents the results of his work with Navajo consultants, all of whom he identifies as medicine men (pp. 393–394). He reports that in all cases, the medicine men were unanimous in their identifications of the south, west, and north holy mountains (see above). Several individuals could not venture an opinion as to either the appearance or the location of the Holy Mountain of the East. Sleight reports that four consultants, however, offered insights that support Matthews' (1897:221) original assessment that *sisnádjini* is near the Pueblo of Jémez and probably means either the Jémez Mountains generally or is specifically the summit known today as Redondo Peak. Of interest are the medicine men's statements that *sisnádjini* (1) is visible on the eastern horizon from the Lukachukai Mountains, (2) appears as "that long line of mountain" (unidentified informant (p. 394)) on the eastern side of the Navajo homeland, and (3) can be seen on the north horizon from Albuquerque's heights. One consultant, many years earlier, reported that he:

> *. . . had actually visited sisnádjini and had collected holy articles for his "medicine." This aged medicine man stated that his pilgrimage carried him to the Pueblo of Jémez, amid the Jémez Mountains. From here he indicated he proceeded in a more or less northwesterly direction to the peak. (p. 393)*

Smith, Anne M.

1974 Ethnography of the Northern Utes. Papers in Anthropology 17. Santa Fe: Museum of New Mexico Press.

Smith notes northern Ute uses of several plants that grow in the Valles Caldera area, including piñon (*Pinus edulis*), quaking aspen (*Populus tremuloides*), and Woods rose (*Rosa woodsii*) for food and tool manufacture. While many groups ate the inner bark as a starvation food, the Ute particularly savored the sap of these trees. They also used some sagebrush bark (*Artemisia* sp.) for making cordage.

Smith, E. R.

1953 History of Grazing Industry and Range Conservation Developments in the Río Grande Basin. Journal of Range Management 6:405–409.

E. R. Smith was the regional administrator of the Bureau of Land Management when he presented this paper in Albuquerque in January 1953. The paper is mainly a discussion of the problems caused by the movement of sediment from the upper watershed through the Middle Río Grande to Elephant Butte Dam.

Smith says that from about 1855 onward, both Hispanic and Anglo operators extended grazing farther and farther from settlements, and that the arrival of the railroad in 1880 gave further impetus to livestock raising, the greatest number being reached about 1900 (220,000 cattle and 1.75 million sheep). He adds that the creation of the Santa Fe National Forest (actually Forest Reserve) in 1892 was the first move toward conservation in the Río Grande Basin.

Smith, Patricia Clark, with Paula Gunn Allen

1987 Earthly Relations, Carnal Knowledge: Southwestern American Indian Women Writers and Landscape. ***In*** **The Desert Is No Lady: Southwestern Landscapes in Women's Writing and Art. Vera Norwood and Janice Monk, eds. Pp. 174–196. New Haven, CT: Yale University Press.**

This insightful essay provides important context for understanding Native American landscape constructions—and the people's relationship with the land—through study of contemporary literature.

> *Long before context became an academic buzz word, it was a Spider Woman word. It speaks of things woven together, and of understanding the meaning of a thread in terms of the whole piece of goods. For southwestern American Indians, the whole is the land in the largest sense. The land is not only landscape as Anglo writers often think of it—arrangements of butte and bosque, mountain and river valley, light and cloud shadow. For American Indians, the land encompasses the butterfly and ant, man and woman, adobe wall and gourd vine, trout beneath the river water, rattler deep in his winter den, the North Star and the constellations, the flock of sandhill cranes flying too high to be seen against the sun. The land is Spider Woman's creation; it is the whole of the cosmos. (p. 176)*

> *Nontribal people often perceive the land as an object, as something faintly or greatly inimical, to be controlled, reshaped, painted, or feared. Tribal people see it as something mysterious, certainly beyond human domination, and yet as something to be met and spoken with rather than confronted. For them the land is not just a collection of objects you do things to, nor is it merely a place you do things in, a stage set for human action. Rather it is a multitude of entities who possess intelligence and personality. These entities are active participants with human beings in life processes, in thoughts and acts simultaneously mundane and spiritual. People and the land hold dialogue within the structure of ritual, in order to ensure balance and harmony. Ritual is the means by which people, spirits, rocks, animals, and other beings enter into conversation with each other. One major part of peoples' ritual responsibility is to speak with these nonhuman entities and to report the conversation; American Indian literature records echoes of that ongoing dialogue. (pp. 176–177)*

The authors examine selected works of Leslie Marmon Silko as part of their essay (see also entry for Silko 1995).

Smith, Robert L.

1979 Ash-Flow Magmatism. Special Paper 180. Boulder, CO: Geological Society of America.

In this technical paper, Smith proposes that calderas related to ash-flow sheets show a positive correlation between caldera area and ejecta volume. "This correlation places

constraints on magma drawdown during eruption and implies a systematic relationship between these parameters and magma volume of the chamber" (p. 5).

Smith focuses his discussion on the Bandelier Tuff. He is mainly concerned to explain the minor-element gradients common to the ash-flow sheets of the Otowi and Tshirege Members. He notes that compositional changes usually are understood to have taken place over an extended period of time. He concludes that eruptions producing ash flows erupt off the top of the magma body (p. 25). He also suggests that a general discernible pattern exists in the behavior of volcanic systems that produce ash flows.

Smith, Robert L., and Roy A. Bailey

1966 The Bandelier Tuff: A Study of Ash-Flow Eruption Cycles from Zoned Magma Chambers. Bulletin of Volcanology 29:83-104.

This article notes that the Bandelier Tuff is a Pleistocene rhyolitic ash-flow formation consisting of the Upper and Lower Bandelier members. The lower member erupted approximately 1.4 million years ago and collapsed to form the Toledo Caldera. The upper member erupted some 1 million years ago and collapsed to form the Valles Caldera.

> *The upper and lower members of the Bandelier thus form two cycles of ash-flow eruption and caldera formation that together are the culmination of a long history of basaltic and andesitic to quartz-latitic and rhyolitic volcanism in the Jemez Mountains. (p. 83)*

> *The lower Bandelier ash-flow sheet, though less perfectly preserved, shows many physical and chemical parallels with the upper sheet. All evidence indicates that the two sheets, separated in time by about 400,000 years, had comparable histories and common origins; and that considered together they broaden our concepts of volcanic cycles. (p. 101)*

Smith, Robert L., and Roy A. Bailey

1968 Resurgent Cauldrons. *In* **Studies in Volcanology A Memoir in Honor of Howel Williams. Memoir 116. Robert R. Coats, Richard L. Hay, and Charles A. Anderson, eds. Pp. 613–662. Boulder, CO: The Geological Society of America.**

Smith and Bailey explain that a resurgent cauldron (caldera) is one that has been uplifted, following subsidence, usually in the form of a structural dome, and that the Valles Caldera is among the best known (others are Toba, Creede, San Juan, Silverton, Lake City, and Timber Mountain). They go on to describe the Valles Caldera in more detail, noting that the structural dome in its center is the Redondo Dome. They state that volcanism in this area began in late Miocene or Pliocene times, continuing into mid-Pleistocene times, when the sequence ended with two gigantic pyroclastic outbursts that produced the Bandelier Tuff (see entry for Smith and Bailey 1966). Each outburst produced at least 50 cubic miles of rhyolite ash and pumice, mainly as ash flows, followed by caldera collapse. The first outburst produced the Toledo Caldera, of which only a semicircular fragment is extant; the second produced the Valles Caldera (p. 617).

Snow, David H.

1979 Rural Hispanic Community Organization in Northern New Mexico: An Historical Perspective. *In* **The Survival of Spanish American Villages. Paul Kutsche, ed. Pp. 45–52. The Colorado College Studies, 15. Colorado Springs: Research Committee, Colorado College.**

Snow adopts the thesis, "The way people arrange themselves on the landscape is a reflection of the patterns of social organization developed in response to natural and cultural environmental factors" (p. 45). Snow then sets out to dispel common characterizations of Nuevomexicano settlement as atomistic, factionalized, and lacking social organization. He considers what environmental factors underlay the dispersed settlement that characterized much of rural Nuevomexicano New Mexico following the Pueblo Revolt of 1680–1692. Snow concludes:

> *It seems safe to say that the overriding values in New Mexico's rural Hispanic communities are those which relate to land. It is the individual and community land which give shape and character to the village, which give justification for the village organization and roots to the people who live there. Without roots, without costumbre, the individual is homeless; without land the community ceases to exist. (p. 52; emphasis in the original)*

Stevenson, Matilda Coxe

1912 Ethnobotany of San Ildefonso and Santa Clara Pueblos. Archives of the Office of Anthropology. Unpublished Manuscript No. 4711. Washington, DC: Smithsonian Institution.

Stevenson reports that plants found in the Valles Caldera of use to the Tewa of San Ildefonso and Santa Clara include milkweed (*Asclepias* sp.) for medicine, western throughwort (*Eupatorium herbaceum*) for dye, spurge (*Euphorbia* sp.) for medicine, gilia (*Ipomopsis* sp.) for medicine, tansy-aster (*Machaeranthera* sp.) for medicine, broomrape (*Orobanche* sp.) for food, and scorpionweed (*Phacelia* sp.) for medicine.

Stevenson, Matilde Coxe

1915 Ethnobotany of the Zuni Indians. Thirtieth Annual Report of the Bureau of American Ethnology. Washington, DC: U.S. Government Printing Office.

Among the diverse assemblage of plants that the Zuni use, Stevenson identifies many taxa that grow in the VCNP. Examples used for food include serviceberry (*Amelanchier* sp.), sagebrush (*Artemisia* sp.), milkweed (*Astragalus* sp.), prickly pear (*Opuntia* sp.), broomrape (*Orobanche* sp.), Indian ricegrass (*Oryzopsis hymenoides*), curlytop knotweed (*Polygonum lapathifolium*), Prairie coneflower (*Ratibida columnifera*), and nightshade (*Solanum* sp.). Medicinal plants include sagebrush (*Artemisia* sp.), aster (*Aster* sp.), buckwheat (*Eriogonum* sp.), western throughwort (*Eupatorium herbaceum*), spurge (*Euphorbia* sp.), ragweed (*Hymenopappus* sp.), pingue (*Hymenoxys* sp.), native lettuce (*Lactuca* sp.), flax (*Linum* sp.), tansy-aster (*Machaeranthera* sp.), primrose (*Oenothera* sp.), prairie coneflower (*Ratibida columnifera*), yellowcress (*Rorippa* sp.), several sorrel and dock species (*Rumex* sp.), ragwort (*Senecio* sp.), nightshade (*Solanum* sp.), and goldenrod (*Solidago* sp.).

Stiger, Mark A.

1977 Anasazi Diet: The Coprolite Evidence. Masters thesis. University of Colorado, Boulder.

Stiger adds pepperweed (*Lepidium* sp.) to the list of VCNP plants that Native Americans potentially used for food while visiting this place.

Strong, Pauline Turner

1979a Santa Ana Pueblo. *In* Southwest. Alfonso Ortiz, ed. Pp. 398–406. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.

This article provides a concise overview of the anthropology and history of Santa Ana Pueblo.

Strong, Pauline Turner

1979b San Felipe Pueblo. *In* Southwest. Alfonso Ortiz, ed. Pp. 390–397. Vol. 9 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.

This article provides a concise overview of the anthropology and history of San Felipe Pueblo.

Summers, W. K.

1976 Catalog of Thermal Waters in New Mexico. Hydrologic Report 4, New Mexico Bureau of Mines and Mineral Resources. Socorro: New Mexico Institute of Mining and Technology.

Summers notes that the upper Jémez River basin includes the caldera and several natural thermal features including hot springs, *fumaroles,* and *solfatara*. In the 1970s, Westates Petroleum Company, Baca Land and Cattle Company, and Union Oil Company drilled wells within the caldera that produced steam and hot water. Summers lists all known thermal waters in the caldera and maps all steam wells drilled to 1976.

Surveyor General, New Mexico

n.d.a Baca Location No. 1. Surveyor General Report, 20. Spanish Archives of New Mexico (SANM) I, Roll 14, Frames 1101–1437. Santa Fe, NM: State Records Center and Archives.

Although this report contains material concerning the four other locations or floats, most of the information has to do with Location No. 1. This file concerns the original grant,

the choice of Baca Location as authorized by federal law, and the surveys of the Baca Location from 1876 to 1912. It contains Luis María Baca's original petition to the provincial deputation of Durango dated January 16, 1821; the original grant by the Provincial Deputation of Durango dated 1825; Baca's request dated January 13, 1826, to be placed in possession of the grant; the details of the relinquishment by Baca's heirs of the original claim; an affidavit (January 28, 1858) of Manuel Antonio Baca (Socorro) the alcalde who placed Baca in possession of the original grant in 1826; and correspondence concerning the choice of the five locations.

The report provides few details concerning the original survey by McBroom and Sawyer 1876 (see entry for McBroom and Sawyer n.d.). Some correspondence pertains to the retracement survey of 1910 done by Lewis D. W. Shelton (who was a private surveyor, not a federal employee). Surveyor Lee Scott attempted a resurvey in 1908, but the U.S. Surveyor General found it inadequate and sent him back into the field. U.S. Surveyor W. B. Douglass recommended a restoration survey in 1911 in response to instructions of the Commissioner of the General Land Office (GLO).

A letter dated June 20, 1911, evidently from the U.S. Surveyor General in Santa Fe to the Commissioner of the GLO, relates to the assignment of U.S. Surveyor W. B. Douglass to perform a restoration survey (subsequently reported on April 8, 1912). This letter states that Douglass has asked that representatives of "such private interests as may desire to be present" (meaning probably both the Redondo Development Company's representatives and prospective buyers from Pennsylvania) should be allowed to be present at the survey because "the property rights at stake are of considerable value" (frame 1406).

U.S. Surveyor Douglass summarized the existing surveys of the Baca Location as of 1911. He noted missing corners, numerous problems with the original field notes of Sawyer and McBroom, and "large errors of alinement and measurement" (frame 1271) (1876, see entry for Douglass and Neighbour n.d.). He concluded by recommending a restoration survey of the boundaries (Frames 1266–1278).

> *A careful consideration of all the facts developed by this examination, while not conclusive, a large preponderance of the evidence supports the view that the survey was made in its entirety, notwithstanding that many corners cannot be found. Long field experience has taught me not to deny the existence of an early and defective survey, supported by topographical notations simply because the corner cannot be found….That such a complete agreement of the rougher topographical features could be the result of a guess cannot be admitted… (frame 1277)*

"I have the honor to recommend a restoration survey of the boundaries of the Baca Location No. 1 Grant…" (Frame 1278).

The restoration survey was carried out in 1912. Douglass filed his report on April 8, 1912. The commissioner of the General Land Office denied the petition of the Redondo Development Company for a resurvey of the boundaries of the grant on July 5, 1912.

Surveyor General, New Mexico

n.d.b Luis María Cabeza de Baca Grant. Surveyor General File No. 103. Spanish Archives of New Mexico (SANM) I, Roll 31, Frames 463–476. Santa Fe, NM: State Records Center and Archives.

This file contains the order of the *alcalde*, José Miguel Baca, dated September 12, 1827, recognizing Miguel Baca as the heir and representative of the deceased, Luis María Baca (frames 465–467). L. M. Baca was killed in June, 1827 (see entry for Cleland 1950). A power of attorney from L. M. Baca to his brother Miguel dated May 27, 1827 is included (frame 469). L. M. Baca signs with a cross, suggesting either that he is illiterate or too weak to sign his name. He also states that he wishes to die as a Christian.

This also file contains the will of L. M. Baca dated May 28, 1827 (signature and rubric; frames 470–471). These records seem to be at variance with the story of his death by violence the following month.

The file also contains a petition of Tomás Cabeza de Baca, resident of the town of Peña Blanca. His father, Luis María Cabeza de Baca, died in 1827. Reference is made to the property at Santa Cruz "about four miles [6.4 km] distant."

Swadesh, Frances Leon

1974 *Los Prímeros Pobladores*: Hispanic Americans on the Ute Frontier. Notre Dame, IN: University of Notre Dame Press.

In this important study of the Hispanic settlement of the Chama and San Luis valleys in the territory of what is now northern New Mexico and southern Colorado, Swadesh documents the ever-changing interactions between the locale's settlers and the region's Ute people, with Abiquiú serving as one of the principal sites for exchanges that ranged from trading, to raiding, to the subsequent ransoming of captives, during the eighteenth and nineteenth centuries.

Although she does not cite the Valles Caldera, it is clear that Utes traversed the whole region. For example, "Albert Schroeder credits the Capotes with the stock depredations complained of in 1736 by the settlers of the Río del Oso" (p. 164), which is just east of the Valles Caldera. Also,

> *The Sabuaganas apparently camped on what used to be called Sabuaganas (or Chaguagua) Creek, later called Chihuahueños or Pedernales Creek. The Capotes were camped on the Vega de Raiño (Raiño Meadow) near the mouth of Cañones Creek, when they fled from Santa Fe after the September 1844 massacre… (p. 232)*

Swadesh states further that Abiquiú's "importance in commerce and military maneuvers lay in its access to Navajo and Ute country" (p. 64; see also p. 163).

> *The Utes most in contact with Abiquiu were the Sabuagana (sometimes called Chaguagua) and Capote bands. Before 1762 they had started making annual trips to the Chama Valley and communities near Santa Cruz to conduct trade and ransom. By 1776 an annual trade fair was held for the Utes at Abiquiu. The Utes brought juvenile captives from the "heathen tribes," as well as deer, buffalo meat, and dressed hides… The growth of trading partnerships with the Utes made it possible for the settlers to petition for new grants and set up residence in areas remote from administrative, ecclesiastical, and military supervision. (p. 47)*

The outbreak of a decade-long period of hostilities between the Hispanics and the Utes in the mid-nineteenth century led to a change in the settlers' herding practices. Writing about the Tierra Amarilla Grant, Swadesh reports that documentary evidence and local traditions state that Hispanic herdsmen worked their prime stock ranges from small summer camps. "People say that the sheep were herded in small flocks and were scattered up the canyons when a Ute raid commenced, so that losses would be minimal" (pp. 62–63).

Swank, George R.

1932 The Ethnobotany of the Acoma and Laguna Indians. Masters thesis. University of New Mexico, Albuquerque.

In this important study, Swank identifies more than 60 plants found in the Valles Caldera area that are of economic, social, or cultural use to the Ácoma and Laguna Pueblos.

Swentzell, Rina

1988 Bupingeh: The Pueblo Plaza. El Palacio 94:14–19.

In this short article, Swentzell, an architectural historian and education consultant from the Tewa Pueblo of Santa Clara, discusses the idea of center in Tewa cosmology as the intersection of the horizontal and vertical regions of the Pueblos' physical and symbolic universe. Although she focuses on the formally negative spaces of Pueblo plazas, Swentzell also refers to the edges of the Pueblo world that necessarily help define centers. She considers the concept of connectedness that unifies peripheries with centers, as well as the energies of all life forces—both physical and metaphysical—that move throughout the sky, earth, and underworld of the Pueblos' cosmos.

Swentzell, Rina

1989a The Butterfly Effect: A Conversation with Rina Swentzell. El Palacio 95:24–29.

Swentzell further explores the idea of connectedness that unifies the many-layered understandings that the Pueblos possess of their cosmos. She explains,

> *That connection is—creativity from the source…, the po-wa-ha, literally "water-wind-breath." It is that energy that flows from everybody, everything—plants, stones. That's why everything takes on life in that world. We all breathe of the same breath the plants do, the rocks do. And so the world itself takes on a different structure. (p. 25)*

Swentzell, Rina

1989b Remembering Tewa Houses and Spaces. Native Peoples: The Arts and Lifeways 3(2):6–12.

Swentzell examines the Pueblos' concepts of center, breath, periphery, movement, and connectedness. In talking about how all these ideas come together within the Pueblos' traditional views of their cosmos, Swentzell concludes:

> *Most importantly, I treasure the sense of sacredness which pervaded that old Pueblo world. All of life, including walls, rocks and people, were part of an exquisite, flowing unity. (p. 12)*

Swentzell, Rina

1991 Levels of Truth: Southwest Archaeologists and Anasazi/Pueblo People. *In* **Puebloan Past and Present: Papers in Honor of Stewart Peckham. Meliha S. Duran and David T. Kirkpatrick, eds. Pp. 177–181. Archaeological Society of New Mexico 17. Albuquerque: Archaeological Society of New Mexico.**

In this extremely important philosophical article, Swentzell addresses the problem of why "the creative process of bringing together different ways of knowing and different modes of perception…does not happen" (p. 177) in interactions between Anglo and Pueblo peoples. She considers that the idea of connectedness underlies traditional Pueblo understandings of their cosmos, whereby "everything/everybody, even the largest whole, has a context or a larger whole within which it belongs" (p. 177). In comparison, Western ways of thinking:

> *. . . operate with the assumption that facts, if appropriately collected and fastidiously recorded, will uncover the truth. Absolute truth is, for the most part, taken for granted. It is there to be uncovered. (p. 178; emphasis added)*

Swentzell considers how dominance and power, tied with prestige that is informed by a particularly defined system of what can be understood, poses real obstacles to building significant cross-cultural understandings. She concludes:

> *The traditional Pueblo world is a world focused on equalitarianism, inclusiveness, and linkages—feminine qualities or values of the human being. The Western-European world is recognized…as a world that focuses on ways of thinking, valuing, and understanding that are characteristically masculine. (p. 180; emphasis added)*

Tiller, Veronica E.

1983 Jicarilla Apache. *In* **Southwest. Alfonso Ortiz, ed. Pp. 440–461. Vol. 10 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

This article provides a concise overview of the anthropology and history of the Jicarilla Apache Tribe.

Tiller, Veronica E.

1992 The Jicarilla Apache Tribe: A History. Revised edition. Lincoln: University of Nebraska Press.

Tiller's book is a comprehensive history of the Jicarilla Apache people. Her discussion of the Jicarilla origin story is also useful in developing a landscape framework for the Apache. Although she does not discuss the Jicarilla occupation of the Valles Caldera, she illustrates the location of an undefined "permanent site" west of Los Alamos near the VCNP in a map titled "Aboriginal Sites and Early Settlements" (p. 15).

Torrez, Robert J.

1994 The Southern Ute Agency at Abiquiu and Tierra Amarilla, New Mexico. Research Paper 36. Guadalupita, NM: Center for Land Grant Studies.

Torrez focuses primarily on the Capote, and to a lesser degree, the Weeminuche, Ute bands and their occupation of northwest New Mexico between 1850 and 1876. During this time "these Southern Ute bands were slowly being driven from their traditional hunting grounds along New Mexico's northern frontier to the reservations they now occupy in southwest Colorado" (p. 2).

Torrez notes that before the arrival of the Spanish, the Capote and Weeminuche Utes spent their summers and falls in New Mexico's mountains. "They hunted deer, elk and small game and gathered berries and seeds to supplement their diet. Occasionally they planted corn,

beans, and squash, which they harvested before moving on to follow migrating game to warmer elevations at the onset of winter" (p. 2).

Torrez does not state whether the Utes used the Valles Caldera. He does, however, provide valuable background information and context for how Utes earned their livelihood in the surrounding territory. If mid-nineteenth-century Ute archaeological sites are positively identified in the VCNP, Torrez's article will prove valuable in assessing these assemblages within the regional settlement system and the prevailing social and political climates of the day.

Trigg, Heather Bethany

1999 The Economy of Early Colonial New Mexico, A.D. 1598–1680: An Investigation of Social Structure and Human Agency Using Archaeological and Documentary Data. Ph.D. dissertation. Department of Anthropology, University of Michigan. Ann Arbor.

Trigg identifies seven plant species recovered from Spanish colonial archaeological contexts that grow in the VCNP. Colonists used goosefoot (*Chenopodium* sp.) for food and medicine, and sedges (*Cyperus* sp.) for mats and roofing material. Trigg also reports that livestock also consumed sedges (p. 144). Hedgehog cactus (*Echinocereus* sp.) yields edible fruits. Filaree (*Erodium* sp.) was a traditional Hispanic medicine for treating gonorrhea and use as a diuretic. Moreover, the Jémez pounded filaree leaves and mixed resulting powder with watermelon seeds to prevent fungus during storage (p. 144).

Hispanic colonists used spurge (*Euphorbia* sp.) as a medicine to treat tonsillitis, rashes, and rattlesnake bites. They also used *Euphorbia* sp. as livestock feed to increase milk production in cows and goats (p. 144).

Like Native American groups, Hispanics used sunflower seeds (*Helianthus* sp.) and piñon pine (*Pinus edulis*) for food and medicine. Both were excellent oil sources. Ethnographic data indicate that the pine nuts frequently were roasted and lightly pounded to crack the shells. The nutmeats then were winnowed from the shells and ground to make a flour, which was shaped into balls, mixed with maize, or used in soups (p. 147).

Trimble, Stephen

1993 The People: Indians of the American Southwest. Santa Fe, NM: School of American Research Press.

Trimble's book is a highly readable, yet comprehensive, discussion of the Southwest's indigenous peoples. His chapters on the Pueblos (pp. 38–120) and the Apaches (pp. 245–296) provide much historical and ethnographic detail. Trimble's discussion of the Pueblos' conceptualization of their world is especially insightful.

Tucker, Edwin A., and George Fitzpatrick

1972 Men Who Matched the Mountains: The Forest Service in the Southwest. Albuquerque, NM: U.S. Department of Agriculture, Forest Service, Southwest Region.

The authors mention the capture of feral horses and burros, some on the Baca Location (p. 81). They also mention construction of the road through the Valle Grande from Los Alamos to Cuba by the Civilian Conservation Corps in 1935 (pp. 162–171).

Turney, J. F.

1948 An Analysis of Material Taken from a Section of Group M of the Cliffs, Frijoles Canyon, Bandelier National Monument, New Mexico. Masters thesis. Adams State College, Alamosa, CO.

Turney identifies several plant species that also grow in the VCNP in his study of pre-Columbian archaeological materials at Bandelier National Monument. Examples include Western red currant (*Ribes cereum*), which was used for food, and New Mexico locust (*Robinia neomexicana*), whose wood was employed in tool making.

Tyler, Hamilton A.

1979 Pueblo Birds and Myths. Norman: University of Oklahoma Press.

This volume does not mention the Valles Caldera. Nevertheless, this study is relevant to the land-use history of the VCNP because it examines how birds found in the Jémez Mountains, including hawks, robins, eagles, turkeys, magpies, wrens, and woodpeckers, among others, are integrated into all aspects of Pueblo community life.

Underhill, Ruth

1979 Pueblo Crafts. Palmer Lake, CO: Filter Press.

Underhill reports that the Zuni use bush mountainspray (*Holodiscus dumosu*), a species found in the VCNP, in their craft activities.

U.S. Congress, House

1860 H.R. Doc. No. 14, 36th Cong., 1st sess., 45.

New Mexico Surveyor General William Pelham, in a report dated December 18, 1850, finds both the Baca Grant and the Town of Las Vegas Grant to be good and valid, and recommends both for confirmation, leaving the adjustment of conflicting rights to the courts.

U.S. Congress, Senate. Committee on Private Land Claims

1860 Reports of the Surveyor General of the Territory of New Mexico, 36th Cong., 1st sess., Rept. 228.

This report, accompanying H.R. 195, deals with two reports covering various land grant claims. The second report includes two claims to the same tract of land: the Baca Grant, confirmed in February 1825 by the departmental assembly of New Mexico, and the Town of Las Vegas Grant of March 25, 1835. The surveyor general "having none but ministerial duties to perform" has recommended confirmation of both grants, "leaving to the respective claimants the right of adjusting their conflicting claims in the courts. But Congress…is bound to legislate in such a manner as to prevent, if possible, so disastrous a result as the plunging of an entire settlement of families into litigation, at the imminent hazard of being turned out of their homes…" The Baca claimants are willing to waive their claim "if allowed to enter an equivalent quantity of land elsewhere within the Territory." The Committee has prepared an amendment to this effect.

U.S. Department of Agriculture, Forest Service

1883–1913 Forest Homestead Records. Albuquerque, NM: Land Status Office, Southwest Region.

The earliest homesteads between Redondo Creek and La Cueva were those of John Kelly and Polito Montoya. Both ranches were established in or before 1883. Subsequent homesteads around La Cueva included those of N. R. Darey, Angeline Eagle, J. S. Eagle, and S. D. Thompson.

U.S. Department of Agriculture, Forest Service

1915 Fire Map, Jemez National Forest, Santa Fe. Copy on file: Santa Fe: Angélico Chávez History Library, Palace of the Governors, Museum of New Mexico.

From 1911 to 1922 the U.S. Surveyor General in Santa Fe oversaw restorative surveys of the Baca Location at the request of the Redondo Development Company, with the object of clarifying the boundaries shared by the Baca Location, the Jémez National Forest, and the Ramón Vigil Land Grant. This survey showed that the Ramon Land and Lumber Company actually had cut about 100,000 board feet of timber from the Jémez National Forest, not the west side of the Rámon Vigil Grant as had been believed.

This restorative survey determined that Sulphur Springs was inside the Baca Location.

U.S. Department of Agriculture, Forest Service

1993 Report on the Study of the Baca Location No. 1. U.S. Department of Agriculture, Forest Service, Southwest Region, August 1993.

This study was issued pursuant to Public Law 101–556 (the full text appears as Appendix A; see entry for U.S. Public Law 101–556). The study is intended "to support informed and educated decisions regarding the Baca in the future" (p. 2); that is, to prepare for its acquisition by the federal government, although this is not stated in so many words because the private owners were not offering the Baca for sale at the time.

The study includes a short history of the Baca Location, a discussion of its current management, management options, and summaries of its resources including recreation, hunting, fishing, logging, grazing, and others, including Indian sacred areas. Included is a list of improvements and a section on the mineral estate, as well as a historical chronology.

The study notes that all logging ceased in the period 1972 to 1980, and then began again using "selected harvest methods," with cutting of only diseased and some mature trees allowed.

U.S. Geological Survey

1918–1925 (2006, June 30). Home page of U.S. Geological Survey Photographic Library, U.S. Department of the Interior. [Online]. Available: http://libraryphoto.cr.usgs.gov [2007, January 23].

The card index to the photograph collection is organized by state, county and photographer. Most photographs are of geological features, but most of the contributing photographers also took occasional images of other things, including camps, vegetation, group portraits, structures, towns and archeological sites.

The following photographs in the vicinity of the Baca Location are on file:

Mansfield, G. R. #420: "Pit J–5 in sulphur deposit 5 miles [8 km] above Jemez Springs. April 15, 1918."

Mansfield, G. R. #421: "Pit J–6, with Mexican boy, and view across sulphur deposit, same locality as No. 420." April 15, 1918.

Mansfield, G. R. #422. "View up Jemez Creek at sulphur deposit 5 miles [8 km] above Jemez Springs, showing exposure of sulphur-bearing rocks." April 15, 1918.

Mansfield, G. R. #423. "Pit J–5 (test pit) and Mexican boy. View N.E. across sulphur deposit at same locality as No. 420." April 15, 1918.

Mansfield, G. R. #424. "View up small ravine across the sulphur deposit 5 miles [8 km] above Jemez Springs in Jemez Canyon." April 15, 1918.

Mansfield, G. R. #425. "View down stream along same bluff shown in No. 422." April 15, 1918.

The following photographs within the Baca Location are on file:

Mansfield, G. R. 426. "Hotel and bath houses at Sulphur Springs, Sulphur Canyon, 14 miles [22.4 km] above Jemez Springs. The little ravine has numerous vents emitting hot sulphurous vapors and waters." April 16, 1918.

Mansfield, G. R. #427. "Bath houses and main sulphur deposit at Sulphur Springs. Nearer view of ravine shown in No. 426." April 16, 1918.

Mansfield, G. R. #428. "Old sulphur mill at Sulphur Springs hills built 1902. From 1902–1904, 200,000 lbs. [101,605 kg] of sulphur were produced here. Same locality as No. 426." April 16, 1918.

Mansfield, G. R. #429. "Main sulphur deposit at Sulphur Springs, Baca Location. (Same locality as Nos. 426–428.)" April 16, 1918.

Lee, W. T. #2704. "Aspen grove on Valle Grande, N.M." N.d., ca. 1925.

Lee, W. T. #2705. "Aspen grove at top of Valle Grande, N.M." N.d., ca. 1925.

Lee, W. T. #2706. "Side of crater of Valle Grande, N.M." N.d., ca. 1925.

Lee, W. T. #2706a. "Same as 2706." N.d., ca. 1925.

Lee, W. T. #2708. "Road to Valle Grande, N.M." N.d., ca. 1925.

U.S. Public Law 167

1860 An Act to Confirm Certain Private Land Claims in the Territory of New Mexico. 36 th. Cong., 1st sess., June 21, 1860.

This act confirms various land grants in New Mexico. Section 6 states:

> *. . . it shall be lawful for the heirs of Luis María Baca, who make claim to the same tract of land as is claimed by the town of Las Vegas, to select instead of the land claimed by them, an equal quantity of vacant land, not mineral, in the Territory of New Mexico, to be located by them in square bodies, not exceeding five in number. And it shall be the duty of the surveyor-general of New Mexico, to make survey and location of the lands so selected by said heirs of Baca when thereunto required by them: Provided, however, That the right hereby granted to said heirs of Baca shall continue on force during three years from the passage of this act, and no longer.*

U.S. Public Law 101–556.

1990 An Act to Authorize the Secretary of Agriculture to Acquire and Study Certain Lands in the State of New Mexico, and for Other Purposes. 101st Cong., November 15, 1990.

The stated purpose of the Act is to acquire two parcels totaling approximately 36 acres (14.6 ha) from the private owner (Dunigan Enterprises), to pay damages in the amount of $1,633,527 to Dunigan Enterprises to compensate for an earlier exchange (1966: 2,456.14 acres [993.95 ha] known as the "Cochiti Properties"), and to authorize the Secretary of Agriculture to study the Baca Location to determine its "scenic, geologic, recreational, timber, mineral, grazing, and other multiple use attributes," and to study options for federal acquisition of the property, in whole or in part.

Van Ness, John R.

1979 Hispanic Village Organization in Northern New Mexico: Corporate Community Structure in Historical and Comparative Perspective. ***In*** **The Survival of Spanish American Villages. Paul Kutsche, ed. Pp. 21–44. The Colorado College Studies, 15. Colorado Springs: Research Committee, Colorado College.**

Van Ness describes this paper as an examination of the social organization of northern New Mexico's Nuevomexicano villages, with an emphasis on the nature of their corporate organization (p. 21). He begins by considering the structure and functioning of Spain's corporate communities, which were subsequently introduced into Latin America.

He observes that the pueblo (an inclusive term referring to all small, rural Spanish communities) historically was the primary social and political unit of Iberian society, especially within mountainous settings (p. 25). Among Spanish people, the term *pueblo* traditionally means a land-based social community. This idea also helps define an individual's identity throughout life, by defining his or her place of birth. Because people, society, and places all are integrated into the concept of pueblo, it is not surprising that Iberian land-use traditions, land occupation, and landscape-making revolve around the economic, social, and political organization of corporate ownership (p. 25). Van Ness notes further, "As in Latin America and Spain, strong sentiments and spiritual values were attached to the community land. The merging of individual identity, community, and physical place has a good deal to do with this value orientation" (p. 42).

Van Valkenburgh, Richard F.

1940 Sacred Places and Shrines of the Navajo. Part II: Navajo Rock and Twig Piles, Called Tsenadjihih. Museum of Northern Arizona Museum Notes 11(3):29–34.

Van Valkenburgh reports that *tsenadjihih* means "picking up and putting on stones" (p. 6). Although *tsenadjihih* are not as dynamic as shrines on the holy mountains or *kethan* (prayer stick) depositories, the Navajo revere these features and account for their origin in Blessingway mythology.

One Navajo authority, Dagach'ibikis from Tohatchi, told Van Valkenburgh that *tsenadjihih* "offerings were made of turquoise and other sacred stones" (p. 9). Another tradition keeper, Maríano Chávez of Torreon, stated, "There once was a man who ran from the Chuska Mountains to the Jemez Mountains. He picked up rocks and started a number of *tsenadjihih*. One is on the old Navajo trail by Jemez Hot Springs, and another is near Cabezon" (p. 9).

Van Valkenburgh adds that Navajo made *tsenadjihih* and made prayers for success and luck "while passing over a trail to some destination where he or she considers luck is needed" (p. 9).

> *Turquoise and other sacred stones make the prayer effective, but an improvised prayer and offering will also work. Burned rocks are never placed on a tsenadjihih. Warriors used Yucca baccata leaves with the points directed toward their enemies. If the wind is blowing, a rock is placed over the twig to hold it on the pile. Nothing that has been stuck by lightning, whirlwinds, or touched by snakes or bears should be placed on a tsenadjihih. It would bring misfortune. (p. 9; emphasis in the original)*

Van Valkenburgh, Richard F., and Scotty Begay

1938 Sacred Places and Shrines of the Navajo. Part I: The Sacred Mountains. Museum of Northern Arizona Museum Notes 11(3):29–34.

The authors provide excerpts from a previously unpublished Navajo origin story that provides a condensed account of the ceremonial creation of the Holy Mountains of Direction:

The Holy people took earth from the mountains of the Second World and placed it in the east. This mountain was made of white shell in the shape of a divine being. It was adorned with all different types of animals, trees, plants, and all living creatures including water animals as well as the water itself. Everything that decorated this mountain was of white shell. Since the mountain had been made in the shape of First Man, this mountain was given the sacred name of Sisnaadjinii, and it was to be equally as holy as the sacred mountain of the east in the Yellow World below…

After all these four mountains had been made, the people were told that as they were sacred, that on these offerings might be made, and favors which might be desired might be obtained from them by offerings and prayer." (pp. 30–31; emphasis in the original)

Van Valkenburgh and Begay describe the construction of mountaintop shrines and the kinds of offerings typically found within them:

Many types of shrines exist. Some are simple, while others are elaborate. Among the various types of shrines are stone cists or boxes, sealed enclosures, walled or unwalled springs, cienegas or pools, natural concavities and peculiarities in rock formations, caves, and rock shelters, in rooms of prehistoric Pueblo ruins, and simple monuments of rough stone…

In many shrines are found objects which have been either transported to or are natural parts of the shrine and become a part of the shrine itself. In some instances these act as altars or receptacles for altar paraphernalia. Some of these are boulders with natural or worked concavities, incised or painted images or carved or uncarved wood or stone. Occasionally anthropomorphic or geometric figures are found on the walls or boulders of the shrine.

Offerings made to these shrines may be practically anything: Prayer sticks of assorted types, semi-precious stones such as turquoise, malachite, lignite, or native jet, beads of these stones, native red and yellow garnets, obsidian and chert flakes, flaked implements, smooth banded stones, petrified wood, fossils, arrowshafts, lengths of reed and wood, stone and semiprecious stone fetishes, both painted and unpainted, metal objects, whole pottery vessels (sometimes as a stationary part of the shrine) and sherds, and very often simple monuments of rocks, twigs and branches of trees. (p. 29–30)

Vestal, Paul A.

1952 Ethnobotany of the Ramah Navajo. Papers of the Peabody Museum of American Archaeology and Ethnology 40(4). Cambridge, MA: Harvard University.

In this study, Vestal identifies Navajo uses of more than two dozen plants that grow in the VCNP. Foods include kittentails (*Bessya plantaginea*), Western tansy mustard (*Descurainia pinnata*), native strawberry (*Fragaria* sp.), Bush mountainspray (*Holodiscus dumosus*), one-seed juniper (*Juniperus monosperma*), coneflower (*Ratibida* sp.), dropseed (*Sporobolus* sp.), and American brooklime (*Veronica americana*). Medicines include aster (*Aster* sp.), Parry's bellflower (*Campanula parryi*), dayflower (*Commelina dianthifolia*), spikerush (*Eleocharis* sp.), Western throughwort (*Eupatorium herbaceum*), Apache plume (*Fallugia paradoxa*), cudweed (*Gnaphalium* sp.), native lettuce (*Lactuca* sp.), dropseed (*Sporobolus* sp.), mustard (*Thelypodium* sp.), cattail (*Typha* sp.), American vetch (*Vicia americana*), goldeneye (*Vicia* sp.), and cliff fern (*Woodsia* sp.). Vestal also notes that the Navajo use Apache plume (*Fallugia paradoxa*) in tool making and cattail (*Typha* sp.) for padding.

Weigle, Marta, ed.

1975 Hispanic Villages of Northern New Mexico. Santa Fe, NM: Lightning Tree.

This is a reprint of Volume II of the 1935 *Tewa Basin Study,* with additions by Weigle. The Indian Land Research Unit of the Office of Indian Affairs conducted the study and carried out the fieldwork from March to July 1935. The unit was made up of economists, rural sociologists, cultural anthropologists, and technical personnel, including surveyors and draftsmen. They investigated relationships between the people of the study areas and their land and resource bases. The Depression and the New Deal were the background for the Roosevelt administration's efforts to analyze problems of rural life, poverty, and subsistence. The authors of the study called it "the first applied anthropological work in the United States." The study was followed by extensive fieldwork in various parts of the United States, carried out by the Applied Anthropology Unit of the Bureau of Indian Affairs, the Soil Conservation Service, and other federal agencies, principally within the Department of Agriculture.

The description of the town of Española (pp. 118–123) emphasizes that the arrival of the Denver and Río Grande Railroad and the establishment of a New Mexico terminal in 1881 created a modern labor market and introduced cash into what had been a barter economy.

> *Among the gentlemen opening stores were Scott and Whitehead, who in partnership had the commissary contract with the railroad company…Early in 1883 the railroad company changed its mind and decided to extend its line into Santa Fe and to build its roundhouse in Alamosa. This left the storekeepers in Española faced with the prospect of another dead railroad town…In what must have been a minor panic, all the merchants sold out. Two young brothers, George W. and Frank Bond, were working for Scott and Whitehead, and these men decided to buy out the stock and the tent of Scott and Whitehead…The Bonds, shrewder than the rest, saw the folly of depending for long-range growth upon the railroad. If they were to grow rich in this country they must do so on the one product that could be sold elsewhere for cash. Their commercial operations, therefore, led inevitably to livestock. In 1883 they had bought up 40 acres [16.2 ha] of land adjacent to the railroad depot for $200 and proceeded to build the facilities for shipping stock. Soon after that they began extending credit on livestock mortgages, and their herds began to be built up. At first they concentrated on cattle, but these proved to be less profitable than sheep. The grazing land open for free use at that time appeared limited, as did the prospects in the grazing industry. The Bond herd increased, and soon they entered into the system of renting out sheep on a sharecropper basis. The partidario, or sharecropper, system, under which most of the sheep industry is carried on in New Mexico today, is as old as Spanish colonization and may have been originally an outgrowth of the Spanish colonial encomienda system, whereby the labor of Indians was given to certain grantees, together with grants of land…The Bonds apparently found this system profitable, and their growth since 1883 has been phenomenal. Today this corporation has extended its operations until it covers a good portion of northern New Mexico and controls a good share of the sheep industry. The growth of Española has paralleled the growth of the Bond Co… (pp. 119–121)*

Case History No. III describes the *partido* arrangement under which Lázaro Salazar grazes sheep on the Baca Location.

> *Lazaro Salazar has been renting Bond's sheep since 1924. He has 300 of Bond's sheep and 900 of his own. Lazaro rents Bond's sheep only to have the right to use the Baca Location (owned by Bond) to graze his sheep at $.25 per head. Lazaro is an exceptional sheep heerder and has been able to stay clear of debt. This he attributed to the fact that only one-fourth of his sheep holdings belong to Bond. When, as is the case with all of the herders, it is necessary to borrow from Bond to finance the herding operations, a contract is made calling for the sale of lambs and wool to the Bond Company at a price to be set by them. In 1934 Lazaro was limited by Bond in grazing privileges on the Baca location to 1,200 sheep. He feels that because of the fact that the ratio of his own sheep to Bond's sheep is too great he will be crowded off the Baca location. (p. 219)*

Wentworth, Edward Norris

1948 America's Sheep Trails. Ames: Iowa State College Press.

This general history of the development of t he sheep industry in the United States is a standard reference for any study of the subject. Wentworth discusses all of New Mexico's major dealers in sheep and wool, including the Bond brothers (pp. 241, 607), noting their many partnerships and associations with other sheep men.

Weslowski, Lois Vermilya

1981 Native American Land Use along Redondo Creek. *In* High-Altitude Adaptations along Redondo Creek: The Baca Geothermal Anthropological Project. Craig Baker and Joseph C. Winter, eds. Pp. 105–127. Albuquerque: Office of Contract Archeology, University of New Mexico.

This article documents the results of an ethnographic analysis to develop a "representative model of Native American land use of the project and study areas" (p. 105). A further objective of her work "was to recover oral history and written documentation pertaining to Native American land use patterns. Although numerous Indian communities, including Río Grande Valley Pueblos, Navajos, Jicarilla Apaches, and Utes are known to have frequented the locality, Weslowski states that she selected Jémez Pueblo for study because (1) the community is closely associated geographically to the project area, (2) Redondo Creek lies within Jémez Pueblo's traditional land use area, and (3) the study's funding and time constraints did not allow for broader study.

Weslowski's report is a comprehensive and well-considered discussion of Jémez Pueblo's continuing associations with the Valles Caldera in general and the Redondo Creek area in particular. Her underlying thesis is "that in order to fully understand the native uses of the project area, it is necessary to recognize the conceptual foundations of these traditional activities" (p. 105). She examines Jémez concepts of land and landownership and finds that this system of ideas is organized and given meaning by a comprehensive system of cosmological belief. "These spiritual precepts dictate not only how the location should be correctly utilized, but also what this utilization symbolically means" (p. 105). In addition, Weslowski shows that the symbolic understandings that underlie the Jémez concepts of land and land use provide meaning to particular features of the broader study area (p. 105). She shows that the Redondo Creek locale is significant to Jémez Pueblo not only because it is a gathering area, but more importantly because Jémez Pueblo values the resources found there as components of traditional community knowledge (p. 106). According to Weslowski, the framework of ideas that organize and motivate an activity are as significant as the practice itself.

Weslowski richly reviews Jémez Pueblo ancestry, world view, social organization, and occupation of its traditional lands. She next documents how Jémez people use the Redondo Creek consistent with traditional ceremonial requirements. Weslowski offers a symbolic analysis of the fundamental cosmological belief systems that inform the Pueblo's uses of the locale and discusses the conceptual frameworks that are linked to the particular features within the broader geographic area, of which Redondo Creek is but a small part.

Wheelwright, Mary C.

1946 Hail Chant and Water Chant. Navajo Religion Series 2. Santa Fe, NM: Museum of Ceremonial Art.

In retelling the Mountainway origin story, Wheelwright (pp. 78–79) has it that the Jémez Mountains (but not Redondo Peak specifically) are the place where the Youth, who has become a medicine man, visits the Kisahni (a Pueblo group that Wheelwright identifies as the Hopi in a sidebar). Here he finds two individuals, who learn the Tohe ceremony that he performed during his visit.

> *The medicine man said to these two that they must have ceremonies given over them before they could be medicine men, and have the Jish or medicine pouch. They said they would have these ceremonies up on Tsilth Klizhin, the Dark Mountain (Jemez Mountain). So all the Kisahni People left their homes to go to this place, and there they built a hogahn with twelve upright posts. It was a very big hogahn called Taytah-haskahni. After this was finished they built another hogahn for the cooking of food during the ceremony, and sent someone out to collect herbs and everything needed for the Wohltrahd, and wood to make the Tse-panse hoops; so now they were prepared to start the ceremony that night. (p. 79)*

The Jémez Mountains are also the place from which two Akananillis (Meal Sprinklers), the messengers who go out to summon the people to the corral dance on the ninth (and last) night of the Mountainway ceremony, departed in the origin story. Moreover, the runner who goes to the west to the White Mountain Apaches was Asheen Tsiskai, whose name derives from the fact that "he was a racer on the plains and valleys, running from the Dark Mountain down the valley to the south, and then north to Debehentsah before the sun rose in the morning" (p. 80). The other runner, Kah-jes-tyinee (Sleeps to Noon), who ran to the east to the Jicarilla Apache, was believed by all Navajos other than his grandmother to be a lazy youth, but was transformed into a perfect young man by his being named as a Meal Sprinkler. Kah-jes-tyinee returns to his people at Dark Mountain just before Asheen Tsiskai (p. 81).

White, Leslie A.

1935 The Pueblo of Santo Domingo, New Mexico. Memoirs 43. Menasha, WI: American Anthropological Association.

Like White's other now-classic ethnological reports about New Mexico's Keresan Pueblo communities, this volume presents a relatively straightforward descriptive account of the culture and history of the people of Santa Domingo Pueblo. Representative of its time in the development of American anthropology, major sections include discussions of social organization, an individual's life cycle, ceremonialism, and myths and tales.

White reports encountering many practical difficulties, including the people's distrust of anthropologists and desire to maintain their privacy. Consequently, he offers no substantive

information about the people's associations with caves, volcanoes, lava flows, or shrines, which might be useful in interpreting specific cultural or physiographic features within the VCNP.

On the other hand, White gives a summary of Santo Domingo cosmology, tracing the emergence of people onto the present world and the movement of the Santo Domingo Pueblo's ancestors to the Río Grande Valley from White House farther north. He presents a diagram of the mythological landscape and provides partial discussion of cardinal mountain, color, and animal associations. Of particular interest is White's mention of the many witches and giants that inhabited the world and plagued the people, as well as of the Warrior Twins, Masewi and Oyoyewi, who killed these enemies before eventually leaving the people and making their homes on Sandia Mountain. Although White does confirm these associations, as documented at other Pueblo communities as well as among the Navajo, the Warrior Twins' slaying of the terrible giants is associated with caves and volcanism.

White, Leslie A.

1942 The Pueblo of Santa Ana, New Mexico. Memoirs 60. Menasha, WI: American Anthropological Association.

White describes the culture and history of the people of Santa Ana Pueblo. Major sections include discussions of social organization, government and social life, corn and the cosmos, hunting, war, sickness and witchcraft, and paraphernalia and ritual.

Once again reflecting the Pueblo people's extreme mistrust of anthropologists and their desire to maintain privacy about their religious practices and beliefs, White does not provide useful information about the peoples' associations with petroglyphs, caves, volcanoes, lava flows, or shrines. His consideration of Santa Ana hunting ritual and belief, however, is important as an illustration of the pervasiveness of the precepts of spiritual ecology and the environmental underpinnings of the people's world view and their senses of time and place as ongoing processes.

Through a liberal use of footnotes, White gives a comparative review of the Keresans' conceptual structure of their world, including major mountain, color, and animal cardinal associations (pp. 80–91). By the time of this study, White had come to recognize that the Keresans represent the world as a square and emphasize places at corners. (White even points out his error in his Santo Domingo monograph where he portrayed the Keresan world as a sphere.)

White also identifies the Santa Ana Pueblo food uses of Gambel oak (*Quercus gambelii*) and nightshade (*Solanum* sp.), both of which grow in the VCNP.

White, Leslie A.

1960 The World of the Keresan Pueblo Indians. *In* Culture in History: Essays in Honor of Paul Radin. Stanley Diamond, ed. Pp. 53–64. New York: Published for Brandeis University by Columbia University Press.

In this, his near final statement of Keresan Pueblo world view and religion based on his ethnographic work with the San Felipe (1932), Ácoma, Santo Domingo (1935), Santa Ana (1942), and Zía (1962) Pueblo communities, White summarizes the major points of these peoples' common cosmology. He describes the Keresan view of the world as square, flat, and consisting of four layers (after White 1942). In his review, White traces the Keresan Pueblos' history from the beginning of known time, when people occupied the lowest world deep inside the earth through their ascent and emergence into the present-day fourth world. He provides color associations and retells the story whereby the Warrior Twins, Masewi and Oyoyewi, killed a giant and eventually left the people to make their home on Sandia Mountain.

White, Leslie A.

1962 The Pueblo of Sia, New Mexico. Bulletin 15. Bureau of American Ethnology. Washington, DC: U.S. Government Printing Office.

As in his previous ethnographic studies of Keresan Pueblo communities, White offers a traditional account of the culture and history of the people of Zía Pueblo. Major sections include discussions of history, setting and background, Christianity, economy, cosmology, social organization, an individual's life cycle, ceremonialism, sickness, and hunting. White describes the Keresan view of the world and recounts the people's history from creation and emergence.

Whiting, Alfred F.

1939 Ethnobotany of the Hopi. Bulletin 15. Flagstaff: Museum of Northern Arizona.

This book is an essential ethnobotanical resource. Whiting identifies approximately two dozen taxa that grow in the VCNP. Food plants include sagebrush (*Artemisia* sp.), Indian paintbrush (*Castilleja* sp.), thistle (*Cirsium* sp.), piñon (*Pinus edulis*), quaking aspen (*Populus tremuloides*), globemallow (*Sphaeralcea* sp.), and cattail (*Typha* sp.). Whiting also notes the use of bee balm (*Monarda* sp.) as a seasoning. Medicinal plants include milkweed (*Asclepias* sp.), barberry (*Berberis* sp.), goldenrod (*Solidago* sp.), spurge (*Euphorbia* sp.), stoneseed (*Lithospermum* sp.), tansy-aster (*Machaeranthera* sp.), primrose (*Oenothera* sp.), native dock or sorrel (*Rumex* sp.), and goldenrod (*Solidago* sp.). Woody species used in tool making and/or construction include barberry (*Berberis* sp.), Apache plume (*Fallugia* sp.), piñon (*Pinus edulis*), and quaking aspen (*Populus tremuloides*). Western red currant (*Ribes cereum*) provides wood for tool manufacture and pigment.

Whitney v. Otero

1893 *Joel Parker Whitney v. Mariano S. Otero et al.* Civil Case No. 3632. Records of the U.S. Territorial and New Mexico District Courts for Bernalillo County. Accession No. 1959–124. Santa Fe: New Mexico State Records Center and Archives.

Joel Parker Whitney, a resident of Rocklin, Placer County, California, petitioned for partition of the Baca Location in 1893. The named defendants were Maríano Sabine Otero and his wife, Thomas B. Catron, Pedro Perea, José L. Perea, Jesus M. Castillo and his wife, and Justo Armijo and his wife. In a response filed in December 1894, they stated that they were the owners in fee of all of the land, that they were not prepared to "fully set out and exhibit the particular undivided interest of each of the said defendants in said tract of land" (p. 1), and that Joel Parker Whitney did not own any interest in the Baca Location.

Whitney claimed that after the death of Luis María Cabeza de Baca, Baca's grandson Tomás appeared before the Surveyor General at the request of all the Baca heirs to pursue their land claims, and that his efforts led to the Congressional act of 1860 authorizing the five Baca locations. Whitney claimed that the heirs paid Tomás with a one-third interest in the Las Vegas Grant, the Ojo del Espiritu Santo Grant, and any other grants he might locate. They accomplished this action in an agreement dated May 2, 1857.

Whitney presented a copy of this agreement to the court. Whitney said that the nine heirs who had signed this document acted as representatives of all the other heirs. Whitney did not know under what authority these heirs had acted, nor did he have any written evidence. Whitney asserted that in this way Tomás Baca obtained a one-third interest in the Baca Location.

No agreement of May 2, 1857, appears in the court papers, but a transcript in Spanish of a document dated May 1, 1857, is among these papers. The transcript states that Tomás Baca is authorized to represent the heirs and that he will subsequently be paid in money or in "a portion of the lands satisfactory to him" (p. 1). The document lists the 14 heirs or living children of heirs, but does not mention any particular grant.

Tomás Baca died in 1881 and left all his interest in the Baca Location to his wife, María Gertrudis Lucero de Baca. She sold this interest to James G. Whitney on August 17, 1881. Whitney and his wife, Octavia J. Whitney, subsequently conveyed this interest to Whitney's brother Joel P. Whitney. The date of this conveyance is left blank in the complaint, but a separate indenture in these court papers gives the date May 17, 1884.

Joel Whitney paid $17,000 for all his brother's right, title, and interest in the Cañada de Cochití Grant, the Baca Location, and the Ojo del Borrego Grant. James and Octavia Whitney were in Santa Fe at this time, and Joel Whitney was a resident of Boston, Massachusetts.

The court found that Whitney did own an interest in the grant, although it was smaller than he had claimed. On October 4, 1898, the court appointed commissioners (Major R. H. Whiting, W. F. Powers, and Charles T. Bonsall) to determine the practicability of partition of the Baca Location in kind; they reported that partition was not feasible. The court issued a decree on January 27, 1899, ordering the Baca Location to be sold to the highest bidder and the proceeds distributed to the claimants.

William D. Lee, an associate justice of the territorial Supreme Court and a judge of the District Court, was the special master appointed by the court. Lee sold Location to Frank W. Clancy for $16,548.21 on March 13, 1899. Clancy was Whitney's attorney of record (and

was also, according to a court decree dated November 20, 1894, the attorney of record for the Valles Land Company).

Lee reported that the costs of the suit were $1,299.77. The court directed him to pay the remainder to each of the parties according the proportionate share of each party. Lee paid out the money less $667.80 that he returned to the court. Lee paid Whitney $2,966.24 after charging him $253.04 as his share of expenses. He paid Maríano Sabine Otero $5,330.86 after charging him $454.75 as his share of expenses. He paid lesser amounts to 46 parties (44 individuals and 2 groups of heirs). Among these was Thomas B. Catron, who received $1,742.06 after a charge of $147.52 as his share of expenses. Presiding Judge J. W. Crumpacker approved Lee's report.

On March 18, 1899, just five days after he bought it, Clancy sold the entire Location to the Valles Land Company.

This file contains a sketch map of the Baca Location drawn by U.S. Deputy Surveyor Walter G. Marmon, as well as the 1876 map of the Location by Sawyer and McBroom. Marmon located Old Fort in unsurveyed Section 20, Township 19 North, Range 5 East, below the Cerro el Medio and on the north side of East Jémez Creek, in the bend of the "Cañada de Cochití Road" or "Old Road." The Sawyer and McBroom map similarly places it on the north side of East Jémez Creek just below the creek's point of rising.

Williams-Dean, Glenna

1986 Pollen Analysis of Human Coprolites. *In* **Archaeological Investigations at Antelope House. Don P. Morris, ed. Pp. 189–205. Washington, DC: U.S. Department of the Interior, National Park Service.**

Williams-Dean identifies the pre-Columbian Pueblo food use of narrowleaf cottonwood (*Populus angustifolia*), which grows in the VCNP.

Windes, Thomas C., and Dabney Ford

1996 The Chaco Wood Project: The Chronometric Reappraisal of Pueblo Bonito. American Antiquity 61:295–310.

The authors report on the pre-Columbian Pueblo uses of two woody species that also grow in the VCNP: white fir (*Abies concolor*) and spruce (*Picea* sp.).

Winter, Joseph C.

1981 Energy and Power along Redondo Creek: II—A Cultural Framework. *In* **High Altitude Adaptations along Redondo Creek: The Baca Geothermal Anthropological Project. Craig Baker and Joseph C. Winter, eds. Pp. 173–190. Albuquerque: Office of Contract Archeology, University of New Mexico.**

This chapter represents an interpretive summary of the archaeological, historical, and ethnographic research completed for the Baca Geothermal Anthropological Project. In preparing this review, Winter sometimes offers some useful new information not included previously in the report. His discussion of obsidian procurement and distribution, however, is problematical (**see entry for Winter 1983 below).**

Winter, Joseph C.

1983 Jemez Mountain Obsidian Exchange: A View From Redondo Valley. *In* **High-Altitude Adaptations in the Southwest. Joseph C. Winter, ed. Pp. 91–107. Cultural Resources Management Report 2. Albuquerque, NM: U.S. Department of Agriculture, Forest Service, Southwest Region.**

This study reports the interpretive findings from 21 obsidian lithic sites in the Redondo Valley and at numerous other sites in the San Juan Basin. Winter asserts that this information demonstrates the existence of exchange networks for obsidian from Paleo-Indian to Historic period Pueblo times. This study, although useful in presenting summary information throughout the region, is problematical for several reasons, including Winter's unsupported characterization of the Redondo Valley lithic sites as *workshops*, a term that implies, among other things, a high level of craft specialization with overarching control imposed by social and political authorities.

With regard to the Historic period, which is relevant to this examination of the VCNP land-use history, Winter states,

> *The procurement and use of Jemez obsidian declined dramatically after the collapse of the Chaco Anasazi culture and the emergence of the ancestral Río Grande and*

related Pueblo groups. It was still used in the 14th century, as shown by hydration dates from several Redondo Valley sites, but by historic Jemez Pueblo times its use had been relegated to societal and ritual activities. Thus the historic Pueblo obsidian exchange systems was poorly developed and of little consequence, despite the fact that Redondo peak and the associated valleys of the Valle Caldera were (and are) important hunting, gathering, grazing, and religious locations. (p. 107)

Witherspoon, Gary

Language and Art in the Navajo Universe. Ann Arbor, MI: University of Michigan Press.

1983 Language and Reality in Navajo World View. *In* **Southwest. Alfonso Ortiz, ed. Pp. 570–578. Vol. 10 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

These publications provide important information about Navajo world view. They are essential to a discussion of how the *Diné* construct and understand their landscape, presumably including the Valles Caldera. However, Witherspoon does not mention the Valles.

Woods, Betty

1942 The Blonds of Vallecito. New Mexico Magazine 20(10):10, 30.

Writing for *New Mexico Magazine*, Woods reported,

every day during the piñon season they [the Jémez] pass through [Vallecito de los Indios] on their way to the mesa tops, for they, too, are great nut hunters.

The country above Vallecito is dense with tall, yellow pine while lower down are the vivid cliffs and canyons where medicine men go to gather herbs and mix their wonder-working potions…we can suppose that ancient Indian medicine men came to the same canyons for their healing herbs and went to the caves for ceremonial making of medicine. Indian customs changes very little. (p. 30, emphasis in the original)

Wright, Cathy

2000 Traditional Cosmology, Ecology and Language of the Ute Indians, from an Interview with James A. Goth. *In* **Ute Indian Arts and Culture: From Prehistory to the New Millennium. William Wroth, ed. Pp. 27–52. Colorado Springs: Taylor Museum of the Colorado Springs Fine Arts Center.**

This accessible, reflective essay is a transcription of a 1999 interview that Wright conducted with James Goth, an anthropologist who worked with the Ute for nearly four decades on issues related to their language. Goth reveals that he ascribes to the Sapir-Whorf school when he states, "I always looked at learning the language as a beginning place for understanding people's traditions, the way they thought, and what they believe" (p. 27).

This essay is valuable because Goth addresses how the Ute construct their landscape traditions through language (see especially pp. 33–37). He also discusses Ute storytelling traditions (pp. 37–42), ecological adaptations (pp. 42–44), selected ritual (pp. 44–47), and color symbolism (pp. 47–49), all of which are organized and motivated by language and underlie the people's landscape constructions. He emphasizes the place of mountains within the Ute's landscape understandings.

This article is an unannotated transcription of an interview. Wright does not provide references.

Wroth, William

2000 Ute Indian Civilization in Prehistory and the Spanish Colonial Period. *In* **Ute Indian Arts and Culture: From Prehistory to the New Millennium. William Wroth, ed. Pp. 53–72. Colorado Springs: Taylor Museum of the Colorado Springs Fine Arts Center.**

Wroth gives a traditional scholarly summary of Ute culture history. Although he does not say that the Utes have used the Valles Caldera, he discusses Jémez Pueblo's familiarity with these Numic hunter-gatherers (pp. 56–58). He also reports on a Ute party, which consisted of more than 100 tipis, that visited San Juan Pueblo in 1752 to trade pelts (p. 58), and outlines the northern New Mexican Spanish settlers' similar dependence on Ute trade at this time (pp. 62–63). Clearly the Ute were common visitors in the region surrounding the Valles Caldera. In the final part of his essay, Wroth considers selected aspects of Ute cosmology and symbolism that complements the discussion offered previously by James Goth (see entry for Wright 2000).

Wyman, Leland C.

1962 The Windways of the Navajo. Colorado Springs: Taylor Museum of the Colorado Springs Fine Arts Center.

In opening his discussion of the geography of the Navajo Windway myths (pp. 78–80), Wyman emphasizes the underlying importance of locality and the even greater significance of the movement of characters in Navajo oral traditions:

> *In his [a Navajo tradition keeper's] speech, movement is described in great detail; he lives conceptually and linguistically in a "universe in motion." In his myths the heroes and supernaturals restlessly undertake long journeys during which many place names are mentioned, even spots merely passed by, and stopping at a spring for a drink of water is an occasion for giving the place a name…The myth of Navajo Windway is no exception; in Black Mustache's narration, fifty-three place names are mentioned, thirty-four in the Journey for Knowledge and Power and fourteen in the episode of Where His Mind and Speech were Stolen, and others throughout the myth. (p. 78)*

The identifiable localities include the four mountains of cardinal direction, including Black Belted Mountain (a.k.a. Horizontal Black Belt). Wyman acknowledges that the identification of the Holy Mountain of the East is uncertain. He reports that the location of the Holy Mountain of the East ranges from Sierra Blanca Peak in southern Colorado to, more commonly, Redondo Peak in the VCNP (p. 70).

Wyman provides a map showing the path, as demarcated by a broken line symbol, of the mythic travel that Black Mustache described in his account of the Journey of Knowledge and Power. Included along this pathway are Redondo Peak, which he co-labels as "Horizontal Black Belt," and the Jémez Mountains, which he co-annotates as "Black Range."

Wyman further identifies the Black Range as the place where the Windway myth hero visits two groups of supernatural beings, the Thunder People and the Black Ant People (table 6). The Thunder People offer the hero a prayerstick on his return journey, while the Black Ant People made him a jewelry payment.

In table 7 Wyman lists (1) the localities where the major events of the Windway myth occurred, (2) the places mentioned as the homes of certain supernaturals who participated in these events, and (3) the places given as the homes of supernatural beings before whom a magical cotton cord was placed "in vain attempts to discover the whereabouts of the hero's stolen mind and speech" (p. 80). In this effort Wyman reports that Horizontal Black Belt (possibly Redondo Peak) was the home of a Talking God, while the Black Range (Jémez Mountains) was shattered by Thunder and also was the home of the Black Ant People. In reference to the part of the myth concerning cotton chord divination, Wyman notes that Horizontal Black Belt was one of the homes of the Small Bird People.

Wyman, Leland C.

1965 The Red Antway of the Navajo. Navajo Religion Series 5. Santa Fe, NM: Museum of Ceremonial Art.

Wyman reports that Navajo narrators who maintain the corpus of traditional myths "usually take advantage of the movement of the actors in them, their journeys to visit the supernaturals, and so on, to give free rein to one of their chief interests, motion within a wealth of geographical detail" (p. 104; see also entry for Wyman 1962). Despite this general propensity, only two of the seven Red Antway myths, Rounded Man and Gun Shooter, possess this characteristic. Of interest to the VCNP, the Rounded Man story tells that the Ant People first lived in the Jémez Mountains (p. 104).

Wyman, Leland C.

1970 Blessingway, with Three Versions of the Myth Recorded and Translated from the Navajo People by Father Berard Haile, O.F.M. Tucson: University of Arizona Press.

Wyman revisits the issue of the identification of the Navajo Holy Mountain of the East (pp. 17–18) and reviews the various accounts that variously identify Pelado Peak (see entry for Matthews 1897), Abiquiú Peak, Pedernal Peak, Wheeler Peak, Mount Wilson near Taos, and Sierra Blanca Peak in the Sangre de Cristo Mountains in southern Colorado (see entry for Haile 1938 above). Wyman, citing Haile (1938) and testimony offered in 1952 by Albert Sandoval, Haile's Navajo translator, concludes that the Holy Mountain of the East is Blanca Peak and notes also that "Navajo public opinion [in the Leupp, Arizona area] seems to have accepted it as their eastern peak" (p. 18).

Wyman explains the meaning of Black Belted Mountain:

In the myth of the Blessingway this mountain is referred to as White-tipped Mountain (mountain white streaked above, or the summit runs into white), an interesting coincidence with the Spanish name, Sierra Blanca…Its other name, Black Belted Mountain, is preferred, however, and is based on the yucca bast belt or sash around the waist of its inner form person which accounted for his name, "black belt around." This mountain is the "heart" of him who became the inner form of the earth. (p. 18)

Wyman adds that Old Mustache of Ramah, a well-known Blessingway singer, "was told by his father, Many Beads, that [Shootingway or Blessingway] singers [from Ramah and Cañoncito] used to stop at a spring known to the Navajos as 'wild spring place' to mix the water with mountain soils" (p. 20) from the Holy Mountains of the South and East.

In Slim Curly's story, "About the Origins of Other People" (pp. 327–334), which serves as an appendix to his version of the Blessingway myth, the bear is associated with the Jémez Mountains:

"You also are my grandchild," he said to the bear. "You may leave, although we were much attached to one another, in the days to come you will always watch over us, we will say prayers to you. By means of pollen below you it is blessed, above you it is blessed, by means of pollen all around you it is blessed. By means of pollen your speech is blessed. You will depart for mountain interiors, everywhere you will be found, although Jemez Range will be your chief (home); go ahead now, he said to it. Dark Mountain, wherever that place is called, into the interior of that he (bear) left. (p. 330)

Frank Mitchell's version of the Blessingway myth similarly associates the bear with Black Mountain (Jémez Mountains) (see p. 456).

In his version of the Blessingway myth, River Junction Curly refers to a place called "the Hollow Gap at the upper end of Black Mountain (Jemez Range)" (p. 554) when telling of Monster Slayer's destruction of the monsters that plagued the people. Based on this description, "Hollow Gap" might refer to the Valle Grande.

Later in his account, River Junction Curly tells about Monster Slayer and the Twelve Roaming Antelopes, which were terrible beasts that killed people, at Dark Mountain (the Jémez Mountains) (pp. 569–571). Monster Slayer gave chase to the Twelve Roaming Antelopes and was going to destroy them to rid the world of their evil. He spared them after receiving their word that they would become peaceful game animals that humans could hunt for food.

Then he approached them there. "I'm going to kill all of you now, don't say anything about pity," he told them. "Nevertheless, let us live, please!" they said as they pleaded. "Just the same I will kill you, that is settled, since your disposition is wicked. You kill people, that accounts for it." "Do not say that! You see we are pleading with you. In spite of all, let us live. Whatever command you may give us, that will direct our conduct," they told him. "Still, I have decided to kill you, of what use can you be?" "Do not say that! In spite of all, let us live, please! You see, we are pleading with you!" they told him. Thus it seems this had happened four times. So it seems this time (he agreed), "Go ahead then since you are pleading. As days go by in the future, earth surface people, when they have come into being, will make use of you." "All right, just so we will be," they said. "By no means must you ever begin to think in a wicked manner! Should you ever again think wickedly I will yet kill you," he told them. "Particularly killing people, this you must never do! Beautiful flowers will now be your food, on the strength of which you will travel. Now go roundabout hunting food. This in particular, that you should live together in one place, must not be!" he told them as he drove them out into the valley. Therefore to this day people eat them, they say." (pp. 570–571)

Wyman, Leland C.

1975 The Mountainway of the Navajo, with a Myth of the Female Branch Recorded and Translated by Father Berard Haile, O.F.M. Tucson: University of Arizona Press.

Wyman's recorded version of the Mountainway story (see pp. 237–244) tells of the origin of the prototype Mountainway ceremony involving two meal sprinklers who travel north and south across the landscape summoning people of outlying settlements, especially masked dancers and magicians, to perform on the last night of the observance. The meal sprinklers are "He-who-lies-underneath-it (a Mountain)," a name which other authors translate as "Sleeps to Noon" (e.g., see entry for Wheelwright 1946), "Lazy Boy," or "Valley Boy."

Wyman identifies the Meal Sprinklers' starting point as "behind Black Mountain" (p. 238). This place-name is a likely reference to the Jémez Mountains in general and, possibly, refers more specifically to the Valle Grande, which is "behind" the Jémez Mountains.

Recounting the details of his journey, Valley Boy, who ran the north course of the race, tells of his visits to the Pueblos of Santo Domingo and Zía to obtain these communities' pledges to arrive before the close of the Mountainway ceremonial. On the last leg of his journey, Valley Boy ran from Zía Pueblo up into the Jémez Mountains, climbed its summit (possibly Redondo Peak), and visited a supernatural being before returning to the race's starting point.

> *Next he set out towards the Black Mountain range again, and required much time before he arrived at its base. He went up to the summit, where he found a narrow canyon and came to a waterfall. Suddenly the Ye'i granduncle gave his call. He descended down into the canyon and there called to him with his whistle.*

He (Valley Boy) entered his (the Ye'i's) home… (p. 240)

Wyman, Leland C.

1983 Navajo Ceremonial System. ***In*** **Southwest. Alfonso Ortiz, ed. Pp. 536–557. Vol. 10 of Handbook of North American Indians, William Sturtevant, ed. Washington, DC: Smithsonian Institution.**

Wyman provides an invaluable overview of the complex system of Navajo beliefs about the dynamics of the universe and the actions with which the people attempt to influence these processes through the orderly demonstration of traditional knowledge in ritual when other rational means fail. Wyman establishes the organizational relationships of the many Navajo ceremonial observances upon which the people rely for sustaining their world.

Wyman, Leland C., and Stuart K. Harris

1941 Navajo Indian Medical Ethnobotany. University of New Mexico Bulletin, Anthropological Series 3(5). Albuquerque: University of New Mexico Press.

In their discussion of Navajo plant medicines, Wyman and Harris identify several useful plants that grow in the VCNP. The medical plants include peavine (*Lathyrus* sp.), lupine (*Lupinus* sp.), Fendler's meadow rue (*Thalictrum fendleri*), and stinging nettle (*Urtica* sp.). They also note that peavine and lupine are food plants.

Wyman, Leland C., and Stuart K. Harris

1951 The Ethnobotany of the Kayenta Navajo: An Analysis of the John and Louisa Wetherill Ethnobotanical Collection. University of New Mexico Publications in Biology 5:1–66. Albuquerque: University of New Mexico Press.

In this study Wyman and Harris contribute additional Navajo ethnobotanical information about plants found in the VCNP. Food plants include native lettuce (*Mimulus* sp.), broomrape (*Orobanche* sp.), mock-orange (*Philadelphus microphyllus*), and deathcamus (*Zigadenus* sp.). Medicinal plants include columbine (*Aquilegia* sp.), hemlock parsley (*Conioselinum scopulorum*), spotted coral root (*Corallorhiza maculate*), western tansy mustard (*Descurainia pinnata*), willowherb (*Epilobium* sp.), buckwheat (*Eriogonum* sp.), filaree (*Erodium* sp.), green wintergreen (*Pyrola chlorantha*), and snowberry (*Symphoricarpo*s sp.). They also report the use of the native currant (*Ribes* sp.) in tool manufacture.

Appendix II.

Introducing a Landscape Approach for Evaluating Communities' Traditional Senses of Time and Place

Kurt F. Anschuetz
(adapted from Anschuetz 2001; Anschuetz and Scheick 1998)

Introduction

The purpose of this essay is to introduce an anthropological landscape approach. It considers landscape broadly as the physical and conceptual interaction of nature and culture rather than the sum of material modifications, which people might make to a particular geographic space. I suggest that cultural resource managers might find this perspective useful in the future when they consider how people of traditional and historical communities in the region construct and sustain their associations with the Valles Caldera National Preserve (VCNP). Using concepts developed by the U.S. Department of Interior, National Park Service (NPS) for managing culturally significant landscape resources, this discussion goes beyond a simple emphasis on the readily visible built environment. It also considers the cultural-historical traditions through which people of affiliated communities have sustained their associations with the VCNP as part of their traditional homelands based on their land use history and traditions.

This essay consists of five parts. The first introduces the NPS landscape concepts, which now are widely in use across the United States in evaluating the significance of cultural landscapes in terms of National Register of Historic Places (National Register) criteria. It also reviews the limitations of these approaches and a recently adopted ethnographic landscape definition developed by the NPS Applied Ethnology Program (Evans et al. 2001). This definition offers an important step toward the resolution of the shortcomings inherent in the National Register process.

The second part considers the ubiquity of cultural landscapes and their significant cultural meanings in the world in which people live, using the intimacy of the relationship between traditional land-based communities and their environments in the southwestern United States as an illustration. The purpose of this discussion is to convey more fully how significant cultural-historical associations can be manifest in landscape even though material traces of human occupation are rare or subtle in appearance.

The third section considers the challenges to researchers and managers in recognizing landscapes and comprehending these cultural constructs within appropriate contexts. I open by addressing issues concerning landscape analyses of the way communities occupy their landscapes. I emphasize that these analyses will never yield a comprehensive understanding of the ideational systems communities use to ascribe particular meanings to places within their landscapes. I next define the landscape concept and review its formal properties. Lastly, I consider how landscapes constitute cultural-historical memories with which communities interact in their day-to-day living.

The fourth part defines the concepts of community and communion. I argue that these ideas are relevant to evaluations of landscapes because they help condition people's patterned perceptions and interpretations of the spaces they inhabit. This discussion also appraises the idea of communion, which is an emotional tie to place.

The final section offers a review of approaches that may be used to implement the ethnographic landscape concept. I introduce the idea of the "storied landscape" (Kelley and Francis 1996) as the principal means for applying the landscape perspective introduced in this essay.

National Park Service Landscape Concepts

The NPS formally identified cultural landscapes as a type of cultural resource in its management policies in 1988 (Page et al. 1998:7). The NPS defines *cultural landscape* "as a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein) associated with a historic event, activity, or person, or that exhibit other cultural or aesthetic values" (NPS 2000:1; see also Page et al. 1998:12). These values, in turn, allow the evaluation of a cultural resource for eligibility for inclusion in the National Register (Evans et al. 2001:53). Moreover, the NPS uses the term *cultural landscape* as a conceptual umbrella to encompass four principal landscape types warranting recognition and protection (after NPS 1994; see also NPS 2000; Page et al. 1998:7).

The first landscape type is the *historic site*, which is significant for its association with important activities, events, and/or persons. Examples include battlefields and presidential properties (NPS 2000:2). The second is the *historic designed*

landscape, which represents deliberate artistic creations that manifest recognized design styles. Aesthetic values play a significant role in designed landscapes, which include parks, campuses, and estates (NPS 2000:1–2). The third is the historic vernacular landscape, whose use, construction, and layout expresses cultural values and illustrates people's patterns of land use. Function plays a significant role in vernacular landscapes, which include rural historic districts and agricultural landscapes (NPS 2000:2). The last cultural landscape type is the *ethnographic landscape*. As defined by the NPS, ethnographic landscapes contain "a variety of natural and cultural resources that associated people define as heritage resources. Examples are contemporary settlements, sacred religious sites, and massive geological structures. Small plant communities, animals, subsistence and ceremonial grounds are often components" (NPS 2000:1). Evans and others (2001:53) observe, "Ethnographic landscapes within the NPS context are broader and do not depend on National Register eligibility criteria for their existence, and importantly, are identified and defined by the cultural groups associated with them rather than by historic preservation professionals." For this reason, and to better serve the purposes of its Ethnographic Resources Inventory Database, the NPS' Applied Ethnography program has defined the term *ethnographic landscape* as:

> *. . . a relatively contiguous area of interrelated places that contemporary cultural groups define as meaningful because it is inextricably and traditionally linked to their own local or regional histories, cultural identities, beliefs, and behaviors. Present-day social factors such as a people's class, ethnicity, and gender may result in the assignment of diverse meanings to a landscape and its component places (Evans et al. 2001:54).*

With this definition, Evans and others (2001:54) report that the NPS acknowledges that ethnographic landscapes are not merely a cultural landscape category. They recognize that it can represent distinct types of landscapes in their own right that might overlap with or contain historic cultural landscapes. People of communities affiliated with an ethnographic landscape determine the significance of a given space within the physical environment and are empowered with the authority to identify and describe these places with which they sustain relationship(s).

It is important to acknowledge here that the NPS recognizes that landscapes (1) represent the interaction of active cultural and historical processes, and (2) are not simply an assemblage of quantifiable material resources or even normative behavioral patterns (e.g., see Mitchell and Page 1993:49; Page et al. 1998:7; see also Levine and Merlan 1993:56). With this understanding, the NPS has adopted the goal to clearly identify "the landscape characteristics and features, values, and associations that make a landscape historically significant (according to the National Register criteria)" (Page et al. 1998:4). The NPS also comprehends that contemporary people often identify and interact with places with which they maintain associations "for their history and for the amenities they provide" (Patten 1991:3; see also Mitchell and Page 1993:53; Travis 1994). Cowley (1991:10, 1994:28) observes further that landscapes can represent a multitude of cultural-historical associations and values among the people of different communities.

The NPS' recognition of the essential role of contemporary cultural associations in the documentation, evaluation, and interpretations of landscapes is illustrated further through its seminal work in defining the traditional cultural property concept. Although the traditional cultural property concept also was developed for use in documenting and evaluating heritage resources eligible for listing in the National Register (Parker 1993a; Parker and King 1990; see also Evans et al. 2001:54–55), its conceptual framework is applicable to cultural landscapes generally and to ethnographic landscapes specifically. According to *National Register Bulletin* 38 guidelines, traditional cultural properties are those "eligible for inclusion in the National Register because of…[their]…association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1990:1; see also Parker 1993b:1).

The four widely published NPS cultural landscape type definitions convey major aspects of this concept. These terse, static descriptions, if viewed in isolation, however, offer relatively little to help us understand how the NPS cultural landscape idea relates to dynamic cultural and historical processes.

The expanded ethnographic landscape definition offered recently by the NPS Applied Ethnology Program (Evans et al. 2001) is both recognition of the shortcomings inherent in the four-part typology and an important step toward their resolution. On the one hand, the four-part typology—historic site, historic designed landscape, historic vernacular landscape, and ethnographic landscape—serves usefully in assisting managers to distinguish the values that give landscapes their significance. It also aids managers in determining how the landscape should be treated, managed, and interpreted (Page et al. 1998:9). On the other hand, rigid adherence to this classification threatens the conceptual segmentation of the landscape concept in ways that are not fully congruent with the effective implementation of a holistic approach. Page and others (1998:9) observe that these landscape types are not mutually exclusive; may be associated with significant events, possess vernacular and formally designed characteristics, and may also be considered significant by specific communities.

The language used by the NPS to define landscape types in terms of static cultural resource management property categories perhaps poses the greatest practical obstacle to fulfilling the goal of developing a comprehensive understanding of the dynamic processes that underlie how people interact with their environments (see Evans et al. 2001 for further discussion of this problem). The landscape typology and "terms are defined in the context of cultural resource management and in particular, cultural landscape management in the national park system" (Page et al. 1998:125). They acknowledge further that NPS terminology sometimes departs from standard dictionary definitions to enhance the typology's usefulness as a tool for resource management.

Through its emphasis on objective (i.e., quantifiable) historic events, activities, persons, or other cultural or aesthetic values, NPS landscape terminology frequently has resulted in the portrayal of cultural landscapes as a collection of materially based resource commodities. This practice works in service of National Historic Preservation Act of 1966 protocols for determining the eligibility of historic properties. For example, while acknowledging that cultural landscape preservation encourages a holistic approach to resource management and possesses relevance to present communities, Birnbaum and Page cast this understanding primarily in terms of "the inter-relationships *between cultural and natural resources within a property*" (1994:3, emphasis added). In a subsequent comment, they give priority to "the physical evidence, including traces of the past…[as] an integral component of the daily lives of those that live in or move through the landscape today" (Birnbaum and Page 1994:4). Friedman similarly calls for discussions "of how the people associated with the site shaped the land to serve their needs and reflect their culture"(1994:6) in implementing landscape approaches for new kinds of interpretation. Even though Friedman implicitly recognizes the importance of including ideational issues in interpreting how people manifest their needs and their cultural expressions in their landscapes, materialist concerns organize the content of her remarks: "Landscape, including trees, plants, shrubs, and walkways, are [sic] comparable to cups, chairs, tables, paintings, and candlesticks. All are part of the collections of a historic site" (1994:6).

The NPS four-part landscape typology and their definitions work efficiently in producing the kinds of observations needed for land and cultural resource managers to fullfill their management responsibilities for natural and cultural resources with materially demonstrable historical contexts and associations. As such, these tools are well suited for a particular task, but as Moore and Keene (1983:4) observe, "methods, like tools, can be abused. The most obvious form of abuse involves using methods not because they fit the task at hand, but because they are methods we know and can easily apply." Tools designed for managing natural and cultural resources with materially demonstrable historical contexts and associations are not necessarily equally well suited for management of resources whose historical values are based on less tangible contexts and associations (after Cushman 1993:50) in an ever-changing world. Thus, it is fair to question whether strict adherence to NPS cultural resource management concepts and methods alone can yield the insights needed to achieve a comprehensive understanding of landscapes' dynamic processes. The significance of landscapes to traditional communities primarily concerned with contemporary social issues concerning their cultural survival goes far beyond mere documentation of historical contexts (Levine and Merlan 1993:55).

The disjunction between the NPS landscape philosophy and its applied practice is more one of emphasis rather than substance. As I discuss below, the NPS ethnographic landscape concept actually is closely aligned intellectually with general cultural landscape ideas derived from the social sciences and the humanities.

Management of cultural landscape resources and comprehension of cultural landscape processes both are fundamentally important components of a holistic landscape approach. These contrasting tasks emphasize qualitatively different landscape aspects. Management of cultural landscapes resources and comprehension of cultural landscapes are not mutually exclusive; each contributes information needed to build even fuller understandings of landscapes.

Land and cultural resource managers likely will need to address issues raised by people of traditional and historical communities who maintain affiliations with the VCNP based on their land use histories and traditions. For this reason, the following discussion introduces the anthropological cultural landscape concept more broadly. By identifying the theoretical bases that the NPS drew from in developing its landscape typology and definitions, I provide a framework for comprehending the holistic logic that unifies the NPS landscape philosophy and its applied practice. My purpose also is to illustrate how a landscape approach, especially with reference to the principles embodied in the NPS Applied Ethnology Program's ethnographic landscape concept and the traditional cultural property idea, can encourage and enable practitioners. That is, the landscape approach can assist managers in considering the cultural-historical traditions through which people occupy and modify their community lands, both materially and ideationally, in their own terms.

Landscapes as Worlds of Cultural Meaning

In a recent exposition on the Southwest's landscape and history, John Brinckerhoff Jackson, nationally prominent landscape essayist and longtime New Mexico resident, observes:

> *What comes first: the blessing or the prayer? It is not easy in this landscape to separate the role of man from the role of nature. The plateau country has been lived in for centuries, but the human presence is disguised even from the camera's eye (Jackson 1994:17)*

Most people intimately familiar with the Southwest's diverse mountain, mesa, valley, and desert settings are struck by the insightfulness and poetry of Jackson's rhetorical question. In noting that humans and their natural environments are fundamentally intertwined, Jackson recognizes that the region's many historical communities have interacted with the landscape in ways that are not always immediately visible. Even though many of their interactions might leave few readily visible material traces, Indian, Hispanic, and Anglo-American communities trace countless generations of occupation in the Southwest as subsistence hunters, gatherers, farmers, ranchers, miners, and developers; each has transformed the landscape's ecology. In addition, through each community's intimate relationships with the land and its resources in every aspect of its material life, including economy, society, polity, and

recreation, the landscape has come to occupy a revered place in community cosmologies.

Just as the NPS has discovered firsthand in defining concepts, developing guidelines, and applying methods related to traditional cultural properties, the understandings that the region's traditional communities have of their historically informed interactions with the landscape often challenge, if not confound, comprehension by outsiders. Many traditional land-based communities identify themselves in terms of the places their families have lived since before living memory. Over time, the land and its people have become inseparable through historical-ecological processes, which are "dialectical relations between human acts and acts of nature" (Crumley 1994:9). Moreover, traditional land-based communities often have "a view of history based on cyclical time in which the past is recreated in the present through traditional beliefs and practices" (Parker 1993b:4).

Regardless of history, culture, or tradition, people everywhere "project culture onto nature" (Crumley and Marquardt 1990:73) through their interactions with their physical environments. In this process, the land, its physical resources, and people's perceptions, actions, and expectations of their environments not only contribute to the patterns of ecological change identifiable in the record of the past. They also structure the opportunities and constraints that are available to cultural communities in the present, as well as the choices and means that will be accessible to the groups' future generations.

Thus, Jackson's rhetorical question grasps the understanding that the Southwest's landscape is simultaneously, and incontestably, both a blessing and a prayer. Through their understandings that culture is inseparable from nature, the people of the traditional communities explain how "they became who they are" (**Peckham 1990**:2) culturally and historically. The fact that traditional groups project their culture onto their natural environment underlies claims by contemporary generations that their communities sustain the occupation of their aboriginal homelands through historically based patterns of cultural action and cognition (e.g., see Feld and Basso 1996). The NPS developed its cultural resource management policies and methods, especially the ethnographic landscape (after Mitchell and Page 1993; Page et al. 1998) and traditional cultural properties concepts (after Parker and King 1990; see also Parker 1993b) in reference to these constructions of landscape meaning through which communities construct their identities.

Jackson (1994:159) identifies the social and cultural qualities that derive from a community of people possessing a common sense of place: "a lively awareness of the familiar environment, a ritual repetition, a sense of fellowship based on a shared experience." Jackson's specific identification of "ritual repetition" as a quality embedded in a community's sense of place derives from an example that he drew from western classical tradition (see Jackson 1994:157). His argument implies that the association of some particularly meaningful places with ritual, repeated celebration, and reverence related to the "indefinable sense of well-being" (Jackson 1994:158) transcends the boundaries of western culture and is shared (to a more or less greater extent) among all human groups.

The Challenge of Terra Incognita

The challenge that researchers and managers now face is to develop interpretive and management guidelines that recognize the existence of landscapes' subtle cultural-historical meanings and relationships. The following discussion provides a framework for considering how people of traditional and historical communities can occupy the landscapes of their traditional homeland areas through their physical and metaphysical cultural constructions to create and sustain senses of community identity (**Anschuetz and Scheick 1998**; **Anschuetz et al. 2001**).

First, we can ask what cultural landscape studies generally and ethnographic landscape investigations specifically can do and what they should not presume to undertake. Comprehending that communities occupy their perceived landscapes to sustain their identity is not the same as understanding the ideational systems through which communities traditionally ascribe particular meanings to places within their landscapes (see **Anschuetz et al. 2001** for an expanded examination of this issue). On the one hand, a landscape perspective enables researchers and managers to identify and to assess the historical significance of the natural and cultural resources that contemporary peoples identify and interact with physically or metaphysically. On the other hand, comprehension by outsiders of a community's specific historical associations with places in their landscapes, which depends on a person's intimate relationship with the group's cultural traditions, is usually both impossible and unnecessary.

More importantly, many societies define behavioral norms and social structures to guide a person's acquisition of often sensitive cultural knowledge needed to comprehend specific meanings of the physical and metaphysical relationships ascribed to particular places. Thus, expectations that a landscape analysis should document and decipher privileged knowledge may be both unrealistic and disrespectful (e.g., see Cushman 1993; Ferguson et al. 1993; Parker 1993b; Sebastian 1993; see also **Anschuetz et al. 2001**). The call for respect of these inviolable traditions and cultural knowledge in ethnographic landscape studies rests on the expanding body of social science findings about long-term benefits of sustaining cultural diversity (after Sebastian 1993:26).

Defining Landscape

A simple yet elegant definition used in the social sciences and humanities for the term landscape refers to the interaction of nature and culture (after Zube 1994:1; see also Ingold 1993:152; Tuan 1977:passim; Yi Fu Tuan, in Thompson 1995:xi). Carl Sauer, a geographer renowned particularly for work in the early twentieth century, offers a more

comprehensive definition. Given its recognition of the organization of people's interactions with their environments as a uniquely evolving cultural-historical process, his definition remains relevant today:

> *The cultural landscape is fashioned from a natural landscape by a culture group. Culture is the agent, the natural area is the medium, the cultural landscape is the result. Under the influence of a given culture, itself changing through time, the landscape undergoes development, passing through phases, and probably reaching ultimately the end of its cycle of development. With the introduction of a different—that is, alien-culture, a rejuvenation of the cultural landscape sets in, or a new landscape is superimposed on the remnants of an older one (**Sauer 1925**:46).*

Sauer stressed human agency "as a force in shaping the visible features of delimited regions on the Earth's surface" (Cosgrove 1998:115) and culture specifically as "the impress of the works of man upon the area" (**Sauer 1925**:38). He cites three factors as basic to the study of landscape: "the physical environment, the character [i.e., culture] of the people, and time" (in Norton 1989:37).

Cultural anthropologists have examined the ideas of place in terms of social identity and contestation (e.g., see Feld and Basso 1996:4). In their explorations of the dynamic properties of landscapes, researchers cite the uncertainties, discontinuities, and multiplicities of voices and action linked to contestation and movement (**Anschuetz et al. 2001**:167). They challenge the common underlying idea that places are defined by static boundaries and relationships based on stable residence (Feld and Basso 1996:5, citing Appadurai and Breckenridge 1988; Deleuze and Guattari 1986; Kapferer 1988; Rosaldo 1988). Instead, researchers suggest that in borderlands characterized by fluidity and hybridization, landscape relationships can be based on place indeterminacy (Feld and Basso 1996:5–6, citing Gupta and Ferguson 1992; Gupta et al. 1992; Appadurai 1992).

Despite the absence of fixity among such "ethnoscapes" (Appadurai 1992), communities sometimes are able to sustain coherent cognitive maps based on perceptions, direct experiences and distant memories, constructed meanings, and imagination. Deterritorialization, however, can result in a homeland being "partly invented, existing only in the imagination of the deterritorialized groups, and it can sometimes become so fantastic and one-sided that it provides fuel for new ethnic conflicts" (Appadurai 1992:193).

Although an explicit linkage of nature with culture is uncommon among most Anglo-Americans today (Jackson 1984:5), these definitions follow an ancient Indo-European tradition of referring to places on the physical landscape as possessing an integral human element, a space defined by people through their interactions with their environment (Jackson 1984:5–8). Importantly, traditional land-based communities in the United States, including both Native American and non–Native American cultural groups, characteristically do not distinguish between nature and culture in their understandings of landscape. Rather, they highlight the idea of fundamental relationship between people and the world in which they live (e.g., see **Cajete** 1993–1994, **1994**, **1999**).

A prominent contemporary geographer has gone as far as to suggest that "landscape is most at home in the cultural context" (Wagner 1995:5). In this sense, *landscape* is intelligible only as human habitat given that *Culture* with a capital "C" is a uniquely human cognitive and behavioral system for producing, storing, and transmitting information over time (e.g., see **Anschuetz 1998b**:31–80, after Hall 1959, 1969; Kirch 1980; Rappaport 1979; Trigger 1991, Tylor 1871; White 1949; among others; see also appendix III). Communities transform their physical surroundings into meaningful places on particular patterns of morphology and arrangement through the daily activities, beliefs, and values of their people. Moreover, communities reshape the natural settings of their geographical spaces to legitimize the meanings they bestow upon the landscape through their physical modification of the environment, the intimacies of their experiences, and their sharing of memories. The ways in which people perceive the land and its resources through their cultural traditions help structure how they interact with their landscapes and define their associations with their heritage resources.

The recognition that landscape is based on interaction between cultural communities and their environments also implicates the existence of historical-ecological processes within human habitats (after Crumley 1994; see also Zube 1994:1). In scientific constructs, therefore, the landscape concept foremost relates to a processual relationship between natural and cultural systems over time.

The NPS landscape definitions, especially those offered by the Applied Ethnography Program (Evans et al. 2001), subscribe to the understanding that landscapes derive from the interaction of nature and culture over time. Importantly, its landscape concepts actually are closely aligned intellectually with general cultural landscape ideas derived from the social sciences and the humanities.

As language tools go, the term *landscape* possibly is exceptional given the great variability in meanings that people encode in the term when discussing the environment. As a language tool of many meanings and uses, *landscape* has an extremely high potential for abuse, not because the term itself is "slippery" but because persons using *landscape* in a dialogue tend to "slip" the concept among contradictory contexts that obscure its meaningfulness. Consequentially, in using *landscape* to discuss a particular idea in any dialogue, but most especially in discourse based on the systematization of observations, methods, and interpretive principles, practitioners need to define the concept clearly and apply this meaning consistently.

Especially troublesome is the use of *landscape* as a synonym for *natural environment*. Should land managers mix their scientific tools for administering the environment and its resources with the Anglo-American view of landscape as an "expanse of naturally occurring physical space viewed from afar" (Anschuetz 1999:3), they risk conceptually segregating the domains of nature and culture. In equating ever-changing natural environments with landscape, researchers are liable to

cast culture as a dependent variable in their explanations of ecological change. If culture change is viewed primarily as reactive to external factors, then recognition and comprehension of how a community's traditional landscape constructions are rooted in its history and continue to be important in sustaining its cultural identity are obscured (see expanded discussion by **Anschuetz et al. 2001**). That is, researchers and managers can become blinded to the landscape concept's intrinsic integrative and synthetic functions (after Jackson 1984:8). More problematical, the conceptual separation of nature and culture into distinct realms is incompatible with the way many land-based communities view the relationship between people and the world in which they live, as well as their relationship with history (e.g., see **Cajete** 1993–1994, **1994**, **1999**). For example, many authors who have worked with the NPS cultural resource management tools have commented that the partitioning of nature and culture within a linear chronology poses great obstacles to consultation with traditional communities (e.g., Cushman 1993; Downer and Roberts 1993; Ferguson et al. 1993; Parker 1993b; Sebastian 1993; see also King 1993). The NPS Applied Ethnography Program's recently revised ethnographic landscape definition helped address these key issues. It did so by empowering the people of communities affiliated with an ethnographic landscape with the authority to identify and describe the places with which they sustain significant relationships important to their heritage and identity (Evans et al. 2001).

A Landscape Approach's Premises

The landscape perspective outlined above is a set of working assumptions, procedures, and findings that define a pattern of inquiry about the nature of our knowledge of the world or some aspect of the world (see Clark 1993; Kuhn 1970; Masterman 1970). The landscape approach is neither a formal theory nor a particular technique; it is a way of looking at and integrating data. A landscape approach, therefore, "is defined more by what it does than what it is" (Whittlesey 1997: 20, emphasis in original; see also Masterman 1970:70).

Four interrelated premises provide the foundations for a landscape paradigm (adapted from **Anschuetz et al. 2001**:160–161):

1. Landscapes are not synonymous with natural environments. Landscapes are synthetic (Jackson 1984:156), with cultural systems structuring and organizing people's interactions with their natural environments (Deetz 1990; see also Ingold 1993:152; Tuan 1977, passim; Thompson 1995:xi; Zube 1994:1). As Cosgrove (1998:13) notes, "landscape denotes the external world mediated through subjective human experience."
2. Landscapes are worlds of cultural product (after Boone 1994:7; see also Norton 1989; Thompson 1995; Tuan 1977; Wagner 1995:5; see also appendix III). Through their daily activities, beliefs, and values, communities transform physical spaces into meaningful places. Taçon (1999:34) notes, "Experience, history, value systems, relationships, circumstance, and individual choices all play a part in how landscapes are…described." Accordingly, a "landscape is not merely the world we see, it is a construction, a composition of that world" (Cosgrove 1998:13). Thus, landscapes are not the same as "built environments," which refer to designed physical constructions (i.e., landscape architecture) (after Domosh 1995:48–49; Foote 1995:294–295). Landscapes represent "a way in which…people have signified themselves and their world through their…relationship with nature, and through which they have underlined and communicated their own social role and that of others with respect to external nature" (Cosgrove 1998:15). In addition, landscapes with high value to one community might appear to be little used tracts to other cultural groups.
3. Landscapes are the arena for all of a community's activities. Thus, landscapes not only are constructs of human populations, they are the milieu in which those populations survive and sustain themselves. A landscape's domain involves patterning in both within-place and between-place contexts (Binford 1982:5; Deetz 1990:2; see also Hubert 1994). Observable patterns of both material traces and empty spaces come from interactions between culturally organized dimensions and nonculturally organized resources and life-space distributions (Binford 1983:380). With landscapes organizing perception and action, economy, society, and ideation are not only interconnected, they are interdependent (see **Anschuetz 1998b**; **Anschuetz and Scheick 1998**).
4. Landscapes are dynamic constructions, with each community and each generation imposing its own cognitive map on an anthropogenic world of interconnected morphology, arrangement, and coherent meaning (**Anschuetz and Scheick 1998**:6; Jackson 1984:156; see also Hoskins 1955; Parcero Oubiña et al. 1998:174). Because landscapes embody fundamental organizing principles for the form and structure of people's activities, they serve both as a material construct that communicates information and as a kind of historical text (Hugill and Foote 1995:20). Moreover, the landscape, as a system for manipulating meaningful symbols in human actions and their material by-products, helps define customary patterned relationships among varied information. Processes of behavioral change across space and over time necessarily result in an ever-changing landscape, however. Thus, landscape is a cultural process (Hirsch 1995; contra Cosgrove 1984:32).

Until the recent addition of the Applied Anthropology Program's expanded ethnographic landscape definition (Evans et al. 2001), the NPS landscape approach was defined primarily by its cultural resource management responsibilities. With this addition, the NPS cultural landscape definition, in concert with its traditional properties concept, conforms to the landscape paradigm's central tenets. Landscapes (1) represent the interaction of dynamic cultural and historical processes (after Mitchell and Page 1993; Page et al. 1998); (2) are associated with cultural practices or beliefs that are rooted in the histories of living communities and are essential in how communities sustain their cultural identities (after Parker and

King 1990; see also Parker 1993b); (3) were shaped by people to serve their needs and reflect their culture (after Friedman 1994); and (4) are simultaneously seen through the eyes of the people of different cultural communities (after Cowley 1991, 1994).

Landscape as a Way to Remember Culture and History

Anthropologists, geographers, and historians, among others, document a common characteristic among all humans: the remembrance and celebration of rich cultural-historical memories through oral traditions. Human history started not with writing but with shared stories from one generation to the next at the beginning of human time.

Every community imbues its landscape with intrinsic meaningfulness based on its cultural patterns of perception and interpretation (see **Anschuetz 1998b**:44–58). These perceptions include not only the community understandings of its physical environment and resources, but also time and how people interact with their cultural-historical memories. For example, Anglo-American communities characteristically view history and landscapes in terms of enduring images inscribed on the land. Many non-Western, land-based communities, in comparison, view history as part of a living process that makes the past a referent for the present and the landscape a memory itself (Anyon et al. 1997; Küchler 1993; Morphy 1993; see also **Anschuetz et al. 2001**; Ferguson et al. 1993; Jackson 1980; Parker 1993b; Roberts 1997). Given that the landscape concepts of people of traditional communities characteristically are land based and process oriented, the landscape is understood immediately to be more than the present built environment (Tallbull and Deaver 1997) or simply a protected cultural resources site (Cleere 1995). Dialogues between indigenous peoples and anthropologists on heritage resources conservation and management of cultural properties illustrate the ways in which landscapes are important to communities for sustaining memory and tradition (Carmichael et al. 1994; Hena and Anschuetz 2000; **Kelley and Francis 1994**; Swidler et al. 1997).

Getting "to know a place" takes time. Consequently, physical space in an environment "becomes a place" only when people establish roots and acquire a certain knowledge of its essential characteristics through their daily activities, beliefs, and values over time. Time alone is not enough, however. Experiences with the land and its resources influence how people learn about a place and understand their relationship with the landscape. Through physical modifications and the experience of history, people reshape the natural environment to legitimate the meanings they imbue on the land and to create an identity in terms of the land. Through the intimacy of experience and the sharing of memories over the passage of time, a community transforms its geographical spaces into valued places of meaning through which people sustain their identity.

Important sources of knowledge from the past about the material consequences of how people used, occupied, and transformed their landscapes are embedded in each community's cultural-historical narratives. History is continuously re-enacted in the present through the group's traditional beliefs and practices, thereby continually reaffirming the community's cultural-historical associations with its landscapes (after Parker 1993b:4). Landscapes, in turn, become a mirror of a community (**Anschuetz et al. 2001**:190). Landscapes are products of communities' relationships with their surroundings, as each generation lives its life and bestows meaning on those surroundings.

The need by people to sustain their community's traditional understandings of time and place across the generations is powerful (after **Anschuetz 1998b**:70–71). On the one hand, a community's ability to provide points of seeming past stability and future assurance in its cultural-historical memories transfixes time. That is, in established landscape constructions, a community's history with the places with which it affiliates seems timeless. On the other hand, the relative absence of time with new places within its landscapes (that is to say, history) might yield a sense of uncertainty, or possibly a feeling of unreality, because the community has yet to invest coherent meaning—and meaningfulness—into its affiliation with a locality (after Popcock 1994:366, 369–370). For example, if a group immigrates into an area with which the people have no direct historical experience, the émigrés might immediately impose conceptual features of their former landscape onto their new environment. If other communities already inhabit the environment, they might adopt aspects of the culture history of established residents to establish immediate frames of reference through a creative construction of community memory (e.g., see Rapoport 1990; Stone 1993). The logic then follows that the new community arrivals will build upon these cultural-historical points of reference as they develop their own intimacy with their new landscape over the passage of time and their direct experience with these places.

Landscapes become a legacy of the past because they result from cultural choices and modifications made by earlier generations. As such, they are not only an organization of space, they are an organization of time. Importantly, each generation is the custodian of the community landscape, which is firmly rooted in tradition. In turn, traditions derive from people's understandings about how they became who they are and how they perceive and understand the world (after **Anschuetz 1998b**:47, citing **Peckham 1990**:2; see also appendix III).

Comprehension that the physical spaces, including tracts of rangeland, surrounding formally built community centers are neither natural nor exclusively part of nature is an indispensable first step. A landscape's physical spaces are not silent on questions of community history and cultural heritage. Through its goal to identify the values and associations that make a landscape historically significant in terms of National Register criteria (Page et al. 1998:4), the NPS has demonstrated the understanding that people do not need to build visually striking villages or great monuments across their

natural environments to construct richly featured cultural landscapes. The places in which people live, raise families, work, and die are more than just scenery. Landscapes are the quintessential product of human presence over time and represent evidence of historical-ecological processes. The landscape is a living map that people are forever reorganizing (e.g., see Jackson 1980, 1984, 1994).

Community and Communion

Because landscape constructions are cultural constructions deriving from people's patterned perceptions and interpretations of the spaces they inhabit, the concepts of community and communion are relevant to this discussion and warrant definition. Social scientists define *community* as simply "a matter of custom and of shared modes of thought and expression, all of which have no other sanction than tradition" (Johnson 1994:81). For example, ethnic/cultural groups may define themselves as communities, irrespective of whether they occupy clearly defined territories. Community definition similarly is applicable to economic, social, and political groups. In all these cases, the idea of community belonging is cast in terms of social action guided through tradition, played out in the arena of a group's interrelationships with their environments to create their landscapes.

Whenever a network of interacting individuals is concentrated in — and associated with — a particular territory, however, community often carries a particular sense of belonging. This sentiment is defined by the group's understanding of the locality in terms of their perceptions of place and time. Such an emotional tie, defined by social scientists as *communion* (Johnson 1994:81), especially characterizes the relationship between the Southwest's historic rural communities with their cultural landscapes. Given their sustained, intensive, and subsistence-based interactions with the land, experiences of the region's traditional rural communities provide contexts for developing communion based on intimate historical-ecological relationship (e.g., Levine and Merlan 1993).

Because people of urban communities emphasize contrasting aspects of social interaction with their environments, their sense of communion is qualitatively different. Urban dwellers whose interactions with the land and its resources are not sustained, intensive, or subsistence-based tend to have senses of time and place based on romanticized views of nature rather than on direct historical-ecological experience. This generalization appears to apply to urban communities both within and outside the Southwest. For example, Anglo-American urban communities today overwhelmingly understand landscape as an expanse of naturally occurring physical space viewed from afar. Equated with *scenery* (see Hirsch 1995:2; Zube 1994:1), this view derives from the sixteenth-century painterly tradition of using the term *landscape* to describe their depictions of rural (i.e., putatively "unoccupied") scenery (Hirsch 1995:2) and from an uncritical acceptance of subsequent ideas derived from "the world of art and make-believe" in the constructions of theatrical stage sets (i.e., scenery) (Tuan 1977:133).

Implementing an Ethnographic Landscape Approach

Our approach for implementing an ethnographic landscape study derives from and builds upon the preceding landscape perspective. Specifically, I will use the idea of the storied landscape presented by Klara B. Kelley, an anthropologist who works among the *Diné* (the people of the Navajo Nation), and Harris Francis, a *Diné* cultural rights consultant, in their work with Navajo communities (Kelley and Francis 1996). As Kelley and Francis recognize, our understanding of the Southwest's landscape derives from more than the study of archaeology, history, geography, and anthropology.

Archaeologists, through their surveys and excavations, "learn to read the past" by using the archaeological record as a kind of historical text. Archaeologists interpret the artifacts, features, old houses, plant remains, and bones of the archaeological record to tell one kind of cultural-historical story and to explain changes in life ways.

Historians read written texts, often provided by first-hand witnesses of events, to tell another kind of story about key players, events, and processes. Historians, too, author rich interpretations of the past.

Geographers offer useful tools for reading landscapes and for evaluating how past human actions help condition contemporary land use practices and cultural relationships with the land. Following Sauer's lead, geographers have played instrumental roles in developing methods for studying the interplay of the physical environment, the culture of the people, and time in communities' landscape constructions.

Ethnographers use information provided by living people as one kind of historical text, supplemented by the archaeological and historical records visible on the ground. Ethnographers also provide cultural frameworks that others can use to interpret the process of culture change over time.

The idea of the storied landscape acknowledges the rich oral histories maintained among traditional communities as necessary elements in landscape history. To be fully understood, physical spaces within an ecological setting must be related to cultural ideas of place, time, and human community. Oral accounts can bridge the difference between small places on the landscape used for particular purposes and general stories that outline culture history and evaluate change. As such, with respect to the dynamic properties of culture (see appendix III), people of traditional and historical communities potentially can contribute valuable historical-ecological lessons obtained through their intimacy with the landscape. In addition, they might be able to offer invaluable insights concerning the application of these lessons to guide decision-making about the future of the landscape.

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Appendix III.

Perspectives on Culture, Tradition,Vernacular Knowledge, and Culture Change to Understand Landscape as a Cultural Process

Kurt F. Anschuetz

Introduction

The underlying premise of this discussion is that people contribute to conditions that warrant the restructuring and reorganization of their interactions with their physical settings, with other members of their communities, and with residents of other communities (see **Anschuetz 1998b**:31–82). People revise their existing tactics and strategies, or adopt altogether new policies, for earning their living. As they accommodate changes in their natural, economic, social, political, and ideational environments at one point in time, they invariably instigate change (Minnis 1985:19; Waddington 1974:35; see also Watts 1988). Thus, culture, and all of its constituents, including landscape, is a dynamic, living process.

The purpose of this essay is to contribute to an understanding of landscape as a dynamic cultural process. This discussion provides part of a framework that land and cultural resource managers might find useful in considering how people of traditional and historical communities construct and sustain affiliations with the Valles Caldera National Preserve.

The discussion consists of six sections. First, the narrative begins by considering that culture is an elaborate cognitive and behavioral system (Kirch 1980:112–114) that people use for the efficient production, storage, and conveyance of information about their interactions with their natural, economic, social, political, and ideational environments. Second, I examine what traditions are and how they serve human communities by sustaining senses of continuity despite the unfolding process of culture change. The third section inspects the properties of vernacular knowledge through which people assign meanings to the facts that they perceive in their everyday world. The fourth segment addresses the assertion that culture change over time is inevitable, while the fifth section looks at how people with controlled access to a community's corpus of vernacular knowledge can use traditions and traditionalism as instruments of culture change. The concluding part provides commentary about why process and landscape concerns alike dictate the adoption of a historical-ecological approach. I suggest that the process of behavioral change conveyed symbolically within a landscape is, to a large degree, related to how communities experience time and place. Moreover, the process of behavioral change requires the fundamental traditions throughout the landscape to remain more or less intact to demonstrate cultural-historical continuity.

Culture With a Capital "C"

Culture has been a central topic of discussion since anthropology's beginnings as a social science more than a century ago. It has been a unifying concept over much of the discipline's history. Nonetheless, its appropriateness increasingly has become a topic of debate since Kroeber and Kluckhohn (1952) noted that practitioners assign it a multiplicity of meanings. Over the past decade, critiques of the culture concept generally focus on the theme that c*ulture* inevitably "suggests boundedness, homogeneity, coherence, stability, and structure whereas social reality is characterized by variability, inconsistencies, conflict, change, and individual agency" (Brumann 1999:S1).

For the purposes of this study, we view culture as an elaborate cognitive and behavioral system (Kirch 1980:112–114) that people use for the efficient production, storage, and conveyance of information about their interactions with their natural, economic, social, political, and ideational environments during their life spans. Culture also allows people to transfer information about past environmental states and the perceived effectiveness of responses to fluctuations in their environments beyond the direct experiences of living generations.

Through their recollection of cultural-historical memory (Flinn and Alexander 1982), people generate a world of cultural product (after Boone 1994:7). Importantly, (1) cultural information flow patterns are highly selective in transmitting data at any point in time and between successive generations; (2) communities assign values to their perceptions and meanings of cultural information differently; and (3) communities are capable of consciously manipulating their cultural inheritance (**Anschuetz 1998b**:44–58; **Anschuetz et al. 2001**:181–184; Wills et al. 1994:298). At any given time, therefore, people not only inherit but also inhabit—that is to say, imitate, modify,

and build upon—their cultural heritage as a conceptual landscape for their own purposes.

Two complementary definitions of culture provide a framework for considering how human communities systematically bias the recognition and manipulate the transmission of environmental information. The first definition is by E. B. Tylor, who conceptualized culture at the time anthropology was emerging as a formal discipline as "that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society" (1871:1). More than 80 years later, Leslie White defined culture as "a class of things and events, dependent upon symboling, considered in an extrasomatic context" (1959:234).

Although Tylor and White's definitions focus on contrasting aspects of culture, they share an underlying principle of patterned information transmission within communities. These information flow patterns are not only selective in what and how data are transmitted among living people and between successive generations, they also exhibit a wide range of variability among human communities. Each group's particular sense of place and time helps organize the structure and pattern of their occupation of sustaining areas and their use of larger physical environments (see **Anschuetz 1998b**:47–50; see also appendix II).

Tradition: Sustaining Senses of Continuity Within Culture Change

Regardless of their particular form of expression, **Stewart Peckham** (**1990**) portrays information regulating mechanisms that structure the content of, and organize the meanings within, data transmitted among living people and between successive generations, as *traditions*. According to **Peckham**, traditions generally relate to people's valued understandings of "how they became who they are" (**1990**:2). In turn, traditions unify how people of a cultural community create and occupy their landscapes across the dimensions of space and time (**Anschuetz 1998b**:47). Trigger argues that traditions arise out "of the need for patterns or structural principles that provide some degree of coherence and meaning to the inexhaustible variety of concepts that the human mind is capable of inventing and manipulating" (1991:557, citing Gellner 1982:116–117). Lastly, Redfield (1940, in Watson 1995:683) recognizes that traditions sustain the validity and coherence of the group's conventional understandings over time.

Peckham (**1990**:2–5) outlines the fundamental characteristics of traditions. These traits include value, persistence, and continuity within a community. Even though traditions allow for persistence and continuity in the threads of constructed meanings, they nevertheless are dynamic and subject to change over time given the latitude in their form and practice (after **Anschuetz 1998b**:48–51; **Peckham 1990**:2–5; see also Rappaport's [1979a] discussion of ritual. Geertz concludes, "that persistence and change are aspects of the same social phenomenon, namely, tradition" (1994:4).

Trigger maintains traditions arise out "of the need for patterns or structural principles that provide some degree of coherence and meaning to the inexhaustible variety of concepts that the human mind is capable of inventing and manipulating" (1991:557, citing Gellner 1982:116–117). As **Anschuetz** (**1998b**:44–58) observes, shared comprehension of meanings defines the contents of traditions.

Two crucial issues underlie this statement (**Anschuetz et al. 2001**:182–183). First, a common world view among community members is implicit and obligatory (Whorf 1956:213–214). Second, fundamental concepts underlie and structure human thought (Lakoff and Johnson 1980:3). These concepts are matters not only of intellect but also of action and include mundane everyday matters. Consequently, people interacted with their environments to define and to mark their occupation of spaces within their physical environments in patterned ways of residence, subsistence, and other activity, including oral tradition (adapted from **Anschuetz et al. 2001**:183).

Even though traditions constrain the structure and organization of human behavior, they do not cast culture in an absolutely determinist role (**Anschuetz 1998b**:50). Traditions are not wholly determining "because the human ability to reason allows individuals to manipulate and modify culture to varying degrees" (Trigger 1991:559) as they "realize their own changing needs and aspirations" (Trigger 1991:560). Geertz (1994:4–5) maintains that traditions by definition must be both resilient and malleable to retain their meaning as people confront changing circumstances. For this reason, traditions can be viewed as strategic resources that can be modified to fulfill desired ends (Geertz 1994:4).

A consequence of this essential latitude in behavior is that cultural systems encompass much greater internal behavioral variability than anthropologists normally recognize (**Anschuetz 1998b**:50; **Anschuetz et al. 2001**:183, after Rambo 1991:71–72; see also Trigger 1991:552). Nevertheless, the need for structural order and coherence of meaning shape the contingent variation of culture and its capacity for elaboration (Trigger 1991:561; see also Atran 1990; Berlin 1973; Berlin et al. 1974; Lakoff 1987; Nazarea 1999a; Shore 1996 for discussions of structures that condition perception and experience). Given these properties of traditions for transmitting information, this discussion now turns to a consideration of how cultures structure perception and information transmission patterns.

Vernacular Knowledge: Reigning Conventional Wisdom

Vernacular knowledge refers to the processes and results of certain kinds of ordinary thinking that people rely on as an indubitable source of truthful knowledge of their everyday world (see Atran 1990:1–4, 275n1 for his discussion of *common sense*). Knowledge is distributed differentially within a community, even though our reference to the group's culture tends to make us think such information is shared among all the people (Barth 2002:1). Access to certain vernacular knowledge can

be exclusive to a community's carriers of tradition (Rumsey 2002). Because traditional knowledge allows people to understand and describe their experience with certain worldly phenomena, the validity of such belief is beyond question.

On one level, vernacular knowledge "is just the way humans are constitutionally disposed to think of things" (Atran 1990:2). On another plane, vernacular knowledge defines and informs their world view. Geertz defines *world view* as "a people's picture of the way things, in sheer reality are, their concept of nature, of self, of society. It contains their most comprehensive ideas of order" (1973:127).

Vernacular knowledge therefore may be understood as a community's conventional wisdom. Cultural meaning, such as that embedded in a group's body of conventional wisdom, however, is dynamic and subject to notable change.

Nazarea suggests the importance of vernacular knowledge to landscape studies: "The landscape, or what's out there, is processed through human perception, cognition, and decision making before a plan or strategy is formulated and an individual or collective action is executed" (1999b:91). Also important in studying landscapes are "the complex ways in which places anchor lives in social formations ranging widely in geographical location, in economic and political scale, and in the accompanying realms of gender, race, class, and ethnicity" (Feld and Basso 1996:7). Landscape, then, deals with every aspect of resource management that underlies a "people's sense of place—the lenses through which they construct the environment and estimate their latitudes of choice and opportunities for challenge and refutation" (Nazarea 1999b:105).

The Inevitability of Culture Change

Just as the physical environment changes over time, so do culture, tradition, and the meanings contained within a community's world view (**Anschuetz et al. 2001**:184). These characteristics all are dynamic properties of human life; they are neither static nor immutable (after Plog 1974).

Although culture change over time is inevitable, the need to sustain order and coherence frame the range of possible variation (**Anschuetz et al. 2001**:184, citing Trigger 1991:561). Marked discontinuities in the structure of information and the organization of behavior, however, can signify the revolutionary overthrow or the transformation of previously established cultural frameworks (see **Anschuetz 1998b**). In the case of revolution, fundamental cognitive aspects that structure and organize the cultural system are replaced. In the case of transformation, change sustains a community's existing structural and organizational themes.

Transformations in a community's traditions carry social and cultural implications. **Peckham** (**1990**:3) observes that great culture change, regardless of the cause or motivation, can disrupt the original intent of the tradition or destroy some critical component to leave certain aspects of the tradition divorced from their ancient context. Of special interest to the present discussion, calculated attempts to reinterpret or revive traditions, such as can occur within nativistic movements (e.g., see Green 1974, 1976), "often involve only selected elements of the earlier tradition" (**Peckham 1990**:4).

Although a transformed tradition might only superficially resemble the original form, it "does not necessarily prevent it from being accepted and effective" (**Peckham 1990**:4) within the community for its contemporary needs and purposes. If the transformation or renewal of tradition results in a redefinition of the community's vernacular knowledge (even if the modification is not consciously recognized), the changes can establish a new configuration for people to interpret, and reinterpret, information available in their contemporary natural, economic, social, political, and ideational environments (see **Anschuetz 1998b**:57, after Williams 1961:23). The integration of folk Catholicism with indigenous belief among Pueblo communities in northern New Mexico following Spanish colonization is an example of transformation in community traditions in which cultural continuity is sustained in the face of considerable change in economic, social, political, and ideational orders (e.g., **Gutiérrez 1991**). From this perspective, study of changes in a community's traditions has less to do "with what they represent in themselves and more to do with what they indirectly reveal about the state of society, other religious bodies, or structures of meaning" (Beckford 1987:392).

Traditions and Traditionalism as Instruments of Culture Change

Anthropologists commonly view culture and its constituents, including tradition, as fundamental properties of human communities (e.g., Hall 1959, 1969; Rappaport 1979b:62; White 1949). In people's day-to-day lives, they use culture to construct and reconstruct traditional meanings with different valuation relevant to the circumstances and events they experience in their changing worlds (after Barth 2002:11; Lakoff and Johnson 1980:3; Rappaport 1979c:158, 1979d; White 1987:277; see also comprehensive case studies by Geertz 1994; Levy 1992; Whiteley 1987, 1988).

Tradition is a strategic cultural resource, which people can modify to fulfill desired ends within their contemporary natural, economic, social, political, and ideational environments. Geertz observes further that tradition is "a way of thinking, a way of speaking, and a way of acting that articulates in myriad ways the webs of significance produced by human cultures" (1994:4; see also Levy 1992:164). Moreover, vernacular knowledge, whose significance is derived and legitimized with reference to tradition, may be viewed as threads in the total fabric of meaning embedded in the community's world view (after Geertz 1994:6).

Through assertive links to tradition and world view, information relevant to contemporary circumstances, including affiliations to places on the landscape, can be cast as a community's vernacular knowledge, way of life, identity, and very being. On the one hand, some outsiders might be tempted to characterize a group's traditional patterns of culture as residues from a past that either at best are disconnected or at worst are irrelevant to the community's contemporary conditions.

In doing so, the term *traditional* is imbued with pejorative connotations that it does not deserve. Bradburd observes that if the term *traditional*:

> *. . . is intended to suggest that some societies are 'cold,' fixed in amber, unwilling or unable to change, then it is both insulting and ridiculous. If nothing else, the narrative of the 20th century is the account of peoples the world over accepting, using and creating 'new' technologies even as they put 'old' practices to new uses (Bradburd 2002:12).*

On the other hand, a group's statements of its associations under certain circumstances may be constructed to assert the immutability of its traditions over the generations since time immemorial (see Barth 2002:5). Such statements typically are made to audiences of persons either within or outside the community for whom access to the assembly's vernacular knowledge is restricted to all but a few specified "knowers" who define the group's social reality (after Geertz 1994:7–8, citing Berger and Luckman 1966:87, 134; see also Barth 2002:5). As a conscious or unconscious creative strategy, the underlying motivation for making such statements can be an overwhelming concern to establish the veracity of shifting claims of affiliation or practice (e.g., Barth 2002:5; Green 1974:68–74). According to Rumsey, "The creative act [on the part of the group's exclusive 'carriers of tradition'] is to do this in such a way as to deny change and temporality and to fabricate for their audiences a sense of transmitted invariance and timelessness: a performative illusion of considerable ingenuity and persuasive power" (2002:15). In this sense, people assert their "old" practices to put the "new" economic, social, and political technologies at their disposal to use (Bradford 2002:12).

To cast the redefinition of community traditions in the face of changing natural, economic, social, political, and ideational environments over time *necessarily* as the cynical products of politicians is inappropriate (after Levy 1992:164). Although a transformed tradition might resemble the original form only superficially, the community may accept the reinterpreted history as a mechanism for sustaining its sense of identity in the face of contemporary circumstances (see Levy 1992:164; **Peckham 1990**:4). In fact, when culture change demonstrately sustains community and identity, some anthropologists extend the notion of *indigenous* to include a group's incorporation of knowledge obtained from outside sources.

Public commentaries and performances declaring strict adherence to a community's traditions fulfill the definition of *traditionalism*. Social science theory has long held the premise that actors, who use traditionalism in nativistic and revitalistic movements, can serve as principal agents of culture change within their communities. Some sociologists argue that "'traditionalsim' is not the same as 'tradition,' but also that the traditionalist is both innovator (Shils 1971:146), and a major instrument of modernization" (Geertz 1994:5, citing Singer 1971:162). Persons who identify themselves as traditionalists in promoting matters said to be held sacred by their communities typically reject the focus and contexts of established traditions and assert revisionist histories to address issues relevant to the community's contemporary needs (after Geertz 1994:5–6; see also Levy 1992; Whiteley 1988).

Discussion: The Need for a Historical-Ecological Perspective

Concerns with process and landscape alike dictate the adoption of an explicitly historical-ecological perspective, which is based on "a culturally specific temporal and spatial perspective applied at the regional scale" (Crumley 1994:8). A historical-ecological perspective broadly embraces a traditional landscape concern, namely, the material traces that people have left on their environments. It builds from the premise that interpretation of vernacular and formally built landscapes alike should be in terms of the essential values and beliefs that a community uses to structure and organize its behavior (e.g., see Cosgrove and Daniels 1988; Meinig 1979; Penning-Rosewell and Lowenthal 1986; see also appendix II).

The process of behavioral change encoded within a landscape over time is, to a large degree, a function of operational cultural constructs of time and place. As a community of people live their lives, they typically move among places within the settings that make up their landscape. People transfer the vernacular knowledge of their communities between and across generations through day-to-day conversation and ritual behavior (Crumley 1994:7), although individuals "participate to greater or lesser degrees in the production and application of perceptions of their environments" (Crumley 1994:9). Generations of people might inhabit and modify a multitude of places within their community landscape differently over time. Nevertheless, as long as fundamental traditions remain more or less intact, elements of a common underlying structural pattern persist over time (e.g., see Rapoport 1990:17). In adopting and applying a historical-ecological perspective, explaining the process of culture change requires the traceable persistence of traditions across the regional landscape over time to demonstrate cultural-historical continuity along a trajectory of path-dependent change.

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