

# CHACO CULTURE NATIONAL HISTORICAL PARK

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National Park Service  
United States Department of the Interior





## **GENERAL MANAGEMENT PLAN AMENDMENT / ENVIRONMENTAL ASSESSMENT**

### **Chaco Culture National Historical Park San Juan and McKinley Counties, New Mexico**

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Chaco Culture National Historical Park is in northwestern New Mexico, about 150 miles northwest of Albuquerque, New Mexico. Chaco Culture National Historical Park was first established as a national monument by Presidential Proclamation in 1907 and was designated as a national historical park in 1980. The park consists of 33,974 acres.

The park has an approved general management plan that was completed in 1984. The 1984 plan provides sufficient direction for park management with the exception of one area: visitor use management. Therefore, the National Park Service is amending the current general management plan to provide specific guidance and direction on this topic.

This document describes four alternatives for managing visitor use in Chaco Culture National Historical Park for the next 15 to 20 years, and the impacts on the environment and cultural resources of implementing each alternative. The no-action alternative describes continuation of existing management and serves as a basis of comparison for the action alternatives.

The action alternatives describe what park management could be like using different visitor use management techniques. Alternative 2 has been identified as the NPS preferred management approach.

Under alternative 2, the National Park Service would implement a reservation system to manage groups and the campground, increase education and outreach programs, and institute a monitoring system that would allow the park to better track and manage resource and visitor experience conditions. If needed, based on monitoring results, a reservation system for individual access to the park may be implemented in the future.

This document has been distributed to other agencies and interested organizations and individuals for their review and comment. The public comment period for this document will last for 30 days after this document is published and distributed. Please note that NPS practice is to make comments, including names and addresses of respondents, available for public review. Please see the “How to Comment on this Plan” section on the next page for further information.

## HOW TO COMMENT ON THIS PLAN

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Denver Service Center-Planning  
Attention: Chaco GMP Planning Team  
PO Box 25287  
Denver, CO 80225-0287

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# SUMMARY

## PURPOSE AND NEED

The purpose of a general management plan is to present the general path the National Park Service intends to follow in managing the park over the life of the plan. Chaco Culture National Historical Park has an approved general management plan, completed in 1984, that provides sufficient direction for park management with the exception of one area: visitor use management. In response to potential changes in visitation, mostly because of the potential improvement of County Road (CR) 7950 by San Juan County, which would make access to the park easier for a larger number of visitors, the park requires a new framework to address visitor use in order to protect the park's sensitive resources and unique visitor experiences.

Although the 1984 general management plan provides general guidance on visitor use, a much more rigorous examination of this topic is essential in order to sustain park resources and the qualities of the park that so many visitors value. A strategic management approach is needed so that the park's fragile cultural resources are protected and also that the visitor experience at Chaco is not sacrificed—an experience that is unique in that visitors are allowed to freely and independently visit the park's world-renowned, yet fragile cultural resources. Lack of roving staff at the sites and the limited regulation of visitor access within and around sites, in groups or otherwise, is affecting management's ability to monitor and protect cultural resources during periods of heavy visitation. Sites that have high levels of visitation have had substantially more instances of disturbance or loss than other, less visited sites. It is expected these impacts could get worse with future changes in visitation patterns. Therefore, this general management plan

amendment is needed to establish management systems and thresholds whereby Chaco Culture National Historical Park staff can proactively respond to changes in visitor use and preserve the park's resources and visitor experiences.

## THE ALTERNATIVES

### Development of the Alternatives

Because there are different approaches to achieving the purpose of this general management plan amendment, the planning team investigated a range of possible management alternatives. Ultimately four alternatives were developed, including the no-action alternative that describes a continuation of the park's current visitor use management approach.

Each alternative involves a different approach to achieving the desired resource conditions and visitor experiences in the park. These differences are expressed through each alternative's unique approach to three types of visitor use management strategies: visitor knowledge, group management, and individual visitor access. The primary distinction between the four alternatives is the spatial and temporal scales at which specific actions within these three types of visitor use management strategies would be implemented.

From the four alternatives, the preferred alternative was selected through an objective analysis process called "choosing by advantages." Through this process, the planning team identified and compared the relative advantages of each alternative according to a set of factors that were based on the desired resource conditions and visitor experiences in the park. The relationship between the advantages and

costs of each alternative was also established. This information was used to identify the alternative that gives the National Park Service and the public the greatest advantage for the most reasonable cost.

The results of the “choosing by advantages” process identified alternative 2 as the agency’s preferred alternative. This alternative provides the best combination of strategies to protect the park’s unique visitor experience and cultural resources, while improving the park’s operational efficiency and effectiveness.

### **Alternative 1 (No Action)**

The no-action alternative is included as a required baseline against which to compare the action alternatives. This alternative prescribes the continuation of the park’s current visitor use management approach. This approach is in keeping with the park’s 1984 general management plan that emphasizes self-discovery of the park’s archeological resources and historic structures. The 1984 plan also states that if visitation exceeds levels identified in the plan, then a reservation or transportation system may be implemented. However, these levels have not been exceeded and currently there are no plans in place to implement a reservation or transportation system.

The no-action alternative would protect visitors’ freedom of choice and flexibility for accessing and touring the park, resulting in minor to moderate beneficial impacts. However, the no-action alternative has limited visitor use management strategies, so park staff may not be able to adequately accommodate increasing trends in visitor use, while not diminishing the park’s fragile cultural resources or the visitor experience; this would result in minor to potentially major adverse impacts. Further, the park has a small staff that has had varying degrees of success in responding to visitor use management needs and impacts resulting from visitor use.

### **Alternative 2 (The Preferred Alternative)**

In alternative 2, visitor use management strategies would be applied year-round and throughout the park. Strategies addressing visitor knowledge include requiring visitors to participate in a structured education program prior to accessing the park’s primary cultural sites. This would ensure that all visitors receive a consistent and comprehensive message regarding the sensitivity of park resources, park regulations, and appropriate visitor behaviors. The park would also increase roving patrols and interpretive contacts at the park’s primary cultural sites.

Group management strategies would include providing all groups with information on the sensitivity of park resources prior to their visit. This would be implemented by requiring groups to obtain advance registration, and carefully managing group size. The number of groups would be limited to no more than two per day, year-round. This strategy would prevent several large groups from accessing the park at one time, which would have a beneficial effect on resources and the visitor experience.

Strategies related to individual visitor access would include providing visitors with an online campsite reservation system in addition to limited first-come/first-served camping. Visitors would also be provided with information about peak use times in order to encourage voluntary redistribution of use. If needed, based on monitoring results, a reservation system for individual access to the park may be implemented in the future.

The preferred alternative provides a high level of protection of park resources because of its more effective parkwide, year-round approach to visitor use management. These strategies would help reduce adverse impacts by keeping them to the minor level of intensity. The preferred alternative also provides the highest level of freedom and

independence once visitors enter the park, given the focus on educating and regulating use at the park entrance, resulting in a long-term moderate beneficial impact. However, the implementation of the structured education program and the potential future reservation system will adversely impact visitors' access to the park. The preferred alternative would be the most effective from an operational standpoint, given the parkwide and year-round strategies.

### Alternative 3

In alternative 3, some visitor use management strategies would be applied on a seasonal basis throughout the park. Strategies related to visitor knowledge would include requiring all visitors to enter the visitor center and receive orientation materials prior to accessing the park's primary cultural sites. Roving patrols and interpretive contacts would also increase at primary cultural sites, particularly during the peak season. If needed, based on monitoring results, a structured education program may be implemented in the future.

Group management strategies would be identical to those in alternative 2, except that during the nonpeak season, more than two groups would be allowed per day.

Individual visitor access strategies would also be identical to those in alternative 2, except that during the nonpeak season, no advance campsite or individual reservations would be needed.

Alternative 3 contains many of the same strategies as the preferred alternative, so impact levels are similar. However, the focus on seasonal strategies may be slightly less protective of resources. This alternative does provide a high level of freedom and independence for visitors once they enter the park, given the focus on educating and regulating use at the park entrance. The operational burden of this strategy would be similar to the preferred alternative, but would be less efficient given the reliance on

seasonal staff and the repeated loss of this investment.

### Alternative 4

In alternative 4, the visitor use management strategies would be applied year-round at individual sites within the park. Strategies addressing visitor knowledge would include on-site education at the park's primary cultural sites. Under this alternative, park staff would be stationed at strategic locations during peak visitation times and during special events.

Group management strategies would be similar to those in alternative 2; however, this alternative would not allow more than one group to visit a single cultural site at any one time.

Individual access strategies under this alternative would also provide information to visitors about peak use times in order to encourage voluntary redistribution of use. All campsites would continue to be available on a first-come/first-served basis and reservations would be available only for the group campsites. If needed, based on monitoring results, access to the park's primary cultural sites may be regulated through on-site queuing techniques (i.e., only a certain number of visitors are allowed within a site at any one time) or through the use of reservations or permits.

Alternative 4 regulates use at a site level, which can be highly protective of the park's fragile resources, but has the potential to influence visitors' spontaneous access at any particular site. The site-level strategies would help reduce adverse impacts to cultural resources by keeping them to the minor level of intensity, but there would be a major adverse impact on visitors' freedom of choice and flexibility to visit sites at their own pace. The operational burden of this strategy would be high given the increased staffing needs, making it less efficient than the other alternatives.

## THE NEXT STEPS

After the distribution of this general management plan amendment / environmental assessment, there will be a 30-day public review and comment period, after which the NPS planning team will evaluate comments from other federal, state, and local agencies; organizations; businesses; and individuals regarding the plan.

Following public review and assessment of public comments, either a finding of no significant impact (FONSI), or a notice of

intent to prepare an environmental impact statement would be prepared. If a FONSI is prepared, it would document the NPS selection of an alternative for implementation, include any necessary errata sheet(s) for factual changes required in the document, and would include responses to substantive comments by agencies, organizations, and the general public. Once the FONSI is signed by the NPS regional director, it would be made available to the public. The plan could then be implemented following a 30-day waiting period.



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# CHAPTER 1



## INTRODUCTION





## A GUIDE TO THIS DOCUMENT

This general management plan amendment / environmental assessment (GMP amendment) is organized into five chapters plus appendixes. Each section is described briefly below.

**Chapter 1: Introduction** describes the context for the entire document. It explains why the plan is being prepared and what issues it will address. It provides guidance (e.g., park purpose, significance, fundamental resources and values, special mandates, servicewide laws and policies) for the alternatives that are being considered. This chapter also describes how this plan relates to other plans and projects.

**Chapter 2: Alternatives**, discusses four alternatives for visitor use management. Mitigative measures for minimizing or eliminating impacts of some proposed actions are then described. Sections on the environmentally preferred alternative and alternatives considered but dismissed follow. A summary comparison table of the alternatives (table 4) is followed by a summary comparison table (table 5) of how the alternatives meet the purpose and need,

along with the environmental consequences of implementing the alternatives.

**Chapter 3: Affected Environment** describes areas and resources that would be affected by actions in the four alternatives—cultural resources, visitor use and experience, and park operations. It also includes a discussion of impact topics that were dismissed from detailed analysis.

**Chapter 4: Environmental Consequences** analyzes the impacts of implementing the alternatives. Methods used to assess impacts are outlined at the beginning of each topic.

**Chapter 5: Consultation and Coordination** describes the history of public and agency coordination during the planning effort; it also lists agencies and organizations who received copies of the document.

The **Appendixes** present supporting information for the document, along with bibliographic references and a list of the planning team and consultants.

## OVERVIEW OF THE PARK

Chaco Culture National Historical Park (Chaco or the park) is in northwestern New Mexico, about 150 miles northwest of Albuquerque, New Mexico (see Vicinity/Park map). The park was first established as a national monument by Presidential Proclamation in 1907. It was later expanded and designated Chaco Culture National Historical Park in 1980 to recognize the interconnections between the park and its 40,000-square-mile area of influence.

From the 9th to 13th centuries, Chaco Canyon was the center of a civilization of social, political and architectural sophistication. An engineered system of roads and evidence of a vast trading network are indicators of its former inhabitants' relationship with a broader area of influence.

The characteristic building of the Chacoan civilization is the "great house," a multi-storied, multi-roomed structure found throughout the Four Corners region of the American Southwest.

The park extends over 33,000 acres and contains some 4,000 recorded archeological sites. The Chacoan people combined many elements: pre-planned architectural designs, astronomical alignments, geometry, landscaping, and engineering to create an ancient urban center of spectacular public architecture—one that still awes and inspires us a thousand years later. In recognition of its superb resources, Chaco Culture National Historical Park was named a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site in 1987.

The park is bounded primarily by Navajo Nation tribal lands with some nearby lands owned by the Bureau of Land Management (BLM), state of New Mexico, and private owners.

The main access to the park is from the northeast via CR 7950 that starts at New Mexico 44/U.S. 550, the main northwesterly highway from the Four Corners region to Albuquerque. The distance from this highway to the park entrance is 21 miles; 13 of these miles are on an unpaved road. A second road approaches the park from the south from US 40 via Crownpoint; the last 19 miles of this road are also unpaved. A third unpaved road that provided access to the site from the northwest was closed in 1994.

## NATURAL RESOURCES

Chaco Culture National Historical Park is near the geographic center of the San Juan Basin. The San Juan Basin is located primarily in the northwestern corner of New Mexico, stretching into southwestern Colorado and abutting the Four Corners area. Geographic features within the San Juan Basin vary from plains and valleys to buttes, canyons, and plateaus. The park is a semi-arid desert steppe in the southeast corner of the Colorado Plateau. The park's elevation ranges from 6,000 to 6,800 feet, and it encompasses three prominent land forms: (1) the alluvium-filled valley floor of Chaco Canyon, with its prominent drainage features; (2) expansive cretaceous sandstone mesas, topped by slickrock outcrops and gently rolling hills; and, (3) a number of small side canyons (locally known as "rincons") eroded into the sandstone faces adjacent to the main canyon floor.

The park's vegetation is predominantly Great Basin grassland and desert scrub. Riparian vegetation, including cottonwood and willow groves, is locally abundant along the arroyo within the canyon floor and around the few seeps found in the park. Diverse scrub and wildflower communities occur around the sandstone bluffs

throughout the canyon. Pinyon-juniper woodland is also well developed at the park's highest elevations on Chacra Mesa, and along the margins of several other mesas.

Although established primarily for its archeological resources and historic structures, the park's natural area is locally significant. The park is one of only two protected areas in the San Juan Basin, and serves as an "island" of biodiversity harboring plants and wildlife that have otherwise been significantly affected by grazing, mineral extraction, and other adjacent land-use activities. Diverse micro-climates associated with soil types, water availability, elevation, and solar aspect angle combine to create a rich variety of ecological zones within the park. This diversity may account for a long history of human occupation—at least 7,000 years in Chaco Canyon.

## **CULTURAL RESOURCES**

For all the wild beauty of Chaco Canyon's high desert landscape, its long winters, short growing seasons, and marginal rainfall create an unlikely place for a major center of ancestral Puebloan culture to take root and flourish. Yet this valley was the center of a thriving culture a thousand years ago. The monumental scale of its architecture, the complexity of its community life, the high level of its social organization, and its far-reaching commerce created a cultural vision unlike any other seen before or since.

The cultural flowering of the Chacoan people began in the mid-800s and lasted more than 300 years. We can see it clearly in the grand scale of the architecture. Using masonry techniques unique for their time, they constructed massive stone buildings (Great Houses) of multiple stories containing hundreds of rooms much larger than any they had previously built. The buildings were planned from the start, in contrast to the usual practice of adding

rooms to existing structures as needed. Construction on some of these buildings spanned decades and even centuries. Although each is unique, all great houses share architectural features that make them recognizable as Chacoan.

In the late 800s, construction began on the great houses of Pueblo Bonito, Una Vida, and Peñasco Blanco, continuing until their completion in the 1000s. Construction of Hungo Pavi, Chetro Ketl, Pueblo Alto, and others began in the 1000s. These structures were often oriented to solar, lunar, and cardinal directions. Lines of sight between the great houses allowed communication. Sophisticated astronomical markers, communication features, water control devices, and formal earthen mounds surrounded them. The buildings were placed within a landscape surrounded by sacred mountains, mesas, and shrines that still have deep spiritual meaning for their descendants.

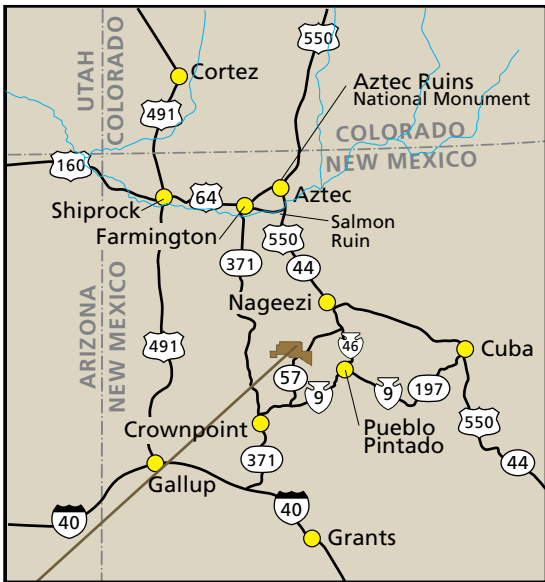
By 1050, Chaco had become the ceremonial, administrative, and economic center of the San Juan Basin. Its sphere of influence was extensive. Dozens of great houses in Chaco Canyon were connected by roads to more than 150 great houses throughout the region. It is thought that the great houses were not traditional farming villages occupied by large populations. They may instead have been impressive examples of "public architecture" that were used periodically during times of ceremony, commerce, and trading when temporary populations came to the canyon for these events.

What was at the heart of this great social experiment? Pueblo descendants say that Chaco was a special gathering place where many peoples and clans converged to share their ceremonies, traditions, and knowledge. Chaco is central to the origins of several Navajo clans and ceremonies. Chaco is also an enduring enigma for researchers. Was Chaco the hub of a turquoise-trading network established to acquire macaws, copper bells, shells, and other highly prized commodities from distant lands? Did Chaco

distribute food and resources to growing populations when the climate failed them? Was Chaco “the center place” binding a region together by a shared vision? We may never fully understand Chaco.

In the mid-1100s and 1200s, change came to Chaco as new construction slowed and Chaco’s role as a regional center shifted. Chaco’s influence continued at Aztec, Mesa Verde, the Chuska Mountains, and other

centers to the north, south, and west. In time, the people shifted away from Chacoan ways, migrated to new areas, reorganized their world, and eventually interacted with foreign cultures. Their descendants are the modern Southwest Indians. Southwest Indian people look upon Chaco as an important stop along their clans’ sacred migration paths—a spiritual place to be honored and respected.



**CHACO CULTURE  
NATIONAL HISTORICAL PARK**



**Figure 1. Vicinity**  
Chaco Culture National Historical Park  
National Park Service / U.S. Department of the Interior  
NPS 310/100548

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## PURPOSE AND NEED FOR THE PLANNING EFFORT

### PURPOSE OF THE PLAN AMENDMENT

The purpose of this amendment is to provide additional guidance and direction for visitor use management at the park (for the next 15 to 20 years) in order to establish management systems and thresholds whereby the park can respond to changes in visitation and preserve its unique resources and visitor experiences. The amendment and its alternatives include many elements that are typical of a visitor use management plan.

The key steps for the plan amendment are

1. Investigate, reevaluate, and document the sensitivities of the park's natural and cultural resources, along with the values and characteristics that contribute to the park's unique visitor experiences and opportunities.
2. Assess current and potential influences (both positive and negative) on park resources and visitor experiences as a result of expected changes in visitation.
3. Identify management strategies that would be most effective and appropriate for protecting park resources and visitor experiences, including an evaluation of the associated tradeoffs. The strategies are a range of management actions and systems and include consideration of operational constraints.
4. Define the process for measuring long-term success at protecting these resources and visitor experiences (including indicators and standards).

### NEED FOR THE PLAN AMENDMENT

The plan amendment is needed because the park's 1984 general management plan does not provide adequate guidance on visitor use management. All other elements of the general management plan remain valid (measures for the protection of resources, indications of the types and general intensities of development, and potential boundary adjustments). The park's infrastructure and operational capacity are adequate to serve current visitor and park needs except during periods of high visitation. The one area that needs attention and planning is the park's framework to deal with visitor use management to protect resources and visitor experiences in response to potential changes in visitation, mostly because of the potential improvement of CR 7950 by San Juan County, which would make access to the park easier for a larger number of visitors. The 1984 general management plan proposes only that "a regulated access system be instituted"—without any details about thresholds for management action.

A much more rigorous examination of the issue of visitor use management is essential if resources are to be protected and the qualities that so many visitors value about the park are to be sustained. Lack of roving staff at the sites and the limited regulation of visitor access within and around sites, in groups or otherwise, is affecting management's ability to monitor and protect cultural resources during periods of heavy visitation. Sites that have high levels of visitation have had substantially more instances of disturbance or loss than other, lesser visited sites. This exacerbates the fragile nature of the sites open for visitation, none of which is assessed to be in good condition. It is expected these impacts could get worse with future changes in visitation

patterns. The existing general management plan states that the park's major archeological sites can sustain virtually unlimited use. With increased knowledge over time about the fragility of the sites and associated resources, this statement is now unsupported and easily refuted by archeologists, including NPS cultural resource staff.

In addition, visitor crowding and conflicts between visitors have been identified by park staff and the public as potential concerns resulting from changes in visitor use levels and patterns. In particular, there is concern that increasing use levels, specifically increasing numbers of people at one time at the primary attraction sites, will detract from the most highly valued aspects of the visitor experience—an experience that is unique in that visitors are allowed to freely and independently visit the park's world-renowned, yet fragile cultural resources. This amendment will help park staff and the public better understand the unique resources of Chaco Culture National Historical Park and actively protect them and the visitor experiences offered at the park.

## **COMPLIANCE WITH THE NATIONAL ENVIRONMENTAL POLICY ACT**

This study is compliant with the National Environmental Policy Act (NEPA), which mandates all federal agencies to analyze the impacts of major federal actions that may have a significant effect on the environment. The National Park Service's guidance outlines several options for meeting the requirements of the act, depending on the severity of the environmental impacts of the alternatives.

An environmental assessment was determined to be the most appropriate instrument for this plan, based on a number of considerations. There is no apparent controversy surrounding this planning

effort, and the agency's preferred alternative was not expected to have major (significant) effects on the environment or park resources and values. Most adverse impacts of the NPS preferred alternative were anticipated to be negligible to minor in intensity.

## **NEXT STEPS**

After the distribution of this general management plan amendment / environmental assessment, there will be a 30-day public review and comment period, after which the NPS planning team will evaluate comments from other federal, state, and local agencies; organizations; businesses; and individuals regarding the plan.

Following public review and assessment of public comments either a finding of no significant impact (FONSI), or a notice of intent (NOI) to prepare an environmental impact statement (EIS) would be prepared. If a FONSI is prepared, it would document the NPS selection of an alternative for implementation, include any necessary errata sheet(s) for factual changes required in the document, and include responses to substantive comments by agencies, organizations, and the general public. Once the FONSI is signed by the NPS regional director, it would be made available to the public. The plan could then be implemented following a 30-day waiting period.

## **IMPLEMENTATION OF THE PLAN**

The approval of this plan does not guarantee that the funding and staffing needed to implement the plan will be forthcoming. The implementation of the approved plan will depend on future funding, and it could also be affected by factors such as changes in NPS staffing, visitor use patterns, and unanticipated environmental changes. Full implementation could be many years in the future. Once the plan has been approved, more detailed planning may be needed before certain components of the selected alternative can be carried out.

Future program and implementation plans, describing specific actions that managers intend to undertake and accomplish in the

park, will tier from the goals, objectives, and strategies set forth in the approved general management plan amendment.

# FOUNDATION FOR PLANNING AND MANAGEMENT

## INTRODUCTION

The National Park Service developed a *Foundation Statement for Chaco Culture National Historical Park* in 2007. This document establishes a foundation for planning and management at the park. It includes a description of the park's purpose, significance, and fundamental and other important resources and values. The following information was taken directly from the stand-alone foundation statement.

The park *purpose* is the specific reason for establishing a particular park. Statements of the park's purpose are grounded in a thorough analysis of the park's legislation (or executive order) and legislative history, including studies done before authorization to document shared assumptions about what the law means in terms specific to the park.

Park *significance statements* express why the park's resources and values are important enough to warrant national park designation. Statements of the park's significance describe why an area is important within a global, national, regional, and systemwide context; significance statements are directly linked to the purpose of the park. These statements are substantiated by data or consensus and reflect the most current scientific or scholarly inquiry and perceptions, which may have changed since the park's establishment.

Park *fundamental resources and values* are those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to warrant primary consideration during planning and management because they are critical to achieving the park's purpose and

maintaining its significance. A fundamental value, unlike a tangible resource, refers to a process, force, story, or experience, such as an island experience, the ancestral homeland, wilderness values, key viewsheds adjacent to a park boundary, relationships among people, or oral histories.

"Other important resources and values" may warrant special consideration during general management planning, but they do not contribute directly to the purpose and significance of the park.

*Special mandates* are legal requirements and administrative commitments that apply to a specific unit of the national park system and provide sideboards to planning and management. They are mandated by Congress or by signed agreements with other entities. They are specific to the park, but they are not an inventory of all the laws applicable to the national park system.

Agreements between the park and other entities, as well as important administrative constraints, are also included in this section.

## PURPOSE AND SIGNIFICANCE OF THE PARK

The purpose of Chaco Culture National Historical Park is to

- Recognize and preserve the archeological resources associated with the prehistoric Chacoan culture in the San Juan Basin and surrounding area.
- Preserve and interpret these resources unimpaired for the enjoyment of present and future generations.

- Facilitate research activities associated with these resources.
- Facilitate and cooperate in the protection, preservation, maintenance, and administration of the Chaco Culture Archaeological Protection Sites Program to further preserve, interpret, and research Chacoan culture.

## **SIGNIFICANCE STATEMENTS AND RELATED RESOURCES AND VALUES**

**Significance Statement:** More than 10,000 years of human activity is preserved in Chaco Canyon. Use of the canyon culminated in the Chaco civilization that flourished between the 9th and 13th centuries and was characterized by remarkable achievements in architecture, designed landscape, art, agriculture, social complexity, economic organization, engineering, and astronomy.

### **Fundamental resources and values:**

- At least 4,000 sites document 10,000 years of continuous use within Chaco Culture National Historical Park.
- The salient remains of the Chacoan culture include
  - Architecture
    - monumental and earthen structures that include great houses such as Pueblo Bonito
    - ceremonial structures
    - habitation and community structures
  - Rock Art
  - Cultural Landscapes—The cultural landscapes at Chaco Canyon are a reflection of human adaptation and use of natural resources and are

expressed in the way land is organized and divided, patterns of settlement, land uses, systems of circulation, and the types of structures that were built by the Chacoans. The character of the Chacoan cultural landscapes are defined both by physical materials, such as roads, buildings, walls, and vegetation, and by uses such as agriculture and hunting that reflect cultural values and traditions.

- Ethnographic Resources—Ethnographic resources at Chaco Canyon are those landscapes, objects, plants and animals, and sites and structures, such as Fajada Butte, that are part of the cultural systems or ways of life of the Indian tribes associated with the park.

**Significance Statement:** Chaco Canyon was once the cultural center for a system of communities linked by an extensive road and trading network within a 40,000-square-mile region. The extent of Chacoan influence was recognized by Congress when it created the system of Chacoan archeological protection sites that is collaboratively protected and preserved by the National Park Service, tribal governments, and other agencies. Its global significance was recognized when Chaco Canyon was designated as a World Heritage site in 1987.

### **Fundamental resources and values:**

- Road and communications systems such as signaling stations
- Evidence of trade through materials such as objects, shells, and lithic artifacts
- The diffusion of cultural ideas and designs across space, and their persistence through time, that are documented by archeological research and the testimony of living descendants of the Chacoans

- Chaco Culture Archaeological Protection Sites Program
- The regional scale of the Chacoan culture system
- The geographic setting that limited, shaped, and enabled the cultural expression achieved by the Chacoan people
- The social complexity—ceremonies, icons, community, and monumental scope—of the Chacoan culture that is revealed through the great houses

**Other important resources and values:**

- Other Chacoan outlier sites (those sites related to Chaco but not identified in the 1980 and 1995 legislation).

**Significance Statement:** The monumental structures known as Chacoan great houses are among the best preserved, largest, and most complex buildings constructed in North America until the late 19th century. Several sites found within the park are formally recognized as archeological “type sites” by the scientific community.

**Fundamental resources and values:**

- Planned, engineered, designed, and constructed masonry great houses such as Pueblo Bonito, Chetro Ketl, Peñasco Blanco, and others, both excavated and unexcavated.
- Type sites are often the first or foundational site discovered about the culture they represent. They contain artifacts found in association with one another that are representative or typical of that culture. Type sites such as Shabik’eshchee Village (Basketmaker III) are found at Chaco Canyon.
- Preservation of the original fabric of great houses and other site types for continued research, continued Indian tribe use, and continued education.

**Significance Statement:** Since the 1880s, scientific research in the park has yielded a systematic record of the environment and lifeways of the region’s former inhabitants. This research has resulted in a valuable collection of millions of objects, records, and samples that are curated to further scientific inquiry, public education, and preservation of shared heritage. Research through time continues to reveal connections between Chacoan civilization and present day cultures.

**Fundamental resources and values:**

- The Chaco museum collection including scholarly reports, unpublished manuscripts, field records, and the park’s archeological holdings from the Anasazi era (complete prehistoric ceramic vessels, stone projectile points, bone tools, ground stone tools, prehistoric construction beams, and a wide variety of effigies and ornaments, as well as bulk collections of ceramics, lithic artifacts, fauna, soil, and pollen samples.
- Chaco-related museum collections held by others.
- The ability to continue to contribute to the existing knowledge base related to the Chacoan civilization.

**Other important resources and values:**

- Partnerships with other research institutions that hold Chacoan-related collections and manuscripts such as The University of New Mexico, School for Advanced Research, American Museum of Natural History, and Smithsonian Institution.

**Significance Statement:** Contemporary Indian tribes, some of whom are descended from the Chacoans, refer to Chaco Canyon and its features in their traditional histories and migration stories. Some tribes regard the canyon as sacred ancestral land. The



descendants of Chacoan people remain connected and committed to Chaco Canyon through ongoing traditions. Members of at least 25 American Indian tribes continue to advise and take an active stewardship role in the park today.

**Fundamental resources and values:**

- Inhabitants of Chaco have not vanished, disappeared, or abandoned the area. They are alive and well and living in present day Pueblos and other Indian communities, conducting rituals and ceremonies—some of which are derived from Chaco.
- Cultural connections between the Chacoan people and modern Indian tribes that provide visitors with a unique understanding of continuity of culture, history, spirituality, and ongoing traditional values.

**Significance Statement:** The solitude, natural quiet, remote high desert environment, and minimal park development allow the visitor an unparalleled opportunity to stand among the ruins and imagine the activity that occurred during the height of the Chacoan occupation. The area is highly valued for its intrinsic spirituality.

**Fundamental resources and values:**

- The physical surroundings that enfold the visitor, conveying both the vast immensity of the San Juan Basin and the busy intimacy of “Downtown Chaco.”
- A century of research that allows the park to bring human stories—and enigmas—to the silent, though awe-inspiring remnants of human activity placed so deliberately in and around the canyon.
- Intertwined with natural and cultural resources and scenery are opportunities to understand Chaco

Canyon through personal experience and enjoyment of its scale and attributes.

- Solitude, natural sounds, sandstone cliffs, natural events, landscape, and remote sites that are integral for visitor understanding of Chaco Canyon.

**Significance Statement:** The dark night sky provides visitors with an opportunity to make astronomical observations and understand the same sky the Chacoans observed and incorporated into their landscape, buildings, and culture.

**Fundamental resources and values:**

- The ability to view the dark night sky including the stars, moon, and other celestial bodies, and to track the sun’s movement through the daytime sky.
- Chacoan people constructed buildings, such as Casa Rinconada and Sun Dagger on Fajada Butte, to align with astronomical and celestial occurrences, which give us a sense of the complexity and sophistication of the Chacoan culture.

**Significance Statement:** Chaco Canyon is the cradle of Southwest archeology. Pioneering exploration and study conducted in Chaco Canyon helped shape the discipline and the legal foundations for historic preservation in the United States.

**Fundamental resources and values:**

- The body of knowledge and collections from Chaco Canyon that has resulted from the study of more than 120 years of investigation—examples range from stratigraphy to Paleo-environmental investigations to use of remote sensing on archeological sites.
- The history of Southwest archeology and preservation is linked to Chaco

Canyon through historical figures such as Richard Wetherill, Edgar Lee Hewett, A. E. Douglass, and Gordon Vivian.

- Chaco is the laboratory for developing and testing archeological and preservation methods and techniques. The history of the archeology in Chaco Canyon shaped and mirrors the development of American archeological method and theory and is still developing.

**Other important resources and values:**

- Partnership with The University of New Mexico (see above).

**Significance Statement:** As one of the rare protected natural areas in the San Juan Basin, the park serves as a reference site for ecological and geomorphic processes and offers opportunities to conserve the region's biodiversity and monitor its environmental quality.

**Fundamental resources and values:**

- The park is the largest area closed to grazing in the New Mexico portion of the Colorado Plateau. As such, it serves as an ecological reference site for plant community and soil recovery. Many of these recovered plant species were used by the Chacoans and continue to be used today.
- Chaco Wash provides one of the few examples, if not the only example, of a properly functioning ephemeral riparian system.
- Chacoans used natural hydrological processes and flows coupled with landscape manipulation to provide water for their uses.

**Other resources and values:**

- Research on the newly established elk herd at Chaco Canyon is providing new information on the

population dynamics and impacts of large wild ungulates in arid ecosystems.

## **SPECIAL MANDATES**

The following special mandates, agreements, and administrative constraints are specific to Chaco Culture National Historical Park.

**Protection of Chacoan-related Sites and Resources.** Public Laws 96-550 and 104-11 provide direction and authority for the protection of Chacoan-related archeological sites and resources that remain in private ownership through land acquisition or the use of cooperative agreements.

**Surface Protection of Archeological Sites.** Public Law 96-550 directs that activities that would endanger the upper surface of archeological protection sites are not permitted; however, nothing prohibits subsurface mineral exploration or development that does not affect the upper surface of the sites.

**Notice of Federal Undertaking.** Public Law 96-550 requires that heads of federal agencies that have jurisdiction over archeological protection sites must, when initiating a federal undertaking, provide the Secretary of the Interior with a reasonable opportunity to comment on the project and its effects on the sites. The federal agency must also seriously consider these comments.

**Assistance to the Navajo Nation.** Public Law 104-11 directs the National Park Service to assist the Navajo Nation with protection and management of Chacoan sites on land owned by the Navajo Nation, including the development of a Navajo facility that would promote appreciation of the sites.

## SERVICEWIDE LAWS AND POLICIES

Many park management directives are specified in laws and policies guiding the National Park Service and are therefore not subject to alternative approaches. For example, there are laws and policies about managing environmental quality (such as the National Environmental Policy Act, the Clean Air Act, the Endangered Species Act, and Executive Order 11990 “Protection of Wetlands”); laws and policies governing the preservation of cultural resources (such as the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, and the American Indian Religious Freedom Act); and laws about providing public services (such as the Architectural Barriers Act)—to name only a few.

In other words, a general management plan (GMP) or GMP amendment is not needed to decide that it is appropriate to protect endangered species, control nonnative species, protect historic and archeological sites, conserve artifacts, or provide for access for persons with disabilities. Laws and policies have already decided those and many other things for us. Although attaining some conditions set forth in these laws and policies may have been temporarily deferred in the park because of funding or staffing limitations, the National Park Service will continue to strive to implement these requirements with or without a new GMP amendment.

The alternatives in this GMP amendment provide guidance on how the park will comply with servicewide laws and policies, and they address aspects of management that are not mandated by law and policy and that must be determined through a planning process.

There are other laws and executive orders that are applicable solely or primarily to units of the national park system. These include the 1916 Organic Act that created the National Park Service; the General Authorities Act of 1970; the act of March 27,

1978, relating to the management of the national park system; and the National Parks Omnibus Management Act (1998).

The NPS Organic Act (16 *United States Code* [USC], Section 1) provides the fundamental management direction for all units of the national park system:

*[P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations . . . by such means and measure as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.*

The National Park System General Authorities Act (16 USC Section 1a-1 et seq.) affirms that while all national park system units remain “distinct in character,” they are “united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage.” The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Further, amendments state that NPS management of park units should not “derogate . . . the purposes and values for which these various areas have been established.”

Section 12 of the National Park System General Authorities Act, P.L. 91-383, requires that units of the national park system complete general management plans and that the plans include “identification of, and implementation commitments for, visitor carrying capacities” (also known as user capacity). The National Park Service defines user capacity as the types and levels of visitor use that can be accommodated while sustaining the quality of park resources and visitor experiences consistent with the purposes of the park. Managing

user capacity in national parks is inherently complex and depends not only on the number of visitors, but also on where the visitors go, what they do, and the “footprints” they leave behind. In managing for user capacity, the park staff and partners rely on a variety of management tools and strategies, rather than relying solely on regulating the number of people in a park area. In addition, the ever-changing nature of visitor use in parks requires a deliberate and adaptive approach to user capacity management.

Several federal laws require special treatment of archeological resources. The Antiquities Act of 1906 provides for the protection of historic and prehistoric ruins and objects of antiquity located on federal lands. The Archeological and Historic Preservation Act of 1974 specifically describes protective or planning measures that must be carried out when archeological data might otherwise be irreparably lost or

destroyed through construction activities or federally licensed activities. The Archaeological Resources Protection Act of 1979 describes prohibited activities and corresponding law enforcement actions that can be taken against offenders. The act also includes regulations for excavation and removal of artifacts. NPS Director’s Order 28A: *Archeology* provides management frameworks and guidelines for undertaking activities both within and outside of the National Park System that may affect archeological resources. NPS Director’s Order 75A: *Civic Engagement and Public Involvement* clarifies and encourages NPS responsibilities to engage the public in a variety of activities including the protection and preservation of cultural resources. The National Park Service also has established policies for all units under its stewardship. These are identified and explained in a guidance manual entitled *NPS Management Policies 2006*.

## PLANNING ISSUES

Planning issues define conflicts, problems, and opportunities regarding the management and use of Chaco Culture National Historical Park. Defining these issues is an important step in developing alternatives for the GMP amendment. Development of these alternatives allows the planning team to explore different strategies for addressing these issues in the context of the park's purpose, significance, and fundamental resources and values.

The general public; local, state, and federal agencies; NPS staff; and organizations identified several planning issues during scoping (early information gathering). The following provides a summary of the planning issues identified during internal and public scoping. The issues are organized by the three primary management topics that are part of the general management plan amendment—resource protection, visitor opportunities and experience, and park operations. The issue of climate change has also been included in this section because it is an emerging, long-term issue that the park will face throughout its future.

The issues are focused on current impacts from visitor use, along with potential impacts resulting from changes in future visitation patterns to the park. These changes are expected because of a number of external factors, which are further described under the cumulative impacts section in chapter 4. The factor that is most likely to affect change is the potential improvement of CR 7950 by San Juan County, which would make access to the park easier for a larger number of visitors. Other less significant factors that may have some influence on visitation patterns include (1) reconstruction of the park's visitor center; (2) the creation of the Chaco "America the Beautiful" quarter; and (3) World Heritage site touring.

The action alternatives in this plan provide strategies for addressing these issues within the context of the park's purpose, significance, and other aspects of the foundation for planning and management. The environmental analysis (chapter 4) provides a means of measuring the alternatives' effectiveness in addressing these issues.

## RESOURCE PROTECTION

The setting of Chaco Canyon allows visitors an unparalleled opportunity to experience the park's primary archeological sites and imagine the activity that occurred during the height of the Chacoan occupation. The park's remote high desert environment, the natural soundscape, dark night sky, and undeveloped scenery also contribute to the uniqueness of the area that is so highly valued by visitors. This setting faces both internal and external threats from (1) increases and changes in visitation, (2) regional population growth and development, and (3) energy exploration and development on adjacent lands.

Ongoing and anticipated increases in park visitation could exacerbate existing impacts and threats to cultural resources. Some visitors are not following the rules of visitor etiquette identified in park messages and materials, resulting in inappropriate behaviors such as walking on or touching walls, straying off designated paths, leaving personal objects at the park's cultural sites, and removing or displacing small artifacts found in the park. Other ongoing threats to cultural resources include vandalism on rock art panels and the introduction of exotic materials, principally human ashes, which requires removal methods that inevitably further degrade the condition of the archeological resources.

Inadvertent wear on all cultural resources has involved several incidences of wear leading to the total collapse of masonry walls in Chaco's great houses. An example of such an incident involved a kiva wall in the Chetro Ketl complex where visitors repeatedly stood next to the kiva wall to gain better views, despite park signage and information requesting visitors to stand back from the wall. Over time the repeated wear from visitors standing directly adjacent to the kiva's wall caused the wall's stone masonry to become weakened and the wall collapsed.

Aspects of the cultural resources' integrity, such as the setting, feeling, association, location, and materials, are critical to the resources' historic significance as well as their cultural, scientific, and educational values. Human use that results in the disturbance or loss of these resources will diminish the ability to understand and interpret the values of these fundamental resources. Sites that have high levels of visitation have had substantially more instances of disturbance or loss than other, less visited sites. This exacerbates the fragile nature of the sites open for visitation, none of which is assessed to be in good condition.

Lack of roving staff at the sites and the limited regulation of visitor access within and around sites, in groups or otherwise, is affecting management's ability to monitor and protect cultural resources during periods of heavy visitation. It is expected these impacts could get worse with future changes in visitation patterns. In total, these current management practices lead to greater degrees of general wear and tear and both intentional and unintentional disturbance to park resources.

The existing general management plan states that the park's major archeological sites can sustain virtually unlimited use. With increased knowledge over time about the fragility of the sites and associated resources, this statement is now unsupported and easily refuted by archeologists, including NPS cultural resource staff. The plan amendment

needs to more adequately address existing and potential visitor impacts to park resources; how increases and changes in visitation could further affect them; and strategies to ensure that unacceptable impacts do not occur.

There are also potential threats to the park's resources and views as a result of regional population growth and associated development and energy exploration. The National Trust for Historic Preservation named the Greater Chaco Landscape (north of the park) on their 2011 Most Endangered Historic Places list because they believe that the prehistoric roads and Chacoan sites outside of the park boundary are in jeopardy because of landscape level changes, particularly increased oil and gas exploration and extraction. The plan amendment provides an opportunity to better understand these external threats to the park's setting; however, the focus of the planning effort is to more adequately address visitor impacts to the park's primary archeological sites.

## **VISITOR OPPORTUNITIES AND EXPERIENCE**

The 1984 general management plan does not adequately address visitor use management in order to manage for potential increases and changes in the type of visitation. A strategic management approach is needed so that the park's fragile cultural resources are protected and also that the visitor experience at Chaco is not sacrificed—an experience that is unique in that visitors are allowed to freely and independently visit the park's world renowned, yet fragile cultural resources.

Maintaining the feel of Chaco, with low levels of use and limited visitor facilities and services, allows visitors to forge individual connections with park resources and is critical to the area's significance as a World Heritage and national park site (Getty



Conservation Institute 2003). During recent visitor survey and public scoping efforts, visitors specifically commented that they value the current opportunities to experience solitude and natural quiet in a remote high desert environment with minimal park development (Freimund 2010). These values have held constant, as demonstrated in visitor studies in 1992 and 1993 (Lee and Stephens 1995). Many visitors have also commented on how much they value the unparalleled opportunity to stand amongst the ruins and imagine the activity that occurred during the height of the Chacoan occupation (Freimund 2010; Lee and Stephens 1995). Further, visitors have noted that the area is highly valued for the conditions that promote natural quiet, low use levels, and close contact with park resources. Keeping distractions to a minimum is important for fully appreciating the values of Chaco (Getty Conservation Institute 2003). These values are important in supporting the park's purpose, significance, and related desired conditions. Therefore, crowding and conflicts have been identified by park staff and the public as potential concerns resulting from changes in visitor use levels and patterns because of heightened awareness of the park and paving a portion of CR 7950. In particular, there is concern that increasing use levels, specifically increasing numbers of people at one time at the primary attraction sites, will detract from the most highly valued aspects of visitors' experiences.

To better understand the likely impact of the road paving proposals by San Juan County, the planning team evaluated and used visitor use projections and data contained in several studies and reports commissioned by the National Park Service, the Upchurch reports (2005 and 2008) and a report by David Evans and Associates (2009). These studies evaluated the potential for changes in the types and volume of visitor use to the park that could result from the improvement of CR 7950.

If the 13-mile section of dirt road were to be paved completely, the park could expect an

initial 12% increase in base visitation for the three years immediately following the road improvements; then the visitation would level off to pre-improvement levels, but at a higher overall visitation rate because of the initial 12% increase (David Evans and Associates 2009). The growth rate is based on the growth in recreational visitation previously experienced at the park with the change in the north access, plus the additional tour bus arrivals expected with full road improvements. With no roadway improvements, the peak monthly visitation in 2029 would likely reach an estimated 6,800 visitors. With full roadway improvements, the peak monthly visitation is estimated to increase to approximately 9,200 visitors (David Evans and Associates 2009).

A proposal had been made that only the initial 4.4 miles of the entire 13-mile section of dirt road be paved. If this proposal were to be enacted, the wash area would still be difficult to pass on the dirt road portion and thus still act as a barrier to many large vehicles (e.g., buses). An increase in visitation would still be expected with this scenario, but would be much lower than if the entire roadway was paved. With only partial roadway improvements on CR 7950, it is estimated that the peak monthly visitation would increase to approximately 7,200 visitors by 2029 (David Evans and Associates 2009). The National Park Service does not have control over the proposed road paving by San Juan County, so it is important to consider proactive management strategies that may be needed in the event the road is paved and visitation patterns change. Finding ways to protect resources and the visitor experience, as it has been for the last 100 years, is a key planning issue for this GMP amendment.

## **PARK OPERATIONS AND FACILITIES**

The park's infrastructure cannot accommodate large numbers of visitors, especially when large numbers of visitors arrive simultaneously (e.g., tour buses). This

is because the number of restrooms is limited, parking lots are small, and demand can easily exceed the capacity of the park's potable water and wastewater systems. The limited number of park staff can also be easily overwhelmed by large numbers of visitors, which can impact the visitor experience and result in resource damage. Much of the park's infrastructure cannot be expanded because of the risk of disturbing the high density of cultural materials found in situ throughout the park. This inability to expand also applies to park housing; this constrains the park's ability to increase staff. The plan amendment needs to consider these operational and facility limitations when developing strategies to address potential changes in future visitation patterns.

## CLIMATE CHANGE

Climate change refers to any significant changes in average climatic conditions (such as average temperature, precipitation, or wind) or climatic variability (such as seasonality or storm frequencies) lasting for an extended period of time (decades or longer). Recent reports by the U.S. Climate Change Science Program, the National Academy of Sciences, and the United Nations Intergovernmental Panel on Climate Change (IPCC 2007) provide clear evidence that climate change is occurring and will accelerate in the coming decades.

In accordance with Executive Order 13423 and Secretarial Order 3289, this planning effort seeks to understand the potential impacts of climate change and develop effective strategies to manage them. Because climate change is a long-term issue that will affect the park beyond the scope of this general management plan amendment, this planning effort is intended to lay the initial groundwork to address climate change issues. In developing this planning document, three key questions were asked:

1. What would be the contribution of the alternatives to climate change, as indicated by the amount of greenhouse gases that would be emitted under each alternative (i.e., carbon footprint)?
2. What are the potential impacts of climate change on the park's resources?
3. What management principles could the park adopt to reduce greenhouse gas emissions and the impacts of climate change on climate-sensitive resources, and how does the best available science inform planning for climate change as it relates to visitor health?

Regarding the first question, it has been determined that the management alternatives described in this document would generate only a negligible amount of greenhouse gases that contribute to climate change. Therefore, this impact topic has been dismissed from detailed analysis. See the section titled, "Carbon Footprint" under the "Impact Topics Considered but Eliminated from Detailed Analysis" portion of chapter 3 for more information.

Regarding the second question, climate change has the potential to alter resource conditions in many different ways at Chaco Culture National Historical Park, but the type and intensity of these changes is still uncertain. Much depends on how much temperature will rise before the effects of climate change diminish the quality of park resources. The potential influences of climate change are described under select resource topics described in chapter 3. These include archeological resources, cultural landscapes, and the visitor experience.

Regarding the last question, this document provides scientific-based management principles to help guide park managers in addressing future climate change impacts on park resources and visitors and to reduce greenhouse gas emissions. These principles are described under the action alternatives in chapter 2.

## RELATIONSHIP OF THIS PLAN AMENDMENT TO OTHER PLANNING EFFORTS

**General Management Plan (1984).** The 1984 general management plan for Chaco Culture National Historical Park provides direction for long-term management of the park. Much of the 1984 plan is still valid and in effect, including general measures for the protection of resources, indications of the types and general intensities of development, and potential boundary adjustments. This current planning effort, the GMP amendment, will not undo or replace the 1984 plan, but rather will build on the guidance provided in that plan by adding a more specific visitor use management planning component to it.

**Resource Management Plan (1995).** This plan provides an overview of the park's natural and cultural resources and the park's resource management program. It contains management objectives and strategies for natural and cultural resource management.

The resource management plan was reviewed for the GMP amendment planning effort, particularly as it contains express goals and objectives (similar to desired conditions) for resources that the planning team was striving to achieve with respect to minimizing or eliminating adverse impacts from visitor use. The 1995 *Resource Management Plan* remains valid and in effect.

**Backcountry Management Plan (1984).** The backcountry management plan provides direction on appropriate uses in the park's backcountry, including trail use, off-trail use, closures, and use limits. Backcountry sites and lands within the park are defined as those that are not attached by the primary loop road. The plan also contains an implementation and monitoring program as well as standards for trail construction, maintenance, and signage in the

backcountry. This plan was evaluated by the planning team for specific guidance on backcountry uses and the management of detached units and outliers. The 1984 backcountry management plan remains valid and in effect.

**San Juan County's County Road 7950 Road Improvement Project.** This project, led by San Juan County and funded by the Federal Highway Administration, was initiated in 2007. The project, and its accompanying draft environmental assessment, evaluates several alternatives for improving CR 7950 to improve public travel and safety. The project plan/environmental assessment has not been completed.

CR 7950 is the primary access road into Chaco Culture National Historical Park. Potential changes in the condition of the road and the type of access it provides to the park could have impacts on the park's resources and on visitation and visitor experience. The National Park Service not only evaluated the information contained in the county's draft environmental assessment, but also evaluated and used visitor use projections and data contained in several studies and reports commissioned by the National Park Service: the Upchurch reports (2005 and 2008) and a report by David Evans and Associates (2009). These studies evaluated the potential for changes in the types and volume of visitor use to the park that would result from the improvement of the park's entrance road (CR 7950). The management strategies and systems included in the action alternatives of this GMP amendment would provide the National Park Service with the guidance and tools it needs to respond to potential changes in the type and levels of visitation.

**Visitor Use and Experience Study (2010).**

The National Park Service, in partnership with The University of Montana, initiated a study to obtain data on visitors to the park and their opinions about certain aspects of park management. The survey project was designed to gather information that would help park managers better understand the public's values and preferences about the park and assist in the development of this plan amendment. The survey was administered to park visitors during the

summer and fall of 2009. The survey was conducted at several locations throughout the park over the course of four weeks during the months of July and October. A total of approximately 500 people participated in the survey: 350 in the summer and 150 in the fall. Data and conclusions from this study are referenced and included in this plan and assisted the planning team in the development of alternatives and the selection of the preferred alternative.



# CHAPTER 2



**THE ALTERNATIVES**





# INTRODUCTION

## OVERVIEW

The purpose of the general management plan amendment is to establish management systems and thresholds whereby Chaco Culture National Historical Park can proactively respond to changes in visitor use and preserve its unique resources and visitor experiences. Because there are different approaches to achieving this purpose, the planning team investigated a range of possible management alternatives. This chapter describes each of these alternatives, how they were developed, and the alternative preferred by the National Park Service.

In addition to the no-action and action alternatives, including the preferred alternative, this chapter also includes management components that are common to all action alternatives. These include (1) visitor use management goals, objectives, and select strategies; (2) indicators and standards; (3) mitigative measures; and (4) management strategies to address climate change. The environmentally preferable alternative and alternatives considered but dismissed are also described. Two summary tables are included at the end of the chapter. The first table summarizes key differences among the alternatives. The second summarizes how the alternatives meet the purpose and need for the plan, along with the associated key impacts of the alternatives based on the analysis presented in “Chapter 4, Environmental Consequences.”

## DEVELOPMENT OF THE ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

The planning team relied on the park’s previous planning documents for guidance in developing the alternatives. These include

the park’s *Foundation for Planning and Management* (2007), *General Management Plan* (1984), *Resource Management Plan* (2003), *Backcountry Management Plan* (1989), and *Collections Management Plan* (2005). Combined, these documents provide clear direction about the kind of place the park should be—its overall character in terms of emphasis on particular kinds of resource conditions and visitor experiences. These desired conditions formed the basis for the visitor use management goals and objectives presented in this chapter—which all of the action alternatives are designed to achieve.

The action alternatives were also developed to address the planning issues described in chapter 1. This is an important aspect of the planning process, because these issues constrain the park’s ability to achieve the visitor use management goals and objectives—and ultimately the desired conditions for the park.

The final factor that played an important role in the development of the alternatives is public input received during scoping. The public scoping process, which also included a comprehensive visitor survey, helped the planning team understand the public’s values and preferences while visiting the park, as well as their concerns, issues, and suggestions related to the planning effort. The main ideas reflected in the comments showed concern for cultural resource preservation, increasing visitor education and interpretation opportunities, options for managing visitor use, and preferences for their visitor experience.

Once the visitor use management goals and objectives were established, the planning team developed a range of strategies to meet each goal and objective. Many of these strategies did not lend themselves to varying by alternative and most are considered best

practices for managing visitor use. These strategies are common to all action alternatives (see section titled “Common to All Action Alternatives”) and would be implemented regardless of which alternative is identified as the agency’s preferred management approach.

The planning team identified three categories of visitor use management strategies: visitor knowledge, group management, and individual visitor access that could be approached in different ways. This process allowed the team to explore a range of reasonable management options, which in the end, led to the development of three distinct action alternatives. These three categories of visitor use management strategies provide the organizing principle to each of these alternatives and include the following:

***Visitor Knowledge—ways to educate visitors about park resources and compliance with desired behaviors.***

This category of strategies aims to promote a high-quality visitor experience and ensure resource conditions are maintained by educating visitors on the importance and sensitivities of park resources and associated rules and regulations. The intent is to make visitors aware of the sensitive nature of park resources and the measures taken to preserve the park in its current state. Providing visitors with this information can increase visitor understanding, encourage behavior that results in less impact, and redirect visitation from heavily used areas.

Multiple modes of educational contact (e.g., signs, brochures, media and rangers), particularly personal contact, are most effective in cultivating understanding of the values of an area and reducing incidences of impacting behaviors (Roggenbuck 1992; Littlefair and Buckley 2008). It is also important to convey messages more than once, including prior to arrival at the area, and to consider the audience when developing key messages (Burn and Winter 2007). It has also been recommended that educational interventions should occur in

close spatial and temporal proximity to the behavior of concern (Chandool 2007). Education can often help reduce visitor impacts by modifying behavior, avoiding the need for additional, more restrictive visitor use management actions. This strategy also helps maintain individual choice and freedom, an important quality of the visitor experience (Wirsching et al. 2003).

***Group Management—ways to manage groups of visitors (i.e., number, size, and distribution) and their influence on resources and the overall visitor experience.***

This category of strategies aims to manage the distribution and size of large organized groups (more than 20 people) in order to provide high quality group opportunities, while avoiding conflicts with individual visitors and impacts to resources. Multiple large groups in any one area of the park at one time can detract from visitors’ ability to learn about important resources, explore the sites at an unfettered pace, and enjoy a peaceful setting (Freimund 2010). In addition, high levels of use at any one time at a site, which can result from pulses of activity associated with large groups, may cause excessive wear and unintentional damage to resources. Managing the distribution and size of groups that enter the park would help to maintain the current visitor experience and minimize the need for increasingly more site-hardening treatments to sustain use.

***Individual Visitor Access—ways to manage individual visitors (i.e., access, use levels, and redistribution) and their influence on resources and the overall visitor experience.***

This category of strategies aims to manage the number and distribution of individual visitors in order to maintain the high level of visitor freedom and independence at Chaco, and minimize the need for additional site-hardening treatments to sustain use. Some form of access regulation may be necessary in the future to control the intensity of visitor use if resource conditions and visitor



experiences are being affected by changes in visitation. Reservation systems or queuing techniques would allow for equitable distribution of opportunities among all interested parties while supporting protection of desired conditions. The primary distinction between the three action alternatives is the spatial and temporal scales at which these three strategies would be implemented. Alternative 2 applies these strategies at a parkwide, year-round scale. Alternative 3 applies them parkwide, but only during the peak visitor use season. Alternative 4 applies them year-round at select sites within the park. Another key distinction between the alternatives is which strategies would be implemented immediately versus those that would be implemented in the future depending on the occurrence of certain changes in visitor use and resource conditions.

In some cases, the alternative management strategies include the implementation of a reservation system to respond to changes in visitor use levels and patterns. Appendix A provides guidelines on how a future reservation system would be implemented, given known and expected use patterns and infrastructure and staffing limitations. If and when a reservation system is determined to be needed by park staff, given monitoring results and changes in visitation, these guidelines should be reaffirmed to determine if the current assumptions are still valid, or if any changes are needed to improve the effectiveness of the system.

Once the action alternatives were developed, they were then compared to the no-action alternative, which is the continuation of the park's current visitor use management approach. The no-action alternative is included as a baseline against which to compare the effects of the action alternatives. The no-action and three action alternatives are described in detail for the three categories of strategies described above.

Identification of the National Park Service's preferred alternative involved evaluating the

action alternatives through the use of an objective analysis process called "choosing by advantages." Through this process, the planning team identified and compared the relative advantages of each alternative according to a set of factors that were based on the visitor use management goals and objectives, the planning issues, and the purpose and need for the plan identified in chapter 1. These factors include the following:

- **Factor 1**—Do the strategies maintain visitors' freedom of choice and flexibility while visiting the park?
- **Factor 2**—Do the strategies minimize visitor crowding and promote visitors' close contact with park resources?
- **Factor 3**—Do the strategies ensure the public's ability to access the park?
- **Factor 4**—Do the strategies adequately protect and preserve the park's cultural resources?
- **Factor 5**—Are the strategies easy to monitor and manage and do they improve the park staff's ability to respond to visitor and resource needs?

The relationship between the advantages and costs of each alternative was also established. This information was used to identify the alternative that gives the National Park Service and the public the greatest advantage for the most reasonable cost.

The results of the "choosing by advantages" process identified alternative 2 as the agency's preferred alternative. This alternative provides the best combination of strategies to protect the park's unique visitor experiences and cultural resources, while improving the park's operational efficiency and effectiveness.

## VISITOR USE MANAGEMENT GOALS AND OBJECTIVES

The following set of visitor use management goals and objectives were developed to help direct the identification of the visitor use management strategies needed to achieve the desired resource conditions and visitor experiences for the park, while addressing the planning issues.

**Goal 1.** Protect resources in a manner that preserves their integrity and keeps them undisturbed, intact, and authentic while promoting visitor understanding of the context of the park's broader setting—now and in the past.

- *Objective 1*—Limit preservation treatments that result from visitor use (i.e., intervention to repair cultural sites damaged by visitors).
- *Objective 2*—Limit visitor impacts to resources (e.g., stealing artifacts, vandalizing petroglyphs and architecture, walking on walls, causing erosion, creating informal trails, adding graffiti, and establishing memorializations).
- *Objective 3*—Ensure a robust understanding of the resources to better protect them.
- *Objective 4*—Select preservation treatments that are appropriate for sites open to visitors.
- *Objective 5*—Maintain the undisturbed, undeveloped setting of the park.

- *Objective 6*—Manage visitor use within the footprint of existing park infrastructure and capacity.

**Goal 2.** Facilitate visitor experience and knowledge in a way that provides for close contact with resources and safe and independent learning in an undisturbed setting with only limited services. Visitors would be able to independently experience the setting (e.g., clear skies, remoteness, pristine viewsheds, natural sounds, and sacredness) while making a connection to the Chacoans and their descendants. Visitor access would be managed sustainably so that access and preservation remain compatible and complementary.

- *Objective 1*—Minimize crowding and conflict between visitors.
- *Objective 2*—Provide a range of opportunities to optimize visitor independence and knowledge.
- *Objective 3*—Provide visitors with an understanding of the resources and encourage visitor stewardship for the resources.
- *Objective 4*—Recognize the relationships between people and this place.

## ACTIONS COMMON TO ALL ACTION ALTERNATIVES

The following set of visitor use management strategies, indicators and standards were developed to achieve the goals and objectives for visitor use management, along with the desired resource conditions and visitor experiences for the park. These primary management components are common to all action alternatives. As stated earlier, many of the strategies listed below are best management practices that do not lend themselves to varying by alternative. Other visitor use management strategies that can be approached differently are incorporated into the three action alternatives presented later in this chapter.

A set of indicators and standards that are common to all action alternatives has also been developed that would allow the park to monitor visitor use and resource conditions in order to more effectively achieve the management goals and objectives. The indicators serve as measurable variables that are monitored to determine whether the park's desired conditions are met. The standards are minimum acceptable conditions and serve as "triggers" for management actions outlined in the alternatives.

Mitigative measures (to lessen the intensity of any adverse impacts on park resources resulting from the alternatives) and management strategies to address climate change are also common to all action alternatives. These components are presented toward the end of this chapter.

### COMMON TO ALL VISITOR USE MANAGEMENT STRATEGIES

Some visitor use management strategies were developed that would be common to all the action alternatives to help achieve the goals and objectives listed above. Many of

these strategies are considered "best practices" for visitor use management. They would be implemented as necessary to enhance the more specific strategies described in the different action alternatives.

### Visitor Access Strategies for Cultural Sites with Preservation Treatments

Some cultural sites within the park have been prepared (hardened and stabilized) for visitation. These sites would continue to be regularly maintained and monitored by professional archeologists and trained technicians using appropriate preservation treatments. While visitors would have access to these sites, visitation would be managed in a manner that limits impacts to the resources. Certain areas within sites may be temporarily or permanently closed to visitors for the purposes of protecting fragile resources.

Specific management strategies would include the following:

- Clearly mark trails to guide visitors through cultural sites, using strategically placed low visual barriers and signs.
- Evaluate cultural sites to ensure visitation is appropriate for the treatment level the sites have received.

### Visitor Access Strategies to Backcountry Cultural Sites without Preservation Treatments

Backcountry sites and lands within the park are defined as those not attached by the primary loop road. Some backcountry sites that have not been prepared (i.e., hardened and stabilized) for visitors are very sensitive to impacts associated with visitor use levels

and certain visitor behaviors. These sites remain closed to visitor use. In the future, these sites may be evaluated, on a case-by-case basis, for limited and controlled visitor access. If access was deemed appropriate, visitor use management strategies related to the amount, timing, and type of visitor use would be employed to ensure long-term protection of these important resources.

The following strategies would be considered if sites were to receive any use. These strategies are similar to current management policies at Shabik’eshchee Village, a large Basketmaker pithouse village located in the backcountry about 6.8 miles southeast of Pueblo Bonito. These strategies were developed because of the fragile nature of the resources and an increasing amount of interest for visitation to the site. These strategies have proven to help minimize impacts associated with visitor use at this type of backcountry cultural site (*Shabik’eshchee Village Carrying Capacity Evaluation* 2008).

- A special use or research permit would be required at all sites.
- Research would be permitted only if it is specifically related to the site.
- Special use permits would be permitted only for groups with specific knowledge of site significance and when accompanied by on-duty trained uniformed ranger.
- The permitted group size would be fewer than 10, including accompanying ranger.
- The permitted groups would be at a rate of no more than one per month and a total of no more than 100 people per year.
- Park staff access to these sites would be allowed via permission of the superintendent and counted as part of the yearly visitation total.

- Barriers and signs would be installed at access points to exclude casual access.
- Visitor and administrative access to these sites would be documented to track compliance.

## Outreach Strategies

These strategies would establish partnerships and conduct outreach to improve understanding of and experiences in the park and to elicit help in preserving the unique qualities of Chaco.

Specific management strategies would include the following:

- Establish partnerships with tribes and other outside entities to offer more diverse visitor services (e.g., interpretive programs).
- Work with tribes and other outside entities to limit encroaching development and other external impacts near or adjacent to the park.
- Promote outreach with surrounding communities (e.g., “meet the ranger” programs).
- Encourage visitor services (e.g., campgrounds) to be provided outside the park.
- Improve materials to highlight partnership efforts.
- Increase outreach efforts with local schools.
- Increase outreach efforts to diverse audiences to increase their awareness of the park and its resources.

## Preservation Strategies

These strategies develop, promote, and staff programs and related activities to minimize impacts on park resources.

Specific management strategies would include the following:

- Complete condition assessments and vulnerability assessments to document the status of cultural resources. Develop a site categorization system based on these results.
- Complete a cultural landscape report to help staff better manage the cultural landscape.
- Promote research of open cultural sites and incorporate findings into interpretive materials. Examples include the documentation of architecture, conditions, integrity, and authenticity.
- Conduct cross-training among divisions of park staff to promote integrated resource and visitor use management.
- Provide staff training of preservation techniques.
- Catalog and produce finding aids for archival collections that are available to researchers.
- Continue working with the Getty Conservation Institute to develop new techniques for stabilizing cultural sites.

Additionally, park staff would be focused on maintaining and improving (where possible) the integrity and condition of all sites to a standard of at least “good” condition and monitor the sites in keeping with the requirements of the NPS archeology program. All of the archeological sites would be regularly inspected, monitored for condition, and their condition recorded in the Archeological Sites Management Information System and List of Classified Structures. Treatment protocols would continue to be followed and the appropriate indicators of visitor use would be noted to deal with visitor and other impacts to the archeological sites. The primary cultural sites in the canyon, such as Pueblo Bonito

and Casa Rinconada, would continue to be stabilized and maintained in good condition.

## **Education Strategies**

These strategies would educate visitors about the significance and fragility of park resources and the appropriate types of behavior that would avoid impacts to those resources.

Specific management strategies would include the following:

- Promote the integration of cultural resource knowledge into interpretive programs. An example includes the interpretation of preservation treatments for visitors to better understand the importance of this work.
- Improve park orientation and informational materials (e.g., brochures, videos, and website) for visitors, including pre-trip planning information. Key messages related to the sensitivities of park resources, the uniqueness of the visitor experience, and associated rules and regulations should be integrated into pre-trip and on-site information sources.
- Educate visitors about the rationale for certain management decisions, such as why visitor services are limited and why certain sites may be temporarily closed within the park.
- Consider the audience when developing educational messages. This includes providing information in multiple languages.
- Provide clear instructions about appropriate visitor behavior to avoid impacts to cultural sites. Provide information that helps visitors better understand how their behavior affects the resources and include this information in both pre-trip and on-site information sources.

- Develop a strategy to better interpret the detached units of the park.
- Educate visitors, especially large groups, prior to their arrival to the park and develop educational packets for this purpose.
- Increase staff presence in cultural sites to enhance visitor education.
- Provide a range of opportunities to optimize visitor independence and knowledge of the park.
- Develop curriculum or guides for use by schools by the teacher-ranger-teacher program.
- Continue educational opportunities with local schools and organized groups.
- Increase the number of day programs and cultural demonstrations at the visitor center.
- Update interpretive materials based on contemporary knowledge of park resources.

## INDICATORS AND STANDARDS

As stated earlier, the purpose of this general management plan amendment is to establish management systems and thresholds whereby the staff of Chaco Culture National Historical Park can respond to changes in visitor use and preserve the park's unique resources and visitor experiences. To achieve this, the National Park Service must actively monitor visitor use and resource conditions and take action when necessary to ensure the park's unique resources and visitor experiences are protected.

Indicators and standards are the cornerstones for this decision-making process. Indicators serve as measurable variables that are monitored to determine whether the park's desired conditions are met. Standards are minimum acceptable conditions and serve as "triggers" for management actions outlined in the

alternatives. The premise is that with any visitor use comes some level of impact that must be accepted; therefore, it is the responsibility of the National Park Service to decide what level of impact is acceptable and what management actions are needed to keep impacts within an acceptable range. In addition, the ever-changing nature of visitor use in parks requires a deliberate and adaptive approach to visitor use management.

A set of four indicators and standards has been developed that are common to all action alternatives. Key topics selected for this purpose include: (1) cultural resource conditions, (2) visitor knowledge, (3) large organized groups, and (4) visitor experience. The indicators and standards developed for each of these topics is presented in table 1.

Please refer to the action alternatives to determine which management strategies would be implemented if the standards are exceeded. Indicators would be monitored over the long term and adjustments to management are made as appropriate, based on a thorough problem analysis.

The planning team considered many potential issues and related indicators that would identify impacts of concern, but those described in the table and below were considered the most significant, given the importance and vulnerability of the resources or visitor experiences affected by visitor use. The planning team also reviewed the experiences of other parks with similar issues to help identify meaningful indicators. Standards that represent the minimum acceptable condition for each indicator were then assigned, taking into consideration the qualitative descriptions of desired conditions, data on existing conditions, relevant research studies, staff management experience, and scoping on public preferences. Monitoring protocol for these indicators and standards would be developed upon implementation of this plan.

Visitor use impacts on cultural resources include wear on structures, unintentional

disturbances, and vandalism. Cultural resources are nonrenewable; impacts, especially those resulting from vandalism, must be minimized to the extent possible. The park staff are already using internal guidelines to monitor cultural resources. The indicator for human impacts to cultural resources is based on this existing monitoring protocol. Management efforts would be focused on maintaining the integrity and condition of all sites to a standard of at least “good” condition. In the future, if additional funding becomes available, other, more specific indicators may be systematically monitored to track impacts resulting from visitor use (e.g., incidences of visitors in unauthorized areas, degree of wear on structures, incidences of graffiti).

Providing education and interpretation to promote understanding of the park’s purpose and significance and related important resources and values is a core part of the NPS mission. This contributes to visitors’ appreciation of the park and supports respect of park resources and other visitors (Roggenbuck 1992). Further, understanding the park’s purpose and significance enhances visitors’ experience and may lead to continued advocacy for conservation of park resources. To determine if educational offerings and materials are effective, visitors’ understanding of park significance would be measured as part of this plan. The planning team considered current guidance on interpretive goals to develop the recommended standard: at least 92% of visitors understand the significance of Chaco Culture National Historical Park.

**TABLE 1. INDICATORS AND STANDARDS**

GENERAL TOPIC	INDICATORS	STANDARDS
<b>Cultural Resource Conditions</b>	Documented condition assessment changes to cultural resources from visitor-caused actions and disturbances, as defined in NPS Archeological Site Management Information System (ASMIS). This system includes a rating system of “good, fair, poor, and destroyed.”	Working towards maintaining sites in a “good” condition, according to ASMIS, with the following specific standards: <ul style="list-style-type: none"> <li>Impacts directly associated with visitor use should not be a significant contributor of changing overall site condition to a lesser condition (i.e., good to fair, fair to poor, etc.) with an emphasis on maintaining sites in good condition.</li> <li>At sites in less than good condition related to visitor use impacts, management actions should seek to improve condition at least one level.</li> </ul>
<b>Visitor Knowledge</b>	Percent of visitors that understand the significance of Chaco Culture National Historical Park.	92% (or better) of visitors understand the significance of Chaco Culture National Historical Park.
<b>Large Groups</b>	Number of incidences per month of groups exceeding the required group size limit of no more than 20 people per group.	No more than one incidence per month of groups exceeding the required group size limit.
<b>Visitor Experience</b>	Number of people at one time at the Pueblo Bonito/Chetro Ketl complex during primary visiting hours for 90% of peak season.	No more than 70 people at one time in the Pueblo Bonito/Chetro Ketl complex during primary visiting hours for 90% of peak season.

**TABLE 1. INDICATORS AND STANDARDS**

GENERAL TOPIC	INDICATORS	STANDARDS
	Number of vehicles exceeding designated parking spaces (for visitors and commercial/school buses) in any activity area.	No more than three vehicles exceed designated parking spaces (for visitors and commercial/school buses) in any activity area more than once a month.

The park is a popular location for large group activities, particularly educational groups. Chaco provides an incredible learning environment for groups to explore the history of this prehistoric culture. Ongoing management of the distribution and size of groups provides for high quality group opportunities, while avoiding conflicts with individual visitors and impacts to resources. The alternatives presented in this plan recommend additional strategies for managing groups, including requiring large groups to split into smaller groups of no more than 20 people per group. This strategy would help minimize noise levels, conflicts with other visitors, and wear and unintentional damage to resources. To help monitor compliance with this recommended strategy, an indicator of the number of incidences of groups exceeding the required group size limit per month was identified. Given the importance of managing groups at Chaco to achieve desired conditions, there is a low tolerance for noncompliance. The standard was set at no more than one incidence of groups exceeding the group size limit per month.

Chaco Culture National Historical Park is managed to provide independent and contemplative visitor experiences, along with opportunities to explore the prehistoric cultural sites. Crowding and conflicts can be of particular concern in such settings. An indicator of the number of other people at one time at the Pueblo Bonito/Chetro Ketl complex was identified as an important measure of crowding. The complex was chosen as the focal point for this indicator because it is the most popular site: 98% of visitors pass through this area of the park.

Therefore, it is the site most susceptible to crowding and conflict concerns (Freimund 2010). The 2009 visitor study confirmed that current conditions related to people at one time at the primary cultural sites are largely acceptable. Only 14% of visitors saw more people than expected at Pueblo Bonito, and the majority of visitors (67%) said the number of people they saw had no effect on their visit (Freimund 2010). In addition, the indicator of number of people at one time was monitored during the same time period as implementation of the visitor study; the number observed never exceeded 50 people at one time in the complex, which is well within the low-end standard for people at one time established in the 1984 general management plan. Given these findings, the planning team believes the 1984 plan standard of no more than 70 people at one time at the Pueblo Bonito/Chetro Ketl complex is an effective threshold and would help the National Park Service ensure high quality visitor experiences and minimize crowding and conflict concerns for the future.

In addition to number of people at one time, managing the efficient use of parking areas can help minimize potential crowding and conflict concerns, as well as visitor safety problems. It is also an important tool for protecting resources. The parking areas have been sized to support an appropriate volume of visitors at each site: if parking is occurring outside these boundaries, then crowding may be occurring at the associated site. In addition, visitors can become frustrated when they are unable to find a designated parking space at their intended use area, detracting from their experience. Further,



visitors parking along roadsides instead of designated parking spaces can result in visitor safety conflicts. Finally, parking along roadsides can also impact sensitive natural and cultural resources. An indicator for tracking the amount of parking occurring outside designated areas has been identified. To minimize these impacts, a standard of no more than three vehicles exceeding designated parking spaces in any activity area per month was established.

## **LONG-TERM MONITORING**

The park staff would continue monitoring of use levels and patterns throughout the park. In addition, the park staff would monitor these indicators. The rigor of monitoring the indicators (e.g., frequency of monitoring cycles, amount of geographic area monitored) might vary considerably, depending on how close existing conditions are to the standards. If the existing conditions are far from exceeding the

standard, the rigor of monitoring might be less than if the existing conditions are close to or trending towards the standard.

Initial monitoring of the indicators would determine if the indicators are accurately measuring the conditions of concern and if the standards truly represent the minimally acceptable condition of the indicator. Park staff might decide to modify the indicators or standards and revise the monitoring program if better ways are found to measure changes caused by visitor use. Most of these types of changes should be made within the first several years of initiating monitoring. After this initial testing period, adjustments would be less likely to occur. Finally, if use levels and patterns change appreciably, the park staff might need to identify new indicators to ensure that desired conditions are achieved and maintained. This iterative learning and refining process, a form of adaptive management, is a strength of the NPS visitor use management program.

## **ALTERNATIVE 1: NO ACTION (CONTINUE CURRENT MANAGEMENT)**

### **OVERVIEW**

The no-action alternative is included as a required baseline against which to compare the action alternatives. The no-action alternative is the continuation of the park's current visitor use management approach. This approach is in keeping with the park's 1984 general management plan that emphasizes self-discovery of the park's archeological resources. The 1984 general management plan also states that if visitation exceeds levels identified in the plan, then a reservation or transportation system may be implemented. However, these levels have not been exceeded and currently there are no plans in place to implement a reservation or transportation system.

### **VISITOR KNOWLEDGE / NPS-LED ORIENTATION**

All visitors to the park would continue to be required to stop at the visitor center to pay entrance fees. Visitors would receive an entrance permit with the rules of conduct on the reverse side. Staff would continue to remind visitors of these rules verbally. Rules and preservation messages would also continue to be found in the park brochure, in the park film, in trail guide booklets, on wayside exhibits, on signs posted at cultural sites, on signs along trails throughout the sites, on the park website, and in park information mailed to visitors at their request. Upon request, visitors would also continue to receive information about the primary cultural sites located throughout the park; however, there would continue to be no required orientation. Visitors may view a video and exhibits providing basic information about the history and culture of the park. Park staff would continue to be

available at the visitor center to answer visitors' questions, and self-guiding brochures would be available with information about each of the park's primary cultural sites. In addition, park staff would continue to patrol the park and provide interpretive programs, particularly during the peak visitor use season (mid-March to mid-November) and special events.

### **GROUP MANAGEMENT**

There would continue to be no limitation on the number or size of groups visiting the park. Organized tour groups would continue to be encouraged, but not required, to contact the park prior to their arrival. All groups would continue to be required to stop at the visitor center to pay entrance fees, but viewing the park's informational video would be optional. Parking availability would continue to be the primary limitation constraining how a group visits the various park sites after their arrival.

Education and school groups would continue to be able to obtain fee waivers to enter the park, and would receive rules for visiting ahead of arrival. These groups would also continue to receive staff orientations and education materials upon arrival. The park's website would also provide trip planning, preservation messages, and a class orientation PowerPoint presentation.

Special events and programs (including cultural demonstrations) would continue to be announced using press releases, posters, announcements at the visitor center and campground, and on the park website calendar of events. There would continue to be no restrictions in place to limit the number of people attending these special events and programs.

## INDIVIDUAL VISITOR ACCESS

Individual visitors (those not part of organized groups or special events) would continue to receive information about park programs and events upon their arrival. Information would also continue to be available on the park's website to assist people with planning their visit.

Visitors would continue to be allowed to freely access the park's primary cultural sites at their discretion and at their own pace. Self-discovery would continue to be emphasized. Parking availability would continue to be the primary limitation constraining how visitors access the various cultural sites.

There would continue to be no reservation system for visitors to reserve individual campsites at the park's campground in advance of their stay. All campsites would continue to operate on a first-come/first-served basis. Reservations would only be available for the group campsites.

- visitor services and interpretation (4.5 FTEs)
- maintenance (5.5 FTEs)

The park's base budget in 2010 was approximately \$2.1 million. More information on costs is provided in table 6 later in this chapter.

## STAFFING AND COSTS

Under the no-action alternative, Chaco Culture National Historical Park would continue to be staffed at the 2010 level. This includes employees organized in six operational divisions:

- the superintendent's office (2 full-time equivalents [FTEs]<sup>1</sup>)
- cultural resources (15 FTEs: 12 in preservation and 3 in museum curatorial)
- natural resources (1 FTE)
- law enforcement and emergency services (2.5 FTEs)

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<sup>1</sup> FTEs are "full-time equivalents." There may be more actual employees than the given number of FTEs, but some of those employees work part-time or seasonally.

## **ALTERNATIVE 2: STRATEGIES APPLIED PARKWIDE, YEAR-ROUND (THE PREFERRED ALTERNATIVE)**

### **OVERVIEW**

In alternative 2, visitor use management strategies would be applied year-round and throughout the park.

The majority of these strategies are further divided into those that would be implemented immediately following approval of this general management plan amendment and those that would be implemented in the future if standards for certain indicators are exceeded. Please refer to the indicators and standards section for more information.

### **VISITOR KNOWLEDGE / NPS-LED ORIENTATION**

#### **Immediate Management Strategies**

To ensure all visitors receive a consistent and comprehensive message regarding the sensitivity of park resources, park regulations, and appropriate visitor behaviors, all visitors would be required to participate in a structured education program (e.g., park ranger presentation or video) at the visitor center before accessing the park's main loop road (where the primary cultural sites are located). This may be implemented using an automatic gate.

To continue visitors' on-site education at the park's primary cultural sites, park staff would increase roving patrols and interpretive contacts, particularly during the peak season (mid-March to mid-November) and special events.

### **Potential Management Strategies**

There would be no potential future management strategies associated with visitor knowledge/NPS-led orientation. The strategies described above would be implemented immediately, rather than after a standard for an indicator is exceeded. However, the effectiveness of the structured education program would be continually evaluated and changes would be made to the program and associated messages on an as needed basis.

### **GROUP MANAGEMENT**

#### **Immediate Management Strategies**

To ensure all groups receive a consistent and comprehensive message regarding the sensitivity of park resources, park regulations, and appropriate visitor behaviors, all groups would receive information prior to their visit.

To ensure high quality group opportunities and maintain other desired conditions, groups would be required to obtain advanced reservations to the park. The number of groups would be limited to no more than two per day. Large groups would be required to split into smaller groups of no more than 20 people and would be asked to disperse their use across the various cultural sites in the park. This strategy would not apply during special events, estimated at four or five days a year. During these times, additional staff would be put in place to ensure protection of resources and visitor safety with increased use levels.

## Potential Management Strategies

If the standard for any indicator is exceeded and the management of groups is determined to be a significant contributing factor, the timing of group reservations may be strategically scheduled throughout the day to disperse their arrival. In addition, the number and size of groups may be further restricted. As a last resort, if additional strategies are needed to achieve the standard, groups may be completely restricted during peak use times of the day during peak season (mid-March to mid-November).

## INDIVIDUAL VISITOR ACCESS

### Immediate Management Strategies

For the purposes of minimizing the intensity of use in the park (i.e., crowding and resource concerns), visitors would receive information about peak use times in order to encourage voluntary redistribution of use.

To provide greater convenience for trip planning and to improve the efficiency of park management activities, all campers would be able to obtain a reservation for a designated campsite in advance of their stay. Some campsites would be available without reservations, on a first-come/first-served basis.

### Potential Management Strategies

If the standard for any indicator is exceeded and the patterns or levels of use is determined to be a significant contributing factor, all visitors may be required to obtain a reservation to visit the park. Some percentage of reservations (likely 15–20%) may be set aside for those arriving without a reservation, on a first-come/first-served basis. See appendix A for more information on the potential reservation system. This strategy would not apply during special events, estimated at four or five days a year. During these times, additional staff would be put in place to ensure protection of

resources and visitor safety with increased use levels.

Additional strategies for redistributing use at key cultural sites may also be needed and would focus on techniques that do not significantly interfere with visitor freedom (e.g., strategic information provided at the visitor center to highlight lesser used areas during peak use times, on-site contacts at key cultural sites to encourage exploration of lesser used sites, and strategically timing and locating park programs).

## STAFFING AND COSTS

Many of the actions identified in the alternative will be implemented using existing staff resources. The additional staffing levels needed to implement the preferred alternative have been estimated as follows:

- a half-time FTE to support the structured education program for all visitors
- a quarter-time FTE to provide pre-trip planning information to groups
- two one-quarter-time FTEs to support the reservation system for groups and campers
- a half-time FTE for roving patrols during peak season
- a half-time FTE to conduct monitoring of the indicators and standards, along with one-tenth of an FTE for oversight by the chief of resources
- if implemented, a half-time FTE to support the reservation system for individuals

Annual operating costs under this alternative, including implementation of the reservation system, would be \$77,000 more than the costs associated with the no-action alternative. Total one-time costs would be \$140,000 to cover an automatic entrance gate, directional fencing, interpretive media, and education program development.

## **ALTERNATIVE 3: STRATEGIES APPLIED PARKWIDE, ON A SEASONAL BASIS**

### **OVERVIEW**

In alternative 3, the visitor use management strategies would be applied on a seasonal basis throughout the park.

These strategies are further divided into those that would be implemented immediately following approval of this general management plan amendment and those that would be implemented in the future, if standards for certain indicators are exceeded. Please refer to the indicators and standards section for more information.

### **VISITOR KNOWLEDGE / NPS-LED ORIENTATION**

#### **Immediate Management Strategies**

To ensure all visitors receive a consistent and comprehensive message regarding the sensitivity of park resources, park regulations, and appropriate visitor behaviors, all visitors would be required to enter the visitor center to receive information about these topics. Visitor access to the park's main loop road (where the primary cultural sites are located) would be allowed only after orientation materials are received. This may be implemented using an automatic gate.

To continue visitors' on-site education at the park's primary cultural sites, park staff would increase roving patrols and interpretive contacts, particularly during peak season (mid-March to mid-November) and special events.

### **Potential Management Strategies**

If the standard for any indicator is exceeded and increased visitor education is determined to be an effective strategy for mitigating the problem, all visitors may be required to participate in a structured education program (e.g., park ranger presentation or video) at the visitor center before accessing the park's cultural sites. If implemented, the effectiveness of the structured education program would be continually evaluated and changes would be made to the program and associated messages on an as needed basis.

### **GROUP MANAGEMENT**

#### **Immediate Management Strategies**

To ensure all groups receive a consistent and comprehensive message regarding the sensitivity of park resources, park regulations, and appropriate visitor behaviors, all groups would receive information prior to their visit.

To ensure high quality group opportunities and maintain other desired conditions, groups would be required to obtain advanced reservations to the park. The number of groups would be limited to no more than two per day during peak season (mid-March to mid-November). Large groups would be required to split into smaller groups of no more than 20 people and would be asked to disperse their use across the various cultural sites in the park. This strategy would not apply during special events, estimated at four or five days a year. During these times, additional staff would be put in place to ensure protection of resources and visitor safety with increased use levels.

## Potential Management Strategies

If the standard for any indicator is exceeded and the management of groups is determined to be a significant contributing factor, the timing of group reservations may be strategically scheduled throughout the day to disperse their arrival. In addition, the number and size of groups may be further restricted. As a last resort, if additional strategies are needed to achieve the standard, groups may be completely restricted during peak use times of the day during peak seasons (mid-March to mid-November).

## INDIVIDUAL VISITOR ACCESS

### Immediate Management Strategies

For the purposes of minimizing the intensity of use in the park (i.e., crowding and resource concerns), visitors would receive information about peak use times in order to encourage voluntary redistribution of use.

To provide greater convenience for trip planning and to improve the efficiency of park management activities, all campers would be able to obtain a reservation for a designated campsite in advance of their stay during the peak season (mid-March to mid-November). Some campsites would be available for those arriving without reservation, on first-come/first-served basis.

### Potential Management Strategies

If the standard for any indicator is exceeded and the patterns or levels of use are determined to be a significant contributing factor, all visitors may be required to obtain a reservation to visit the park during the peak season (mid-March to mid-November). Some percentage of reservations (likely 15–20%) may be

reserved for those who arrive without reservation, on a first-come/first-served basis. See appendix A for more information on the potential reservation system. This strategy would not apply during special events, estimated at four or five days a year. During these times, additional staff would be put in place to ensure protection of resources and visitor safety with increased use levels.

Additional strategies for redistributing use at key cultural sites may also be needed and would focus on techniques that do not significantly interfere with visitor freedom (e.g., strategic information provided at the visitor center to highlight lesser used areas during peak use times, on-site contacts at key cultural sites to encourage exploration of lesser used sites, and strategically timing and locating park programs).

## STAFFING AND COSTS

Many of the actions identified in the alternative will be implemented using existing staff resources. The staffing levels needed to implement alternative 3 would be similar to alternative 2, except several of the actions are implemented only during the peak season, so the staffing costs of those actions were reduced by 25%. In addition, in this alternative the structured educational program would be implemented only if needed.

Annual operating costs under this alternative would be \$69,000 more than the costs associated with the no-action alternative. These costs are slightly lower than under the preferred alternative, because some actions are implemented only during the peak visitor use season, rather than year-round. Total one-time costs would be \$140,000 to cover an automatic entrance gate, directional fencing, interpretive media, and education program development.

## **ALTERNATIVE 4: STRATEGIES APPLIED YEAR-ROUND, ON A SITE-SPECIFIC BASIS**

In alternative 4, the visitor use management strategies would be applied year-round on a site-specific basis within the park.

These strategies are further divided into those that would be implemented immediately following approval of this general management plan amendment and those that would be implemented in the future, if standards for certain indicators are exceeded. Please refer to the indicators and standards section for more information.

### **VISITOR KNOWLEDGE / NPS-LED ORIENTATION**

#### **Immediate Management Strategies**

To continue visitors' on-site education at the park's primary cultural sites, park staff would be stationed at strategic locations at key sites during peak visitation times and special events.

#### **Potential Management Strategies**

If the standard for any indicator is exceeded and increased visitor education is determined to be an effective strategy for mitigating the problem, all visitors may be required to participate in a structured education program (e.g., park ranger presentation or video) at the visitor center before accessing the park's cultural sites. If implemented, the effectiveness of the structured education program would be continually evaluated and changes would be made to the program and associated messages on an as needed basis.

### **GROUP MANAGEMENT**

#### **Immediate Management Strategies**

To ensure all groups receive a consistent and comprehensive message regarding the sensitivity of park resources, park regulations, and appropriate visitor behaviors, all groups would receive information prior to their visit.

To ensure high quality group opportunities and maintain other desired conditions, groups would be required to obtain advanced reservations to visit certain cultural sites. No more than one group would be allowed to visit a cultural site at any one time and no more than two groups per day parkwide. Large groups would be required to split into smaller groups of no more than 20 people. This strategy would not apply during special events, estimated at four or five days a year. During these times, additional staff would be put in place to ensure protection of resources and visitor safety with increased use levels.

#### **Potential Management Strategies**

If the standard for any indicator is exceeded and the management of groups is determined to be a significant contributing factor, the timing of group reservations may be strategically scheduled throughout the day to disperse their arrival. In addition, the number and size of groups may be further restricted. If additional strategies are needed to achieve the standard, groups may be completely restricted during peak use times of the day during the peak season (mid-March to mid-November).



## INDIVIDUAL VISITOR ACCESS

### Immediate Management Strategies

For the purposes of minimizing the intensity of use in the park (i.e., crowding and resource concerns), visitors would receive information about peak use times in order to encourage voluntary redistribution of use.

There would continue to be no reservation system for visitors to reserve individual campsites at the park's campground in advance of their stay. All campsites would continue to be available on a first-come/first served basis. Reservations would only be available for the group campsites.

### Potential Management Strategies

If the standard for any indicator is exceeded and the patterns or levels of use are determined to be a significant contributing factor, the amount of use at certain cultural sites or the backcountry may be regulated through on-site queuing techniques (i.e., only a certain number of visitors are allowed within a site at any one time) or through the use of reservations or permits. The number of visitors allowed within the park's primary cultural sites would be dictated by direction set forth in the 1984 general management plan (and evaluated by recent park research). The 1984 general management plan included both low and high end estimates for people at one time, but only the low end estimates are included in the table below. Because of a greater understanding of the adverse impacts on the park's sensitive resources resulting from current use levels, the planning team determined during this planning effort that the low end estimates were more appropriate for long-term management of cultural resources and visitor experiences. See the following table for that direction and appendix A for more discussion on the recommendation for the low end estimates. This strategy would not apply during special events, estimated at four or five days a year. During these times, additional staff would be put in place to

ensure protection of resources and visitor safety with increased use levels.

**TABLE 2. NUMBER OF VISITORS PERMITTED AT SITES\***

Cultural Site	Number of People (at any one time)
Pueblo Bonito/Chetro Ketl	70
Pueblo del Arroyo	15
Kin Kletso	20
Casa Rinconada	30
Stairway (observation turnout)	10

\*Low-end estimates set forth by the 1984 general management plan and reconfirmed during this planning effort

## STAFFING AND COSTS

Many of the actions identified in the alternative will be implemented using existing staff resources. The additional staffing levels needed to implement this alternative have been estimated as follows:

- if implemented, a half-time FTE to support the structured education program for all visitors
- a quarter-time FTE to provide pre-trip planning information to groups
- a quarter-time FTE to support the reservation system for groups
- four FTEs for stationed rangers during peak season
- a half-time FTE to conduct monitoring of the indicators and standards, along with 1/10 of an FTE for oversight by the chief of resources.

Annual operating costs under this alternative would be \$146,000 more than the costs of the no-action alternative. These costs are higher than under the preferred alternative and alternative 3, because it includes stationed rangers. Total one-time costs would be \$110,000 to cover directional fencing, interpretive media, and education program development.

## **MITIGATIVE MEASURES FOR THE ACTION ALTERNATIVES**

### **INTRODUCTION**

The National Park Service defines mitigation as a modification of the proposal or alternative that lessens the intensity of its impact on a particular resource. NPS staff routinely evaluate and implement mitigative measures whenever conditions occur that could adversely affect the sustainability of national park system resources. To ensure that implementation of the action alternatives protects natural and cultural resources and the quality of the visitor experience, a set of mitigative measures would be applied to actions proposed in this plan.

Because of the action alternatives' emphasis on visitor use management programs, standard mitigation associated with proposed developments does not apply. Rather, the following mitigative measures

and best management practices have been developed to avoid or lessen impacts associated with immediate and potential future visitor use management actions. The potential visitor use management strategies suggested in each alternative serve as the means to mitigate impacts to the visitor experience and the park's cultural resources.

### **PROTECTION OF CULTURAL RESOURCES**

National Park Service staff would consult with the New Mexico state historic preservation officer, members of Indian tribes traditionally associated with park lands, as well as representatives of state and local governments and the general public, to seek ways to avoid, minimize, or mitigate any adverse effects on historic properties.

# MANAGEMENT STRATEGIES TO ADDRESS CLIMATE CHANGE

## INTRODUCTION

Climate change has the potential to adversely affect the future resource conditions of Chaco Culture National Historical Park. As global and regional climates continue to change, a management approach that enhances the protection and resiliency of climate-sensitive resources is becoming increasingly important. The following outlines such a strategy that adapts to our growing understanding of climate change influences and the effectiveness of management to contend with those influences.

Climate change science is a rapidly advancing field and new information is continually being collected and released; yet, the full extent of climate change impacts on resource conditions is unknown. Park managers and policy makers have not determined the most effective response mechanisms for minimizing impacts and adapting to change. Thus, this proposed management strategy does not provide definitive solutions or directions; rather it provides science-based management principles to consider when implementing the broader management direction of any action alternative.

Many of these principles are adapted from the publication, “Some Guidelines for Helping Natural Resources Adapt to Climate Change” (IHDP 2008). Further elaboration and adaption of these principles are anticipated as implementation of the general management plan amendment proceeds.

## MANAGEMENT STRATEGIES

- Identify key cultural and natural resources and processes that are at risk from climate change. Establish baseline conditions for these resources, identify their thresholds, and monitor for change. Increase reliance on adaptive management to minimize risks.
  - Restore key ecosystem features and processes, and protect cultural resources to increase their resiliency to climate change.
  - Use best management practices to reduce human-caused stresses (e.g., park infrastructure and visitor-related disturbances) that hinder the ability of species and fragile cultural resources to withstand climatic events.
  - Form partnerships with other resource management entities to maintain regional habitat connectivity and refugia that allow species dependent on park resources to better adapt to changing conditions.
  - Reduce or mitigate greenhouse gas emissions associated with park operations, such as alternative transportation options (e.g., low-emission vehicles) and bio-fuels and other renewable energy sources for the visitor center, administrative buildings, park housing, and the campground.
  - Use the park’s fragile cultural sites as an opportunity to educate visitors about the effects of climate change on the resources they are enjoying. Inspire visitors to take action through leadership and education.
- Conduct a climate change scenario planning workshop.

## THE ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The environmentally preferable alternative is defined as “the alternative that will promote national environmental policy as expressed in section 101 of the National Environmental Policy Act.” Section 101 states that it is the continuing responsibility of the federal government to

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
2. assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.
3. attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences.
4. preserve important historic, cultural, and natural aspects of our national heritage; and maintain, wherever possible, an environment that supports diversity, and a variety of individual choices.
5. achieve a balance between population and resource use that would permit high standards of living and a wide sharing of life’s amenities.
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

**Criterion 1**—As a steward of Chaco Culture National Historical Park, the National Park Service would continue to fulfill its obligation to protect this area for future generations under all alternatives. The preferred alternative would provide the greatest level of protection of park resources because of its more effective parkwide, year-round approach to visitor use management. Alternatives 3 and 4 would fulfill this responsibility less so because of their focus

on seasonal and site-specific strategies. However, their visitor use management strategies in alternatives 3 and 4 would meet this criterion more so than the strategies identified in the no-action alternative.

**Criteria 2, 3, and 4**—All of the action alternatives meet these criteria because of their emphasis on providing future visitor use of the park’s cultural sites in a manner that ensures the preservation of these authentic, world-renowned cultural resources. Each of the action alternatives also seeks to maintain visitors’ freedom of movement to independently explore these resources. The preferred alternative and alternative 3 would provide the highest level of freedom and independence once visitors enter the park, given the focus on educating and regulating use at the park entrance. In addition, the preferred alternative would be the most effective at achieving these criteria from an operational standpoint, given the parkwide and year-round strategies. Alternative 4 would meet these criteria to a lesser extent, given the emphasis on regulating use at a site level, which has the potential to influence visitors’ spontaneous access at any particular site. The more limited visitor use management strategies described under the no-action alternative would meet all of these criteria less so.

**Criterion 5**—Each of the action alternatives seeks to maintain an experience at Chaco Culture National Historical Park that is unparalleled and highly valued by its visitors. The strategies described in these alternatives are designed to accommodate increasing trends in visitor use, while not diminishing the visitor experience or the park’s fragile cultural resources. All of the action alternatives meet this criterion by achieving this balance between visitation and resource use. The no-action alternative currently meets this criterion as well; however, as visitor use of the park increases, its more

limited visitor use management strategies may not be able to adequately balance these demands in the future.

**Criterion 6**—All of the alternatives would equally enhance the quality of renewable resources and the recycling of depletable resources through NPS management of the park.

The environmentally preferable alternative for the general management plan amend-

ment is alternative 2, the preferred alternative. According to the ratings included in table 3, this alternative would surpass the other alternatives in realizing the full range of national environmental policy goals as identified in section 101 of the National Environmental Policy Act. This is primarily the result of its more effective parkwide, year-round approach to visitor use management.

**TABLE 3. ENVIRONMENTALLY PREFERABLE ALTERNATIVE ANALYSIS**

CRITERIA	ALTERNATIVES			
	Alternative 1 No Action	Alternative 2 Preferred	Alternative 3	Alternative 4
1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.	3	5	4	4
2. Ensure safe, healthful, productive, and aesthetically and culturally pleasing surroundings for all Americans.	4	5	5	5
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.	4	5	5	5
4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and a variety of individual choices.	4	5	5	4
5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.	4	5	5	5
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.	5	5	5	5
<b>Total Points*</b>	<b>24</b>	<b>30</b>	<b>29</b>	<b>28</b>

\*Five points were given to the alternative if it fully meets the criteria; four points if it meets nearly all of the elements of the criteria; three points if it meets more than one element of the criteria; two points if it meets only one element of the criteria; and one point if the alternative does not meet the criteria.

## ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED EVALUATION

During the planning process, three other visitor use management strategies were considered for Chaco Culture National Historical Park, but they were dismissed from detailed evaluation. These strategies included (a) closing the park's entrance gate to visitors when it reaches a predetermined use level, (b) requiring visitors to accompany a guide while visiting certain cultural sites within the park, and (c) relying solely on fencing and area closures to protect resources. The following provides a brief rationale for dismissing these strategies from the reasonable range of alternatives presented earlier in this chapter.

The strategy of closing the park's entrance gate was dismissed because it would result in too great an impact on potential visitors to the park and would not meet the project objectives. Given the park's remoteness, closing the park's entrance gate when it reaches a predetermined use level would be extremely inconvenient for those who traveled long distances prior to knowing the park was full. It would also be technically infeasible to notify all potential visitors about a gate closure with enough lead time prior to their departure. Electronic signs on major transportation routes, notifications on the park website, and radio announcements could alert some potential visitors about the park closure; however, most people would likely be well en route to the park before receiving this information, if at all. Furthermore, based on public scoping for this planning effort, most visitors plan their trip to Chaco a month or more ahead of time. Because of this, the planning team determined that a reservation system would be more effective and efficient at regulating use levels than closing the park's entrance gate to visitors when it reaches a predetermined use level.

Requiring visitors to accompany a guide was dismissed because it would not meet the project objectives. This strategy conflicted with one of the park's fundamental values, which is to provide visitors with the freedom to independently visit the park's primary cultural sites. This is one of the distinguishing characteristics of Chaco that makes it so unique compared with other park's in the Southwest (e.g., Mesa Verde). By requiring visitors to accompany a guide while visiting certain cultural sites within the park would diminish an experience that has been in place for the last 100 years at Chaco. Comments collected during public scoping for this plan, including results from the visitor survey, made it evident that many visitors highly value this aspect of their experience and consider it of paramount importance for motivating their visit to the park (Freimund 2010). In addition, scoping and survey data suggests that visitors prefer other management techniques (e.g., regulating use levels, education, and managing large groups) over requiring guided access. As a result, the planning team determined that this is not an appropriate strategy for managing visitor use at Chaco.

Relying solely on fencing and area closures for protecting resources was also dismissed for many of the same reasons as stated above. Blocking a significant amount of access for visitors to enter and explore large sections of the park's primary sites does not meet project objectives. The opportunity for visitors' to walk through significant portions of the sites on designated paths and have close contact with the primary resources is one of the fundamental values of Chaco. Visitors are currently able to directly experience these remarkable resources that contribute to their opportunities to develop a rich understanding of past cultural achievements. When fencing and area closures are used sparingly and when

absolutely necessary, they are important and viable management strategies. The park will continue to use these strategies on an as-needed basis. However, the idea of using these strategies as the primary tool and

blocking entry to many of the park's primary sites has been dismissed. When these strategies are employed, it will be done sparingly to maintain as much as access to the park's primary sites as possible.



## SUMMARY TABLES

TABLE 4. SUMMARY OF KEY DIFFERENCES AMONG THE ALTERNATIVES

	Alternative 1: No-action Alternative	Alternative 2: Strategies Applied Year-round, Parkwide Preferred Alternative	Alternative 3: Strategies Applied During Peak Season	Alternative 4: Strategies Applied Year- round on a Site-specific Basis
<b>Overview</b>	The no-action alternative is the continuation of the park's current visitor use management approach.	Visitor use management strategies would be largely applied year-round at the park level.	Visitor use management strategies would be largely applied at the park level on a seasonal basis.	Visitor use management strategies would be largely applied on a site level within the park.
<b>SUMMARY OF ALTERNATIVES BY OVERALL MANAGEMENT STRATEGY</b>				
<b>Visitor Knowledge/ NPS-led Orientation</b>	<p>Upon request from visitors, information would continue to be provided about the primary cultural sites located throughout the park; however, there would continue to be no mandatory orientation.</p> <p>Park staff would continue to be available at the visitor center to answer visitors' questions, and self-guiding brochures would be available with information about each of the park's primary cultural sites.</p> <p>In addition, park staff would continue to patrol the park and provide interpretive programs, particularly during the peak visitor use season (mid-March to mid-November) and special events.</p>	<p><b>Immediate Strategies</b> All visitors would be required to participate in a structured education program at the visitor center before accessing the park's primary cultural sites. This may be enforced using an automatic gate.</p> <p>Park staff would increase roving patrols and interpretive contacts, particularly during the peak season and special events.</p> <p><b>Potential Future Strategies</b> There would be no potential future management strategies associated with visitor knowledge/NPS-led orientation.</p>	<p><b>Immediate Strategies</b> All visitors would be required to enter the visitor center to receive information about sensitivity of park resources, park regulations, and appropriate visitor behaviors. Visitor access to the park's primary cultural sites would be allowed only after orientation materials are received. This may be enforced using an automatic gate.</p> <p>Park staff would increase roving patrols and interpretive contacts, particularly during the peak season and special events.</p> <p><b>Potential Future Strategies</b> If the standard for any indicator is exceeded, all visitors may be required to participate in a structured education program at the visitor center before accessing the park's cultural sites.</p>	<p><b>Immediate Strategies</b> To continue visitors' on-site education at the park's primary cultural sites, park staff would be stationed at strategic locations or key sites during peak visitation times and special events.</p> <p><b>Potential Future Strategies</b> Same as alternative 3.</p>

**TABLE 4. SUMMARY OF KEY DIFFERENCES AMONG THE ALTERNATIVES**

	<b>Alternative 1: No-action Alternative</b>	<b>Alternative 2: Strategies Applied Year-round, Parkwide Preferred Alternative</b>	<b>Alternative 3: Strategies Applied During Peak Season</b>	<b>Alternative 4: Strategies Applied Year- round on a Site-specific Basis</b>
<b>Group Management</b>	<p>There would continue to be no limitation on the number or size of groups visiting the park. All groups would continue to be required to stop at the visitor center to pay entrance fees. Parking availability would continue to be the primary limitation constraining how a group visits the park after their arrival.</p> <p>Educational and school groups would continue to be able to obtain fee waivers to enter the park, receive orientation materials upon their arrival, and receive information prior to their arrival in preparation for their visit.</p> <p>Special events and programs (including cultural demonstrations) would continue to be announced using press releases.</p>	<p><b>Immediate Strategies</b> To ensure all groups receive a consistent and comprehensive message regarding the sensitivity of park resources, park regulations, and appropriate visitor behaviors, all groups would receive information prior to their visit.</p> <p>Groups would be required to obtain advanced reservations to the park. The number of groups would be limited to no more than two per day. Large groups would be required to split into smaller groups of no more than 20 people and would be asked to disperse their use across the various cultural sites in the park. This strategy would not be applied during special events.</p> <p><b>Potential Future Strategies</b> If the standard for any indicator is exceeded, the timing of group reservations may be strategically scheduled throughout the day to disperse the arrival of groups. In addition, the number and size of groups may be further restricted. If additional strategies are needed to achieve the standard, groups may be completely restricted during peak use times of the day during the peak season.</p>	<p><b>Immediate Strategies</b> Same as alternative 2, except groups would be limited to no more than two per day during the peak season. This strategy would not be applied during special events.</p> <p><b>Potential Future Strategies</b> Same as alternative 2.</p>	<p><b>Immediate Strategies</b> Groups would be required to obtain advanced reservations to visit certain cultural sites. No more than one group would be allowed to visit a cultural site at any one time and no more than two groups per day parkwide. This strategy would not be applied during special events.</p> <p><b>Potential Future Strategies</b> Same as alternative 2.</p>

**TABLE 4. SUMMARY OF KEY DIFFERENCES AMONG THE ALTERNATIVES**

	<b>Alternative 1: No-action Alternative</b>	<b>Alternative 2: Strategies Applied Year-round, Parkwide Preferred Alternative</b>	<b>Alternative 3: Strategies Applied During Peak Season</b>	<b>Alternative 4: Strategies Applied Year- round on a Site-specific Basis</b>
<b>Individual Visitor Access</b>	<p>Visitors would continue to be provided information about park programs and events upon their arrival. Information would also continue to be available on the park's website to assist people with planning their visit. Special events and programs would continue to be announced using the park website and press releases.</p> <p>Visitors would continue to be allowed to freely access the park's primary cultural sites at their discretion and at their own pace. Self-discovery would continue to be emphasized. Parking availability would continue to be the primary limitation constraining how visitor access the various cultural sites.</p> <p>There would continue to be no reservation system for visitors to reserve individual campsites at the park's campground in advance of their stay. All campsites would continue to be first-come/first served. Reservations would only be available for the group campsites.</p>	<p><b>Immediate Strategies</b> For the purposes of minimizing the intensity of use in the park, visitors would receive information about peak use times in order to encourage voluntary redistribution of use.</p> <p>All campers would be able to reserve a designated campsite in advance of their stay. Some campsites would be available for those arriving without reservations, on a first-come/first-served basis.</p> <p><b>Potential Future Strategies</b> If the standard for any indicator is exceeded, all visitors may be required to obtain a reservation to visit the park. Some percentage of reservations (likely 15–20%) may be reserved for those arriving without reservations, on a first-come/first-served basis. This strategy would not be applied during special events.</p> <p>Additional strategies for redistributing use at key cultural sites may also be needed and would focus on techniques that do not significantly interfere with visitor freedom.</p>	<p><b>Immediate Strategies</b> Same as alternative 2, except campground reservations would be required during the peak season only.</p> <p><b>Potential Future Strategies</b> Same as alternative 2.</p>	<p><b>Immediate Strategies</b> For the purposes of minimizing the intensity of use in the park, visitors would receive information about peak use times in order to encourage voluntary redistribution of use.</p> <p>As in the no-action alternative, all campsites would continue to be first-come/first served. Reservations would be available only for the group campsites.</p> <p><b>Potential Future Strategies</b> If the standard for any indicator is exceeded, the amount of use at certain cultural sites or the backcountry may be regulated through queuing techniques or permits. The number of visitors allowed within the park's primary cultural sites would be dictated by direction set forth in the 1984 general management plan. This strategy would not be applied during special events.</p>

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**TABLE 5. SUMMARY OF HOW EACH ALTERNATIVE MEETS PURPOSE AND NEED AND THE KEY IMPACTS OF THE ALTERNATIVES**

	<b>Alternative 1: No-action Alternative</b>	<b>Alternative 2: Strategies Applied Year- round, Parkwide: Preferred Alternative</b>	<b>Alternative 3: Strategies Applied During Peak Season</b>	<b>Alternative 4: Strategies Applied on a Site-specific Basis</b>
<b>SUMMARY OF HOW EACH ALTERNATIVE MEETS THE PURPOSE AND NEED</b>				
<p><b>Purpose and Need:</b> The purpose of this amendment is to provide additional guidance and direction for visitor use management at the park (for the next 15 to 20 years) in order to establish management systems and thresholds whereby the park can respond to changes in visitation and preserve its unique resources and visitor experiences.</p> <p>The plan amendment is needed because the park's 1984 general management plan does not provide adequate guidance on visitor use management to protect resources and visitor experiences in response to potential changes in visitation.</p>	<p>The no-action alternative does not fully meet the plan's purpose and need. The 1984 general management plan proposes only that "a regulated access system be instituted"—without any details about thresholds for management action. A much more rigorous examination of the issue of visitor use management is essential if resources are to be protected and the qualities that so many visitors value about the park are to be sustained. The no-action alternative would protect visitors' freedom of choice and flexibility for accessing and touring the park. However, the no-action alternative has limited visitor use management strategies, so park staff may not be able to adequately accommodate increasing trends in visitor use, while not diminishing the park's fragile cultural resources or the visitor experience. Further, the park has a small staff that has had varying degrees of success in responding to visitor use management needs and impacts resulting from visitor use.</p>	<p>The preferred alternative best meets the purpose and need of this plan since it would provide a high level of protection of park resources because of its more effective parkwide, year-round approach to visitor use management. The preferred alternative also provides the highest level of freedom and independence for visitors once they enter the park, given the focus on educating and regulating use at the park entrance. In addition, the preferred alternative would be the most effective at achieving purpose and need from an operational standpoint, given the parkwide and year-round strategies.</p>	<p>Alternative 3 contains many of the same strategies as the preferred alternative, so it also meets the purpose and need, but less so because of the focus on seasonal strategies, which may be less protective of resources. This alternative does provide a high level of freedom and independence for visitors once they enter the park, given the focus on educating and regulating use at the park entrance. The operational burden of this strategy would be similar to the preferred alternative, but would be less efficient given the reliance on seasonal staff and the repeated loss of this investment.</p>	<p>Alternative 4 contains many of the same strategies as the preferred alternative, so it also meets the purpose and need, but less so because of the focus on site specific strategies. Alternative 4 regulates use at a site level, which can be protective of the park's fragile resources, but has the potential to influence visitors' spontaneous access at any particular site. The operational burden of this strategy would be high given the increased staffing needs, making it less efficient at meeting the purpose and need.</p>

**TABLE 5. SUMMARY OF HOW EACH ALTERNATIVE MEETS PURPOSE AND NEED AND THE KEY IMPACTS OF THE ALTERNATIVES**

	<b>Alternative 1: No-action Alternative</b>	<b>Alternative 2: Strategies Applied Year- round, Parkwide: Preferred Alternative</b>	<b>Alternative 3: Strategies Applied During Peak Season</b>	<b>Alternative 4: Strategies Applied on a Site-specific Basis</b>
<b>SUMMARY OF IMPACTS ON CULTURAL RESOURCES</b>				
<b>Archeological Resources</b>	Continuation of the current approach to park management and visitor use would indirectly cause moderate, permanent, adverse impacts to archeological resources because of ongoing inadvertent and intentional visitor use-related impacts to these resources. The intensity of these adverse impacts could rise to the major level if park visitation increases.  Cumulative impacts would be permanent, moderate, and adverse.	The strategies included in alternative 2 would help reduce adverse impacts to archeological resources caused by visitor use. Adverse impacts would be minor and permanent.  Cumulative impacts would be permanent, minor, and adverse.	Same as alternative 2.	Same as alternative 2.
<b>Ethnographic Resources</b>	Continuation of the current approach to park management and visitor use would indirectly cause moderate, permanent, adverse impacts to ethnographic resources because of ongoing inadvertent and intentional visitor use-related impacts to these resources. The intensity of these adverse impacts could rise to the major level if park visitation increases.  Cumulative impacts would be permanent, moderate, and adverse.	The strategies included in alternative 2 would help reduce adverse impacts to ethnographic resources caused by visitor use. Adverse impacts would be minor and permanent.  Cumulative impacts would be permanent, minor, and adverse.	Same as alternative 2.	Same as alternative 2.

**TABLE 5. SUMMARY OF HOW EACH ALTERNATIVE MEETS PURPOSE AND NEED AND THE KEY IMPACTS OF THE ALTERNATIVES**

	<b>Alternative 1: No-action Alternative</b>	<b>Alternative 2: Strategies Applied Year- round, Parkwide: Preferred Alternative</b>	<b>Alternative 3: Strategies Applied During Peak Season</b>	<b>Alternative 4: Strategies Applied on a Site-specific Basis</b>
<b>SUMMARY OF IMPACTS ON VISITOR ACCESS, USE, AND EXPERIENCE</b>				
<b>Ability to Access the Park</b>	<p>This alternative continues to provide unrestricted access to the park, except for the requirement to stop and pay the entrance fee at the visitor center, resulting in a long-term, moderate, beneficial impact to visitors' ability to access the park.</p> <p>This alternative would also maintain the current campground system that does not require any prior reservation and would continue to be managed on a first-come, first served basis. This would allow more unrestricted access to the park, but may lead to some visitors being turned away from the campgrounds at times of peak visitation, which would result in a long-term, moderate, adverse impact given the remote location of the park and access to other camping and lodging options in the nearby area.</p>	<p>The structured education program would hinder visitors' immediate access to the park and would impact their ability to freely access the park at their convenience; this would result in a long-term, moderate, adverse impact to visitors' ability to access the park.</p> <p>Since most large groups and individuals plan their trips well in advance, the possible need for a reservation should not be a significant inconvenience and would result in a long-term, minor to moderate, adverse impact on their access to the park.</p> <p>The camping reservation system would result in an overall long-term, moderate, beneficial impact because of increased convenience and ability to be guaranteed a campsite in the park.</p>	<p>The requirement to stop at the visitor center to receive information would hinder visitors' immediate access to the park and would impact their ability to freely access the park at their convenience; this would result in a long-term, minor, adverse impact to visitors' ability to access the park.</p> <p>Since most large groups and individuals plan their trips well in advance, the requirement for a reservation during the peak season should not be a significant inconvenience and the strategy would not apply outside of the peak season; this would result in a long-term, minor to moderate, adverse impact on their access to the park.</p> <p>The camping reservation system during the peak season would result in an overall long-term, moderate, beneficial impact because of increased convenience and ability to be guaranteed a campsite in the park.</p>	<p>Alternative 4 proposes restrictions at the site level, but does not restrict overall access to the park; a long-term, moderate, beneficial impact.</p> <p>If implemented, the education program would hinder visitors' immediate access to the park and impact their ability to freely access the park at their convenience; a long-term, moderate, adverse impact.</p> <p>Alternative 4 would also maintain the current campground system that does not require any prior reservation and would continue to be managed on a first-come, first served basis. This would allow more unrestricted access to the park, but may lead to some visitors being turned away from the campgrounds at times of peak visitation, which would result in a long-term, moderate, adverse impact given the remote location of the park and access to other camping and lodging options in the nearby area.</p>

**TABLE 5. SUMMARY OF HOW EACH ALTERNATIVE MEETS PURPOSE AND NEED AND THE KEY IMPACTS OF THE ALTERNATIVES**

	<b>Alternative 1: No-action Alternative</b>	<b>Alternative 2: Strategies Applied Year- round, Parkwide: Preferred Alternative</b>	<b>Alternative 3: Strategies Applied During Peak Season</b>	<b>Alternative 4: Strategies Applied on a Site-specific Basis</b>
<b>Freedom of Choice and Flexibility to Visit Sites</b>	The no-action alternative would allow visitors and groups to have unrestricted access to the sites within the park. This freedom gives visitors the opportunity to determine their own pace and visit sites at their own discretion; this would result in a long-term, moderate, beneficial impact on visitors' freedom of choice and flexibility for visiting sites.	Under alternative 2, the freedom of choice and flexibility to visit the sites would be retained. Visitors would largely be able to determine their own pace and visit sites at their own discretion. In addition, the strategies related to individual and group access will help minimize crowding, which should increase all visitors' unfettered access to the primary sites in the park, a long-term, moderate, beneficial impact.	Given the similarity in strategies, except for the application to the peak season only, the impacts to freedom of choice and flexibility to visit sites are largely the same as alternative 2.	If monitoring indicates a need, visitors may be subject to a queuing system or need to obtain a reservation/permit to access the primary sites. In addition, staff would be stationed at high use sites to ensure protection of resources and to manage use levels. These strategies would help alleviate congestion at certain popular sites, but it would significantly reduce visitor freedom of choice and flexibility to visit sites; a long-term, major, adverse impact. Large groups would also be required to obtain a reservation for visiting the primary sites, resulting in a long-term, moderate, adverse, impact.
<b>Management of Visitor Crowding and Promotion of Close Contact with the Resource</b>	<p>The current direction for managing visitors does not provide specific direction for managing the effect of outside influences and possible increases in visitation, which may lead to crowding and visitor conflicts in the future; a long-term, moderate, adverse impact.</p> <p>In terms of cumulative impacts, the new visitor center combined with the elements of the no-action alternative would have a long-</p>	<p>Providing visitors with information about peak use locations and times would encourage voluntary redistribution of visitors, resulting in less crowded conditions at certain sites and times. If needed based on monitoring results, a reservation system may be implemented to further manage use levels and minimize incidences of crowding and congestion throughout the park.</p> <p>Implementing group reservations</p>	<p>Given the similarity in strategies, except for the application to the peak season only, the impacts to management of visitor crowding and promotion of close contact are largely the same as alternative 2.</p> <p>In terms of cumulative impacts, alternative 3 is similar to alternative 2.</p>	<p>Managing use at the site level for both individuals and large groups would be highly effective in minimizing crowding and promoting close contact with resources. Given the various management strategies of alternative 4, there would be a long-term, moderate, beneficial impact on crowding and close contact with the resources.</p> <p>In terms of cumulative impacts,</p>



**TABLE 5. SUMMARY OF HOW EACH ALTERNATIVE MEETS PURPOSE AND NEED AND THE KEY IMPACTS OF THE ALTERNATIVES**

	<b>Alternative 1: No-action Alternative</b>	<b>Alternative 2: Strategies Applied Year- round, Parkwide: Preferred Alternative</b>	<b>Alternative 3: Strategies Applied During Peak Season</b>	<b>Alternative 4: Strategies Applied on a Site-specific Basis</b>
	term, moderate, beneficial cumulative effect. The impacts of potential paving of CR 7950 and increased awareness of the park as a result of the Chaco Quarter and World Heritage touring, when combined with the actions in the no-action alternative, would have a long-term, moderate, adverse cumulative effect. Impacts of the no-action alternative would comprise a relatively small portion of the overall cumulative effect.	<p>would prevent several large groups from accessing the park at one time, minimizing crowding and conflicts with other visitors. Large groups would also be required to split into smaller groups of no more than 20.</p> <p>These strategies would result in a long-term, moderate, beneficial impact on visitor crowding and the ability to form connections with park resources.</p> <p>In terms of cumulative impacts, the new visitor center combined with the elements of the no-action alternative would have a long-term, moderate, beneficial cumulative effect. The impacts of potential paving of CR 7950 and increased awareness of the park as a result of the Chaco Quarter and World Heritage touring, when combined with the actions in alternative 2, are largely mitigated, resulting in a long-term, minor, beneficial impact. Impacts of the preferred alternative would comprise a relatively substantial portion of the overall cumulative effect.</p>		alternative 4 is similar to alternative 2 and 3.

**TABLE 5. SUMMARY OF HOW EACH ALTERNATIVE MEETS PURPOSE AND NEED AND THE KEY IMPACTS OF THE ALTERNATIVES**

	<b>Alternative 1: No-action Alternative</b>	<b>Alternative 2: Strategies Applied Year- round, Parkwide: Preferred Alternative</b>	<b>Alternative 3: Strategies Applied During Peak Season</b>	<b>Alternative 4: Strategies Applied on a Site-specific Basis</b>
<b>SUMMARY OF IMPACTS ON PARK OPERATIONS</b>				
	<p>The no-action alternative's effect on park operations would continue to be moderate, adverse, and long term, given the continued limited ability of park staff to respond to current and potential future impacts from visitor use.</p> <p>The cumulative effect on park operations would be minor to moderate, adverse, and long term. The no-action alternative's contribution to this effect would be substantial.</p>	<p>The effect of alternative 2 on park operations would be moderate, beneficial, and long term given the new staffing and management systems that are identified to improve the education and management of visitors. However, the alternative would have increased staffing needs, along with the development of new management systems, which would have adverse impacts on park operations.</p> <p>The cumulative effect on park operations would be minor to moderate, beneficial, and long term. The contribution of alternative 2 to this effect would be substantial.</p>	<p>The effect of alternative 3 on park operations would be moderate, beneficial, and long term given similar reasons as identified for alternative 2.</p> <p>The cumulative effect on park operations would be minor to moderate, beneficial, and long term. The contribution of alternative 3 to this effect would be substantial</p>	<p>The effect of alternative 4 on park operations would be minor, beneficial, and long term given the new staffing and management systems that are identified to improve the education and management of visitors. However, the alternative would have substantially increased staffing needs, along with the development of new management systems, which would have adverse impacts on park operations.</p> <p>The cumulative effect on park operations would be negligible to minor, beneficial, and long term. The contribution of alternative 4 to this effect would be substantial.</p>

## COST ESTIMATES FOR IMPLEMENTING THE ALTERNATIVES

The cost estimates in this plan are intended only to provide an estimate of the relative costs of the alternatives for comparison purposes. NPS cost estimating guidelines were used to develop the costs (in 2010 dollars) to the extent possible, but the estimates should not be used for budgeting purposes. Actual NPS costs would vary depending on if and when the actions are implemented.

The approval of this general management plan amendment does not guarantee that funding and staffing needed to implement the plan would be forthcoming. Full implementation of the plan could be many

years in the future. Implementation of the approved plan would depend on future NPS funding levels and agency priorities.

It is important to note that the staffing and cost estimates for the no-action alternative are for supporting the continuation of all park's operations, not just those related to visitor use management. The staffing and cost estimates for the action alternatives also include those staffing needs and costs associated with the implementation of each alternative; the figures include staffing and costs associated with the no-action alternative.

**TABLE 6. COST ESTIMATES FOR IMPLEMENTING THE ALTERNATIVES**

	Alternative 1 No Action	Alternative 2 Preferred	Alternative 3	Alternative 4
Annual Operating Costs (ONPS) <sup>(1)</sup>	\$2,100,000	\$2,177,000 (\$77,000 above no action)	\$2,169,000 (\$69,000 above no action)	\$2,246,000 (\$146,000 above no action)
Staffing—FTE <sup>(2)</sup>	28	31 (3 additional FTE)	31 (3 additional FTE)	34 (6 additional FTE)
Total One-Time Costs	N/A	\$140,000	\$140,000	\$110,000
Facility Costs <sup>(3)</sup>	N/A	\$30,000	\$30,000	\$0
Nonfacility Costs <sup>(4)</sup>	N/A	\$110,000	\$110,000	\$110,000

Note: All cost estimates are in 2010 dollars

- (1) Annual operating costs are the total costs per year for maintenance and operations associated with each alternative, including utilities, supplies, staff salaries and benefits, leasing, and other materials. Cost and staffing estimates assume that the alternative is fully implemented as described in the narrative.
- (2) Total full-time equivalent (FTE) employees are the number of persons/year of staff required to maintain the assets of the park at a good level, provide acceptable visitor services, protect resources, and generally support the park's operations. The number of FTE employees indicates ONPS-funded NPS staff only, not volunteer positions or positions funded by partners. FTE employee salaries and benefits are included in the annual operating costs.
- (3) One-time facility costs typically include those for the design, construction, rehabilitation, or adaptive reuse of visitor centers, roads, parking areas, administrative facilities, educational facilities, maintenance facilities, etc.
- (4) One-time nonfacility costs include actions for preservation of cultural or natural resources not related to facilities, development of visitor use tools not related to facilities, and other park management activities that would require substantial funding above the park's annual operating costs.





# CHAPTER 3



**AFFECTED ENVIRONMENT**



## INTRODUCTION

This chapter describes what is known about the environment of Chaco Culture National Historical Park within the context of visitor use management. The focus is on key known park resources, visitor experiences, and park operations that could be affected by the alternatives if they were implemented. The chapter does not provide an exhaustive description of these resources; rather enough detail is provided to understand the effects of implementing the alternatives. These topics were selected on the basis of federal law, regulations, executive orders, NPS expertise, and concerns expressed by other agencies or members of the public during project scoping. The description of the existing environment establishes the baseline for the analysis in “Chapter 4: Environmental Consequences.”

During internal scoping, the park’s interdisciplinary team conducted a preliminary analysis of resources to

determine the context, duration, and intensity of effects that the proposal may have on park resources. If the magnitude of effects was determined to be at the negligible or minor level, there is no potential for substantial impact and further impact analysis is unnecessary; therefore, the resource is dismissed as an impact topic. If however, during internal scoping and further investigation, resource effects are greater than a minor level of intensity, then the analysis of that resource as an impact topic is carried forward.

The first section in this chapter discusses impact topics that are analyzed in detail in this GMP amendment. The next section describes impact topics that are not analyzed in detail (see table 7) and explains the rationale for this decision. Information about each resource topic corresponds to the level and type of impacts being analyzed.

**TABLE 7. IMPACT TOPICS**

Impact Topics Analyzed in this Plan	Impact Topics Eliminated from Detailed Analysis in this Plan
Alternatives in this plan could affect the following resources or topics:	The following resources or topics are important, but alternatives in this plan would have only beneficial impacts on these resources or adverse impacts that are negligible to minor.
Visitor Use and Experience	Air Quality
Archeological Resources	Geologic Resources and Soils
Ethnographic Resources	Water Resources (including water quality, wetlands, floodplains, and streams)
Park Operations	Ecologically Critical Areas Carbon Footprint Vegetation and Wildlife



**TABLE 7. IMPACT TOPICS**

Impact Topics Analyzed in this Plan	Impact Topics Eliminated from Detailed Analysis in this Plan
Alternatives in this plan could affect the following resources or topics:	The following resources or topics are important, but alternatives in this plan would have only beneficial impacts on these resources or adverse impacts that are negligible to minor.
Park Operations	Federal and State Listed Species (including threatened and endangered species)  Natural Soundscapes  Dark Night Skies  Museum Collections  Historic Structures (addressed under Archeological Resources)  Cultural Landscapes (addressed under Archeological Resources)  Sacred Sites  American Indian Trust Resources  Environmental Justice  Socioeconomic Environment  Energy Requirements and Conservation Potential

See below, for an in-depth discussion of impact topics retained for analysis. A description of impact topics considered but dismissed from further analysis begins on the following section.

**A Note on Climate Change:** Climate change is an important factor that has the potential to influence future trends in resource conditions. According to the Environmental Protection Agency (1998), by the year 2100, average temperatures in New Mexico are projected to increase by 3–4 degrees Fahrenheit in spring and fall and by 5°F in winter and summer. As a result, the climate of New Mexico will likely become more variable, such as an increase in the frequency and intensity of extreme weather (e.g., storms, droughts, floods, hot or cold spells) and other associated natural events (e.g., wildfires and pest outbreaks). Precipitation

is also expected to become more variable, and the Environmental Protection Agency estimates a slight decrease in summer precipitation and an increase in fall, winter, and spring precipitation.

Other climate models predict different results, especially regarding regional precipitation patterns and trends. In fact, there is broad consensus among climate models that the Colorado Plateau will become more arid with periodic droughts that are more severe and possibly longer (Seager et al. 2007).

These changes, and their potential influences on the condition of archeological and other cultural resources, as well as on visitor use and experience, should be taken into account over time.



## IMPACT TOPICS RETAINED FOR DETAILED ANALYSIS

### CULTURAL RESOURCES

#### Introduction

Cultural resources in the park are nationally and internationally significant. The park was designated a UNESCO World Heritage Site in 1987. Chaco Cultural National Historical Park is listed in the National Register of Historic Places.

This section describes the cultural resources present in Chaco Culture National Historical Park that would be affected by the management alternatives. These descriptions are concise summaries organized by the resource topics listed below, which match the impact topics analyzed in “Chapter 4, Environmental Consequences.” Information about each of the following resource topics corresponds to the level and type of impacts being analyzed:

- Archeological Resources
- Ethnographic Resources

As noted in the 1984 general management plan, the 1984 backcountry management plan, and the 2003 resource management plan, Chaco Culture National Historical Park includes an extensive number of archeological resources. Each of these approved plans should be used as baseline and background information about the history and culture of the park. The following information provides a brief synopsis of what is contained in these other documents regarding cultural resources. As this document is an amendment to the 1984 general management plan, the information from that document is referenced here, but not discussed extensively.

Chaco Culture National Historical Park protects and preserves the archeological sites and material culture of these past

societies for the purpose of improving public awareness, understanding, and appreciation of its rich cultural heritage, and to research its resources to improve knowledge. The historical park includes more than 4,000 prehistoric and historic archeological sites, representing more than 10,000 years of human history in Chaco Canyon. Chaco “Great Houses,” provide evidence of a complex and widespread civilization that persisted for 500 years. Between the 9th and 13th centuries, the inhabitants of Chaco Canyon created multifaceted and wide-reaching social, ceremonial, and technological achievements that provided a framework for the entire region.

Chaco is known throughout the world for its monumental public and ceremonial buildings, and its distinctive architecture. The construction of the buildings, as well as the associated Chacoan roads, ramps, dams, and mounds, required extensive organization and planning, design, and resource acquisition. The Chacoan people made unparalleled advances in architectural design, astronomy, geometry, landscaping, and engineering to create an ancient urban center of spectacular public architecture. In addition to its architecture, Chaco is known for the remarkable preservation of its buildings and rich array of household, ritual, and mortuary objects that indicate extensive trade, wealth, and exchange.

Extensive documentation of the rock art in the park has revealed that Chaco contains the most numerous and one of the most complex assemblages of images in the new world. The sheer amount of elements, in addition to the variety of methods combined and used, such as pecking, painting, intaglio, incising, and bas relief, form a view of the ancient world and sky. Rock art in Chaco is quite difficult to see, often placed in areas with difficult access, hidden from view in

crevices, and located 30 to 50 feet up the cliff faces.

## Historic Overview

It is possible that Chaco Canyon was known to some of the early Spanish explorers from the 1600s and 1700s. These explorers named Peñasco Blanco and Fajada Butte. More extensive descriptions of the area come from the early American period starting in the 1840s. Archeological investigations began in earnest with the Hyde Exploring Expedition from 1896 to 1901. Research efforts on archeological resources have continued to the present. Research has included field work, archival search, artifact analysis, theoretical study, excavation, and survey. Archeological work conducted by the National Park Service in Chaco today focuses primarily on preservation activities such as condition assessments and site monitoring; testing materials and methods for preservation treatments, such as backfilling; and facilitating research through collaboration with educational institutions.

## Archeological Resources

### Agency Responsibilities and Guidance.

The National Park Service is charged with preserving cultural resources for the enjoyment of present and future generations. The National Park Service will protect and manage cultural resources in its custody through effective research, planning, and stewardship, and in accordance with the policies and principles contained in National Park Service *Management Policies 2006* and the appropriate NPS Director's Orders. National Park Service Director's Order 28 *Cultural Resource Management Guidelines*, and NPS *Management Policies 2006* require the consideration of impacts on historic properties that are listed in, or eligible to be listed in, the National Register of Historic Places. The National Register includes districts, sites, buildings, structures, and objects important for their significance in

American history, architecture, archeology, engineering, and culture. Historic properties listed in the National Register can be significant to a local community, a state, an Indian tribe, or the nation as a whole. The above-mentioned policies and regulations require federal agencies to coordinate consultation with other federal, state, and local agencies, Indian tribes, and the public regarding the potential effects on properties listed in or eligible for the National Register of Historic Places. In addition, the park submits periodic reports on the condition and preservation of the listed resources to the UNESCO World Heritage Convention.

Archeological resources are nonrenewable and irreplaceable, so it is important that all management decisions and activities throughout the national park system do not harm or otherwise adversely impact the integrity of the resources.

The entirety of Chaco Culture National Historical Park has been surveyed for archeological materials, revealing a great number of archeological resources throughout Chaco Canyon and surrounding areas. Archeological inventory surveys have documented some 4,000 sites within and immediately adjacent to the boundaries of the park, while inventory surveys at the Chaco Protection Sites, in collaboration with the Interagency Management Group managers, have documented thousands more. Although the park inventory surveys are considered to represent 100% coverage, changing standards and methods during the past 40 years and recent condition assessments have documented more archeological resources, amounting to up to 25% more resources than were originally discovered.

Of the some 4,000 known archeological resources at Chaco, approximately 50 sites are being interpreted and are open to visitors. The rest of the sites are exposed ruins in areas classified as backcountry. Backcountry sites and lands within the park are defined as those not attached by the primary loop road. These backcountry areas

can be visited only with permission from park management (Getty Conservation Institute 2003).

Only a small fraction of the archeological artifacts have been scientifically collected and are part of the museum collection. The vast majority of the artifacts are still in their original context, including exposed on the ground in and near sites with public access. These artifacts, numbering in the tens of millions, hold a wealth of information if they remain in place as they were originally deposited, and within an assemblage of other materials.

### **Brief Overview of Archeological**

**Resources.** Chaco's archeological resources represent an extensive time period that extends back almost 10,000 years. Although no known sites from the Paleo-Indian (approximately 13,000 BC to 8500 BC) period have been found in the area, the park has sites from the Archaic (6000 to 1000 BC) period. These Archaic sites constitute the earliest ancestral Puebloan sites found in the park.

The period referred to as Basketmaker II (1000 BC to AD 500) is also considered ancestral to the modern Pueblos. It was during this period when people began using domesticated plants such as corn and squash.

The first subsistence farming in the vicinity of Chaco began with the Basketmaker III period (AD 500 to 750). Villages of up to 20 pithouse dwellings were established. Pottery was first manufactured during this period.

During the Pueblo I period (AD 750 to 900), aboveground jacal and masonry storage rooms occurred in conjunction with pithouses. Villages were composed of small storage rooms, larger habitation rooms, and pithouses. Domestic architecture became more formalized in Pueblo II period (AD 900 to 1050), with increasing use of masonry to construct larger multistory buildings by the end of the period.

Up to AD 900, people living in Chaco were little different from their neighbors throughout the Colorado Plateau. Some of the smaller structures were similar in construction and layout to contemporary sites in the areas north of the San Juan River and along the Little Colorado River drainages, among others.

The 10th century was a turning point in Chaco prehistory. Between AD 900 and 1140 numerous large masonry buildings were constructed. New architectural techniques such as rubble core/banded veneer masonry appeared. Pueblo Bonito, Chetro Kettle, Una Vida, Peñasco Blanco, Hungo Pavi, and Kin Bineola are examples of these carefully planned multistoried houses of up to several hundred rooms. Diagnostic features include great kivas, enclosed plazas, earthen mounds, elevated kivas, and road alignments, among others.

Similar construction spread far beyond the immediate Chaco Canyon area, into the greater San Juan Basin and beyond. The canyon may have served as the population, cultural, and trading nucleus for what has become recognized as a cohesive economic and possibly ceremonial system linking dozens of Chacoan communities and resource areas throughout the San Juan Basin.

Yet the small (3–20 rooms) communities with masonry rooms and kivas—typical of earlier times—continued to be built in the canyon and around the huge communal structures (with an average number of rooms between 100 and 400) of both the canyon and the outlying communities. Smaller habitations continued to be occupied and expanded through accretion. The material culture of the small villages was similar to that found at the large structures. The settlements appeared to have been comprised of small village domiciles clustered around a multistory communal structure and great kiva(s). These population centers were often connected by a formal network of straight, wide roads. Other structures that possibly represent public

works such as reservoirs, dams, and irrigation canals were also common.

By AD 1050, there was a large regional economic system operating, especially to the south and west. Trade and exchange proliferated along with construction of civic architecture, and communication networks composed of signaling and road alignment expanded.

Around AD 1100, outlying communities appeared in the north, reflecting interaction with populations in the San Juan River Valley or Mesa Verde region. No major new construction occurred in the following Late Pueblo III period (AD 1130 to 1200). It is likely that Chaco's political and economic powers moved to the north into the Aztec complex, to the west into the Chuska slope, and to the south into the Rio Puerco and Little Colorado River drainages. This Chaco system moved and evolved into the 12th and 13th centuries.

#### **Condition of Archeological Resources.**

None of the archeological sites open for visitation are assessed to be in good condition, primarily because of their fragile nature and size. The park lacks adequate staff and funding to maintain some 500,000 square feet of 1,000-year-old masonry in good condition, as it is defined in ASMIS. However, some sections of the archeological structures are in good condition, particularly those areas near visitor trails where park management does not allow conditions to deteriorate to the point where visitor safety is at risk.

The majority of the sites and areas open for visitation are in fair condition and receive limited routine, emergency, or cyclic preventative improvements. The sections in fair and poor condition are those generally targeted for emergency and cyclic treatments to prevent catastrophic site loss. These treatments improve the conditions of these sections to a "good" condition, but this only lasts from five to 10 years. After this period, if cyclic funding is not available for continued preservation treatment, the

sections deteriorate to fair or poor condition.

There is mounting evidence that visitor impacts are adversely affecting the park's cultural resources through inadvertent wear and tear on the exposed architectural elements, and through vandalism to the resources and theft of artifacts (see figure 2). Inadvertent wear on all Chaco's cultural resources, including archeological resources, has involved several incidences of unintentional wear leading to the total collapse of masonry walls in Chaco's great houses. An example of such an incident involved a kiva wall in the Chetro Ketl complex where visitors repeatedly stood next to the kiva wall to gain better views, despite park signage and information requesting visitors to stand back from the wall. Over time the repeated wear from visitors standing directly adjacent to the kiva's wall caused the wall's stone masonry to become weakened and the wall collapsed.

Park staff cannot adequately patrol, monitor, or protect all of the areas that are currently open to visitation. A steady increase in the incidents of vandalism, particularly to rock art panels and masonry walls, and the nearly 100% loss of artifacts in the frontcountry structures and along trails indicate that this cumulative damage has reached significant levels. Frontcountry sites and lands are defined as those attached by the primary loop road within the park.

Based on case incidents, confiscated artifacts, and objects mailed or otherwise turned in voluntarily, park staff have estimated that between 40,000 and 50,000 artifacts are stolen each year. The frontcountry sites, particularly Pueblo Bonito, Pueblo del Arroyo, Chetro Ketl, and Casa Rinconada, should contain tens to hundreds of objects per square meter, but the average density of artifacts is less than one object per 10 square meters because of theft. As a point of comparison, sites not open to visitation, which are in the vicinity of the open sites and comparable in time and function, have density and assemblage of

artifacts in the 10 to 100 objects per square meter. This contrast illustrates that sites open to visitation and sites along visitor trails have been literally emptied of their original material culture.

Park staff have documented an average of nine to 14 cases of vandalism on the rock art panels that are monitored through the site steward program. Staff monitor about 20 panels in the frontcountry that comprise approximately 20% of the rock art open to visitation, so the amount of annual vandalism is considerably greater.

## **Ethnographic Resources**

According to the National Park Service's Cultural Resource Management Guideline (DO-28), ethnographic resources are any "site, structure, object, landscape, or natural resource feature assigned with traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (NPS 28, Cultural Resource Management Guideline, 181). Ethnographic resources are associated cultural practices, beliefs, the sense of purpose, or existence of a living community that is rooted in that community's history or is important in maintaining its cultural identity and development as an ethnically distinctive people.

There are four major kinds of ethnographic resources: ethnographic landscapes, ethnographic places, ethnographic objects, and ethnographically significant natural resources. Ethnographic landscapes and places may include specific sites and structures. Determination that a cultural resource is an ethnographic resource is based primarily on the perception of the social group or groups associated with the resource and the declaration of that group that the resource:

- has value as an element of their ethnic history
- is traditionally meaningful to their identity as a group

- (when applicable) is vital to the survival of their traditional life ways

## **Types of Ethnographic Resources**

- Ethnographic Places
- Ethnographic Objects
- Ethnographic Landscape/  
Natural Resources
- Ethnographic Places/Structures
- Ethnographic Places/Sites of  
Significant Events

Ethnographic resources at Chaco Culture National Historical Park are the landscapes, objects, plants and animals, and sites and structures, such as Fajada Butte, that are of importance to people traditionally associated with the region. These peoples are the contemporary park neighbors and ethnic or occupational communities that have been associated with the park for two or more generations (40 years), and whose interests in the historical park's resources began prior to its establishment. Living peoples of many cultural backgrounds may have a traditional association with a particular park (NPS 2010).

The identified contemporary communities with ethnographic ties to Chaco Culture National Historical Park include the Hopi Tribe, Navajo Nation, and the Pueblo Indian peoples of New Mexico. The archeological, historical, and ethnographic records reveal a long history of human use of the park area for these cultures, spanning from Paleo-Indian period to present day. The sites remain a part of the sacred homeland of associated tribes, all of whom continue to respect and honor them. Many members of these tribes and nations participate in the management of the park and its collections as employees, consultants, or elders. A number of locations in the park, as noted by the 1984 general management plan, have sacred meaning to some or all of the 26 American Indian tribes and nations who have ancestral ties to Chaco.

These traditionally associated tribes prefer to cite the entire park as an ethnographic resource, rather than identifying individual sites or features for their specific ethnographic significance. Therefore, this plan considers the entire Chaco Canyon National Historical Park and all of the cultural resources (archeology, cultural landscapes, historic structures, museum collections) and natural resources (water, geological features, vegetation, etc.) it contains as ethnographic resources as well. These groups have free and open access to use all of the sites in the park, including those in the backcountry.

While access to ethnographic resources is unencumbered to traditionally associated American Indian tribes, the physical conditions of Chaco's ethnographic resources is the same as those described for archeological resources (which includes the resource categories of cultural landscapes and historic structures). In summary, the park's ethnographic resources show evidence of inadvertent wear and tear from foot traffic and regular visitor use, as well as from intentional impacts in the form of vandalism, theft of artifacts, and deposition of cremations. A steady increase in the incidents of vandalism, particularly to rock art panels and masonry walls, and the nearly 100% loss of artifacts in the frontcountry structures and on trails indicate that this cumulative damage has reached significant levels. These effects contribute to the ongoing deterioration of the ethnographic resources' physical condition at Chaco.

### Cultural Landscapes

According to the National Park Service Cultural Resources Management Guideline (Director's Order 28), a cultural landscape is:

*"...a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and types of structures that are built. The character of a cultural landscape is defined, both by*

*physical materials such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions."*

Cultural landscapes vary in size and location. A cultural landscape encompasses a diversity of places, many with important land use history or other cultural values. Cultural landscapes include national battlefields; the homes and designed estate grounds of dignitaries, inventors, and writers; the sites held sacred by native peoples from prehistoric times to the present; and the valleys where our ancestors settled and farmed. Cultural landscapes have often maintained a continuity of land use into the present (CSI 2003). Chaco Canyon exhibits many of the features of multiple National Register-eligible cultural landscapes.

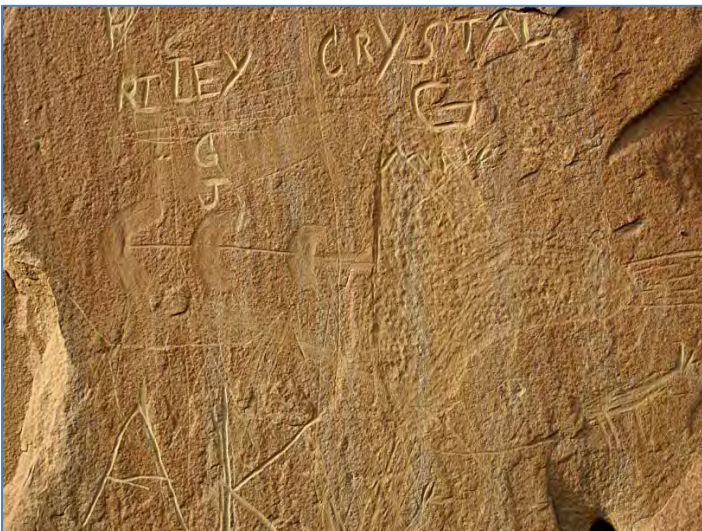
Informal evaluations indicate the potential for prehistoric and current cultural landscapes for the park. A general assumption has been made that within the park are landscapes associated with ancient inhabitants of the area, beginning around 1000 BC. Tribes contribute to these cultural landscapes, as well as early Hispanic, historic Navajo, and early European American occupants, and the relatively recent Civilian Conservation Corps and NPS eras. Further study and analysis is needed to further define the areas within the park that lend themselves to the designation of cultural landscapes.

Since cultural landscape inventories have not yet been completed for the park, nearly the entire park area is tentatively managed as a large cultural landscape for the purpose of resource protection. At the same time, the potential cultural landscape resources are the same as those already managed as archeological resources, which also includes prehistoric/historic structures and landscape features. As a result, archeological resources and cultural landscape features are virtually the same resources under park cultural resource management. Therefore, to avoid redundancy in the impact analysis section of this plan, cultural landscapes are included under archeological resources.

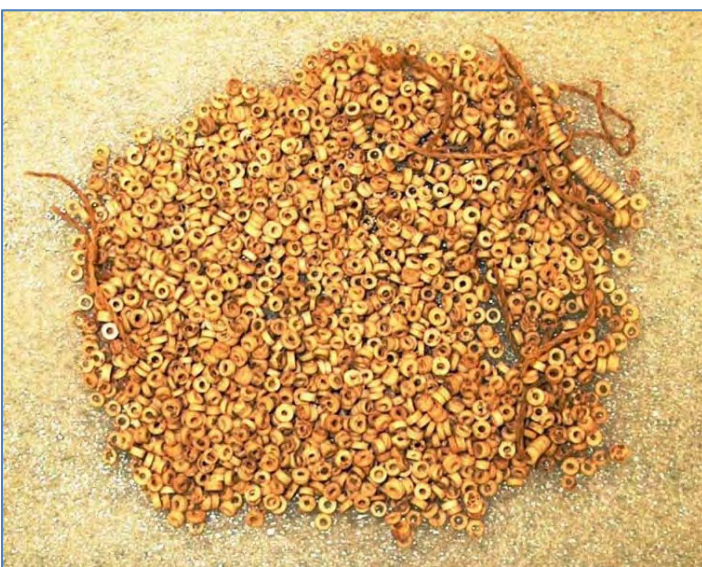




This collapsed wall at the great house of Chetro Ketl is an example of the unintended consequence of visitors walking near a kiva wall.



This photograph shows several examples of recent graffiti (2005) caused by visitors who carved their initials into a wall containing ancient rock art.



These 1,890 stone beads were stolen from the park, but returned by mail from an anonymous sender in 2000. The package received by the park contained 2,173 prehistoric items.

**FIGURE 2. EXAMPLES OF VISITOR USE IMPACTS TO CULTURAL RESOURCES AT CHACO**

## VISITOR USE AND EXPERIENCE

### Visitor Use Characteristics

Visitation to Chaco Culture National Historical Park has remained relatively even for the past 20 years with a spike in 1997 as a result of the Pecos Conference that was held adjacent to the park. Archaeologists gather in the southwestern United States during this annual conference to discuss recent research and challenges relating to this field. The number of visitors dropped after a change in the method of counting in 2004 (figure 3) with an average of 49,764 visitors per year from 2004 through 2009. The decline in visitation also corresponds with an overall decline in visitation across the entire national park system. However, the park system as a whole has recently begun to see an increase in overall visitation.

Tracking these trends in visitation patterns may be especially important at Chaco because of a few external influences which may impact visitation patterns in the next 10 to 15 years. Regional population growth and the increased awareness of Chaco may have a minimal influence on increasing the amount of visitors to the park, but the biggest factor could be the improvement of the main entrance road (CR 7950) to the park.

As population grows in the surrounding region, there may be a corresponding increase in visitation to the park. The park's status as a World Heritage site may also influence visitation in the future if the popularity of these types of sites increases. The park will also be featured on a United States quarter in 2012, thus increasing the public's awareness of the park.

The most significant factor to likely influence visitation patterns is the potential paving of CR 7950. The main road to the park is currently a 13-mile-long dirt road. The route includes a single at-grade wash crossing that during periods of heavy rain can be impassible to some motor vehicles.

The road is a limiting factor for some vehicles regardless of the occasional rain storm. Because of the rough nature of the dirt road, vehicles such as buses and large RVs have a difficult time accessing the park.

To better understand the likely impact of the road paving proposals by San Juan County, the planning team evaluated and used visitor use projections and data contained in several studies and reports commissioned by the National Park Service: the Upchurch reports (2005 and 2008) and a report by David Evans and Associates (2009). These studies evaluated the potential for changes in the types and volume of visitor use to the park that would result from the improvement of CR 7950.

If the 13-mile section of dirt road were to be paved completely, the park could expect an initial 12% increase in base visitation for the three years immediately following the road improvements; then the visitation would level off to pre-improvement levels, but at a higher overall visitation rate because of the initial 12% increase (David Evans and Associates 2009). The growth rate is based on the growth in recreational visitation previously experienced at the park with the change in the north access, plus the additional tour bus arrivals expected with full road improvements. With no roadway improvements, the peak monthly visitation in 2029 would likely reach an estimated 6,800 visitors. With full roadway improvements, the peak monthly visitation is estimated to increase to approximately 9,200 visitors (David Evans and Associates 2009).

A proposal had been made that only the initial 4.4 miles of the entire 13-mile section of dirt road be paved. If this proposal were to be enacted, the wash area would still be difficult to pass on the dirt road portion and thus still act as a barrier to many large vehicles (e.g., buses). An increase in visitation would still be expected with this scenario, but would be much lower than if the entire roadway was paved. With only partial roadway improvements on CR 7950, it is estimated that the peak monthly



visitation would increase to approximately 7,200 visitors by 2029 (David Evans and Associates 2009). The National Park Service does not have control over the potential road paving being proposed by San Juan County, so it is important to consider proactive management strategies that may be needed in the event the road is paved and visitation patterns change.

A recent visitor study at the park (Freimund 2010) identified the current visitor profile in terms of demographics, trip characteristics, and preferences. The study was conducted by The University of Montana during the summer and fall of 2009. Visitor contacts were made at Pueblo Bonito and Chetro Ketl; 75% of the people contacted responded to the survey.

Based on the study, family and friends comprised the largest group of visitors (77%) with most of the groups having four or less people (86%). The remainder of the visitors were either in a group of at least 10 people or with an educational (i.e., school) group (8% and 5% respectively).

The average length of stay for visitors was 5.1 hours for those who did not stay overnight. For those who spent more than 24 hours, the average length of stay was 2.2 days. A majority of visitors (51%) had completed at least some graduate work and another 38% had completed at least some college work. Roughly one-third of visitors contacted during the study were repeat visitors to the park. The majority of respondents were from the United States (90%), with 5% of visitors coming from outside the United States (5% provided no response).

The vast majority of visitors to the park plan at least two days in advance of their visit with 52% making their decision between one month and a year in advance; only 7% of the respondents said they decided to come to the park the day of their visit. Visitors who

received information prior to their visit stated that the NPS website (54%), word of mouth (35%), and other non-NPS websites (26%) were the primary sources of information for planning their trip to the park. When visitors arrived at the park, 89% entered through the north gate (access from CR 7950) and exited through the north gate.

The majority of the visitors went to only a few of the main attractions in the park. Almost all of the visitors went to the park visitor center (97%) and Pueblo Bonito (98%), followed by Chetro Ketl (69%), Hungo Pavi (52%), and Una Vida (42%). The pattern of use in the park and the sites visited are consistent with a visitor survey conducted in 1995 (Lee and Stevens 1995).

### **Visitors' Ability to Access the Park**

The park is accessed by two primary roads, NM 57 and CR 7950. Both of these are dirt roads; the vast majority of visitors (89%) access the park via CR 7950. The 13-mile entrance road (CR 7950) is a primitive road that can occasionally be challenging to navigate, especially during rain events and for certain vehicles (e.g., RVs and charter buses). The 2009 survey (Freimund 2010) asked visitors their perceptions of the road to the park. Visitors agreed with the following statements about the road: the road deters visitors, the road keeps the park uncrowded, the road protects the park, the road can damage cars, and the road enhances the experience. Conversely, visitors stated that the road does not reduce their time in the park, nor does the threat of rain detract from their decision to visit. The threat of rain is still a legitimate concern for some visitors, especially those in cars, buses and RVs not equipped with four-wheel drive. However, the majority of visitors did not feel that the threat of rain negatively affected their enjoyment of the park experience.

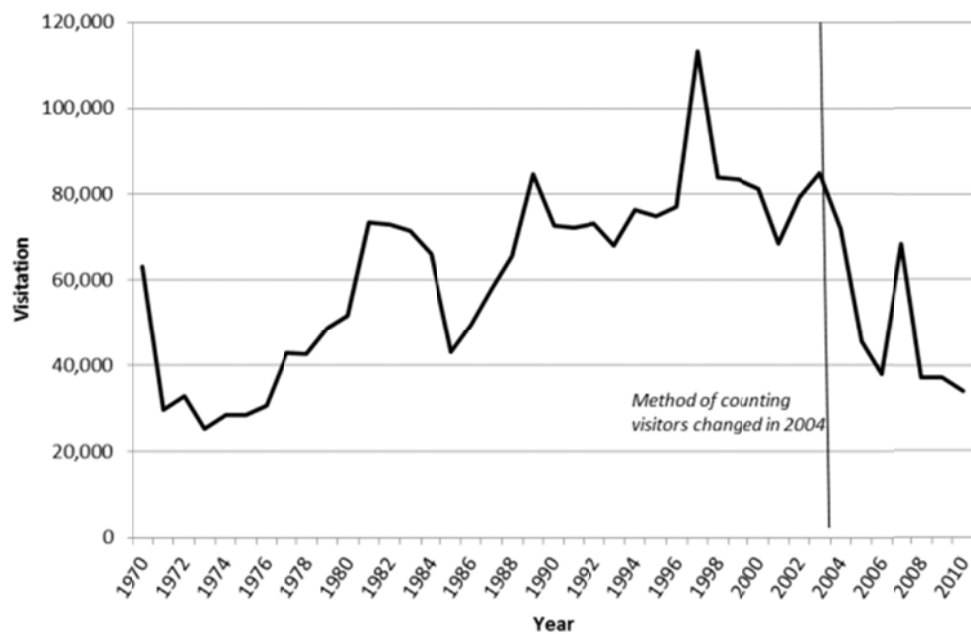


FIGURE 3. ANNUAL VISITATION, 1970–2010

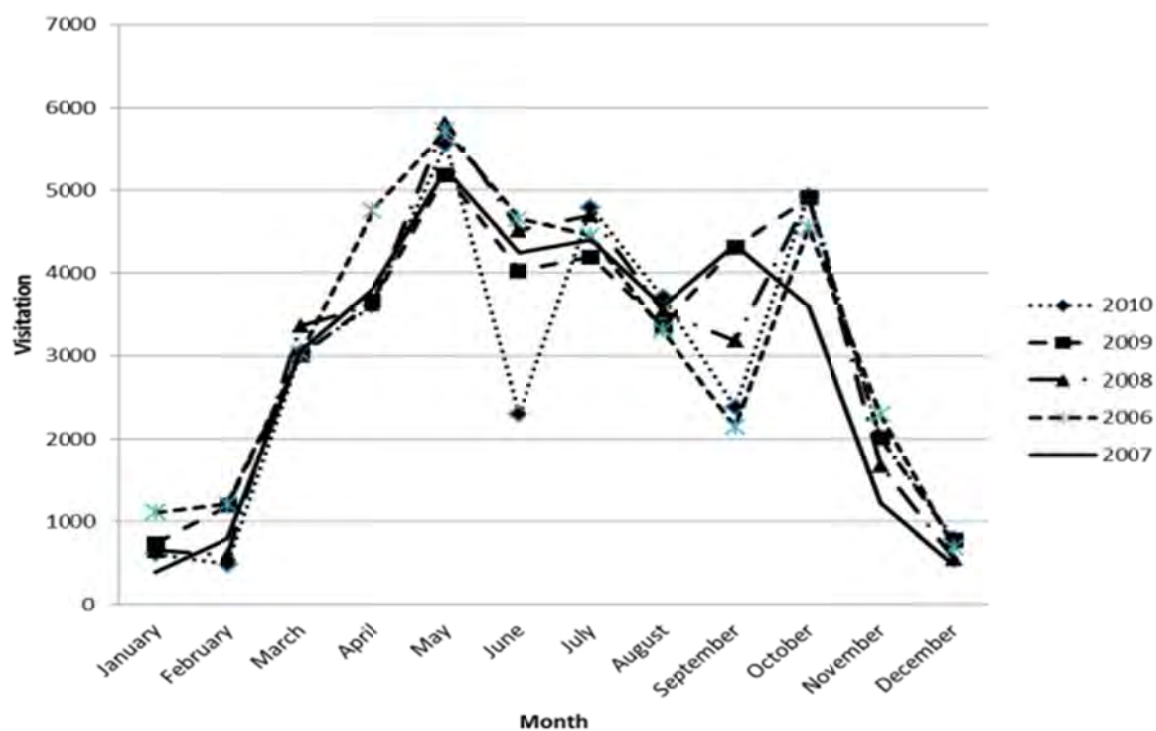


FIGURE 4. MONTHLY VISITATION, 2007–2010

The road can sometimes deter large groups from visiting the park, but large groups do still visit. Large groups of at least 12 were encountered by 36% of the survey respondents (Freimund 2010). The 2009 visitor survey revealed that visitors felt large groups neither detracted nor enhanced their visit, but visitors felt that limiting group size was an acceptable management action if use by groups was conflicting with other management goals.

The 2009 visitor survey asked visitors their preferences for different management options related to accessing the park. This was done to better understand what sort of management actions visitors would be willing to support if overall use levels were conflicting with other management goals such as protecting resources and preserving the unique visitor experience at Chaco.

On a scale of 1 to 5 (1=strongly disagree, 5=strongly agree), limiting group size was most popular, but only just above a neutral rating on average (Freimund 2010). Requiring group tours was the least popular of the options surveyed (ranked at a 2.1 on average). Compulsory orientation and closing the gate were ranked at a neutral level on average (3.0 and 2.9, respectively). Limiting the number of permits to key sites, requiring a reservation and restricting access to Pueblo Bonito were all rated at 2.6 or below on the 5 point agreement scale (Freimund 2010).

To better understand visitors' preferences for management options, some visitors received a separate, focused survey on management alternatives (Freimund 2010). In this survey, visitors were asked about three management scenarios for managing access to Chaco if visitation were to double. Most visitors (45%) preferred a system similar to how the park is currently managed. Open access would be provided with a mandatory educational orientation to the park and its resources. A management scenario proposing a reservation system was supported by 28% of the visitors and a mixed system of open access and

reservations at Pueblo Bonito was supported by 27% of the visitors surveyed. People who responded during the public scoping period of the project echoed this sentiment. Nearly a quarter of the public scoping comments received related to protecting the visitor experience, stating that they were in favor of tighter restrictions on access to the park (e.g., closing off sensitive areas or requiring permits to visit certain areas of the park).

The management options survey provided insight into why visitors preferred the different management proposals. Overall, perceptions of convenience and maintaining quality of both resources and visitor experiences were the driving factors. Many who favored the current management of the park cited the convenience it afforded, while those in favor of a reservation system cited that convenience would be maintained, but that the reservation system would add another layer of protection to the resources at the park (Freimund 2010).

Currently, the park has several facilities that are accessible to visitors with disabilities including the visitor centers at headquarters, and several trails and sites. There also is a campsite that is accessible. Currently, many of the sites are not designed for universal access. Although there are not many facilities in the park designed specifically to promote universal access, there have been several organized groups of visitors with disabilities who have visited the park.

### **Freedom of Choice and Flexibility to Visit Park Sites**

Currently, visitors can wander freely to explore the monumental stone structures in Chaco and have close contact with these resources. Items frequently identified in the 2009 visitor survey that greatly contribute to a high quality visitor experience at Chaco include freedom to move about the park, the park being in a remote location, ability to explore the primary sites, the ability to have access within the sites, and the accessibility of parking within the park (Freimund 2010).

Many visitors have commented on how much they value the unparalleled opportunity to stand amongst the ruins and imagine the activity that occurred during the height of the Chacoan occupation. Information collected in the 1995 and 2009 studies (Freimund 2010, Lee and Stevens 1995) specifically evaluated the importance of the opportunities, services, and facilities that contribute to visitors' enjoyment. The ability to have a self-directed experience, looking around on their own, and having resource information were rated the highest on both the 1995 and 2009 surveys. This sentiment was also expressed during the public scoping phase of this project. Approximately 25% of the comments related to the visitor experience expressed a desire to keep the sites within the park accessible as they are now. Public scoping, the 1995 visitor survey, and the 2009 visitor survey all confirm the importance that visitors place on the ability to move around the park and visit the sites without restrictions.

### **Management of Visitor Crowding and Promotion of Close Contact with the Resource**

Enjoying the park and its resources at a slow pace with largely unfettered access to the resources is a fundamental part of the visitor experience at Chaco. Keeping distractions to a minimum is important for fully appreciating the values of Chaco (Getty Conservation Institute 2003). The experience is heightened when it progresses from enjoyment to an understanding of the reasons for the park's existence and the significance of its resources. Participating in personal interpretive services (e.g., staffed visitor centers, ranger-led activities), and making use of nonpersonal interpretive services (e.g., wayside exhibits, visitor center exhibits, publications, computer technologies) helps visitors form their own intellectual and emotional connections with the meanings and significance of the park's resources.

The park provides a number of interpretive facilities and programs for visitors. A visitor center at the entrance of the loop road is staffed year-round; it has exhibits on natural and cultural history, a movie, and Una Vida is a short walk just outside the doors of the visitor center. Evening talks or campfire programs cover topics such as astronomy, wilderness, and what it was like to live in the canyon during the time of the Chacoans. Park staff offer guided tours of the primary sites seasonally. Ranger-led tours are available to Pueblo Bonito, and occasionally to Hungo Pavi, Una Vida, Chetro Ketl, Pueblo del Arroyo, and Casa Rinconada. Ranger-led tours were rated as an important opportunity available at the park on both the 1995 and 2009 visitor surveys.

Additional education and orientation is provided to visitors via nonpersonal services such as trailhead bulletin boards, waysides, trail signs, and park brochures. According to the 2009 survey, these opportunities are highly valued by visitors. When asked what motivates them to visit the park, visitors stated that learning about ancient cultures and learning about history were important to them. In fact, aspects of learning and curiosity were the most highly ranked reasons for a visit and important to almost all visitors (Freimund 2010). Visitors were also asked to rate the importance of certain services provided by the park. The availability of information exhibits/signs, park brochures, and museum exhibits were all rated as highly important to the visitor experience at the park.

Given the low levels of use at the park and the relatively unfettered access to park sites, there is concern that overcrowding can be a problem at peak use times and may get worse with changes in visitation patterns resulting from the paving of CR 7950. Visitors were asked about their perceptions of the number of other visitors at the park during the 2009 visitor survey (Freimund 2010). The number of other visitors had little effect on visitor experience, but encountering large groups or noise from

other visitors did detract from the visitor experience.

During the public scoping process, nearly 25% of visitor experience comments reflected concern for overcrowding in the park in the future. A number of comments also showed a desire to maintain wilderness qualities, such as solitude, a pristine environment, and the undeveloped nature of

the park. Scoping also revealed that several respondents showed support for management of large groups by requiring reservations and/or limiting the size of groups (Freimund 2010). By limiting the number of groups as well as the size of groups, it may be possible to help mitigate issues of crowding, especially at sites such as Pueblo Bonito/Chetro Ketl complex (figure 5).

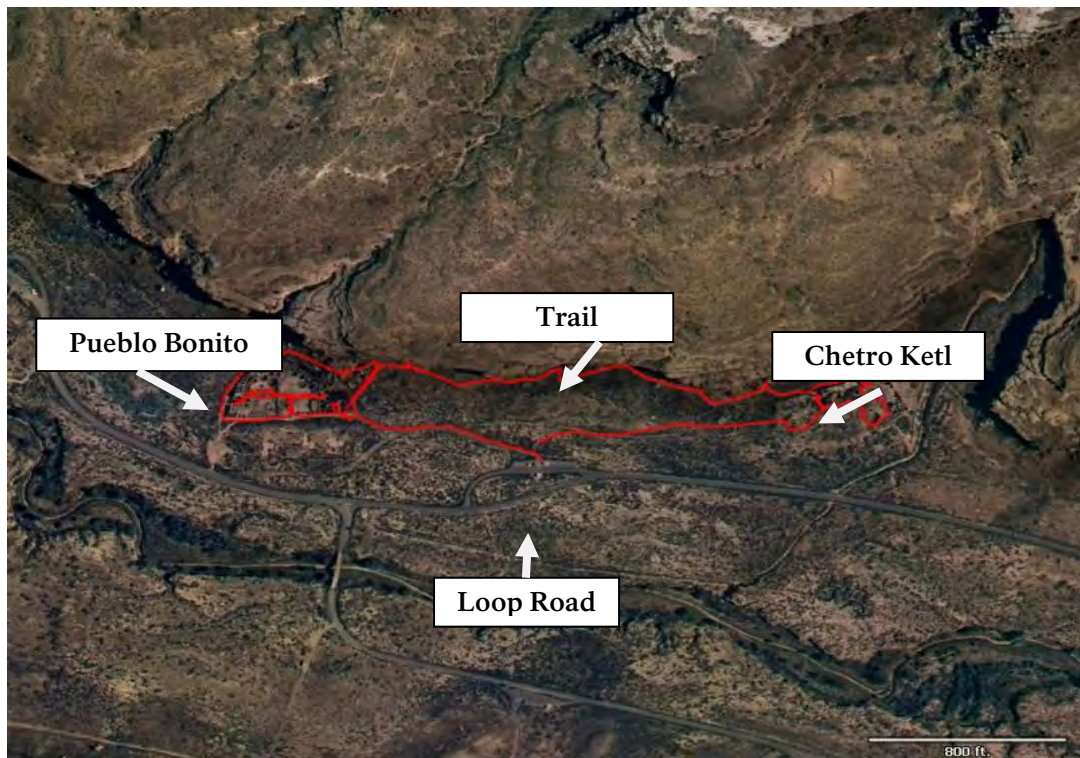


FIGURE 5. PUEBLO BONITO/CHETRO KETL COMPLEX

Visitors seem to be satisfied with the visitation levels at the park and crowding is not a primary concern for visitors, unless large groups (e.g., school groups or tour groups) happen to be in the park that day. However, because of the unique experience available at the park, if visitation should increase, crowding could be a more significant issue in the future. If portions of CR 7950 were to be paved, it would allow greater access for larger vehicles such as tour buses. These road improvements could also encourage visits by those visitors who are currently cautious about taking their cars on

this challenging portion of road. All of this could add up to an increase in visitation, thus increasing the number of people in the park at one time. This increase in people at one time could lead to crowding at certain sites within the park, which as the 2009 visitor survey revealed, might detract from the overall visitor experience at the park.

## PARK OPERATIONS

Four park operations subtopics that are relevant to the scope of this plan are discussed in this section: budget and staffing;

general park and visitor center operations; park housing; and visitor use management systems.

### **Budget and Staffing**

The park's base budget in 2010 was approximately \$2.1 million, of which \$300,000 was allocated to a site protection project. Currently, the park has a staff of 21 permanent employees and 16 seasonal employees, which together represent the equivalent of 27 FTEs. The park staff is organized in six operational divisions: the superintendent's office (2 FTEs), cultural resources (12–15 FTEs in preservation and 3 in museum curatorial), natural resources (1 FTE), law enforcement and emergency services (2.5 FTEs); visitor services and interpretation (4.5 FTEs), and maintenance (5.5 FTEs). The park staff is supplemented by more than 10 volunteers or Student Conservation Association (SCA) interns each year.

The park has a small staff that has had varying degrees of success responding to visitor use management needs and impacts resulting from visitor use. Maintenance staff focuses primarily on facility asset management and deferred maintenance needs; however, they do occasionally assist with visitor use projects. Interpretation staff focus on educating visitors on the significance of the park, providing interpretive programs, and collecting fees, but have limited time to systematically manage visitor use needs and issues. Cultural resource management activities include resource preservation, research, and responding to impacts on resources from visitor use. The NPS site stewardship program supplements park staff activities with voluntary community participation in various management and monitoring activities.

### **General Park and Visitor Center Operations**

The park is open all year-round, from sunrise to sunset, although the unpaved

roads that lead to the park entrance can be difficult to navigate during inclement weather. An entrance fee of \$8 per car or \$4 per motorcycle is required to visit the park; this fee is collected at the visitor center.

Current estimates are that 90% of all visitors stop at the visitor center and either pay their fee or check in.

Of the some 4,000 archeological sites that have been identified within park boundaries, numerous are open to visitors. These are located on the loop road and on some of the backcountry trails. The sites and trails located along the loop road can be visited from sunrise to sunset daily. Trails with interpretive signs that lead visitors through the primary sites are surfaced with compacted crushed gravel. The 19 miles of trails in the backcountry areas and the mesa tops are rougher. To gain access to the backcountry sites, visitors must obtain permits so that rangers can keep track of the number of hikers who hike into the backcountry on a given day. The detached park units are connected to the park by paved and unpaved roads passing through state, federal, tribal, and private land. Thus, the construction of gates to limit access is precluded.

The visitor center, built in 1957, is being razed and a new visitor center built in the existing footprint; it is scheduled to be open by winter 2012. A temporary visitor center is currently in operation nearby. The visitor center is open daily from 8:00 a.m. to 5:00 p.m., except on Thanksgiving, Christmas, and New Year's Day, when it is closed. The visitor center is staffed on average by an equivalent of two FTEs (Bodnar, pers. comm., 2010). When completed, the visitor center complex will contain exhibit space, a movie viewing room, a bookstore, administrative offices, restrooms, and drinking fountains.

Visitation by large groups (i.e., groups larger than 20 people) tends to be most popular in the spring (Bodnar, pers. comm., 2010). In a typical year, the park receives on average about 80–90 groups of 20–30 people; about

10 groups of 30–50 people; and about five groups of 50–100 or more people.

Most of the park's administrative functions are performed within the visitor center, in the portion of the building designated for those purposes. Maintenance and some curatorial functions are largely accomplished within the park's maintenance area. Both the visitor center and the maintenance areas, along with park housing, are contained within the park's development subzone. Approximately 18 park staff and volunteers have their work stations in the visitor center, along with an administrative work area for the Western National Parks Association. Most of the park staff works out of the visitor center, but are currently based out of a modular office unit (trailer) during the visitor center construction period. However, it is expected that the new visitor center and the modern office space it will contain will be operational by winter 2012.

There are four picnic areas in the park with a total of nine picnic tables; camping sites have their own eating areas. Parking areas along the interpretive loop road can accommodate 62 vehicles and two buses. Off the main entrance road is a 46-site campground and a two-site group camping area with comfort stations. The site is 60 miles from the nearest town that provides accommodations. There are no lodging, automobile services, or food facilities inside the park.

Because of its relative remoteness, all maintenance facilities and employee housing are within the park in an area not far from the visitor center. These facilities consist of 6

maintenance and 10 housing structures. A water well and storage tanks, water and sewage pipelines, and 2 acres of sewage discharge lagoons are nearby on the mesa top.

## **Park Housing**

The 17 housing structures in the park have limited housing capacity: there are four single-family residences, eight apartments, a trailer, and four duplex units. There are also three RV/trailer sites. Housing is assigned in priority order to permanent full-time employees, permanent subject to furlough employees, term employees, seasonal and essential cooperators (SCA), and other nonpaid partners (including researchers, volunteers, and speakers). The duplex units are often shared between unrelated people to maximize the housing available. Because of the concentration and sensitivity of the park's cultural resources, the park desires to maintain the existing development footprint and not expand their housing stock. Consequently, the available housing stock is limited and does not allow the park to offer housing to an expanded staff or to host other professionals who may be assisting the park in their work.

## **Visitor Use Management Systems**

The park has no reservation systems for general park visitation, group tours, or camping. There is currently no mandatory orientation for visitors about site access and behavior.

## IMPACT TOPICS CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Some resource impact topics that are commonly considered during the planning process were dismissed from detailed analysis because either the management alternatives would have no effect, a negligible effect, or a minor effect on the resource, or because the resource does not occur in the park addition lands.

For purposes of this section, an impact of negligible intensity is one that is “at the lowest levels of detection, barely perceptible, and not measurable.” An impact of minor intensity is one that is “measurable or perceptible, but is slight, localized, and would result in a limited alteration or would impact a limited area.” The rationale for dismissing these specific topics is stated for each resource.

### NATURAL RESOURCE TOPICS

#### Vegetation and Wildlife

The actions described in the alternatives are specific to visitor use management primarily within cultural sites located along the park’s loop road. The park’s native plants and wildlife would be largely unaffected by these actions. Currently, some minor informal trailing occurs outside of these higher-use areas, which cause negligible to minor trampling impacts on adjacent vegetation. Some minor disturbances to wildlife also occur when visitors cause pronghorn, elk, deer, and other species to flush when encountered. Visitors also contribute to the spread of nonnative plant species, such as tamarisk in the riparian area near the park road. Implementation of the action alternatives would result in minor benefits to native vegetation and wildlife. For example, the potential use of a backcountry

reservation or permit system would help to alleviate these types of disturbances by minimizing crowding or dispersing visitors. Programs could also be tailored to improve visitor awareness about these potential impacts. Because these impacts would only be minor in intensity, vegetation and wildlife have been dismissed from further analysis.

#### Federal and State Listed Species

The Endangered Species Act of 1973 requires examination of impacts on all federally listed threatened, endangered, and candidate species to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. In addition, *NPS Management Policies 2006* and *NPS Director’s Order 77: Natural Resources Management Guideline* require the National Park Service to examine the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species.

Endangered species are those in danger of extinction throughout all or a significant portion of their range (Endangered Species Act section 3(6)). Threatened species are those likely to become endangered in the foreseeable future through all or a significant portion of their range (ESA section 3(20)). Sensitive species or species of concern are informal terms that refer to those species that the U.S. Fish and Wildlife Service believes could be in need of concentrated conservation actions.

No federally listed threatened or endangered species are known to exist at CCNHP. A threatened and endangered species survey was completed in July 2001 for the purpose of assessing the presence or



absence of such species in the project areas (North Wind 2001). This survey did not identify any threatened or endangered species within park lands. In addition, a series of biological inventories have been conducted in recent years by the Southern Colorado Plateau Inventory and Monitoring Network for the purpose of assessing the presence or absence of species across park habitat types. This parkwide inventory identified no suitable habitat for threatened and endangered species (North Wind 2001).

There are five species of concern identified by the U.S. Fish and Wildlife Service that may be found in the park. A riparian vegetation survey was conducted and finished in 2004 (Floyd-Hanna 2004) and a rare plants survey (Barlow-Irich 2008) recently gathered data parkwide. *Aletes macdougalii* (San Juan false carrot), a state sensitive species, has been surveyed at higher elevations on cretaceous sandstone benches in the main park unit that consist of gravelly/sandy soils. The only wildlife species of concern that may occur in public use areas of the park are two species of bat (Fringed Myotis and Townsend's big-eared bat), the burrowing owl, and the loggerhead shrike.

The actions being considered for this plan amendment are unlikely to have any measurable effect on special status species or associated critical habitats. No new park areas would be opened to the public and no new visitor activities are proposed, apart from new educational orientation at the visitor center; visitor access would be limited to the same frontcountry sites and backcountry trails, and during the same hours as currently allowed. Motor vehicle traffic is not expected to increase appreciably and changes in park operations would be largely administrative in nature. Therefore, there would be no or only negligible effects on special status species. Further, such effects would not result in any unacceptable impacts; the proposed action is consistent with section 1.4.7.1 of NPS *Management Policies* 2006. Because the effects on special status species would be

minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

## Geologic and Soil Resources

The actions described in the alternatives are specific to visitor use management primarily within cultural sites located along the park's loop road. The park's geologic and soil resources would be largely unaffected by these actions.

## Water-related Resources

The actions described in the alternatives are specific to visitor use management primarily within cultural sites along the park's loop road. The park's water-related resources (including water quality, wetlands, riparian areas, and floodplains) would be largely unaffected by these actions.

## Air Quality

The Clean Air Act of 1963 (42 USC 7401 et seq.) was established to promote the public health and welfare by protecting and enhancing the nation's air quality. The act establishes specific programs that provide special protection for air resources and air quality related values associated with national park system units. Section 118 of the Clean Air Act requires park units to meet all federal, state, and local air pollution standards.

Chaco Culture National Historical Park is designated as a Class II air quality area under the Clean Air Act. A Class II designation indicates the maximum allowable increase in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter as specified in section 163 of the Clean Air Act. Further, the Clean Air Act provides that the federal land manager has an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural

resources, and visitor health) from adverse pollution impacts.

The National Park Service strives to perpetuate the best possible air quality, because air pollution, even at relatively low levels, affects ecological and human health, scenic views, and visitor enjoyment. Progress toward this goal is measured by examining current conditions and trends for key air quality indicators, including ozone, visibility, and atmospheric deposition. Of these indicators, visibility at Chaco is the most immediate management concern.

Air quality at Chaco is generally good because of its remote location and setting, though regional energy development activities contribute significantly to the park's overall air pollution, with reduced visibility being one effect routinely noted by park visitors and managers. Two large coal burning power plants are located northwest of the park: the 1800-megawatt San Juan Generating Station west of Farmington, New Mexico, and the 2040-megawatt Four Corners Power Plant near Fruitland, New Mexico. These plants are believed to contribute adversely to air quality conditions in and around Chaco, though formal air quality monitoring is not conducted at the park. A third large coal-fired power plant, the 1,500-megawatt Desert Rock Power Plant, has been proposed nearby at Burnham, New Mexico. Park managers believe that oil and gas resource extraction also contributes to air pollution at the park; these activities are expected to increase in coming years across the region.

Despite these broader impacts, air quality (including visibility) would be largely unaffected by the management alternatives. As is suggested by the park's annual visitation of approximately 45,000 persons, motor vehicle traffic at Chaco is generally light. Because of a sparse population, regional traffic levels are also low. Emissions produced under the action alternatives would generally be the same as under the no-action alternative because visitor use volume and patterns would be similar to the

no-action alternative. Consequently, no increase in emissions beyond current conditions is anticipated.

Overall, the plan amendment is expected to have no more than negligible effects on air quality. The Class II air quality designation for Chaco Culture National Historical Park would not be affected by the proposal. Further, because the Class II airshed would not be affected and no air quality analysis would be required under New Mexico law, there would be no unacceptable impacts; the proposed action is consistent with section 1.4.7.1 of *NPS Management Policies 2006*. Because there would be no more than negligible effects on air quality, and the proposed action would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

## Viewsheds

The actions described in the alternatives would have no effect on the park's viewsheds. Only non-NPS actions could have an effect (e.g., energy exploration and development along the park boundary would degrade the natural setting).

## Dark Night Skies

The actions described in the alternatives would have no effect on the park's dark night skies because no new lighting is proposed for any of the facilities and management programs that are included in the plan.

## Prime or Unique Farmlands

In 1980, the Council on Environmental Quality directed federal agencies to assess the effects of their actions on farmland classified by the Natural Resources Conservation Service as prime or unique. Prime farmlands are defined as lands that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and are

also available for these uses. Prime farmlands have the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. Unique farmlands are lands other than prime farmland that are used for the production of specific, high-value food and fiber crops. Because there are no prime or unique farmlands at Chaco Culture National Historical Park, this impact topic has been dismissed from further consideration.

### **Energy Requirements and Conservation Potential**

The implementing regulations of the National Environmental Policy Act require that energy requirements, natural or depletable resource requirements, and conservation potential be analyzed. The National Park Service's *Guiding Principles of Sustainable Design* (1993) provides a basis for achieving sustainability in facility planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. Sustainability can be described as the result achieved by doing things without compromising the environment or its capacity to provide for present and future generations. The guidebook describes principles to be used in the design and management of visitor facilities that emphasize environmental sensitivity in construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings. Sustainable practices minimize the short- and long-term environmental impacts of developments and other activities through resource conservation, recycling, waste minimization, and the use of energy efficient and

ecologically responsible materials and techniques.

Chaco Culture National Historical Park strives to reduce energy costs, eliminate waste, and conserve energy resources by using energy efficient and cost effective technology wherever possible. Energy efficiency would also be incorporated into any decision-making process affecting park operations. Value analysis would be used to examine energy, environmental, and economic implications of proposed development. The park would encourage suppliers, permittees, and contractors to follow sustainable practices and address sustainable practices in interpretive programs. Thus, under all management alternatives, there would be negligible impacts on energy requirements and conservation potential. Therefore, this topic was dismissed as an impact topic.

### **Environmental Justice**

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low Income Populations" requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of federal programs and policies on minority and low-income populations and communities.

San Juan and McKinley counties have both minority and low-income populations and communities; however, environmental justice was dismissed as an impact topic for the following reasons:

- The planning team actively solicited public comments, including from the tribes, as part of the planning process and gave equal consideration to input from all persons regardless of age, race, ethnicity, income status, or other socioeconomic or demographic factors.
- The alternatives would not result in any disproportionate adverse

impacts on minorities or low-income populations and communities.

## **Carbon Footprint**

For the purpose of this planning effort, “carbon footprint” is defined as the sum of all emissions of carbon dioxide and other greenhouse gases (e.g., methane and ozone) that would result from implementation of the two management alternatives. Understanding the carbon footprint of each alternative is important to determine their contribution to climate change.

It has been determined that the management alternatives described in this document would only emit a negligible amount of greenhouse gases that contribute to climate change; therefore, this impact topic has been dismissed from detailed analysis in this plan. The reasons for dismissing this impact topic are that (1) no new road or facility construction is proposed under either alternative; and (2) there would be no increase in emissions from current visitor-related activities described under the no-action alternative. Vehicle emissions could be reduced slightly when compared to the no-action alternative because of the likelihood that visitors would spend less time driving in search of a parking space. However, because the change in the amount of greenhouse gas emissions that would result from each alternative is negligible, a quantitative measurement of their carbon footprint was determined by the planning team not to be practicable.

## **SOCIOECONOMICS**

The actions contained in the plan would have negligible effects on the economy of the area. The park is a destination park with no major gateway communities; the actions included in the plan would be unlikely to affect visitation or spending by visitors. The alternatives do not include any substantial facility construction or provide

opportunities for local businesses. Potential changes in visitor use management resulting from the alternatives would not affect socioeconomics.

## **CULTURAL RESOURCE TOPICS**

### **Prehistoric/Historic Structures**

The historical park contains numerous prehistoric and historic structures. These resources are managed within the context of the cultural resources management program and are listed on the Archeological Sites Management System because the structures are either in ruins or are the subsurface remains of structures. Others are also listed in the List of Classified Structures. These structures range from those built 2,000 years ago to structures built as recently as 50 years ago. Park staff manages all of these structures as archeological resources because of the considerable overlap between the definition of structures and archeology. These resources are considered one and the same for the purpose of resource management at Chaco. As a result, prehistoric/historic structures will be combined with archeological resources and addressed under archeological resources in the impact analysis.

Archeological surveys have identified other prehistoric structures in the park, but these are not aboveground structures and therefore are also maintained by the Archeological Sites Management System. Therefore, because only ruins and subsurface remains of the prehistoric structures now exist, and other historic structures would not be impacted by the plan, the topic of prehistoric/historic structures will be combined with archeological resources and addressed under archeological resources in the impact analysis.

## Cultural Landscapes

As with the prehistoric/historic structures resources, cultural landscapes are also addressed as archeological resources for the purpose of resource management and protection because cultural landscapes are composed of exactly the same sites, patterns, landscape features, and structures as those resources already managed as archeological resources. To avoid redundancy, cultural landscapes are included in the impact analysis for archeological resources in this plan.

## Museum Collections

Museum collections are prehistoric and historic objects, artifacts, works of art, archival material, and natural history specimens. The park's museum collections contain over 1.9 million objects and archival documents. The Chaco collections have received national and international attention and have and continue to be the focus for important archeological research.

The park's museum collections are currently housed off-site in the Hibben Center for Archeological Research at The University of New Mexico (UNM), under a cooperative agreement. The museum collection is accessible to members of the public via a public research request system. The park also includes an extensive online virtual exhibit of the collection's holdings, and includes interpretive information about the collection within the context of Chaco Culture National Historical Park.

Chaco Culture National Historical Park's museum collections would not be impacted by this plan because none of the alternatives involves making significant additions or

changes to the museum collections of Chaco Culture National Historical Park.

Collections would continue to be acquired, accessioned and cataloged, preserved, protected, and made available for access and use according to NPS standards and guidelines. Therefore museum collections are not further analyzed in this document.

## American Indian Trust Resources

Secretarial Order 3175, *Departmental Responsibilities for Indian Trust Resources*, requires that any anticipated impacts on Indian trust resources from a proposed project or action by the Department of the Interior agencies be explicitly addressed in environmental documents. Departmental responsibilities are identified in 512 DM section 2. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal (and allotted) lands, assets, resources, and treaty rights; it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are four tracts within the main unit of Chaco Culture National Historical Park and four additional tracts in detached units of the park that qualify as individual Indian allotments. The land in these tracts is used primarily for grazing, and they remain unimproved. No tract is within the development subzone of the park, and the nearest such tract to the visitor center is approximately 1 mile away. Because the allotments within the park are not likely to be affected by any of the activities proposed in the general management plan amendment, the proposed actions would have no more than negligible effects on individual Indian allotments.





# CHAPTER 4



**ENVIRONMENTAL CONSEQUENCES**





## INTRODUCTION

The National Environmental Policy Act of 1969 (40 CFR 1500–1508) mandates that environmental assessments disclose the environmental impacts of a proposed federal action. In this case, the proposed federal action is implementation of the general management plan amendment for the park addition lands. The alternatives in this document provide broad management direction. Thus, this environmental assessment should be considered a programmatic document. Before undertaking specific actions to implement the approved plan, NPS managers will need to determine if more detailed environmental documents must be prepared, consistent with the provisions of the National Environmental Policy Act.

The first part of this chapter discusses terms and assumptions used in the discussions of impacts. The next three parts cover policy and terminology related to cumulative impacts and unacceptable impacts. Next, the impacts of the no-action alternative and the action alternatives are discussed. Each impact topic includes a description of the impacts of the alternative, a discussion of cumulative effects, and a conclusion. The impact analysis for the no-action alternative considers current management and trends. The impacts of the action alternatives describe the difference between implementing the no-action alternative and implementing the action alternatives. To understand the consequences of the action alternatives, the reader must consider what would happen if no action were taken (i.e., consider the no-action alternative).

### TERMS AND ASSUMPTIONS

Each impact topic includes a discussion of impacts, including the intensity, duration, and type of impact. *Intensity* of impact describes the degree, level, or strength of an impact as negligible, minor, moderate, or

major. Because definitions of intensity vary by resource topic, separate intensity definitions are provided for each impact topic. *Duration* of impact considers whether the impact would occur over the short term or long term. Unless otherwise noted, *short-term* impacts are those that, within a short period of time (generally less than five years), would no longer be detectable as the resource or value returns to its pre-disturbance condition or appearance. *Long-term* impacts refer to a change in a resource or value that is expected to persist for five or more years. The *type* of impact refers to whether the impact on the resource or value would be *beneficial* (positive) or *adverse* (negative).

An important assumption for analyzing the action alternatives is the fact that the National Park Service would initiate actions to protect resources and the visitor experience, but would do so without the benefit of a systematic visitor use management framework with which to consider, implement, and evaluate their decisions.

### CUMULATIVE IMPACTS

#### Introduction

The Council on Environmental Quality regulations, which implement the National Environmental Policy Act, requires assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes such other actions. Cumulative impacts can result from individually minor but collectively important actions taking place over a period of time. Cumulative impacts are considered for both the no-action and the action alternatives.

These impacts were determined by combining the impacts of the alternatives proposed in this document with the impacts of each alternative with the impacts of other past, present, and reasonably foreseeable future actions. To do this, it was necessary to identify these other projects or actions at the park and in the surrounding area. For the purposes of most impact topics in this analysis, the cumulative impact analysis area was San Juan and McKinley counties, New Mexico. The time horizon for the cumulative impacts analysis depends on the impact topic under consideration, but in most cases was about five years.

### **Other Projects**

The following past, present, and reasonably foreseeable future projects were identified for the purposes of conducting the cumulative effects analysis.

#### **San Juan County Road 7950**

**Improvement Project.** San Juan County and the Federal Highway Administration had been developing an environmental assessment that proposes alternatives to improve the northern entrance road up to the park's boundary (CR 7950).

**Park Visitor Center Reconstruction.** The park's visitor center, built in 1957, is being razed and a new visitor center built in the

existing footprint. The new visitor center is expected to be open in 2012 and will contain improved exhibit space, visitor center functions, and administrative offices.

**Increased National and World Profile of the Park.** Several external projects and circumstances have the ability to increase the profile of the park and consequently the public's awareness and potential visitation to the park:

- Chaco has been selected to appear on the 2012 America the Beautiful quarter.
- The park's status as a World Heritage site draws special international interest in and visitation to the park. Other areas of the world, including Europe, are experiencing an increase in public interest and visitation to World Heritage sites.

### **Past Impacts on Archeological Sites**

Impacts on archeological sites in the park have occurred in the past from natural wind and water erosive processes, from illegal artifact removal and vandalism, and from wear and tear associated with typical visitor use.

## IMPACTS ON CULTURAL RESOURCES

The analysis of cultural resources of the Chaco Culture National Historical Park is based on the professional judgment of park staff, NPS planners, and other specialists in the field of cultural resource management.

To provide a thorough analysis of the park's cultural resources, this section has been organized by the two impact topics listed below, which correspond to the cultural resource topics described in "Chapter 3: Affected Environment":

- Archeological Resources
- Ethnographic Resources

Because the three cultural resource types of archeological resources, prehistoric/historic structures, and cultural landscapes essentially encompass the same resources at Chaco, for the purposes of this impact analysis, these three categories are combined under archeological resources to avoid redundancy. Although ethnographic resources at Chaco encompass these same cultural resources, impacts to ethnographic resources are analyzed separately in this section to address additional issues related to ethnographic resources, such as traditional access to sites and intangible qualities, such as a traditional group's relationship with ethnographic resources.

Compliance with section 106 of the National Historic Preservation Act will be conducted separately from this environmental assessment.

### ARCHEOLOGICAL RESOURCES

#### Methods and Assumptions for Analyzing Impacts

The actions included in the management alternatives that relate to visitor use

management are a primary focus of this GMP amendment. Therefore, impact analysis of the actions related to part visitation and its potential impacts to archeological resources is an important component of this impact analysis. Examination of visitor use impacts to cultural resources is an inherent challenge to resource managers because site assessments of resource conditions cannot quantitatively establish a direct relationship between visitor use levels and the deterioration of archeological resources. For example, regular monitoring of archeological resource conditions cannot establish that "x" number of people equals "y" impacts to cultural resources. In lieu of this data, interviews with park staff helped inform the types and intensity levels of the impacts analyzed in this section, and therefore were an important part of the impact analysis methodology.

To this end, the team consulted with park cultural resources staff with more than 20 years tenure at Chaco. These staff members have deep empirical knowledge and understanding of the types of impacts to the park's cultural resources. They assert that both wear and tear and intentional impacts, such as vandalism, to cultural resources increase substantially during periods of heavy visitation. This information strongly suggests that there is a direct relationship between visitation and negative impacts to cultural resources. In addition, the planning team reviewed on-going monitoring data, along with a case study conducted by the Getty Conservation Institute (2005) to determine the degree to which the park's resources have been protected under current management.

Types of adverse impacts known to occur at the park include inadvertent wear and tear on exposed archeological resources from foot traffic as well as environmental deterioration, such as moisture, freeze/thaw,

and wind. Intentional human-caused adverse impacts known to occur at the park include vandalism to the resources, theft of artifacts, and offerings or deposition of ashes from human cremation, which require extensive cleaning measures that can diminish resource integrity.

Impacts to archeological resources were evaluated by comparing projected changes resulting from the action alternatives (alternatives 2, 3, and 4) to those of the no-action alternative (alternative 1). The thresholds used to determine impacts on these resources are defined as follows.

**Negligible:** Impact is at the lowest level of detection. Impacts would be measurable but with no perceptible consequences.

**Minor:** Disturbance of a site(s) results in little loss of integrity.

**Moderate:** Site(s) is disturbed but not obliterated.

**Major:** Site(s) is obliterated.

**Beneficial impact:** The action would result in the stabilization, preservation, rehabilitation, or restoration of the character-defining features of a National Register-listed or National Register-eligible archeological site or district in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

## Alternative 1, No Action

The current approach to park management and visitor use includes strategies that are intended to protect archeological resources. Although park staff is limited, the staff currently seeks to maintain archeological sites in good condition and monitors sites in keeping with the requirements of the NPS Archeology Program.

## Visitor Knowledge /NPS-led

**Orientation.** Visitor knowledge and information concerning the fragility of archeological resources and appropriate visitor etiquette would continue to be available on a voluntary basis. Rules and preservation messages would be available upon request when visitors pay entrance fees at the visitor center. Because there is no mandatory orientation for visitors, messages of archeological resource protection and preservation are often inconsistent and do not reach all visitors, such as those who do not take the initiative to read the information provided. Although nearly all visitors receive the park brochure, it is not always read by visitors. As a result, many visitors are either not getting or not consistently getting information on proper etiquette at sites, site preservation concerns, and rules about leaving personal objects or cremations in the sites and in the park in general.

Under the no-action alternative, visitors would continue to acquire information about archeological sites at the visitor center and through the use of self-guiding brochures. Inappropriate behavior at archeological sites would continue, and would increase as visitation increases, resulting in greater adverse effects to the sites from inadvertent and intentional visitor-use impacts. Although continued patrols and interpretive programs would provide messages of protection to visitors, limited park staff would have to focus efforts on mitigating the ongoing, cumulative damage to the archeological resources, such as vandalism and theft, instead of conducting preventative treatments and improving conditions.

As a result, continuation of the current visitor orientation practices in the no-action alternative could indirectly contribute to an increasingly significant level of moderate, permanent adverse impacts to archeological resources caused by inappropriate visitor behaviors, such as vandalism, theft of artifacts and objects, or the deposition of offerings and cremations. The intensity level

of these impacts could rise to the major level if deterioration from visitor use impacts worsens because of high levels of visitation to the park.

**Group Management.** Under the no-action alternative, groups visiting Chaco would continue to be managed with no limitations on the number or size of groups coming to the park. There is also no limit to the frequency and size of ranger-led tours, which can reach as many as 60 persons per tour during peak periods. The management of groups can impact archeological resource conditions, as some large groups, particularly school groups that are not properly supervised, result in moderate to major impacts to the resources, such as vandalism, theft, and other damage.

Groups use more of any given space within a site than individuals and stay in certain areas longer while guides do presentations. This situation magnifies the amount of wear and tear on elements within the archeological sites, resulting in greater need for preservation treatments. Mitigating the impacts of large volumes of visitors, in groups or individual, takes staff away from necessary preventative treatments, and consequently the condition of cultural resources deteriorates.

Under the no-action alternative, special events would continue to occur without restrictions regarding the numbers of individual visitors or groups attending the events. There is no plan in place to manage visitor numbers at special events, beyond the size of parking facilities, assuming parking regulations are enforced. Special events often include various types of intense use activity not generally allowed in the sites thereby increasing potential for adversely affecting the integrity of the archeological resources. At current levels of visitation related to visitor groups and special events, there would be moderate and potentially major adverse, permanent impacts to archeological sites because of wear and tear and other forms of inadvertent deterioration to archeological resources associated with

visitor use, as well as increased risk of intentional (vandalism) adverse impacts.

If group levels exceed the levels identified in the 1984 general management plan, there could be increased moderate to major, permanent, adverse impacts to archeological sites caused by increased disturbance and the resulting deterioration brought about by groups of unlimited sizes. The lack of a reservation system for the campground (except for group campsites) means that park staff would not be able to plan for and anticipate the arrival of visitors, particularly large groups of visitors during the peak season. As a result, ongoing first-come, first-served use of individual campsites would indirectly contribute to ongoing moderate to major, permanent, adverse impacts to archeological sites related to visitor use in the park.

**Individual Visitor Access.** Under the no-action alternative, visitors would continue to access the park's primary archeological sites on their own and at their own pace. Although unrestricted and unsupervised access is detrimental to Chaco's archeological resources, the number of available parking sites would continue to limit the numbers of people able to access archeological sites at one time. At the current levels of visitation, particularly during the peak visitor season of mid-March to mid-November, visitor use causes a low level of disturbance and deterioration to archeological resources that have not been hardened or are easily accessible from trails and developed areas. These archeological resources are vulnerable to surface disturbance, wear and tear, other types of inadvertent damage, and vandalism because visitors access sites on their own and largely without supervision because of the lack of staffing. Continuation of this type of visitor use management under the no-action alternative would result in ongoing disturbance to and deterioration of archeological resources with current visitation levels, and would result in moderate and potentially major permanent, adverse impacts to those resources.

There is no provision for limiting the number of visitors to the park or to individual sites, should indicator levels be reached. The number of visitors who pass through a site affects the park staff's ability to maintain the sites in good or fair condition at a minimum. The greater the visitation levels, the greater the expense will be to maintain the prehistoric structures and the greater the potential for adverse effects to archeological sites.

If the number of visitors coming to the park exceeds the levels identified in the 1984 general management plan, or if standards are exceeded for the chosen indicators, then there could be increased adverse impacts to archeological sites caused by foot traffic, vandalism, theft, and other types of deterioration associated with increased visitor use. An increase in park visitation could result in moderate and potentially major, permanent, adverse impacts to archeological resources.

**Cumulative Impacts.** A new visitor center at the park is currently being rebuilt on the existing footprint of the old visitor center. No impacts to archeological resources would occur from this action.

External trends and changes, such as improvements to CR 7950, the release of the America the Beautiful quarter, and the park's status as a World Heritage site, could increase visitation and thus result in inadvertent damage and vandalism to archeological resources. Such adverse impacts would be minor in intensity and permanent.

As described above, implementation of the no-action alternative would result in moderate and potentially major adverse impacts to archeological resources if inadvertent and intentional visitor use impacts continue to worsen at the park. These impacts would be permanent impacts to archeological resources. The moderate-to-major, permanent, adverse impacts of the no-action alternative, in combination with the minor, permanent, adverse impacts of

other past, present, and reasonably foreseeable future actions, would result in an overall permanent, moderate, adverse, cumulative effect to archeological resources.

**Conclusion.** The no-action alternative would cause moderate and potentially major, permanent, adverse impacts to archeological resources. There could be increased adverse impacts if visitor use levels exceed the limits identified in the 1984 general management plan. Cumulative impacts would be permanent, moderate, and adverse.

## Alternative 2, The Preferred Alternative

The preferred alternative would put in place year-round strategies to address increased visitation and the impacts to resources associated with visitor use.

### Visitor Knowledge / NPS-led

**Orientation.** The immediate and potential management strategies of the preferred alternative would better impart to visitors, through the use of a structured education program, appropriate resource protection information when compared to the strategies of the no-action alternative.

Under this program, all visitors would be required to listen to and/or watch a video on the fragility of archeological resources in the form of a consistent and comprehensive resource orientation message at the visitor center where visitors pay their entrance fees. The orientation program includes information on park and site etiquette, a preservation message, and information about park rules concerning leaving offerings and cremations, inappropriate behaviors, and how visitors can lessen the visitor use impacts to the cultural resources. This program would ensure that all visitors acquire information about the appropriate types of behavior that would help avoid impacts to Chaco's archeological sites. It is anticipated that this would reduce the current levels of visitor-induced damage that

would continue to occur without this program under the no-action alternative. Therefore, the visitor orientation in the preferred alternative would provide for additional protection to all cultural sites within the park, including archeological resources.

Adverse impacts to archeological resources, whether inadvertent or intentional (such as vandalism), would likely continue to a certain degree, but the intensity and frequency of these impacts would be less than the adverse impacts in the no-action alternative. Adverse impacts would be permanent, adverse, and minor in intensity.

**Group Management.** Under alternative 2, groups visiting Chaco would be required to receive information on the sensitivity of park cultural resources, including archeological resources, prior to visiting the park. The number of groups visiting the park would be limited to two groups per day. Groups larger than 20 people would be required to break into sub-groups no larger than 20. Dividing large groups into smaller groups will help facilitate group management and allow park staff to monitor both individuals and group dynamics that could impact archeological resources. This would ultimately help reduce the wear and tear and other types of visitor-use impacts on archeological resources.

Under the preferred alternative, if the standard for any indicator is exceeded, potential management strategies include timing group reservations so that they are strategically scheduled throughout the day to disperse their arrival. As a last resort, groups could be completely restricted during peak use times of day and the peak season in an effort to protect archeological resources. It is anticipated that dispersing groups throughout the park during high visitation would help eliminate some of the impacts caused by large groups and large ranger-led tours. However, this strategy would not apply during special events, estimated at four or five days a year. During these times, additional staff would be put in place to ensure protection of resources and

visitor safety with the increased use levels that occur during these events. Overall, the proactive actions to improve visitor orientation would help minimize permanent, adverse impacts to the archeological resources at Chaco and keep those impacts in the minor range of intensity.

**Individual Visitor Access.** Under the preferred alternative, mandatory visitor orientation program on appropriate visitor behavior and visitor-related impacts to archeological resources during peak use times would encourage appropriate visitor etiquette, minimize crowding, and thus help reduce potential adverse impacts to archeological resources. Visitors' receipt of information prior to visiting and the encouragement of trip planning would further control access to the park; however, once they go through the main visitor area, visitors would continue to freely visit the park sites as in the past. These preventative actions would help limit deterioration to archeological resources brought about by increased visitation and visitation numbers that exceed established standards for any of the indicators. As a result, adverse impacts to archeological resources would be permanent, but would be kept to the minor range. This would be less than those in the no-action alternative.

Under the preferred alternative, additional strategies for dispersing visitors in an effort to distribute visitor use impacts could involve encouraging visitors to visit the less-used areas of the park. These areas could be highlighted using strategic information provided at the visitor center or by using on-site contacts at key cultural sites during the busy peak season (mid-March to mid-November). Such actions to disperse crowding would help reduce impacts to the most heavily visited archeological resources. Adverse impacts to archeological resources would still occur, but these actions would keep them to the minor range and be less than those in the no-action alternative. Adverse impacts to archeological resources would be permanent.

If visitation were to increase to the level where the advance reservation system would be implemented, the reservation system would help park management anticipate, plan, disperse, and regulate visitors and their use levels to protect certain cultural resources, including archeological resources. Although the impact of the reservation system to archeological resources would be indirect and would apply only to specific sites, this action would help keep the permanent adverse effects from visitor use to the minor level of intensity—less than the no-action alternative.

**Cumulative Impacts.** A new visitor center is currently being built on the existing footprint of the old visitor center. No impacts to archeological resources would occur as a result of this action.

External trends and changes, such as improvements to CR 7950, the release of the America the Beautiful quarter, and the status of the park as a World Heritage site, could result in increased park visitation, resulting in inadvertent damage and vandalism to archeological resources. Such adverse impacts would be permanent and minor in intensity.

As described above, implementation of alternative 2 would result in minor, permanent, adverse impacts to archeological resources. These impacts of alternative 2, in combination with the minor, permanent, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a permanent, minor, adverse cumulative effect. The minor, adverse impacts of alternative 2 would be a small component of the adverse cumulative impact.

**Conclusion.** The preferred alternative would have minor, adverse impacts on Chaco's archeological resources. Cumulative impacts would be permanent, minor, and adverse.

### Alternative 3

Alternative 3 would put in place strategies to address increased visitation on a seasonal basis at the park. The immediate and potential management strategies described in alternative 3 would help minimize adverse impacts to archeological resources.

#### Visitor Knowledge / NPS-led

**Orientation.** Under alternative 3, visitors would be required to stop at the visitor center to receive information about the fragility of park archeological resources. This approach to visitor orientation would reduce the current levels of visitor-induced damage to archeological resources that occur without this program in place under the no-action alternative. Therefore, the visitor orientation in alternative 3 would provide additional protection to all cultural sites within the park, including archeological resources. Adverse impacts to archeological resources, whether inadvertent or intentional (such as vandalism), would likely continue to a certain degree, but the intensity and frequency of these impacts would be less than the adverse impacts in the no-action alternative. Adverse impacts would be permanent and minor in intensity.

Under alternative 3, on-site education would occur at the park's primary archeological sites using park staff on an as-needed basis. Roving patrols and interpretive contacts would be increased at these sites during the busy peak season (mid-March to mid-November). Since currently there are very little to no roving activities occurring in the park, this would result in a slight increase in resource protection over the no-action alternative. These actions would help visitors receive a standardized message concerning the preservation of archeological resources and visitor etiquette; this would help modify behaviors, both inadvertent and intentional, that could cause adverse impacts to archeological resources. Adverse impacts would be permanent, but would be kept to the minor level of intensity, which would be less than those in the no-action alternative.



**Group Management.** Under alternative 3, groups visiting Chaco would receive information prior to visiting the park to ensure consistent messaging regarding the fragility of the park's archeological resources. No more than one group would be allowed to visit a cultural site at any time, with a limit of two groups per day. Large groups would be required to split into smaller groups of no more than 20 people each. These actions would help reduce wear and tear on archeological structures, and as a result, adverse impacts caused by visitor use would be permanent, but would be kept to the minor range of intensity, and would be less than in the no-action alternative.

Under alternative 3, if general visitation were to increase to the level where the advance reservation system would be implemented, the reservation system would help park management anticipate, plan, disperse, and regulate visitors to protect certain cultural resources. However, this strategy would not apply during special events, estimated at four or five days a year. During these times, additional staff would be put in place to ensure protection of resources and visitor safety with increased use levels. Although the impact of the reservation system on archeological resources would be indirect and would apply only to specific sites, this action would help keep the permanent adverse effects from visitor use in the minor range, and would be less than the no-action alternative.

**Individual Visitor Access.** The immediate management strategies for individual visitor access involve providing information to visitors prior to their visits and encouraging trip planning would further control access and encourage voluntary distribution of use in the park, although visitors would continue to visit sites as in the past once they enter the main visitor area. These strategies would help minimize impacts to archeological resources by limiting deterioration brought about by visitation numbers that exceed established standards for any of the indicators. These actions would help keep

permanent, adverse impacts resulting from increased visitor use to the minor level of intensity.

**Cumulative Impacts.** A new visitor center at the park is currently being built on the existing footprint of the old visitor center. No impacts to archeological resources would occur from this action.

External trends and changes, such as improvements to CR 7950, the release of the America the Beautiful quarter, and the park's status as a World Heritage site, may increase park visitation; this could result in increased inadvertent damage and vandalism to archeological resources. Such adverse impacts would be minor in intensity and permanent.

As described above, implementation of alternative 3 would result in minor, permanent, adverse impacts to archeological resources. These impacts of alternative 3, in combination with the minor, permanent, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a permanent, minor, adverse cumulative effect. The minor adverse impacts of alternative 3 would be a small component of the adverse cumulative impact.

**Conclusion.** Alternative 3 would result in minor permanent impacts on Chaco's archeological resources. Cumulative impacts would be permanent, minor, and adverse.

## Alternative 4

Alternative 4 includes year-round strategies to help protect archeological resources on a site-specific basis.

### Visitor Knowledge / NPS-led

**Orientation.** Visitor knowledge and orientation under alternative 4 would be a continuation of the current strategies, as described under the no-action alternative. Visitor orientation would continue to be voluntary and obtained upon request when

visitors pay entrance fees at the visitor center. Because alternative 4 does not include mandatory orientation for visitors, messages of resource protection and preservation would be inconsistent and would not reach all visitors, such as those who do not take the initiative to read the information provided. Instead, visitors would continue to acquire information about archeological sites at the visitor center and through the use of self-guiding brochures. Although continued patrols and interpretive programs would provide messages of protection to visitors, under alternative 4, limited park staff will have to focus efforts on mitigating the ongoing, cumulative damage to the archeological resources, such as vandalism and theft, instead of conducting preventative treatments and improving conditions.

As a result, orientation practices under alternative 4 could indirectly contribute to an increasingly significant level of moderate adverse impacts to archeological resources caused by inadvertent damage or vandalism, such as theft of artifacts and the deposition of offerings and cremations. These adverse impacts would be permanent, and could even increase to the major level of intensity under alternative 4 if visitation substantially increases. This alternative would result in the same adverse impact as that of the no-action alternative.

Alternative 4 would involve immediate management strategies that would put additional staff on-site at key locations and sites during peak visitation and special events as a means of addressing impacts from increased visitation. However, even though this alternative takes a site-specific approach to resource protection, sites open to visitation that do not have rangers stationed at them during the peak season would not receive increased protection. As a result, only those sites with roving or stationed rangers would have improved protection, while the remainder of the open sites without park staff would be vulnerable to visitor impacts. The immediate and potential management strategies described

in alternative 4 would result in minor and potentially moderate, permanent, adverse impacts to some archeological resources. Because some archeological sites would have increased protection from visitor use impacts during periods of high visitation, these impacts would be slightly less intense and less frequent than the adverse impacts under the no-action alternative.

**Group Management.** Under alternative 4, groups visiting Chaco would receive information prior to visiting the park to ensure consistent messaging regarding the fragility of the park's archeological resources.

No more than one group would be allowed to visit certain cultural sites at any one time, with a limit of two groups per day. Large groups would be required to split into smaller groups of no more than 20 people each. This would limit the level of intense group impacts in specific locations, though it would not limit the daily impacts from the smaller groups of 20 that would result from a very large group. Group arrival times may be dispersed through the day, and the number and size of groups may be further restricted. Overall, these actions would help reduce wear and tear and incidences of intentional impacts (vandalism) on the park's archeological resources. As a result, adverse impacts caused by visitor use would be permanent, but would be kept in the minor range under this action, and would be less than the no-action alternative.

**Individual Visitor Access.** The immediate management strategies for individual visitor access that would encourage voluntary redistribution of use would minimize crowding and thereby reduce potential adverse impacts to archeological resources. Providing information to visitors prior to their visit, encouraging trip planning, and using queuing techniques would further control access to archeological sites. Park staff would provide on-site education at strategic locations in the park, but only during peak visitation times.

If the standard for any indicator is reached, individual visitors may need to get reservations ahead of time. There may also be limits on the number of person who can enter given sites on a daily basis by using queuing techniques at access points to certain archeological sites. These actions would help minimize the concentration of visitors at any one place in the park, and help to reduce intense use of certain archeological sites over short periods. These actions would limit deterioration brought about by increased visitation and numbers of visitors that exceed established standards for any of the indicators. Adverse impacts to archeological resources from visitor use would be permanent, minor and adverse, and would be less than the no-action alternative.

**Cumulative Impacts.** A new visitor center at the park is currently being built on the existing footprint of the old visitor center. No impacts to archeological resources would occur.

External trends and changes, such as improvements to CR 7950, the release of the America the Beautiful quarter, and the status of the park as a World Heritage site, could increase park visitation, which could result in increased inadvertent damage and vandalism to archeological resources. Such adverse impacts would be minor in intensity and permanent.

As described above, implementation of alternative 4 would result in minor, permanent, adverse impacts to archeological resources. These impacts, in combination with the minor permanent adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a permanent, minor, adverse cumulative effect. The minor adverse impacts of alternative 4 would be a small component of the adverse cumulative impact.

**Conclusion.** Alternative 4 would result in minor, adverse, permanent impacts on Chaco's archeological resources. Cumulative

impacts would be long-term, minor, and adverse.

## **ETHNOGRAPHIC RESOURCES**

### **Methods and Assumptions for Analyzing Impacts**

In lieu of quantitative data, interviews with park staff helped inform the types and intensity levels of the impacts to ethnographic resources analyzed in this section, and therefore were an important part of the impact analysis methodology.

Cultural resources staff with more than 20 years tenure at Chaco were consulted to help determine impacts to ethnographic resources. These staff members have deep empirical knowledge and understanding of the types of impacts to the park's cultural resources. They assert that both wear and tear and intentional impacts, such as vandalism, increase substantially during periods of heavy visitation. This information strongly suggests that there is a direct relationship between visitation and negative impacts to the resource condition of ethnographic resources.

Types of adverse impacts known to occur at the park include inadvertent wear and tear on exposed ethnographic resources from foot traffic as well as environmental deterioration, such as moisture, freeze/thaw cycles, and wind. Intentional human-caused adverse impacts to the park's ethnographic resources include vandalism to the resources, theft of artifacts, and offerings or deposition of ashes from human cremation, which require extensive cleaning measures that can diminish resource integrity.

Impacts to ethnographic resources were evaluated by comparing projected changes resulting from the action alternatives (2, 3, and 4) to those of the no-action alternative (1). The thresholds used to determine

impacts on these resources are defined as follows:

**Negligible:** The impact would be barely perceptible and would alter neither resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the traditionally associated group's body of beliefs and practices. There would be no change to a group's body of beliefs and practices.

**Minor:** The impact would be slight but noticeable and would appreciably alter neither resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the traditionally associated group's body of beliefs and practices.

**Moderate:** The impact would be apparent and would alter resource conditions. Something would interfere with traditional access, site preservation, or the relationship between the resource and the traditionally associated group's beliefs and practices, even though the group's beliefs and practices would survive.

**Major:** The impact would alter resource conditions. Something would block or greatly affect traditional access, site preservation, or the relationship between the resource and the traditionally associated group's body of beliefs and practices, to the extent that the survival of the group's beliefs or practices would be jeopardized.

**Beneficial impact:** Actions would include stabilization, preservation, rehabilitation, or restoration of the character-defining features of a national register-listed or national register-eligible ethnographic resource (as defined above) in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

## Alternative 1, No Action

**Visitor Knowledge / NPS-led Orientation.** Knowledge and information

concerning the fragility of ethnographic resources and visitor etiquette would continue to be obtained voluntarily. Rules and preservation messages would be available upon request when visitors pay entrance fees at the visitor center. Because there is no mandatory orientation for visitors, messages of resource protection and preservation are often inconsistent and do not reach all visitors, such as those who do not take the initiative to read the information provided. Although nearly all visitors receive the park brochure, all do not read it. As a result, many visitors are either not getting or not consistently getting information on proper etiquette in sites, site preservation concerns, and rules about leaving objects or cremations in the ethnographic sites and the park in general.

Under the no-action alternative, visitors would continue to acquire information about the importance of protecting ethnographic sites at the visitor center and through the use of self-guiding brochures. Inappropriate behavior at ethnographic sites will continue, and will increase as visitation increases, resulting in greater adverse effects to the sites caused by inadvertent and intentional visitor actions. Continued patrols and interpretive programs would provide messages of protection to visitors. However, under the no-action alternative, limited park staff would have to focus efforts on mitigating the ongoing, cumulative damage to the ethnographic resources, such as vandalism and theft, instead of conducting preventative treatments and improving conditions.

As a result, continuation of the current visitor orientation practices in the no-action alternative could indirectly contribute to an increasingly significant level of moderate to major adverse impacts to the condition of ethnographic resources and tribal relationships with those resources caused by inappropriate visitor behaviors. These adverse impacts would be permanent to ethnographic resources.

**Group Management.** Under the no-action alternative, groups visiting Chaco would continue to be managed with no limitations on the number or size of groups coming to the park. There also would be no limit to the frequency and size of ranger-led tours, which can reach as many as 60 persons per tour during peak periods. The management of groups can impact ethnographic resource conditions, as some large groups, particularly school groups that are not properly supervised, result in moderate to major impacts to the resources, including vandalism and theft.

Groups use more of any given space within a site than individuals and stay in certain areas longer while guides do presentations. This situation magnifies the amount of wear and tear on elements within the ethnographic sites, resulting in greater need for preservation treatments. Mitigating the impacts of large volumes of visitors, whether they arrive in groups or as individuals, takes staff away from necessary preventive treatments, and consequently the condition of ethnographic resources deteriorates.

Under the no-action alternative, special events would continue to occur without restrictions on the numbers of individual visitors or groups attending the events. There is no plan in place to manage visitor numbers at special events, beyond the limitations imposed by the size of parking facilities, assuming parking regulations are enforced. Special events often include various types of intense activity not generally allowed in the sites, thereby increasing the potential for adversely affecting the integrity of the ethnographic resources. At current levels of visitation related to visitor groups and special events, there would be moderate to major, adverse, permanent impacts to ethnographic sites because of wear and tear and other forms of inadvertent deterioration associated with visitor use, as well as increased risk of intentional adverse impacts (vandalism).

If group levels exceed the levels identified in the 1984 general management plan, there

could be moderate and potentially major, permanent, adverse impacts to the condition of ethnographic sites caused by increased disturbance and the resulting deterioration brought about by groups of unlimited sizes. The lack of a reservation system for individual campground use under the no-action alternative, except for group campsites, means that park staff would not be able to plan and anticipate the arrival of visitors, particularly large groups of visitors during the peak season. As a result, ongoing first-come, first served use of individual campsites would indirectly cause ongoing moderate and potentially major, permanent, adverse impacts to ethnographic sites related to visitor-use impacts in the park.

**Individual Visitor Access.** Under the no-action alternative, visitors would continue to access the park's ethnographic sites on their own and at their own pace. Although unrestricted and unsupervised access is detrimental to the condition and traditional associations of Chaco's ethnographic resources, the number of available parking sites would continue to limit the numbers of people able to access ethnographic sites at one time. At the current levels of visitation, particularly during the peak visitor season of mid-March to mid-November, visitor use causes a low level of disturbance and deterioration to ethnographic resources that have not been hardened or are easily accessible from trails and developed areas. These ethnographic resources are vulnerable to surface disturbance, wear and tear, other types of inadvertent damage, and vandalism because visitors are allowed to access these sites on their own, largely without supervision because of lack of staffing. Continuation of this type of visitor use management under the no-action alternative would result in ongoing disturbance to and deterioration of ethnographic resources under current visitation levels, and would result in moderate to major, permanent, adverse impacts to those resources.

There is no provision for limiting the number of visitors to the park or to individual sites within the park should

indicator levels be reached. The number of visitors that pass through a site affects the park's ability to maintain the site in good or fair condition, at a minimum. The greater the visitation levels, the greater the expense will be to maintain cultural resources, and the greater the potential for adverse effects to ethnographic sites.

If the number of visitors coming to the park exceeds the levels identified in the 1984 general management plan, or if standards are exceeded for the chosen indicators, then there could be increased adverse impacts to ethnographic sites caused by foot traffic, vandalism, theft, and other types of deterioration associated with increased visitor use. An increase in park visitation could result in moderate to major, permanent, adverse impacts to the condition of ethnographic resources which could, in turn, affect the relationship associated tribes have with that resource.

While the resource condition and associated tribes' relationship with park ethnographic resources would be adversely impacted under the no-action alternative, the associated tribes' traditional access to ethnographic resources would likely not be impacted.

**Cumulative Impacts.** Currently a new visitor center at the park is being rebuilt on the existing footprint of the old visitor center. The new visitor center will provide improved exhibit space and would potentially result in a beneficial impact to ethnographic resources as a result of better visitor understanding and appreciation of the resources and their relationship to associated tribes.

External trends and changes, such as improvements to CR 7950, the release of the America the Beautiful quarter, and the status of the park as a World Heritage site, could increase park visitation; this could result in increased inadvertent damage and vandalism to ethnographic resources from visitor use impacts. Such adverse impacts would be minor in intensity and permanent.

As described above, implementation of the no-action alternative would result in moderate and potentially major, permanent, adverse impacts to ethnographic resources. These impacts, in combination with the minor, permanent, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a permanent, moderate, adverse, cumulative effect.

**Conclusion.** The no-action alternative would result in moderate, permanent, adverse impacts to ethnographic resources. There could be increased moderate, adverse impacts if visitor use levels exceed the limits identified in the 1984 general management plan. Cumulative impacts would be permanent, minor, and adverse.

## Alternative 2, The Preferred Alternative

The preferred alternative would put in place year-round strategies to address increased visitation that would result in the potential for fewer adverse impacts to ethnographic resources when compared with the no-action alternative.

While ethnographic resource condition and the associated tribes' relationship with park ethnographic resources would be adversely impacted under the preferred alternative, the associated tribes' traditional access to ethnographic resources would likely not be impacted under this alternative.

### Visitor Knowledge / NPS-led

**Orientation.** The immediate and potential management strategies of the preferred alternative would better impart to visitors appropriate resource protection information when compared to the strategies of the no-action alternative. Under this program, all visitors would be required to listen to and/or watch a video on the fragility of ethnographic resources, receiving a consistent and comprehensive resource orientation message at the visitor center. The orientation program would include information on park and site etiquette, a

preservation message, and information about park rules concerning leaving personal offerings and cremations, inappropriate behaviors, and how visitors can lessen their impacts to the cultural resources. This program would ensure that all visitors acquire information about the appropriate types of behavior that help avoid impacts to Chaco's ethnographic sites. It is anticipated that this would reduce the current levels of visitor-induced damage to ethnographic resources that occur without this program in place under the no-action alternative.

Therefore, the visitor orientation in the preferred alternative would provide for additional protection to all cultural sites within the park, including ethnographic resources. Adverse impacts to ethnographic resources, whether inadvertent or intentional (such as vandalism), would likely continue to a certain degree, but the intensity and frequency of these impacts would be less than the adverse impacts in the no-action alternative. Adverse impacts would be permanent and minor in intensity.

**Group Management.** Under alternative 2, groups visiting Chaco would be required to receive information on the sensitivity of park cultural resources, including ethnographic resources, prior to visiting the park. The number of groups visiting the park would be limited to two groups per day. Groups larger than 20 people would be required to break into sub-groups no larger than 20. Dividing large groups into smaller groups will help facilitate group management and allow park staff to monitor both individuals and group dynamics that could impact ethnographic resources. This would ultimately help reduce wear and tear and other types of visitor impacts on ethnographic resources.

Under the preferred alternative, if the standard for any indicator is exceeded, potential management strategies would include timing group reservations so they are strategically scheduled throughout the day to disperse their arrival. As a last resort, groups could be completely restricted during peak use times of day and the peak season in an effort to protect ethnographic

resources. It is anticipated that dispersing groups throughout the park during high visitation would help eliminate some of the impacts caused by large groups and large ranger-led tours. However, this strategy would not apply during special events, estimated at four or five days a year. During these times, additional staff would be put in place to ensure protection of resources and visitor safety. Although adverse impacts to ethnographic resources from visitor use would continue under alternative 2, these actions would help minimize permanent, adverse impacts to the ethnographic resources at Chaco and keep those impacts in the minor level of intensity.

**Individual Visitor Access.** Under the preferred alternative, mandatory visitor orientation program on appropriate visitor behavior and visitor-related impacts to the park ethnographic resources during peak use times would encourage appropriate visitor etiquette, minimize crowding, and thus help reduce potential adverse impacts to ethnographic resources from individuals. Visitor's receipt of information prior to visiting and the encouragement of trip planning would further control access to the park, although visitors would continue to freely visit the park sites as in the past once they go through the main visitor area. These preventative actions would help limit deterioration to ethnographic resources brought about by increased visitation and visitation numbers that exceed established standards for any of the indicators. As a result, adverse impacts to ethnographic resources would be permanent, but would be kept to the minor range. This would be less than those in the no-action alternative.

Under the preferred alternative, additional strategies for dispersing visitors could involve encouraging visitors to visit the less-used areas of the park. These areas could be highlighted using strategic information provided at the visitor center or by using on-site contacts at key cultural sites during the busy peak season (mid-March to mid-November). Such actions to disperse crowding would help reduce impacts to the

most heavily visited ethnographic resources. Adverse impacts to ethnographic resources would be permanent, but would be kept to the minor range and be less than those in the no-action alternative.

If visitation were to increase to the level where the advance reservation system would be implemented, the reservation system would help park management anticipate, plan, disperse, and regulate visitors to protect certain cultural resources, including ethnographic resources. Although the impact of the reservation system to ethnographic resources would be indirect and would apply only to specific sites, this action would help keep the permanent adverse effects from visitor use to the minor level of intensity, and would be less than the no-action alternative.

**Conclusion.** The preferred alternative would have minor permanent, adverse impacts on Chaco's ethnographic resources. Cumulative impacts would be permanent, minor, and adverse.

### Alternative 3

Alternative 3 would put in place strategies to address increased visitation on a seasonal basis. The immediate and potential management strategies described in alternative 3 would help minimize adverse impacts to ethnographic resources.

While ethnographic resource condition and the associated tribes' relationship with the park's ethnographic resources would be adversely impacted under alternative 3, the associated tribes' traditional access to ethnographic resources would likely not be impacted under this alternative.

#### Visitor Knowledge / NPS-led

**Orientation.** Under alternative 3, visitor information concerning ethnographic resource protection would be obtained through a required stop at the visitor center. This information would include material about the fragility of park ethnographic

resources. This approach to visitor orientation would reduce the current levels of visitor-induced damage to ethnographic resources that occur without this program in place under the no-action alternative.

Therefore, the visitor orientation in alternative 3 would provide additional protection to all cultural sites within the park, including ethnographic resources. Adverse impacts to ethnographic resources, whether inadvertent or intentional (such as vandalism), would likely continue to a certain degree, but the intensity and frequency of these impacts would be less than the adverse impacts in the no-action alternative. Adverse impacts would be permanent and minor in intensity.

Under alternative 3, on-site education would occur at the park's primary ethnographic sites using park staff on an as-needed basis. Roving patrols and interpretive contacts would be increased at these sites during the busy peak season (mid-March to mid-November). Since there currently is very little to no roving occurring in the park, this would be a slight increase in resource protection over the no-action alternative. These actions would help visitors receive a standardized message concerning the preservation of ethnographic resources and visitation etiquette. Adverse impacts to ethnographic resources would be permanent, but would be kept to the minor range and be less than those in the no-action alternative.

**Group Management.** Under alternative 3, groups visiting Chaco would receive information prior to visiting the park to ensure consistent messaging regarding the fragility of the park's ethnographic resources. No more than one group would be allowed to visit a cultural site at any one time, with a limit of two groups per day. Large groups would be required to split into smaller groups of no more than 20 people each. These actions would help reduce wear and tear on ethnographic sites; as a result, adverse impacts caused by visitor use would be permanent, but would be kept in the



minor range, and would be less than the no-action alternative.

If visitation were to increase to the level where the advance reservation system would be implemented, the reservation system would help park management anticipate, plan, disperse, and regulate visitors to protect certain cultural resources. However, this strategy would not apply during special events, estimated at four or five days a year. During these times, additional staff would be put in place to ensure protection of resources and visitor safety. Although the impact of the reservation system on ethnographic resources would be indirect and would apply only to specific sites, this action would help keep the permanent adverse effects from visitor use in the minor range, and would result in less impact than the no-action alternative.

**Individual Visitor Access.** The immediate management strategies for individual visitor access involve providing information to visitors prior to their visits and encouraging trip planning; these strategies would further control access and encourage voluntary distribution of use in the park, although visitors would continue to visit sites as in the past, once they enter the main visitor area. These strategies would help minimize impacts to ethnographic resources by limiting deterioration brought about by visitation numbers that exceed established standards for any of the indicators. These actions would help keep permanent, adverse impacts to the minor level.

**Cumulative Impacts.** Currently the visitor center at the park is being rebuilt on the existing footprint of the old visitor center. The new visitor center will provide improved exhibit space and would potentially result in a beneficial impact to ethnographic resources as a result of better visitor understanding and appreciation of the resources and their relationship to associated tribes.

External trends and changes, such as improvements to CR 7950, the release of the America the Beautiful quarter, and the status of the park as a World Heritage site, may increase park visitation; this could result in increased inadvertent damage and vandalism to ethnographic resources. Such adverse impacts would be minor in intensity and permanent.

As described above, implementation of alternative 3 would result in minor permanent adverse impacts to ethnographic resources. These impacts, in combination with the minor, permanent, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a permanent minor adverse cumulative effect.

**Conclusion.** Alternative 3 would have minor adverse impacts on Chaco's ethnographic resources. Cumulative impacts would be permanent, minor, and adverse.

## Alternative 4

Alternative 4 includes year-round strategies to help protect ethnographic resources on a site-specific basis.

While ethnographic resource condition and the associated tribes' relationship with park ethnographic resources would be adversely impacted under alternative 4, the associated tribes' traditional access to ethnographic resources would likely not be impacted under this alternative.

### Visitor Knowledge / NPS-led

**Orientation.** Visitor knowledge and orientation under alternative 4 would be a continuation of the current strategies, as described under the no-action alternative. Visitor orientation would continue to be voluntary and be available upon request when visitors pay entrance fees at the visitor center. Because alternative 4 does not include mandatory orientation for visitors, messages of resource protection and preservation would be inconsistent and would not reach all visitors, such as those

who do not take the initiative to read the information provided. Although continued patrols and interpretive programs would provide messages of protection to visitors, under alternative 4, limited park staff would have to focus efforts on mitigating the ongoing, cumulative damage to the ethnographic resources, such as vandalism and theft, instead of conducting preventative treatments and improving conditions.

As a result, orientation practices under alternative 4 could indirectly contribute to an increasingly significant level of moderate and potentially major adverse impacts to ethnographic resources caused by inadvertent damage or vandalism. These adverse impacts would be permanent.

Alternative 4 would involve immediate management strategies that would put additional staff on-site at key locations and sites during peak visitation and special events as a means of addressing impacts from increased visitation. However, even though this alternative takes a site-specific approach to resource protection, sites open to visitation that do not have rangers stationed at them during the peak season would not receive increased protection. As a result, only those sites with roving or stationed rangers would have improved protection, while the remainder of the open sites without park staff would be vulnerable to visitor impacts. The immediate and potential management strategies described in alternative 4 would result in minor to moderate, permanent, adverse impacts to some ethnographic resources. Because some ethnographic sites would have increased protection from visitor use impacts during periods of high visitation, these impacts would be slightly less intense and less frequent than the adverse impacts under the no-action alternative.

**Group Management.** Under alternative 4, groups visiting Chaco would receive information prior to visiting the park to ensure consistent messaging regarding the fragility of the park's ethnographic resources. No more than one group would

be allowed to visit certain cultural sites at any one time, with a limit of two groups per day. Large groups would be required to split into smaller groups of no more than 20 people each. This would limit the level of intense group impacts in specific locations, though it would not limit the daily impacts from the groups of 20 that would result from a very large group. Group arrival times may be dispersed through the day, and the number and size of groups may be further restricted. Overall, these actions would help reduce wear and tear and incidences of intentional impacts (vandalism) on the park's ethnographic resources. As a result, adverse impacts caused by visitor use would be permanent, but would be kept in the minor range, and would be less than the no-action alternative.

**Individual Visitor Access.** The immediate management strategies for individual visitor access that would encourage voluntary redistribution of use would minimize crowding and thereby reduce potential adverse impacts to ethnographic resources. Providing information to visitors prior to their visit, encouraging trip planning, and using queuing techniques would further control access to ethnographic sites. Park staff would provide on-site education at strategic locations in the park, but only during peak visitation times.

If the standard for any indicator is reached, individual visitors may need to get reservations ahead of time. The number of persons who can enter a given site may be limited by using queuing techniques at access points to certain ethnographic sites. These actions will help minimize the concentration of visitors at any one place in the park, and help to reduce intense use of certain ethnographic sites over short periods. These actions would limit deterioration brought about by increased visitation and numbers of visitors that exceed established standards for any of the indicators. Adverse impacts to ethnographic resources from visitor use would be permanent and minor in intensity, and would be less than the no-action alternative.

**Cumulative Impacts.** Currently the visitor center at the park is being rebuilt on the existing footprint of the old visitor center. The new visitor center will provide improved exhibit space and would potentially result in a beneficial impact to ethnographic resources as a result of better visitor understanding and appreciation of the resources and their relationship to associated tribes.

External trends and changes, such as improvements to CR 7950, the release of the America the Beautiful quarter, and the status of the park as a World Heritage site, may increase park visitation; this could result in increased inadvertent damage and vandalism to ethnographic resources. Such adverse

impacts would be minor in intensity and permanent.

As described above, implementation of alternative 4 would result in minor, permanent, adverse impacts to ethnographic resources. These impacts, in combination with the minor, permanent, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a permanent, minor, adverse cumulative effect.

**Conclusion.** Alternative 4 would have minor, permanent, adverse impacts on ethnographic sites. Cumulative impacts would be permanent, minor, and adverse.

## IMPACTS ON VISITOR ACCESS, USE, AND EXPERIENCE

### METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

The impact analysis considers various aspects of visitor access, use, and experience at Chaco Culture National Historical Park. The analysis is primarily qualitative rather than quantitative because of the conceptual nature of the alternatives. Impacts on visitor access, use, and experience were determined considering the best available information including visitor use data and opinions taken from a recent survey conducted by The University of Montana during the summer and fall of 2009 (Freimund 2010). Other relevant studies that were analyzed included a detailed visitor survey completed at the park from 1992 and 1993 (Lee and Stephens 1995), a case study conducted by the Getty Conservation Institute (2005) to determine the degree to which the park's resources have been protected under current management, and an analysis of visitor projections by David Evans and Associates (2009).

Other information considered in the analysis includes the park's annual visitor use levels, overnight stays, and local and regional travel and tourism data. Visitor use information collected from the University of Idaho Park Studies Unit annual visitor survey card project was also considered. In addition, the background data was supplemented by information gathered during the planning process for this management plan, including opinions from park visitors and information from park staff.

The impact analysis considers various aspects of visitor access, use, and experience at the park, including the visitor's ability to access the park; the visitor's ability to maintain the freedom of choice and flexibility while in the park's primary sites and while touring around the park; and the

visitor's ability to have close contact with park resources and avoid crowding and conflict with other visitors. Many of the actions in the alternatives also affect the degree to which visitor use impacts resources. This aspect of the impact analysis is covered in other sections of this chapter.

### Duration

A short-term impact would last less than one year and would affect only one season's use by visitors. A long-term impact would last more than one year and would be more permanent in nature.

### Intensity

The thresholds to determine impact intensity are defined as follows:

**Negligible:** The changes in the visitor access, use, and experience would not be noticeable. Visitors would be largely unaware of any effects.

**Minor:** Changes in visitor access, use, and experience would be detectable, although the changes would be slightly noticeable. Visitors would be aware of the effects, but the effects would be slight.

**Moderate:** Changes in visitor access, use, and experience would be readily apparent. Visitors would be aware of the effects and would be able to formulate opinions about the changes.

**Major:** Changes in visitor access, use, and experience would be readily apparent and have lasting consequences. Visitors would be aware of the effects and would be likely to have strong opinions about the changes.

## **RATIONALE FOR THE THREE FACTORS USED FOR VISITOR USE AND EXPERIENCE**

### **Ability to Access the Park**

While maintaining the freedom to visit the sites in the park, it is also desirable to ensure that visitors can gain largely unfettered access into the park.

### **Freedom of Choice and Flexibility to Visit Park Sites**

It is desirable that visitors have the ability to plan their trip and visit the sites within the park largely at their own discretion and not under the control of management. This is a key aspect of the visitor experience to be protected at the park.

### **Management of Visitor Crowding and Promotion of Close Contact with Resources**

Visitors highly value opportunities to have direct contact with park resources. During peak visitation at the park, there is the potential for visitors to have their experience impacted by the number of people in the park, and in particular, at certain sites within the park. To preserve the close contact with the resources, it may be necessary to manage the number of people in the park or at specific popular sites.

## **ALTERNATIVE 1, NO ACTION (CONTINUE CURRENT MANAGEMENT)**

### **Ability to Access the Park**

Visitors currently are able to visit the park at their leisure. Individual visitors and large groups can come to the park at any time and are not required to have a reservation. Visitors have the opportunity to get

information prior to their visit on the park's website and also at the visitor center upon arrival at the park. Visitors are not required to go through a mandatory educational program, but do receive an entrance permit with the rules of conduct on the reverse side, a park brochure, and the option to watch the park movie and ask questions of park staff. The current system of managing access promotes a high degree of freedom for visitors, resulting in a long-term, moderate, beneficial impact. However, because an educational orientation is not required, visitors may not get enough information to fully understand the exceptional qualities of the park and the unique nature of the visitor experience, resulting in a long-term, minor, adverse impact.

Large, organized groups (e.g., tour buses) and individual visitors alike may occasionally have trouble accessing the main road leading to the park (CR 7950) because of the primitive nature of the road. This is sometimes an issue when there is a substantial rain event, which can lead to flooding of the wash that crosses the main road. According to the 2009 visitor study, the road is seen as a beneficial influence on the experience by deterring large amounts of visitors, and thereby protecting the park by keeping the sites largely uncrowded. The road is also seen as an adverse influence on the visitor experience because it can be unpleasant to drive on and is sometimes rough in nature. Further, time spent accessing the park on this road may slightly reduce the amount of actual time spent in the park (Freimund 2010). Because the primitive nature of the road acts, to a certain extent, as a limiting factor for some visitors, there is a minor, adverse impact for those visitors.

The no-action alternative would also maintain the current campground system that does not require any prior reservation and would continue to be managed on a first-come, first-served basis. This would allow more unrestricted access to the park, but may lead to some visitors being turned away from the campgrounds at times of peak

visitation, resulting in a long-term, moderate, adverse impact, given the remote location of the park and the lack of easy access to other camping and lodging options in the nearby area.

Overall, if current conditions, which generally allow most visitors a high degree of freedom to access the park, are maintained, there is a long-term, moderate, beneficial impact to visitors' ability to access the park.

### **Freedom of Choice and Flexibility to Visit Park Sites**

Currently, visitors have unrestricted access to the sites within the park. This freedom gives visitors the opportunity to determine their own pace and visit sites at their own discretion. During the recent visitor study, visitors affirmed that open access provides a sense of fairness for all visitors and also maintains the quality of the experience (Freimund 2010). However, this freedom can lead to congestion at certain popular sites and congestion at the park's limited water and sanitary facilities during peak times, such as the weekends in the spring and fall. This is especially true in regards to large groups. Currently, large groups are not required to make site reservations prior to their visit. This can lead to several groups accessing the park at one time and causing an influx of people at popular sites. The freedom for large groups to access the park without notifying park staff can provide a sense of spontaneity, but can also take away from other visitors' experiences. To help alleviate this issue, park staff encourage large groups to split into smaller groups. The no-action alternative would perpetuate these conditions resulting in an overall long-term, moderate, beneficial impact on visitor's ability to maintain their freedom while accessing the sites in the park.

### **Management of Visitor Crowding and Promotion of Close Contact with the Resource**

During the public scoping process, nearly one-fourth of the visitor experience related comments reflected concern for over-crowding in the park in the future. However, visitors are currently satisfied with the visitation levels at the park according to the data gathered as part of the 2009 visitor study (Freimund 2010). Survey results revealed that visitors currently do not feel crowded; they feel they are able to explore the sites at their own pace and make personal connections with park resources. Crowding is not a primary concern for current visitors to the park, unless several large groups (e.g., school groups or tour groups) are in the park on that day. In addition, visitors rated the sounds made by other visitors as detracting from their overall experience. If visitation were to increase, crowding and associated noise impacts could be a potential concern. If the park is managed under the no-action alternative and visitation does not increase substantially, there would be a long-term, minor, beneficial impact to the visitor experience.

However, current management of the park does not take into account the potential for an increase in visitation as a result of road improvements or an increased awareness of the unique nature of the park (e.g., the Chaco quarter). If CR 7950 were to be paved, there would be the potential for visitation to increase to the point where crowding could become a problem and the unique experience currently available may be adversely impacted. If the 13-mile section of dirt road was to be paved completely, the park could expect an initial 12% increase in base visitation for the three years immediately following the road improvements; then, the visitation would level off to pre-improvement levels, but at a higher overall visitation rate because of the initial 12% increase (David Evans and Associates 2009). More people will mean

more opportunities for crowding and conflict that would take away from the values that visitors currently find to be important, such as solitude, quiet, or freedom to move about the park, and the ability to self-explore the sites. The no-action alternative does not provide specific strategies for managing a potential increase in visitation as a result of outside influences. For this reason there would be a long-term, moderate, adverse impact on the visitor's ability to form close contact with the resources and avoid visitor crowding.

Because an educational orientation is not required, visitors may not get enough information to fully understand the exceptional qualities of the park, sensitive nature of its resources, and the uniqueness of the visitor experience. In addition, education provides the opportunity to teach visitors how to disperse their use by season and by site to help prevent crowding issues within the park. Education can also provide visitors with the knowledge of the park and resources, allowing them to develop a connection with the park (Roggenbuck 1992; Littlefair and Buckley 2008). Without more emphasis on an educational orientation in the no-action alternative, there would be a long-term, minor, adverse impact on visitors' ability to form close contact with the resources and avoid visitor crowding.

### **Cumulative Impacts**

Several past, present, or reasonably foreseeable actions may affect visitors to the park. Currently, the visitor center at the park is being rebuilt on the existing footprint of the old visitor center. The new visitor center will provide improved exhibit space, visitor center functions, and administrative offices. Rebuilding the visitor center would create a short-term, minor, adverse impact on the visitor experience because of the closure of the visitor center; however, once the new visitor center is completed in 2012 (expected), there would be a long-term, minor to moderate, beneficial impact to the

visitor experience. This action combined with the elements of the no-action alternative, would have a long-term, moderate, beneficial cumulative effect.

Additionally, there are other external trends and changes that may impact the visitor experience, such as improvements to CR 7950, the production of the America the Beautiful quarter, and the status of the park as a World Heritage site. The proposed paving of CR 7950 could bring an increase in visitation to the park, leading to increased crowding and conflicts. The production of the America the Beautiful quarter could potentially raise awareness of the park and thus lead to an increase in visitation, as well as visitor crowding and conflicts. Finally, the status of the park as a World Heritage site has drawn special interest from domestic as well as international travelers. As World Heritage sites increase in popularity, the number of visitors to the park could increase. The actions in the no-action alternative, combined with these actions would have a long-term, moderate, adverse cumulative effect. Impacts of the no-action alternative would comprise a relatively small portion of the overall cumulative effect.

### **Conclusion**

Under the no-action alternative, no substantial changes would be made to the management of visitors. Continued implementation of this existing system would affect various components of the visitor experience differently. The no-action alternative would have a beneficial impact on visitors' freedom of choice and flexibility for accessing and touring the park. However, this alternative would have long-term, moderate, adverse impacts on visitor crowding and the ability to have close contact with park resources. The current method of managing visitors would continue to provide unrestricted access to the park, but would not take into consideration the effect of outside influences and possible increases in visitation, which may lead to crowding and visitor conflicts in the future.

## **ALTERNATIVE 2, THE PREFERRED ALTERNATIVE**

### **Ability to Access the Park**

Alternative 2 would provide visitors with a more structured visitor experience regarding overall access to the park. Visitors would be required to participate in an educational program prior to accessing the park's main loop road. This program would be in the form of a video or a ranger presentation at the visitor center and would inform visitors about the sensitivity of park resources as well as ways to distribute themselves around the park to avoid conflicts at popular sites. The education program would hinder visitors' immediate access to the park and would impact their ability to freely access the park at their convenience. However, visitors are already required to stop at the visitor center to pay their entrance fee. This alternative adds the requirement to participate in an education program prior to accessing the park. As already noted, freedom of access to park sites is a primary factor affecting the visitor experience (Freimund 2010). Therefore, alternative 2 would result in a long-term, moderate, adverse impact to visitors' ability to access the park.

This alternative would also require large groups to receive information about the park prior to their visit. This would be done to ensure that large groups receive a consistent and comprehensive message regarding the sensitivity of park resources, park regulations, and appropriate visitor behavior. Also, large groups would be required to make reservations prior to their visit and would be limited to two groups per day. This strategy would prevent several large groups from accessing the park at one time, helping to alleviate crowding and congestion at key visitor sites. Since most large groups plan their trips well in advance, the requirement for a reservation should not be a significant inconvenience. However, as

demand potentially increases for access to the park, there may be times when a large group cannot gain access on their preferred day, but would likely be able to secure a reservation for a nearby date. This strategy would result in a long-term, minor, adverse impact on their access to the park.

Upon approval of the plan, an immediate strategy would require all campers to get a reservation prior to their visit. This would be done to provide for improved visitor trip planning on the part of visitors and more efficient management of the campgrounds on the part of park staff. Currently, the campground fills up during peak periods of visitation and some visitors are turned away. The camping reservation system would help to alleviate this problem by allowing visitors to plan in advance and be guaranteed a campsite. In addition, a certain percentage of campsites would remain available on a first-come-first-served basis to accommodate last minute arrivals. Given the improved ability of campers to secure a campsite, this strategy would result in increased convenience and a long-term, moderate, beneficial impact to campers' ability to access the park under alternative 2.

A reservation system for individual access could also be implemented parkwide if standards were exceeded (see appendix A for more information). This reservation system would be implemented if changing visitor use patterns and/or the park staff indicate (through monitoring) an increase in visitation that results in unacceptable impacts to the resources and visitor experience. The reservation system would be implemented year-round. The park does not see a tremendous amount of visitation outside of peak use times; therefore, these times are not in need of a reservation system. However, by implementing the reservation system year-round, there is less of a chance for confusion for the visitor and it streamlines operations for park staff. The visitor study conducted during 2009 revealed that visitors supported a reservation system if it were implemented to protect resources, to improve convenience, and to



maintain the quality of the visitor experience (Freimund 2010).

A reservation system for individual access would protect the unique visitor experience by limiting the number of people who enter the park on a given day. Visitors have shown support for a reservation system if deemed necessary. It is expected that this reservation system would not cause significant hardship on most visitors to the park since current use levels could be accommodated, along with a portion of the projected visitation. However, there would be a point in the future where demand may exceed supply and some potential visitors may not be able to gain access to the park, at least on their preferred date. If implemented, there would be a long-term, moderate, adverse impact on individual visitors' ability to access the park.

### **Freedom of Choice and Flexibility to Visit Park Sites**

Under alternative 2, the freedom of choice and flexibility to visit the sites within the park would be slightly enhanced because of strategies to provide a better orientation for visitors and to manage large groups, both of which would result in less crowding and conflict at the primary sites. Otherwise, visitors would have the same unrestricted access to the sites within the park as they do in the no-action alternative.

This alternative would largely retain visitors' opportunities to determine their own pace and visit sites at their own discretion. During the recent visitor study, visitors affirmed that freedom to move about the park and access the sites within the park are important factors in the visitor experience (Freimund 2010). To minimize existing instances of congestion at popular sites during peak times that may impede visitors' access to certain sites, this alternative includes an immediate action of requiring an educational orientation to provide visitors with information about peak use locations and times. This information is intended to encourage voluntary redistribution of visitors to lesser used sites and times and to

help modify behaviors to protect resources (Roggenbuck 1992; Littlefair and Buckley 2008).

Large groups would still have the freedom to travel through the park and visit the primary sites at their own pace. They would be required to make reservations prior to their visit and would be limited to two groups per day. This strategy would prevent several large groups from accessing the park at one time, minimizing crowding and conflicts with other visitors. Very large groups would also be required to split into smaller groups of no more than 20 people. This would also help alleviate some of the congestion at the major sites in the park, but would limit the freedom of the large groups to visit certain sites at certain times. Reducing crowding and conflict by managing large groups should generally increase all visitors' unfettered access to the primary sites in the park.

There is the potential that large groups would be limited further (e.g., the number and size of groups) and individuals would be required to get reservations if standards are violated. However, this would not affect visitors' ability to access sites freely inside the park. Given the likely outcomes of the strategies for improved visitor information and the management of large groups, there would be an overall, long-term, moderate, beneficial impact on visitors' ability to maintain their freedom while accessing the sites in the park as a result of alternative 2.

### **Management of Visitor Crowding and Promotion of Close Contact with the Resource**

The current data gathered as part of the 2009 visitor study (Freimund 2010) revealed that visitors currently do not feel crowded and feel able to have close contact with park resources. The strategies outlined in alternative 2 would be aimed at continuing to promote this high level of satisfaction with park visits through increased education,

better distribution of use, and regulation of use levels, if needed.

Alternative 2 would require visitors to have an education based orientation to the park and its resources. All visitors would be educated on the sensitive nature of the resources and associated visitor experience, and the unique opportunities provided at the park for close contact with these resources. This educational orientation would target key messages to all visitors about park resources and rules and regulations, which would be more in-depth and far reaching than current educational efforts. In addition, this education would promote a deeper understanding of the important values of the park, which would create another form of close contact with park resources.

Alternative 2 takes into account the possibility of a potential increase in visitation that could lead to crowding and adverse impacts on the unique experience currently available at the park. To help alleviate this possibility, indicators and standards were developed to measure the impact to the visitor experience. If the standards are consistently violated, then a parkwide reservation system could be implemented. The reservation system would put a limit on the number of visitors in the park at one time, but would help alleviate crowding problems and adverse effects to resources that result from too many people. The reservation system, by limiting the number of people in the park, would also maintain the visitors' ability to engage in close contact with the resource.

The group management strategies proposed in this alternative also aim to reduce the potential for crowding. Groups would be limited to two per day; they would receive information about the park before their visit and they would be required to obtain a reservation. Large groups also would be required to split into groups of fewer than 20 people to better distribute their use throughout the park and to further lessen the impacts of crowding and conflict at key destinations. The 2009 visitor study revealed that impacts from large groups can detract

from the ability of some visitors to have close contact with the resources; thus, if standards related to large group impacts are exceeded, there would be the management option of further restricting large groups (strategic scheduling and complete restriction during the peak season).

Given all of these strategies for educating visitors and distributing use, there would be a long-term, moderate, beneficial impact on the management of visitor crowding and the ability of visitors to experience close contact with park resources while protecting park resources.

### **Cumulative Impact**

Several past, present or reasonably foreseeable actions may affect visitors to the park. Currently the visitor center at the park is being rebuilt on the existing footprint of the old visitor center. The new visitor center will provide improved exhibit space, visitor center functions, and administrative offices. This action would result in a short-term, minor, adverse impact because of the closure of the visitor center; however, once the new visitor center is completed in 2012 (expected), there would be a long-term, minor to moderate, beneficial impact to the visitor experience. This action, combined with the elements of alternative 2, would have a long-term, moderate, beneficial cumulative effect.

Additionally, there are other external trends and changes that may impact the visitor experience, such as improvements to CR 7950, the release of the America the Beautiful quarter, and the park's status as a World Heritage site. The proposed paving of CR 7950 could bring a significant increase in visitation to the park. The release of the America the Beautiful quarter could potentially raise awareness of the park and lead to an increase in visitation. Finally, the park's status as a World Heritage site draws special interest from domestic as well as international travelers. As World Heritage sites increase in popularity, the number of

visitors to the park could increase. These potential increases in visitation would have a long-term, moderate, adverse impact on the visitor experience, if not managed.

Combined with the actions proposed in alternative 2, these actions would largely be mitigated, resulting in a long-term, minor, beneficial impact. Impacts of the preferred alternative would comprise a relatively substantial portion of the overall cumulative effect.

## **Conclusion**

As a result of the management strategies outlined in alternative 2, visitors would have an experience similar to current conditions once they enter the park. Visitor's freedom to enter particular sites at their own discretion would not be significantly impacted by this alternative; most of the differences this alternative proposes affect visitor use prior to their arrival at the park or upon immediate arrival. There would be beneficial impacts as a result of the implementation of a reservations system for campers because they would not run the risk of being turned away at the campground entrance because it was full. There is the possibility that a parkwide reservation system would be implemented if visitation increases to the point that the resources and the visitor experience are being impacted. Although this reservation system would help to protect the resource and the experience, it would have an adverse effect on visitors' ability to freely access the park and may also impact their sense of spontaneity. The management of large groups would provide beneficial impacts for the management of crowding and the promotion of close contact with the resources. Also, educating individual visitors as well as groups as part of alternative 2 would help protect the sites as well as preserve the unique visitor experience at the park.

## **ALTERNATIVE 3**

### **Visitor Ability to Access the Park**

Visitors would be required to stop in the visitor center and would be given information prior to accessing the park's main loop road. The information would inform visitors about the sensitivity of park resources as well as ways to redistribute use around the park to avoid conflicts at popular sites. The required stop at the visitor center would hinder visitors' immediate access to the park and would impact their ability to freely access the park at their convenience. However, visitors are already required to stop at the visitor center to pay their entrance fee. This alternative adds the requirement for all visitors to receive information about the park's resources and rules and regulations. Freedom of access to the park is a primary factor affecting the visitor experience (Freimund 2010). For this reason, there would be a long-term, minor, adverse impact to visitors' ability to access the park.

This alternative would also require large groups to receive information about the park prior to their visit. This would be done to ensure that large groups receive a consistent and comprehensive message regarding the sensitivity of park resources, park regulations, and appropriate visitor behavior. Also, large groups would be required to make reservations prior to their visit and would be limited to two groups per day during the peak season. This strategy would prevent several large groups from accessing the park at one time during the busiest times of the year, helping to alleviate crowding and congestion at key visitor sites. Since most large groups plan their trips well in advance, the requirement for a reservation during the peak season should not be a significant inconvenience. However, as demand potentially increases for access to the park, there may be times when a large group cannot gain access on their preferred day, but would likely be able to secure a reservation for a nearby date and time. This

strategy would result in a long-term, minor, adverse impact on their access to the park.

Upon approval of the plan, an immediate strategy would be to require all campers to get a reservation during the peak season prior to their visit. This would be done to provide for improved visitor trip planning and more efficient park management of the campground during times of high use. The campground currently fills up during peak periods of visitation and some visitors are turned away, resulting in an adverse impact given the remote location of the park and the lack of convenient access to other camping and lodging options in the nearby area. The camping reservation system would help to alleviate this problem by allowing visitors to plan in advance during peak times and be guaranteed a campsite. In addition, a certain percentage of campsites would remain on a first-come, first-served basis during the peak season to accommodate some last minute arrivals. The camping reservation system would not be used during off-peak times because it would be less necessary then, benefiting those visitors who prefer less structured and more spontaneous trip planning. There would be an overall long-term, moderate, beneficial impact to overnight campers' ability to access the park as a result of alternative 3.

A reservation system for individual access may also be implemented parkwide during the peak season if indicators and standards are violated. This reservation system would be a result of changing visitor use patterns and the park staff identifying (through monitoring) an increase in visitation that results in unacceptable impacts to the resources and visitor experience. The visitor survey conducted during 2009 revealed that visitors supported a reservation system if it was implemented to protect resources, to add convenience, and to maintain the quality of the visitor experience (Freimund 2010). The off-peak season would not have a reservation system implemented because the visitation to the park is much lower and restricting access during these times is unnecessary. It is expected that this

reservation system would not cause significant hardship on visitors to the park because current use levels could be accommodated, along with some of the projected visitation. However, there would be a point in the future where demand may exceed supply during the peak season and some potential visitors may not be able to gain access to the park, at least on their preferred date. If implemented, there would be a long-term, moderate, adverse impact on individual visitor's ability to access the park.

### **Freedom of Choice and Flexibility to Visit Park Sites**

Under Alternative 3, freedom of choice and flexibility to visit the sites within the park would be slightly enhanced given strategies for managing large groups that would result in less crowding and conflict at the primary sites. Otherwise, visitors would still have the same unrestricted access to the sites within the park. This alternative would retain visitors' opportunity to determine their own pace and visit sites at their own discretion, which are important factors to the visitor experience (Freimund 2010). This freedom could still lead to some congestion at certain popular sites during peak times such as the weekends in the spring and fall. However, an immediate action of this alternative is to provide visitors with information about peak use times in order to encourage voluntary redistribution of use, which would help reduce congestion at popular sites within the park.

Large groups would still have the freedom to travel through the park and visit primary sites at their own pace. They would be required to make a reservation prior to their visit and would be limited to two groups a day during the peak season. This strategy would prevent several large groups from accessing the park at one time, minimizing crowding and conflicts with other visitors. The freedom for large groups to access the park without notification can provide a sense of spontaneity, thus requiring a reservation could take away from their

visitor experience. Large groups would also be required to split into smaller groups of no more than 20. This would help alleviate some of the congestion at the primary sites in the park, but it limits the freedom of the large groups to visit certain sites at certain times. Large groups would not be required to get a reservation and would not be limited to two per day during off-peak times because it would be less necessary during these times, benefiting those visitors that prefer less structured and more spontaneous trip planning. Reducing crowding and conflict by managing large groups should generally increase all visitors' unfettered access to the primary sites in the park.

In summary, alternative 3 would still allow for the freedom and flexibility to visit individual sites within the park. Large groups would be required to get a reservation and individual visitors would be required to stop at the visitor center for information. There is the potential that large groups would be limited further during the peak season (e.g., the number and size of groups) and individuals would be required to get reservations during the peak season if standards are violated. However, this would not affect visitors' ability to access sites freely inside the park. For these reasons, there would be an overall long-term, moderate, beneficial impact on visitors' ability to maintain their freedom while accessing the sites in the park as a result of alternative 3.

### **Management of Visitor Crowding and Promotion of Close Contact with the Resource**

The current data gathered as part of the 2009 visitor study (Freimund 2010) at the park revealed that visitors currently do not feel crowded and are able to have close contact with the resources. The strategies outlined in alternative 3 would be aimed at continuing to promote this high level of satisfaction with park visits through increased education, better distribution of use, and regulation of use, if needed, on a seasonal basis.

Alternative 3 would require visitors to stop at the visitor center to receive information about the park and the resources. All visitors would be educated on the sensitive nature of the resources and associated visitor experience, and the unique opportunities provided at the park for close contact with these resources. This educational orientation would target key messages to all visitors about park resources and rules and regulations, which would be more in-depth and far reaching than current educational efforts. In addition, this education would promote a deeper understanding of the important values of the park, which is another form of close contact with park resources.

Alternative 3 takes into account the possibility of a potential increase in visitation that could lead to crowding and adverse impacts on the unique experience currently available at the park during the peak season. To help alleviate this possibility, indicators and standards were developed to measure the impact to the visitor experience. If the indicators and standards are consistently violated, then a parkwide reservation system may be implemented during times of peak visitation. The reservation system would put a limit on the number of visitors in the park at one time, but would help alleviate crowding problems that result from too many people. The reservation system, by limiting the number of people in the park, would also maintain visitors' ability to form close contacts with the resource. The reservation system would not be required during off-peak times because it is less necessary then, because of a decrease in visitation during these times.

The group management strategies proposed for this alternative aim to reduce the potential for crowding as well by limiting the number of groups in the park at any one time and better distributing their use throughout the park. The 2009 visitor study revealed that impacts from large groups can detract from the ability of some visitors to have close contact with the resources. Thus, if indicators and standards are exceeded

related to large group impacts, there is the management option of further restricting large groups during the peak season (strategic scheduling and complete restriction during the peak season). As previously mentioned, large groups would not be required to get a reservation and would not be limited to two per day during off-peak times because it is less necessary, benefiting those visitors that prefer less structured and more spontaneous trip planning.

Given all of these strategies for educating visitors and distributing use during peak use times, there would be a long-term, moderate, beneficial impact on the management of visitor crowding and the visitor's ability to form close contact with park resources.

### **Cumulative Impacts**

Several past, present, or reasonably foreseeable actions may affect visitor experiences and opportunities to visit the park. Currently the visitor center at the park is being rebuilt on the existing footprint of the old visitor center. The new visitor center will provide improved exhibit space, visitor center functions, and administrative offices. There would be a short-term, minor, adverse impact because of the closure of the visitor center, however once the new visitor center is completed in 2012 (expected) there would be a long-term, minor to moderate beneficial impact to the visitor experience. Combined with the actions proposed in alternative 3, this action would have a long-term, moderate, beneficial cumulative effect.

Additionally, there are other external trends and changes that may impact the visitor experience, such as improvements to CR 7950, the release of the America the Beautiful quarter, and the status of the park as a World Heritage site. The proposed paving of CR 7950 could bring a significantly higher amount of visitation to the park.

The America the Beautiful quarter could potentially raise awareness of the park and

lead to an increase in visitation, as well as visitor crowding and conflicts. Finally, the park's status as a World Heritage site draws special interest from domestic as well as international travelers. As World Heritage sites increase in popularity, the number of visitors to the park could increase. Therefore, these events could reduce visitors' ability to connect with park resources and reduce visitors' opportunities for solitude. These potential increases in visitation would have a long-term, moderate, adverse impact on the visitor experience, if not managed. Combined with the actions proposed in alternative 3, these actions would largely be mitigated during the peak season, resulting in a long-term, minor, beneficial impact. Impacts of the preferred alternative would comprise a relatively substantial portion of the overall cumulative effect.

### **Conclusion**

Under alternative 3 visitors would have an experience similar to current conditions, from a site-based perspective. Visitor's freedom to enter particular sites at their own discretion would not be significantly impacted by this alternative. Most of the differences this alternative proposes affect visitor use prior to their arrival at the park, upon immediate arrival, and on a seasonal basis. There would be beneficial impacts as a result of the implementation of a reservation system for campers during the peak season because they would not run the risk of being turned away at the campground entrance because it was full. There is the possibility that a parkwide reservation system would be implemented if visitation increases during the peak season to the point that the resources and the visitor experiences are being impacted. Although this reservation system would help to protect the resources and the experience, it would have an adverse effect on visitor's ability to freely access the park and impacts their sense of spontaneity during periods of high use. The management of large groups would provide beneficial impacts for the management of crowding

and the promotion of close contact with the resources. Also, educating individual visitors as well as groups as part of alternative 3 would help protect the sites and preserve the unique visitor experience at the park.

## **ALTERNATIVE 4**

### **Ability to Access the Park**

Alternative 4 proposes restrictions at the site level, but does not restrict overall access to the park. Visitors would not be required to notify the park of their visit or get a reservation to visit the park. Large groups also would not be required to get a reservation to enter the park. Maintaining visitors' unfettered access to the park would result in a long-term, moderate, beneficial impact.

The exception would be that if indicators and standards are being exceeded, visitors may be required to participate in a structured education program at the visitor center prior to accessing the sites within the park. This would be done to ensure that visitors are receiving a consistent message about the sensitive nature of the resources and the uniqueness of the visitor experience. The education program would hinder visitors' immediate access to the park and impact their ability to freely access the park at their convenience. However, visitors are already required to stop at the visitor center to pay their entrance fee. This alternative adds the requirement to participate in an education program prior to accessing the park. Similarly, this alternative would require that the large groups receive information about the park prior to their visit. If the education program is implemented, there would be a long-term, moderate, adverse impact to visitors' ability to access the park.

Alternative 4 would also maintain the current campground system that does not require any prior reservation and would continue to be managed on a first-come,

first-served basis. This would allow more unrestricted access to the park, but may lead to some visitors being turned away from the campgrounds at times of peak visitation, which would result in a long-term, moderate, adverse impact, given the remote location of the park and access to other camping and lodging options in the nearby area.

### **Freedom of Choice and Flexibility to Visit Park Sites**

Under alternative 4, visitors' access to the sites within the park would be managed to protect resources and minimize crowding and conflicts, affecting visitors' freedom of choice and flexibility to visit the sites at their own discretion. If standards for resource conditions and/or visitor experience are exceeded, visitor use at the primary sites in the park would be managed through the implementation of queuing strategies (e.g., one person is permitted in as one person exits) or a reservation/permit system. These strategies would be guided by the number of people at one time per site as explained in the 1984 general management plan. Outside of peak use times, visitors would still retain the freedom to visit sites at their own pace. However during peak use times, it may be necessary to obtain a permit ahead of time or be subject to a queuing system. These strategies would help alleviate congestion at certain popular sites during peak times such as the weekends in the spring and fall, but it would significantly reduce visitor freedom during these times.

Another strategy, which would be implemented immediately, would be to station park staff at strategic locations at or within key sites during peak times and special events. This would allow rangers to have contact with visitors in order to educate them about the unique qualities of the park. Many visitors would appreciate this increased contact with park staff, but some may perceive increased presence of rangers as a deterrent to their spontaneity and freedom to visit the sites.

Large groups would be required to make a reservation to certain sites prior to their visit and would be limited to two a day. This strategy would prevent several large groups from accessing primary park sites at one time, minimizing crowding and conflict with other visitors. The freedom for large groups to access park sites without notifying the park can provide a sense of spontaneity, thus requiring a reservation could take away from their visitor experience. Large groups would also be required to split into smaller groups of no more than 20 people. This would help alleviate some of the congestion at the primary sites in the park, but it limits the freedom of the large groups to visit certain sites at certain times. There is also the potential that large groups would be limited further (e.g., the number and size of groups) if indicators and standards are exceeded and management of large groups was considered a contributing factor.

Given the significance of these strategies to affect visitors' ability to access sites freely inside the park, there would be an overall long-term, major, adverse impact as a result of alternative 4.

### **Management of Visitor Crowding and Promotion of Close Contact with the Resource**

The data gathered as part of the 2009 visitor study (Freimund 2010) at the park revealed that visitors currently do not feel crowded and are able to have close contact with the resources. There are times, such as during peak weekends or when multiple large groups arrive, that there can be instances of crowding and congestion.

An immediate action of this alternative would be to station park staff at specific locations at, or within, sites during the peak season and special events. This would provide opportunities for staff to educate visitors about the sensitive nature of the resources and about the unique visitor experience. The presence of staff may also detract from visitors' experiences. Visitors

may feel intimidated by or obligated to interact with park staff, thus taking away from the experience at the park. It may also help distribute use during peak times and reduce conflicts between visitors.

In addition, alternative 4 takes into account the possibility of a potential increase in visitation to the point where crowding might become a problem and the unique experience currently available at the park may be adversely impacted. To help alleviate this possibility, indicators and standards were developed to measure the impact to the visitor experience. If the indicators and standards are consistently violated, then a site-based queuing or a permit/reservation system may be implemented. This system would provide a high level of hands-on management at primary sites to reduce crowding and conflicts and ensure resources and visitor experiences are protected.

Alternative 4 would not immediately require visitors to have an education-based orientation to the park and the resources. This action would only be implemented if the indicators and standards are exceeded. The education-based orientation would provide visitors with knowledge about the unique nature of the park and through this knowledge the visitors would be able to have a more connected relationship with the resources. The education orientation would also teach visitors the importance of dispersing use across the park to avoid crowding at primary sites within the park.

One of the purposes of group management for this alternative is to reduce the potential for crowding at specific sites within the park as well. Groups would be limited to two a day; they would receive information about the park before their visit, and would be required to obtain a reservation to visit certain sites prior to their visit. Large groups would also be required to split into groups of less than 20 to further lessen the impacts of crowding. The 2009 visitor study revealed that impacts from large groups can detract from the ability of some visitors to have close contact with the resources. Thus if



indicators and standards are exceeded related to large group impacts at certain sites, there is the management option of further restricting large groups (strategic scheduling and complete restriction during the peak season). Restricting large groups to certain sites at certain times could reduce crowding in the park, but may reduce the group's ability to connect with the resource because of this highly structured management approach.

Given these various management strategies and related implications on minimizing crowding and promoting contact with park resources, there would be a long-term, moderate, beneficial impact as a result of alternative 4.

## **Cumulative Impacts**

Several past, present, or reasonably foreseeable actions may affect visitor experiences and opportunities to visit the park. Currently, the visitor center at the park is being rebuilt on the existing footprint of the old visitor center. The new visitor center would provide improved exhibit space, visitor center functions, and administrative offices. There would be a short-term, minor, adverse impact because of the closure of the visitor center. However, once the new visitor center is completed in 2012 (expected), there would be a long-term, minor to moderate, beneficial impact to the visitor experience. Combined with the actions proposed in alternative 3, this action would have a long-term, moderate, beneficial cumulative effect.

Additionally, there are other external trends and changes that may impact the visitor experience, such as improvements to CR 7950, the release of the America the Beautiful quarter, and the status of the park as a World Heritage site. The proposed paving of CR 7950 could bring a significantly higher amount of visitation to the park. The production of the America the Beautiful quarter could potentially raise awareness of the park and thus lead to an increase in

visitation. Finally, the park's status as a World Heritage site draws special interest from domestic as well as international travelers. As World Heritage sites increase in popularity, the amount of visitors to the park could increase. Therefore, this could reduce visitors' ability to connect with the park and reduce visitors' opportunities for solitude. These potential increases in visitation would have a long-term, moderate, adverse impact on the visitor experience, if not managed. Combined with the actions proposed in alternative 4, these actions would largely be mitigated during the peak season, resulting in a long-term, minor, beneficial impact. Impacts of the preferred alternative would comprise a relatively substantial portion of the overall cumulative effect.

## **Conclusion**

Visitors' freedom to enter the park at their own discretion would not be impacted by this alternative; most of the differences this alternative proposes are at the site level. There would be both beneficial and adverse impacts as a result of not implementing a reservations system for campers. Their sense of spontaneity would be preserved because they would not have to call ahead, but they would run the risk of being turned away at the campground entrance if it was full. There is the possibility that a site-based queuing and/or permit/reservation system would be implemented if visitation increases to the point that the resources and the visitor experiences are being impacted. Although these systems would help to protect the resource and the experience, it would have an adverse effect on visitors' ability to freely access the sites within the park and would impact their sense of spontaneity. The management of large groups would provide beneficial impacts for the management of crowding and the promotion of close contact with the resources. Also, educating individual visitors as well as groups as part of alternative 4 would help protect the sites as well as preserve the unique visitor experience at the park.

## IMPACTS ON PARK OPERATIONS

### METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

Implementation of a project or management plan can affect park operations—such as the number of employees needed, the type of duties that need to be conducted, how activities should be conducted, and administrative procedures. Operational efficiency, for the purposes of this analysis, refers to the adequacy of the staffing levels and quality and effectiveness of the infrastructure, systems, and programs used in the operation of the park in order to adequately protect and preserve vital park resources and provide for an effective visitor experience. This includes an analysis of (1) existing and needed staffing levels and budgets, (2) general park and visitor center operations, (3) park housing, and (4) visitor use management systems. Park staff knowledge was used to evaluate the impacts of each alternative and is based on the current description of park operations presented in the “Affected Environment” section of this document. The thresholds used to assess potential changes in park operations are defined as follows:

**Negligible:** Park operations would not be affected, or the effect would be at or below the lower levels of detection, and would not have an appreciable effect on park operations.

**Minor:** The effect would be detectable, but would be of a magnitude that would not have an appreciable effect on park operations. If mitigation were needed to offset adverse effects, it would be relatively simple and successful.

**Moderate:** The effects would be readily apparent and would result in a substantial change in park operations that is noticeable to staff and the public. Mitigation measures

would probably be necessary to offset adverse effects and would likely be successful.

**Major:** The effects would be readily apparent and would result in a substantial change in park operations that is noticeable to staff and the public, and would be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, could be expensive, and their success could not be guaranteed.

### ALTERNATIVE 1, NO ACTION

#### Analysis

Under the no-action alternative, NPS staffing would remain at current levels and park staff would continue to have limited ability to respond to current and potential future impacts from visitor use, including the need for increased maintenance, visitor education, group management, and enforcement. The park’s budget would also likely remain at current levels. Current park and visitor center operations would not be able to keep pace with the changes and impacts from increased visitation, leading to losses of operational efficiency and eventually park resource damage. Park infrastructure and facilities (such as parking lots, restrooms, waste water treatment facility, and the visitor center) would continue to be congested and at capacity during peak visitation periods. In addition, there may be future demand to expand these visitor facilities to accommodate increased use, which would have significant cost in terms of the park’s budget and impacts to cultural and natural resources. The occupancy and utility of park housing would remain the same as staffing levels remain at current levels. Without any new tools to help manage large groups, campers, or overall

use, park staff and operations would continue to be inefficient. Furthermore, information on park user capacity and triggers for appropriate management responses would not be available to the park staff to assist them in preserving the unique qualities of the park. The absence of an approved visitor use management plan would continue to put pressures on existing systems and infrastructure.

Considering all of the above, the no-action alternative's effect on park operations would continue to be moderate, adverse, and long-term.

### **Cumulative Impacts**

In general, the cumulative projects would likely result in increased visitation to the park that over time exceeds the park staff's ability to manage visitor use impacts. The efficiency and effectiveness of current staff activities and operational systems would be further diminished. The effect of these cumulative projects on park operations would be minor to moderate, adverse, and long term.

Impacts of the above actions, combined with the impacts of the no-action alternative, would result in long-term, moderate, adverse cumulative effects on park operations. The no-action alternative's contribution to this cumulative effect would be substantial.

### **Conclusion**

The no-action alternative's effect on park operations would continue to be moderate, adverse, and long term. The cumulative effect on park operations would be minor to moderate, adverse, and long term. The no-action alternative's contribution to this effect would be substantial.

## **ALTERNATIVE 2, THE PREFERRED ALTERNATIVE**

### **Analysis**

Under alternative 2, new staffing and management systems that are present year-round would have the following beneficial impacts. NPS staffing would be increased by three FTEs<sup>2</sup> and park staff would have an improved ability to educate and manage visitors. New systems would be put in place, such as enhanced fee collection, visitation data collection, entry gates, website, and other programmatic materials, that would provide park staff with tools needed to properly preserve the visitor experience and protect park resources. Consequently, park infrastructure and facilities (such as parking lots, restrooms, and visitor center) would not be congested and at capacity, and pressures to expand facilities would be reduced or eliminated. Management of large groups and individuals would be improved by a formal reservation system. The campground reservation system would eliminate current issues associated with managing the supply and demand of campsites. Maintenance time and costs would be reduced because of expected reductions in incidences of vandalism, graffiti, and other visitor use impacts to structures and sites. Information on park user capacity and triggers for appropriate management responses would be available to enable park staff to make effective decisions that better protect park resources and the visitor experience.

Alternative 2 would also result in adverse impacts on park operations. The actions proposed would require the park to develop new systems and programs that require capital investment, staff training, and specialized skills. Demands for park housing could increase as new staff are added.

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<sup>2</sup> FTEs are "full-time equivalents." There may be more actual employees than the given number of FTEs, but some of those employees work part-time or seasonally.

Considering all of the above, the effect of alternative 2 on park operations would be moderate, beneficial, and long term.

### **Cumulative Impacts**

In general, the cumulative projects would likely result in increased visitation to the park that over time would affect the park staff's ability to manage visitor use impacts. The efficiency and effectiveness of current staff activities and operational systems would be further diminished. The effect of these cumulative projects on park operations would be minor to moderate, adverse, and long term.

Impacts of the above actions, combined with the impacts of alternative 2, would result in long-term, minor to moderate, beneficial cumulative effects on park operations. The contribution of alternative 2 to this cumulative effect would be substantial.

### **Conclusion**

The effect of alternative 2 on park operations would be moderate, beneficial, and long term. The cumulative effect on park operations would be minor to moderate, beneficial, and long term. The contribution of alternative 2 to this effect would be substantial.

## **ALTERNATIVE 3**

### **Analysis**

Under alternative 3, new systems and certain staff that are present year-round would have the following beneficial impacts. NPS staffing would be increased by 2.5 FTEs and park staff would have an improved ability to educate and manage visitors. New systems would be put in place, such as enhanced fee collection, visitation data, entry gates, website, and other programmatic materials, that would provide park staff with tools

needed to properly preserve the visitor experience and protect park resources. Consequently, park infrastructure and facilities (such as parking lots, restrooms, and visitor center) would not be congested and at capacity, and would pressures to expand facilities would be reduced or eliminated. Management of large groups and individuals would be improved by a formal reservation system. The campground reservation system would eliminate current issues associated with managing the supply and demand of campsites. Maintenance time and costs would be reduced because of expected reductions in incidences of vandalism, graffiti, and other visitor use impacts to structures and sites. Information on park user capacity and triggers for appropriate management responses would be available to enable park staff to make effective decisions that better protect park resources and the visitor experience.

Alternative 3 would also result in adverse impacts on park operations. The actions proposed would require the park to develop new systems and programs that require capital investment, staff training, and specialized skills. The training investment for new staff would be even greater than in alternative 2 because of the reliance on seasonal staff and the repeated loss of this investment. Demands for park housing could increase as new staff are added. The greater reliance on seasonal staffing under this alternative would likely compound housing demand and shortages.

Considering all of the above, the effect of alternative 3 on park operations would be moderate, beneficial, and long term.

### **Cumulative Impacts**

In general, the cumulative projects would likely result in increased visitation to the park that over time would affect the park staff's ability to manage visitor use impacts. The efficiency and effectiveness of current staff activities and operational systems would be further diminished. The effect of

these cumulative projects on park operations would be minor to moderate, adverse, and long term.

Impacts of the above actions, combined with the impacts of the alternative 3, would result in long-term, minor to moderate, beneficial, cumulative effects on park operations. The contribution of Alternative 3 to this cumulative effect would be substantial.

## **Conclusion**

The effect of alternative 3 on park operations would continue to be moderate, beneficial, and long term. The cumulative effect on park operations would be minor to moderate, beneficial, and long term. The contribution of alternative 3 to this effect would be substantial.

## **ALTERNATIVE 4**

### **Analysis**

Under alternative 4, new systems and certain staff that are present year-round would have the following beneficial impacts. NPS staffing would be increased by six FTEs and park staff would have an improved ability to educate and manage visitors. New systems would be put in place, such as enhanced fee collection, visitation data, website, and other programmatic materials, that would provide park staff with tools needed to preserve the visitor experience and protect park resources. Consequently, park infrastructure and facilities (such as parking lots, restrooms, and visitor center) would not be congested and at capacity, and pressures to expand facilities would be reduced or eliminated. Management of large groups and individuals would be improved by a site-based queuing or reservation system. Maintenance time and costs would be reduced because of expected reductions in incidences of vandalism, graffiti, and other visitor use impacts to structures and sites. Information on park user capacity and

triggers for appropriate management responses would be available to enable park staff to make effective decisions that better protect park resources and the visitor experience.

Alternative 4 would also result in adverse impacts on park operations. The actions proposed would require the park to develop new systems and programs that require capital investment, staff training, and specialized skills. The training investment for new staff would be greatest in this alternative given site-level staffing needs. It is also believed that the remote working conditions under this alternative (because of its site-specific arrangement) would contribute to reduced employee satisfaction and increased staff turnover. Demands for park housing would increase as new staff are added. Impacts from not having a campground reservation system (difficulty with managing supply and demand) would continue as in the no-action alternative. The overall operational burden is greatest in this alternative because of management needs at the site level.

The fact that this alternative does not include an electronic gate system means that the necessity for specialized skills for troubleshooting and maintenance would be reduced in comparison to the other alternatives, but the same as the no-action alternative. However, the beneficial impacts accrued from the gate system (such as full capture of all visitors and improved visitation data) would be foregone.

Considering all of the above, the effect of alternative 4 on park operations would be minor, beneficial, and long term.

### **Cumulative Impacts**

In general, the cumulative projects would likely result in increased visitation to the park that over time would affect the park staff's ability to manage visitor use impacts. The efficiency and effectiveness of current staff activities and operational systems

would be further diminished. The effect of these cumulative projects on park operations would be minor to moderate, adverse, and long-term.

Impacts of the above actions, combined with the impacts of alternative 4, would result in long-term, negligible to minor, beneficial cumulative effects on park operations. The contribution of alternative 4 to this cumulative effect would be substantial.

## **Conclusion**

The effect of alternative 4 on park operations would be minor, beneficial, and long term. The cumulative effect on park operations would be negligible to minor, beneficial, and long term. The contribution of alternative 4 to this effect would be substantial.



# CHAPTER 5



**CONSULTATION AND COORDINATION**





## PUBLIC INVOLVEMENT, INCLUDING SCOPING

The public was notified of this planning effort via: (1) a press release for the general management plan amendment and distribution of a scoping newsletter for the planning effort in November 2009, and (2) an announcement printed in the *Farmington Daily Times*, the local newspaper of record, on December 4, 11, 18, and 25, 2009.

Scoping is an early and open process for determining the scope of a proposed action or project and for identifying issues related to the project. During scoping, NPS staff provide an overview of the project, including purpose and need and preliminary issues. The public is asked to submit comments, concerns, and suggestions relating to the project and preliminary issues.

### The scoping newsletter

- introduced the general management plan amendment planning effort
- described the project approach and how the visitor use survey would fit into the general management plan amendment process
- outlined issues and presented preliminary management strategies and options
- presented the foundation for planning and management—the park’s purpose and significance statements
- provided a general timetable for development of the general management plan amendment

- invited the public to participate in the planning process by providing comments
- provided a comment form and website link to facilitate public comment

The newsletter was distributed to a mailing list of about 300 contacts and was also made available at the visitor center and online.

A public comment period was open from November 27 to December 31, 2009. The National Park Service received 36 comments submitted via the mail or web.

Another element of scoping and public involvement was the visitor use and experience survey that was conducted for the project in the park during the summer and fall of 2009. The survey was conducted at several locations throughout the park over the course of four weeks during the months of July and October. Approximately 500 people participated in the survey—350 in the summer and 150 in the fall. The survey project was designed to gather information that would help park managers better understand the public’s values and preferences about the park and assist in the development of the general management plan amendment.

The planning effort was also discussed with park visitors at campfire and other special programs during the summer and fall of 2010.

## **CONSULTATION AND COORDINATION TO DATE WITH OTHER AGENCIES, OFFICES, AND THE TRIBES**

Consultation with federal and state agencies and American Indian tribes was initiated by the National Park Service in 2010 (see appendix D).

### **CONSULTATION WITH THE U.S. FISH AND WILDLIFE SERVICE AND THE NEW MEXICO DEPARTMENT OF GAME AND FISH**

The National Park Service initiated informal consultation with the U.S. Fish and Wildlife Service on February 23, 2010, to determine if federal listed threatened, endangered, and candidate species might occur in the park. The Endangered Species Act of 1973, as amended, requires in section 7(a)(2) that each federal agency, in consultation with the secretary of the interior, ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. This section of the act sets out the consultation process, which is further implemented by regulation (50 CFR 402).

The New Mexico Ecological Services Field Office of the U.S. Fish and Wildlife Service responded to the request on October 12, 2010. Their letter referred the planning team to their website for species occurring in San Juan and McKinley counties, where the park is located. In a telephone conversation between NPS staff and the U.S. Fish and Wildlife Service on October 12, 2010, the National Park Service indicated that the actions contained in the plan amendment would have “no effect” on listed species at the park. The U.S. Fish and Wildlife Service generally agreed with this determination, but

stated that they would review the plan and provide formal comments when the environmental assessment was released and their concurrence was requested.

In a letter dated February 23, 2010, the National Park Service also requested the New Mexico Department of Game and Fish to provide input on state listed species that may inhabit the park. In a letter dated March 10, 2010, the department provided a list of special status species that may inhabit the area.

The information provided by the U.S. Fish and Wildlife Service and New Mexico Department of Game and Fish was used to develop the list of special status species found in “Chapter 3, Affected Environment.”

The U.S. Fish and Wildlife Service and New Mexico Department of Game and Fish were also sent copies of the scoping newsletter and this general management plan amendment/environmental assessment for their review.

### **NATIVE AMERICAN CONSULTATION**

The National Park Service recognizes that indigenous peoples have traditional and contemporary interests at Chaco Culture National Historical Park. Related to tribal sovereignty, the need for government-to-government Native American consultations stems from the historic power of Congress to make treaties with American Indian tribes as sovereign nations. Consultations with American Indians are required by various federal laws, executive orders, regulations, and policies. For example, such consultations are needed to comply with Executive Order 13175, *Consultation and*

*Coordination with Indian Tribal*

*Governments* (11/2000), and section 106 of the National Historic Preservation Act of 1966, as amended. Implementing regulations of the Council on Environmental Quality for the National Environmental Policy Act of 1969, as amended, also call for Native American consultations.

Formal consultation with tribes associated with Chaco Culture National Historical Park was initiated in 2010. A formal request to consult was sent on March 5, 2010, to the more than 20 tribes associated with the park. The following tribes were invited to this consultation meeting:

Hopi Tribe  
Jicarilla Apache Nation  
Mescalero Apache Tribe  
Navajo Nation  
Ohkay Owingeh Pueblo of Jemez  
Pueblo of Acoma  
Pueblo of Cochiti  
Pueblo of Isleta  
Pueblo of Laguna  
Pueblo of Nambe  
Pueblo of Picuris  
Pueblo of Pojoaque  
Pueblo of San Felipe  
Pueblo of Sandia  
Pueblo of Santa Ana  
Pueblo of Santa Clara  
Pueblo of Santo Domingo  
Pueblo of San Ildefonso  
Pueblo of Taos  
Pueblo of Tesuque  
Pueblo of Zia  
Pueblo of Zuni  
Southern Ute Tribe  
Ute Mountain Ute Tribe  
Ysleta del Sur Pueblo

seek their input. The following tribes sent representatives to attend the meeting:

Hopi Tribe  
Navajo Nation  
Pueblo of Acoma  
Pueblo of Isleta  
Pueblo of Laguna  
Pueblo of Santa Ana  
Pueblo of Santa Clara  
Pueblo of Tesuque  
Ute Mountain Ute Tribe

Topics pertinent to this GMP amendment discussed in the May 18, 2010, meeting included potential increases in park visitation, visitor carrying capacity, possible degradation of park resources as a result of increased visitation, and how GMP amendment alternatives address the management of increased visitation and visitor use impacts. Discussion included access to sites for spiritual, ritual, or traditional purposes and allowing tribal elders special use access by granting them greater flexibility than the current permitting system in place for visitors. This special use system would be established on a case-by-case basis through consultation, and would comply with the rights for access to such spiritual, ritual, or traditional resources under the American Indian Religious Freedom Act and the Native American Graves Protection and Repatriation Act (Ford pers. comm.).

Copies of this document will be sent to each associated tribe for review and comment. Tribes will have the opportunity to identify any subsequent issues or concerns, and the park will continue to consult during preparation of the GMP amendment and throughout its implementation.

A consultation meeting was held on May 18, 2010, to discuss the plan amendment and

## **SECTION 106 CONSULTATION WITH THE NEW MEXICO STATE HISTORIC PRESERVATION OFFICE**

Agencies that have direct or indirect jurisdiction over historic properties are required by section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 270 et seq.), to take into account the effect of any undertaking on properties listed in or eligible for listing in the National Register of Historic Places. In a letter dated

February 23, 2010, the National Park Service informed the New Mexico state historic preservation officer (SHPO) about the project and invited her to participate in the planning process and comment on the plan as it progressed. No response was received; however, the park has been in communication with the SHPO several times about this project and others during the planning process for this plan amendment. As section 106 consultation is continuing, a section 106 assessment of effect will be prepared as a separate document.

## **AGENCIES, ORGANIZATIONS, AND INDIVIDUALS RECEIVING A COPY OF THIS DOCUMENT**

### **FEDERAL AGENCIES**

Advisory Council on Historic Preservation  
U.S. Department of the Interior  
    U.S. Fish and Wildlife Service, New  
        Mexico Ecological Services Field  
        Office  
U.S. Environmental Protection Agency

### **U.S. SENATORS AND REPRESENTATIVES**

Honorable Jeff Bingaman, Senator  
Honorable Tom Udall, Senator  
Honorable Ben Lujan, House of  
    Representatives

### **STATE AGENCIES**

New Mexico Department of Game and Fish  
New Mexico Department of Cultural Affairs  
    Historic Preservation Division

### **STATE OFFICIALS**

Honorable Susana Martinez, Governor  
State Senator Joe Pinto  
State Representative W. Ken Martinez

### **AMERICAN INDIAN TRIBES TRADITIONALLY ASSOCIATED WITH PARKLANDS**

Mr. Leigh Kuwanwisiwma  
Hopi Cultural Preservation Office

Mr. Terry Morgart  
Hopi Cultural Preservation Office

President Levi Pesata  
Jicarilla Apache Nation

Ms. Lorene Willis  
Jicarilla Cultural Center

Governor Tony Tortalita  
Kewa Pueblo

Ms. Ellen Bigrope  
Mescalero Apache Tribe

President Mark Chino  
Mescalero Apache Tribe

Governor Marcellus Medina  
Mescalero Apache Tribe

Mr. Timothy Begay  
Navajo Nation

Mr. Tony Joe  
Navajo Nation

Mr. Ron Maldonado  
Navajo Nation

President Ben Shelley  
Navajo Nation

Mr. Alan Downer  
Navajo Nation HPD

Mr. Joseph M. Talachy  
Poeh Museum & Cultural Center

Mr. Damian Garcia  
Pueblo of Acoma

Ms. Theresa Pasqual  
Pueblo of Acoma

Governor Randall Vicente  
Pueblo of Acoma

Mr. Ernest M. Vallo  
Pueblo of Acoma HPO Advisory Board

Governor Vernon M. Garcia  
Pueblo of Cochiti

Mr. Tony Herrera  
Pueblo of Cochiti

Governor Robert Benavides  
Pueblo of Isleta

Mr. Moses Lujan  
Pueblo of Isleta

Mr. Valentino Jaramillo  
Pueblo of Isleta

Governor Joshua Madalena  
Pueblo of Jemez

Mr. Chris Toya  
Pueblo of Jemez

Governor John Antonio, Sr.  
Pueblo of Laguna

Mr. Roland E. Johnson  
Pueblo of Laguna

Mr. Larry Lente  
Pueblo of Laguna

Governor Ernest Mirabel  
Pueblo of Nambe

Mr. Herman Agoyo  
Pueblo of Ohkay Owingeh

Governor Marcelino Aguino  
Pueblo of Ohkay Owingeh

Governor Manuel Archuleta  
Pueblo of Picuris

Governor George Rivera  
Pueblo of Pojoaque

Governor Feliciano Candelaria  
Pueblo of San Felipe

Governor Perry Martinez  
Pueblo of San Ildefonso

Mr. Darryl Martinez  
Pueblo of San Ildefonso

Governor Joe Lujan  
Pueblo of Sandia

Mr. Victor Montoya  
Pueblo of Sandia

Mr. Ben Robbins  
Pueblo of Santa Ana

Governor Bruce Sanchez  
Pueblo of Santa Ana

Governor Walter Dasheno  
Pueblo of Santa Clara

Mr. Ben Chavarria  
Pueblo of Santa Clara

Mr. Jeff Lyon  
Pueblo of Santa Clara

Mr. Richard Aspenwind  
Pueblo of Taos

Governor James Lujan, Sr.  
Pueblo of Taos

Governor Frederick Vigil  
Pueblo of Tesuque

Mr. Mark Mitchell  
Pueblo of Tesuque

Mr. Cel Gachupin  
Pueblo of Zia

Governor Norman Cooney  
Pueblo of Zuni

Mr. Jonathan Damp  
Pueblo of Zuni

Mr. Arden Kucate  
Pueblo of Zuni

Chairman Matthew Box  
Southern Ute Tribe

Mr. Neil Cloud  
Southern Ute Tribe Cultural Preservation  
Office

Chairman Leroy Shingoitewa  
The Hopi Tribe

Chairman Ernest House, Sr.  
Ute Mountain Ute Tribe

Mr. Terry Knight  
Ute Mountain Ute Tribe

Governor Frank Paiz  
Ysleta del Sur Pueblo

Mr. Rick Quezada  
Ysleta del Sur Pueblo

## **LOCAL AND REGIONAL GOVERNMENT AGENCIES**

Keith Johns, County Manager, San Juan  
County, New Mexico

Dezirie Gomez, County Manager, McKinley  
County, New Mexico

Rob Mayes, City Manager, Farmington,  
New Mexico

## **ORGANIZATIONS AND BUSINESSES**

Chaco Alliance

Friends of Chaco

Getty Conservation Institute

Nageezi Navajo Nation Chapter House

National Parks Conservation Association

Plateau Sciences Society

San Juan Citizens Alliance

Zuni High School

## **INDIVIDUALS**

The list of individuals is available from park headquarters.







# **APPENDIXES, REFERENCES, PREPARERS AND CONSULTANTS**





## **APPENDIX A: RESERVATION SYSTEM**

### **GUIDELINES FOR A RESERVATION SYSTEM FOR INDIVIDUAL ACCESS**

#### **Background**

Chaco Culture National Historical Park offers visitors the opportunity to explore ancestral Puebloan structures that were built a thousand years ago. Today, visitors can walk on their own from sun up to sun down on any of the frontcountry or backcountry (frontcountry sites and locations are those attached to the primary loop road within the park; backcountry are those not attached to the primary loop) designated trails that take them through these monumental stone structures known as “great houses,” and throughout the ancient cultural landscapes of the park. The park has maintained the integrity of the structures and landscapes by using appropriate preservation strategies, keeping visitor facilities and services to a minimum. These management decisions, along with low levels of use, help to protect the conditions that visitors value such as their feeling of solitude, ability to directly experience the remarkable resources, and opportunities to develop a rich understanding of past cultural achievements. During this general management plan amendment process, the planning team examined potential changes in visitation, how those changes may influence resource conditions and visitor experiences, and the most effective and efficient ways to manage visitor use in the park long term. The purpose of this appendix is to outline specific guidance for a potential reservation system for individual access to the park if monitoring suggests the need for such a strategy.

Ongoing and anticipated increases in park visitation could exacerbate existing impacts and threats to cultural resources. Some visitors are not following the rules of visitor etiquette identified in park messages and materials, such as not walking on or touching walls, staying on designated paths, not leaving objects at the park’s cultural sites, and the removal or displacement of small artifacts found in the park. Other ongoing threats to cultural resources include vandalism on rock art panels and the introduction of exotic materials, principally human ashes, which requires removal methods that inevitably further degrade the condition of the archeological resources.

Aspects of the cultural resources’ integrity, such as the setting, feeling, association, location, and materials, are critical to the resources’ historic significance as well as their cultural, scientific, and educational values. Human use that results in the disturbance or loss of these resources will diminish the ability to understand and interpret the values of these fundamental resources. Sites that have high levels of visitation have had substantially more instances of disturbance or loss than other, lesser visited sites. This exacerbates the fragile nature of the sites open for visitation, none of which is assessed to be in good condition.

Visitors are currently satisfied with their visits to the park. When asked specifically about crowding and conflict concerns, the majority did not identify these issues as a problem (Freimund 2010). During recent visitor survey and public scoping efforts, visitors specifically commented that they value the current opportunities to experience solitude and natural quiet in a remote high desert environment with minimal park development. These values have held constant, as demonstrated in a visitor study in 1992 and 1993 (Lee and Stephens 1995). Many visitors have also commented on how much they value the unparalleled opportunity to stand amongst the ruins and imagine the activity that occurred during the height of the Chacoan occupation (Freimund 2010; Lee and Stephens 1995). Further, visitors have noted that the area is highly valued for the conditions that promote natural quiet, low use levels, and close contact with park resources.

These values are important in supporting the park's purpose, significance, and related desired conditions. Therefore, crowding and conflicts have been identified by park staff and the public as potential future concerns resulting from changes in visitor use levels and patterns if there is heightened awareness of the park and a portion of the county road is paved. In particular, there is concern that increasing use levels, specifically increasing numbers of people at one time (PAOT) at the primary attraction sites, will detract from the most highly valued aspects of visitors' experiences. Most importantly, there is mounting evidence that visitor impacts are already adversely affecting the park's cultural resources, through both inadvertent wear on the exposed architectural elements, and more severely, through vandalism to the resources and theft of artifacts. Park staff cannot adequately patrol, monitor, or protect all of the areas that are currently open to visitation. A steady increase in the incidents of vandalism, particularly to rock art panels and masonry walls, and the nearly 100% loss of artifacts in the frontcountry structures and along trails indicate that this cumulative damage has reached significant levels. PAOT thresholds for the primary sites in the park were included in the 1984 GMP since the road paving project was considered imminent at that time. These PAOT thresholds have been evaluated during the recent visitor study (Freimund 2010) and have been included in this plan amendment.

Generally, conditions at the park are well within these existing PAOT standards, most visitors do not experience crowding. However, there are times when large groups arrive at one time causing congestion and increased noise levels that can detract from other visitors' experiences at the most popular sites in the park, such as the Pueblo Bonito and Chetro Ketl Complex. A recent study by David Evans and Associates suggested that more than one busload of visitors at a time at any one site could potentially overwhelm the existing infrastructure and increase crowding (2009). It is expected that paving the park road may allow easier access for a larger number of people, leading to increased use levels during both peak and off-peak times. This includes the potential of attracting more large groups since access for larger vehicles may become easier with improved road conditions.

These potential concerns have been addressed in the plan in various ways. For instance, the preferred alternative includes a structured education program for all visitors, limitations on the number and timing of large groups, and the potential for a future reservation system. Upon implementation of the plan, park staff would begin a structured education program to ensure all visitors receive a consistent and comprehensive message regarding the sensitivity of park resources, park regulations, and appropriate visitor behaviors. In addition, park staff would implement ongoing management of the distribution and size of groups, providing for high quality group opportunities, while avoiding conflicts with individual visitors and impacts to resources. A reservation system for individuals, if implemented, would allow for equitable distribution of opportunities among all interested parties while supporting protection of desired conditions. If visitation patterns change appreciably and monitoring indicates that conditions are being influenced by the levels of use, all visitors would be required to obtain a reservation to visit the park. The reservation system would be in effect for days of normal operation, but not on special event days. During special events, estimated at four or five days a year, additional staff would be in place to ensure protection of resources and visitor safety with increased use levels.

### **Analysis of Visitation Patterns to Support Reservation System Estimates**

Current and projected visitation patterns were analyzed to support development of the reservation system. Current peak visitation averages 185 people per day with a maximum of 225 people per day (NPS 2010; David Evans and Associates 2009). May is the busiest month with about 30 additional people a day above the average, but this spike is most likely a result of school

groups on end-of-the-year field trips. Assuming no improvements to CR 7950, visitation is likely to increase to 275 by 2029. With full roadway improvements, it is estimated that approximately 375 visitors would visit on a peak day, and with partial roadway improvements it is estimated at approximately 295 visitors (David Evans and Associates 2009). Average group size for one carload of visitors is four people and the average size for large organized groups is one busload or 45 people (Freimund 2010). The average stay in the park is relatively long at 5 hours (Freimund 2010). Peak times are roughly 10:00 a.m. and 2:00 p.m. Given current use patterns, it is estimated that visitor use turns over about 1.5 times each day. The turnover rate is calculated by estimating the ratio of the total number of people or groups that use a recreation site during a single day compared to the average number of people or groups at the site at one time (Duncan et al. 2004).

When considering how to understand use patterns and implement a reservation system, the most important link in the system is the main attraction of the park, the Pueblo Bonito and Chetro Ketl Complex. On average, 98% of visitors go to the Pueblo Bonito/Chetro Ketl Complex with an average stay of 2 hours, a maximum stay of 3 hours, and a minimum stay of 1.5 hours (Freimund 2010). Peak times at the complex match those of the park with peaks of use around 10:00 a.m. and 2:00 p.m. The study in the summer of 2009 collected data on observed use levels in the Pueblo Bonito/Chetro Ketl Complex with a maximum of 48 people at one time, which is well within the PAOT standards (70–90 PAOT) established in the 1984 GMP for this area (Freimund 2010).

## Reservation System Estimates

To support consideration of a future reservation system for the park, the planning team used the information outlined above to make reasonable assumptions about the potential number of reservations that could be made available while maintaining the quality of desired resource conditions and visitor experiences. The goal of the analysis was to provide estimates of the potential number of reservations that could be made available. The analysis was based on known visitation patterns, including average use patterns of campers, and the new limitations on organized groups as outlined in the preferred alternative.

Since the assumptions used in this analysis are based on current use patterns, it is recommended that these assumptions be revisited at the time the reservation system is implemented by park staff. With adjustments to some of the key assumptions, it is possible that the overall number of reservations may change. However, it is expected that this analysis, should provide a reasonable target for a future reservation system, and any future changes would not produce a substantially different result. Future monitoring would help determine the validity of the assumptions for the reservation system, along with the effectiveness of the system once it is implemented.

Table A outlines the primary assumptions used to develop estimates for the reservation system. Managing visitor use levels and patterns at the park's main resource sites is a critical component to minimizing crowding and maintaining visitors' ability to have close contact with park resources without further unacceptable impacts. Therefore, the PAOT thresholds established in the 1984 general management plan, and evaluated during this planning effort, form the foundation for the future reservation system. The 1984 GMP included both a low-end and high-end estimate for PAOT at each of the main resource sites, except Hungo Pavi (see table B). The GMP also stated that the park's major archeological sites can sustain virtually unlimited use. With increased knowledge over time about the fragility of the sites and associated resources, this statement is now unsupported and easily refuted by archeologists, including NPS cultural resource staff. Over the last two decades, the National Park Service has gained a greater understanding of the impacts on the park's sensitive resources, resulting from current use levels. Given this knowledge, the planning team determined that the low-end estimates for PAOT were more appropriate for long-

term management. The low-end estimates are more likely to help protect resources and visitor experiences in combination with the other strategies outlined in the preferred alternative. The first line of the table (row 1) includes a maximum total for people at one time at the primary sites, including an estimate based on park staff recommendations of 32 PAOT for Hungo Pavi, which was not included in the 1984 GMP. In addition to PAOT at attraction sites, a small portion of visitors may hike and visit sites in the park's backcountry. Thus, an additional 20 PAOT was estimated based on current visitation patterns and added to the overall PAOT estimates (row 2).

In order to implement the reservation system, the maximum PAOT estimates were then translated into a maximum per day estimate by multiplying the PAOT calculation by the expected turnover rate of 1.5 per day (row 3), excluding backcountry use since it is expected that these users are in the park longer and the turnover rate is less. Row 4 provides the total supply for people per day based on the PAOT thresholds, backcountry use, and the turnover rate. Given that these estimates are based on a number of averages and assumptions, the numbers have been rounded (see parentheses) to acknowledge the limited precision of the analysis and provide a more general range of estimates.

The number of campers and large groups, per this plan, are established and a system would be in place to regulate them. The number of campers is based on the existing facility capacity and the number of large groups is limited to two per day per the preferred alternative. So the next step of the analysis was to identify the number of reservations available for individuals who are not camping or participating in large group activities. The average use levels for campers (row 5) and large groups (row 6) was subtracted from the maximum potential supply for people per day. The assumption for the occupancy rate for campers was based on existing use patterns. Although two large groups would be permitted per day, per the preferred alternative, the assumption for the reservation estimates was based on an expected average of one group per day since increased group management should lead to better dispersion of their use over the season. The remaining supply for people per day (row 7) forms the basis for calculating the number of reservations that could be made available for day use visitors who are not camping or part of large groups. Similar to above, the numbers have been rounded (see parentheses) to acknowledge the limited precision of the analysis and provide a more general range of estimates.

To ease the administration of a reservation system, the planning team has recommended that reservations be provided by individual carload rather than to each individual. Given this recommendation, the remaining supply for individual participants per day (row 7) was divided by the average group size of four people per car to identify the estimate of available reservations (row 8). In addition, it has been recommended that 20% of reservations be reserved as "first-come, first-served," so row 9 calculates the number of reservations that could be provided for advanced booking and row 10 includes the amount for "day of" reservations. Again, the numbers have been rounded (see parentheses) to acknowledge the limited precision of the analysis and provide a more general range of estimates.

**TABLE A: RESERVATION ESTIMATES**

Row	Assumptions	Estimate
<b>1</b>	Maximum people at one time (total based on per site PAOT* from the GMP, including an estimate for Hungo Pavi of 32 PAOT)	177
<b>2</b>	Average number of people at one time in the backcountry	20
<b>3</b>	Turnover rate (not applied to backcountry groups since it assumed these groups turnover less)	1.5
<b>4</b>	<b>Maximum number of people per day</b> , including backcountry groups and expected turnover rate	256 (≈250)
<b>5</b>	Average number of campers (46 sites total with an average of 4 people per site, but assumes 75% occupancy rate during peak)	138
<b>6</b>	Average number of people in large/organized groups (assumes 1 reservation on average a day=45 people)	45
<b>7</b>	<b>Estimated maximum number of individual participants per day</b> , excluding average camper use and group reservations	73 (≈75)
	<b>Estimates for Reservations Per Day</b>	<b>Low</b>
<b>8</b>	Individual reservations per day by carload (individual participants per day / 4 people per group)	<b>18 (≈20)</b> (80 ppl)
<b>9</b>	Advanced reservations (80% of total)	<b>15</b> (60 ppl)
<b>10</b>	First-come, first-served reservations (20% of total)	<b>4 (≈5)</b> (20 ppl)

\*Low-end Estimates for People at One Time from 1984 GMP

**TABLE B**

Site	Number of People at One Time
Pueblo Bonito/Chetro Ketl	70–90
Pueblo del Arroyo	15–25
Kin Kletso	20–30
Casa Rinconada area	30–40
Stairway pulloff	3–6
Total	145–200

The estimates for the reservation system would allow for some growth over existing maximum use levels, which roughly average 185 people per day with a maximum of 225 people per day. These estimates would accommodate a portion of the proposed growth in visitation should the county road be paved. Assuming no improvements to CR 7950, visitation is likely to increase to 275 by 2029. With full roadway improvements, it is estimated that approximately 375 visitors would visit on a peak day, and with partial roadway improvements it is estimated at approximately 295 visitors (David Evans and Associates 2009). Therefore, it is expected that this reservation system would not cause significant hardship on potential visitors to the park since

current visitor use levels can be accommodated, along with a portion of the projected visitation. However, if visitation were to increase at a higher rate than expected, this reservation system in combination with the management of large groups would better disperse and regulate use levels to protect park resources and visitor experiences and ensure that desired conditions are maintained.

## **Implementing the Reservation System**

There are multiple triggers that might signal the need for implementing the reservation system. As briefly mentioned above, park staff would be monitoring the indicators and standards established in Chapter 2, which are related to important characteristics for resource conditions and the quality of the visitor experience. If monitoring indicates that any of these standards have been violated, or there are negative trends in the condition of one or more of the indicators, then park staff may consider implementing the reservation system, particularly if other related strategies, such as the structured education program, have not proven effective in improving conditions. Further, park staff may consider implementing the reservation system if visitation routinely nears or exceeds the estimated maximum people per day, roughly 250 people (see table 1). If the reservation system is implemented, monitoring of the indicators would continue to ensure that the system is effectively protecting desired conditions. If needed, the system may be adjusted to better protect conditions or improve the efficiency of operations. As noted above, the reservation system would be in effect for normal operations, but not on special event days.

The planning team would encourage the use of an online system for administering the reservations, since it is the most efficient and user-friendly way of reaching potential visitors. Currently, the Recreation.gov website would be the likely choice for an online system. The Recreation.gov website manages the “inventory” of reservations available, including day-of reservations. The website is handled by a third party, making the burden on park staff relatively low. The park staff would only need to provide initial inputs for the system and respond to ongoing issues, as needed. Although Recreation.gov is a good option, there may be other, more effective and efficient options, available when the time comes to actually implement the system.



## APPENDIX B: LEGISLATION

### 1907 Legislation

#### PROCLAMATIONS.

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA.

March 11, 1907.

##### A PROCLAMATION.

WHEREAS, it is provided by section two of the Act of Congress, approved June 8, 1906, entitled, "An act for the preservation of American Antiquities", "That the President of the United States is hereby authorized, in his discretion, to declare by public proclamation historic land marks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be National Monuments, and may reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected";

Chaco Canyon  
National Monu-  
ment, N. Mex.  
Preamble.  
Vol. 34, p. 225.

And whereas, the extensive prehistoric communal or pueblo ruins in San Juan and McKinley Counties, Territory of New Mexico, principally embraced within the Chaco Canyon and generally known as the Chaco Canyon ruins, situated upon the public lands owned and controlled by the United States, are of extraordinary interest because of their number and their great size and because of the innumerable and valuable relics of a prehistoric people which they contain, and it appears that the public good would be promoted by reserving these prehistoric remains as a National Monument with as much land as may be necessary for the proper protection thereof.

Now, therefore, I, Theodore Roosevelt, President of the United States of America, by virtue of the power in me vested by section two of the aforesaid act of Congress, do hereby set aside as the Chaco Canyon National Monument, subject to any valid and existing rights, the prehistoric ruins and burial grounds situated in San Juan County, New Mexico, more particularly located and described as follows, to wit:

National Monu-  
ment, New Mexico.

Sections 7 and 8 and sections 16 to 29, inclusive, township 21 north, range 10; sections 1, 2, 3 and 4, sections 8 to 14 inclusive, and sections 17, 19, 20 and 30 in township 21 north, range 11; the south half of section 12 in township 20 north, range 8; the south east quarter of section 32 in township 21 north, range 12; the south east quarter of section 28 in township 17 north, range 12; the south east quarter of section 17 in township 17 north, range 10, all west of the New Mexico Principal Meridian, New Mexico, as shown upon the map hereto attached and made a part of this proclamation.

Boundaries.

Warning is hereby expressly given to all unauthorized persons, not to appropriate, excavate, injure or destroy any of the prehistoric ruins or remains hereby declared to be a National Monument or to locate or settle upon any of the lands reserved and made a part of said monument by this proclamation.

Reserved from  
settlement, etc.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the United States to be affixed.

Done at the City of Washington, this 11th day of March in the year of our Lord one thousand nine hundred and seven  
[SEAL.] and the Independence of the United States the one hundred and thirty-first.

THEODORE ROOSEVELT

By the President:

ELIHU ROOT

*Secretary of State.*

## 1980 Legislation

Public Law 96-550, December 15, 1980

### TITLE V-CHACO CULTURE NATIONAL HISTORICAL PARK

Sec. 501. (a) The Congress finds that--,

(1) archeological research in the San Juan Basin conducted over the past several years has greatly increased public knowledge of the scope of the prehistoric culture referred to as Chacoan Anasazi;

(2) the discoveries and the increased general interest in the Chaco phenomenon have come at a time when the San Juan Basin is experiencing extensive exploration and development for a wide variety of energy-related resources, including coal, uranium, oil, and natural gas;

(3) development of the San Juan Basin's important natural resources and the valid existing rights of private property owners would not be adversely affected by the preservation of the archeological integrity of the area; and

(4) in light of the national significance of the Chacoan sites and the urgent need to protect them, continued cooperation between federal agencies and private corporations is necessary to provide for development in the San Juan Basin in a manner compatible with preservation and archeological research.

(b) It is the purpose of this title to recognize the unique archeological resources associated with the prehistoric Chacoan culture in the San Juan Basin; to provide for the preservation and interpretation of these resources; and to facilitate research activities associated with these resources.

Sec. 502.(a) There is hereby established in the State of New Mexico, the Chaco Culture National Historical Park comprising approximately 33,989 acres as generally depicted on the map entitled " Chaco Culture National Historical Park," numbered 310/80,032-A and dated August 1979.The Chaco Canyon National Monument // 16 USC 431 // is hereby abolished, as such, and any funds available for the purpose of the monument shall be available for the purpose of the Chaco Culture National Historical Park.

(b) Thirty three outlying sites generally depicted on a map entitled "Chaco Culture Archeological Protection Sites," numbered 310/ 80,033-A and dated August 1980, are hereby designated as "Chaco Culture Archeological Protection Sites." The 33 archeological protection sites totaling approximately 8,771 acres are identified as follows:

Site	Acres
Allentown	42
Andrews Ranch	640
Bee Burrow	40
Bisa' ani	31
Casa del Rio	40

Coolidge	15
Dalton Pass	10
Great Bend	19
Greenlee Ruin	60
Grey Hill Spring	23
Halfway House	40
Haystack	115
Hogback	71
Indian Creek	100
Jacques	40
Kin Nizhoni	726
Lake Valley	30
Las Ventanas	31
Morris 41	85
Muddy Water	1,210
Newcomb	44
Peach Springs	985
Pierre's Site	440
Raton Well	23
San Mateo	14
Sanostee	1,565
Section 8	40
Skunk Springs/ Crumbled House	588
Standing Rock	321
Twin Angels	40
Toh-la-kai	10
Upper Kin Klizhin	60
Squaw Springs	870

Sec. 503. The Secretary of the Interior shall continue to search for additional evidences of Chacoan sites and submit to Congress within two years of date of enactment of this Act and thereafter as needed, his recommendations for additions to, or deletions from, the list of archeological protection sites in section 502(b) of this title. Additions to or deletions from such list shall be made only by an Act of Congress.

Sec. 504. (a) The Secretary is authorized to acquire lands, waters, and interests therein within the boundaries of the Chaco Culture National Historical Park (hereinafter referred to as the "park") and the archeological protection sites as identified in section 502 of this title by donation, purchase with donated or appropriated funds, or exchange. Property owned by the State of New Mexico or any political subdivision thereof, may be acquired by exchange or donation only. Property held in trust for the benefit of any Indian tribe or for the benefit of any individual member thereof may be acquired only with the consent of such owner or beneficial owner as the case may be.

(b) The respective tribal authorities are authorized to convey by exchange, purchase, on donation the beneficial interest in any lands designated by section 502 of this Act and held in trust by the United States for the respective tribes, to the Secretary, subject to such terms and conditions as the tribal authority deems necessary and which the Secretary deems are consistent with the purposes of this title.

(c)(1) The Secretary shall attempt to acquire private lands or interests therein by exchange prior to acquiring lands by any other method authorized pursuant to section 504 of this Act.

(2) The Secretary shall attempt to enter into cooperative agreements pursuant to section 505 of this Act with owners of private property for those archeological protection sites described in section 502(b) of this Act. The Secretary shall acquire fee title to any such private property only if it is necessary to prevent direct and material damage to, or destruction of, Chaco cultural resources and no cooperative agreement with the owner of the private property interest can be effected.

(d)(1) For purposes of completing an exchange pursuant to subsections(a) and (b), the Secretary shall designate a pool of at least three times the private acreage described in subsections (a) and (b), comprised of federal property interests of a similar resource character to property to be exchanged. Federal property shall, whenever possible, be designated in blocks of at least one section in size, but in no event shall the blocks designated be less than one-quarter of a section in size.

(2) The Secretary may include within the pool any federal property under his jurisdiction except units of the national park system, national forest system, or the national wildlife refuge system that are nominated by the owner of the private property to be exchanged. Exchanges shall be on the basis of equal value, and either party to the exchange may pay or accept cash in order to equalize the value of the property exchange, except that if the parties agree to an exchange and the Secretary determines it is in the public interest, such exchange maybe made for other than equal values.

(e) All Federal lands, waters, and interests therein excluded from the boundaries of Chaco Canyon National Monument by this title may be exchanged for non-federal property to be acquired pursuant to this title. Any lands so excluded shall be managed by the Secretary under the provisions of the Federal Land Policy and Management Act of 1976. Transfer of administration of such lands to the Bureau of Land Management shall not be considered a withdrawal as that term is defined in section 103(j) of the Federal Land Policy and Management Act of 1976.

Sec. 505. The Secretary shall seek to enter into cooperative agreements with the owners, including the beneficial owners, of the properties located in whole or in part within the park or the archeological protection sites. The purposes of such agreements shall be to protect, preserve, maintain, and administer the archeological resources and associated site regardless of whether title to the property or site is vested in the United States. Any such agreement shall contain provisions to assure that (1) the Secretary, or his representative, shall have a right of access at all reasonable times to appropriate portions of the property for the purpose of cultural resource protection and conducting research, and (2) no changes or alterations shall be permitted with respect to the cultural resources without the written consent of the Secretary. Nothing in this title shall be deemed to prevent the continuation of traditional Native American religious uses of properties which are the subject of cooperative agreements.

Sec. 506. (a) The Secretary shall administer the park in accordance with the provisions of this title and the provisions of law generally applicable to the administration of units of the national park system, including the Act of August 25, 1916 (39 Stat. 535; 16 U.S.C.1, 2- 4), and the Act of August 21, 1935 (49 Stat. 666; 16 U.S.C. 461 - 7).

(b) The Secretary shall protect, preserve, maintain, and administer the Chaco Culture Archeological Protection Sites, in a manner that would preserve the Chaco cultural resource and provide for its interpretation and research. Such sites shall be managed by the Secretary in accordance with the provisions of this title and the provisions of law generally applicable to public lands as defined in section 103(e) of the Federal Land Policy and Management Act of 1976: Provided, however, That lands held in trust by the Secretary for an Indian tribe or any individual member thereof, or held in restricted fee status shall continue to be so managed or held by the Secretary.

(c) No activities shall be permitted upon the upper surface of the archeological protection sites which shall endanger their cultural values. For the purposes of this title, upper surface shall be considered to extend to a depth of twenty meters below ground level. Nothing in this title shall be deemed to prevent exploration and development of subsurface oil and gas, mineral, and coal resources from without the sites which does not infringe upon the upper surface of the sites.

(d) Nothing in this title shall be deemed to prevent the continuation of livestock grazing on properties which are the subject of cooperative agreements.

(e) Within three complete fiscal years from the date of enactment, the Secretary shall transmit to the Committee on Interior and Insular Affairs of the United States House of Representatives and the Committee on Energy and Natural Resources of the United States Senate, a general management plan for the identification, research, and protection of the park, pursuant to the provisions of subsection (12)(b) of the Act of August 18, 1970, // 16 USC 1a-7. // to be developed by the Director, National Park Service, in consultation with the Directors, Bureau of Land management and Bureau of Indian Affairs and the Governor, State of New Mexico, and a joint management plan for the identification, research, and protection of the archeological protection sites, to be developed by the Director, National Park Service, in consultation and concurrence with the Directors, Bureau of Land Management and Bureau of Indian Affairs, and the Governor, State of New Mexico.

Sec. 507. (a) Consistent with and in furtherance of the purposes of the Division of Cultural Research of the Southwest Cultural Resources Center, operated by the National Park Service, the Secretary shall continue such research and data gathering activities as may be appropriate to further the purposes of this title and knowledge of the Chaco culture. The Secretary shall submit in writing within six months of the effective date of this section, to the Committee on Interior and Insular Affairs of the United States House of Representatives and the Committee on Energy and Natural Resources of the United States Senate, a plan for the continued operational program of the Division. The Secretary is authorized and encouraged to establish a committee composed of professional archeologists and others with related professional expertise including the designee of the Governor of the State of New Mexico to advise the Secretary in matters related to the surveying, excavation, curation, interpretation, protection, and management of the cultural resources of the historical park and archeological protection sites.

(b) The Secretary shall, through the Division of Cultural Research of the Southwest Cultural Resources Center of the National Park Service, be responsible for the development of a computer-generated data base of the San Juan Basin, and make such information available to federal and private groups when to do so would assist such groups in the preservation, management, and development of the resources of the basin.

(c) The head of any federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking with respect to the lands and waters in the archeological protection sites, and the head of any federal agency having authority to license or permit any undertaking with respect to such lands and waters, shall prior to the approval of the expenditure of any federal funds on such undertaking, or prior to the issuance of any license or permit, as the case may be, afford the Secretary a reasonable opportunity to comment in writing with regard to such undertaking and its effect upon such sites, and shall give due consideration to any comments made by the Secretary and to the effect of such undertaking on the purposes for which such sites are established.

Sec. 508. Effective October 1, 1981, there are authorized to be appropriated such sums as may be necessary to carry out the provisions of this title but not to exceed \$11,000,000 for acquisition and \$500,000 for development.

## 1995 Legislation

### CHACOAN OUTLIERS PROTECTION ACT OF 1995

Public Law 104-11  
104th Congress

An Act

To amend title V of Public Law 96-550, designating the Chaco Culture  
Archeological Protection Sites, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in  
Congress assembled,

#### SECTION 1.SHORT TITLE.

This Act may be cited as the “Chacoan Outliers Protection Act of 1995”.

#### SEC. 2.CONFORMING AMENDMENT.

Section 501(b) of Public Law 96-550 (16 U.S.C. 410ii(b)) is amended by striking “San Juan Basin;”  
and inserting in lieu thereof, “San Juan Basin and surrounding areas;”.

#### SEC. 3.ADDITIONS TO CHACO CULTURE ARCHEOLOGICAL PROTECTION SITES.

Subsection 502(b) of Public Law 96-550 (16 U.S.C. 410ii-1(b)) is amended to read as follows:

“(b)(1) Thirty-nine outlying sites as generally depicted on a map entitled ‘Chaco Culture  
Archeological Protection Sites’, numbered 310/80,033-B and dated September 1991, are hereby  
designated as ‘Chaco Culture Archeological Protection Sites’. The thirty-nine archeological  
protection sites totaling approximately 14,372 acres identified as  
follows:

Name	Acres
Allentown	380
Andrews Ranch	950
Bee Burrow	80
Bisa’ani	131
Casa del Rio	40
Casamero	160
Chimney Rock	3,160
Coolidge	450
Dalton Pass	135
Dittert	480
Great Bend	26
Greenlee Ruin	60
Grey Hill Spring	23
Guadalupe	15
Halfway House	40
Haystack	565
Hogback	453
Indian Creek	100
Jaquez	66
Kin Nizhoni	726



Lake Valley	30
Manuelito-Atsee Nitsaa	60
Manuelito-Kin Hocho	116
Morris 41	85
Muddy Water	1,090
Navajo Springs	260
Newcomb	50
Peach Springs	1,046
Pierre's Site	440
Raton Well	23
Salmon Ruin	5
San Mateo	61
Sanostee	1,565
Section 8	10
Skunk Springs/ Crumbled House	533
Standing Rock	348
Toh-la-ka	10
Twin Angeles	40
Upper Kin Klizhin	60

“(2) The map referred to in paragraph (1) shall be kept on file and available for public inspection in the appropriate offices of the National Park Service, the office of the State Director of the Bureau of Land Management located in Santa Fe, New Mexico, the office of the Area Director of the Bureau of Indian Affairs located in Window Rock, Arizona, and the offices of the Arizona and New Mexico State Historic Preservation Officers.”.

#### SEC. 4.ACQUISITIONS.

Section 504(c)(2) of Public Law 96-550 (16 U.S.C. 410ii-3(c)(2)) is amended to read as follows:

“(2) The Secretary shall seek to use a combination of land acquisition authority under this section and cooperative agreements (pursuant to section 505) to accomplish the purposes of archeological resource protection at those sites described in section 502(b) that remain in private ownership.”

#### SEC. 5. ASSISTANCE TO THE NAVAJO NATION

Section 506 of Public Law 96-550 (16 U.S.C. 410ii-5) is amended by adding the following new subsection at the end thereof:

“(f) The Secretary, acting through the Director of the National Park Service, shall assist the Navajo Nation in the protection and management of those Chaco Culture Archeological Protection Sites located on land under the jurisdiction of the Navajo Nation through a grant, contract, or cooperative agreement entered into pursuant to the Indian Self-Determination and Education Act (Public Law 93-638), as amended, to assist the Navajo Nation in site planning, resource protection, interpretation, resource management actions, and such other purposes as may be identified in such grant, contract, or cooperative agreement. This cooperative assistance shall include assistance with the development of a Navajo facility to serve those who seek to appreciate the Chacoan Outlier Sites.”.

Approved May 18, 1995.

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## APPENDIX C: CONSULTATION LETTERS



*United States Department of the Interior*

NATIONAL PARK SERVICE

Chaco Culture National Historical Park

P.O. Box 220

Nageezi, New Mexico 87037-0220

505-786-7014



In reply refer to: CHCU 105165A

February 23, 2010

Special status species coordinator  
New Mexico Game and Fish Department  
P.O. Box 25112  
Santa Fe, NM 87504

To Whom It May Concern:

The National Park Service (NPS) has begun the preparation of an amendment to the general management plan for Chaco Culture National Historical Park in northern New Mexico. The purpose of the project is to revise and update the park's general management plan to include additional information and direction for how visitor use of the park will be managed. Consistent with the park's purpose, significance, and legislative mandates, the plan amendment will identify different strategies for achieving desired resource conditions and visitor experiences.

In compliance with the National Environmental Policy Act of 1969, the general management plan amendment (GMPA) will be accompanied by an Environmental Assessment (EA). The GMPA/EA will identify significant issues and concerns, present a reasonable range of management alternatives for addressing these issues, and will analyze the environmental impacts of each alternative. Enclosed is a copy of the scoping newsletter that was recently issued for the project.

To fulfill our National Environmental Policy Act and satisfy NPS Management Policies, we are requesting a list of all state-listed or other special status species that might occur in the park (located in San Juan and McKinley counties, NM). Your response by March 31, 2010 would be appreciated.

Please direct your response to Patrick Malone, Project Manager, at the Denver Service Center, 12795 W. Alameda Parkway, Denver, CO 80225. You can also e-mail Patrick at [patrick\\_malone@nps.gov](mailto:patrick_malone@nps.gov). Should you have any questions, please call him at 303-969-2415.

Thank you for your assistance.  
Sincerely,

Barbara West, Superintendent



*United States Department of the Interior*

NATIONAL PARK SERVICE

Chaco Culture National Historical Park

P.O. Box 220

Nageezi, New Mexico 87037-0220



505-786-7014

In reply refer to:  
CHCU 105165A

February 23, 2010

Jan V. Biella, State Historic Preservation Officer (Interim)  
Department of Cultural Affairs - New Mexico Historic Preservation Division  
Bataan Memorial Building  
407 Galisteo Street, Suite 236  
Santa Fe, NM 87501

Dear Ms. Biella:

The National Park Service (NPS) has begun the preparation of an amendment to the general management plan for Chaco Culture National Historical Park in northern New Mexico. The purpose of the project is to revise and update the park's general management plan to include additional information and direction for how visitor use of the park will be managed. Consistent with the park's purpose, significance, and legislative mandates, the plan amendment will identify different strategies for achieving desired resource conditions and visitor experiences.

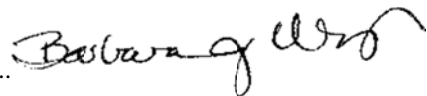
In compliance with the National Environmental Policy Act of 1969, the general management plan amendment (GMPA) will be accompanied by an Environmental Assessment (EA). The GMPA/EA will identify significant issues and concerns, present a reasonable range of management alternatives for addressing these issues, and will analyze the environmental impacts of each alternative.

In accordance with provisions of the National Historic Preservation Act of 1969, as amended, and the 2008 Programmatic Agreement among the National Park Service, the Advisory Council for Historic Preservation, and the National Conference of State Historic Preservation Officers, we invite your participation as the New Mexico State Historic Preservation Officer in the GMPA planning process. Enclosed is a copy of the scoping newsletter that was recently issued for the project. Your response by March 31, 2010 would be appreciated.

Please direct your response to Patrick Malone, Project Manager, at the Denver Service Center, 12795 W. Alameda Parkway, Denver, CO 80225. You can also e-mail Patrick at [patrick\\_malone@nps.gov](mailto:patrick_malone@nps.gov). Should you have any questions, please call him at 303-969-2415.

Thank you for your assistance.

Sincerely,

... 

Barbara West, Superintendent  
Chaco Culture National Historical Park



United States Department of the Interior  
NATIONAL PARK SERVICE  
Chaco Culture National Historical Park



P.O. Box 220  
Nageezi, New Mexico 87037-0220  
505-786-7014

Reply to:.....

Tribal Consultation on GMP Amendment

Dear Tribal Representative,

A number of things have transpired since our last consultation meeting that we would like to discuss with you. Most importantly, we are in the process of amending the park's General Management Plan to address issues of visitor capacity to protect resources and to assure quality visitor experiences. This letter serves as our request to enter into formal consultation on the Amendment. We hope that you have comments and suggestions that will improve the plan's alternatives. In addition, we have tentatively scheduled this year's consultation meeting for **May 18, 2010 at 10:00 am at the Hibben Center at the University of New Mexico**(map attached). Among the other specific issues to discuss then are:

- The park is in the process of upgrading and/or replacing many components of our infrastructure, including the park's visitor center. We will discuss what has been accomplished to date, what will be accomplished this year, and what we plan to do in the next year;
- We will report on the inadvertent discovery and data recovery that occurred as part of our lift station replacement process;
- We will bring you up-to-date on the preservation treatment projects we accomplished last year and what we hope to accomplish this year;
- We will share information on the progress of the ethnographic study Aztec and Chaco have been pursuing along with several tribes;
- We will discuss the plans for road improvements on County Road 7950 and what may happen in the future with this project; and
- We will continue our discussions of how to treat sacred objects and objects of cultural patrimony.

We will send you another letter closer to the meeting that includes the specifics on logistics. Our intent in sending this letter is to notify you of the date. If you have any specific issues you would like to discuss, please let us know so that we can add them to the agenda.

Sincerely,

Barbara J. West, Superintendent



*United States Department of the Interior*

NATIONAL PARK SERVICE

Chaco Culture National Historical Park

P.O. Box 220

Nageezi, New Mexico 87037-0220

505-786-7014



In reply refer to: CHCU 105165A

February 23, 2010

U.S. Fish and Wildlife Service  
New Mexico Ecological Services Field Office  
2105 Osuna NE  
Albuquerque, NM 87113

To Whom It May Concern:

The National Park Service (NPS) has begun the preparation of an amendment to the general management plan for Chaco Culture National Historical Park in northern New Mexico. The purpose of the project is to revise and update the park's general management plan to include additional information and direction for how visitor use of the park will be managed. Consistent with the park's purpose, significance, and legislative mandates, the plan amendment will identify different strategies for achieving desired resource conditions and visitor experiences.

In compliance with the National Environmental Policy Act of 1969, the general management plan amendment (GMPA) will be accompanied by an Environmental Assessment (EA). The GMPA/EA will identify significant issues and concerns, present a reasonable range of management alternatives for addressing these issues, and will analyze the environmental impacts of each alternative. Enclosed is a copy of the scoping newsletter that was recently issued for the project.

To fulfill our National Environmental Policy Act and Endangered Species Act requirements, and satisfy NPS Management Policies, we would like to initiate informal consultation on this project. We are therefore requesting a list of all federally listed threatened and endangered species, critical habitats, proposed species, or other special status species that might occur in the park (located in San Juan and McKinley counties, NM). Your response by March 31, 2010 would be appreciated.

Please direct your response to Patrick Malone, Project Manager, at the Denver Service Center, 12795 W. Alameda Parkway, Denver, CO 80225. You can also e-mail Patrick at [patrick\\_malone@nps.gov](mailto:patrick_malone@nps.gov). Should you have any questions, please call him at 303-969-2415.

Thank you for your assistance.

Sincerely,

Barbara West, Superintendent  
New Mexico Game and Fish



GOVERNOR  
Bill Richardson



DIRECTOR AND SECRETARY  
TO THE COMMISSION  
Tod Stevenson

Robert S. Jenks, Deputy Director

## STATE OF NEW MEXICO DEPARTMENT OF GAME & FISH

One Wildlife Way  
Post Office Box 25112  
Santa Fe, NM 87504  
Phone: (505) 476-8008  
Fax: (505) 476-8124

Visit our website at [www.wildlife.state.nm.us](http://www.wildlife.state.nm.us)  
For information call: 505/476-8000  
To order free publications call: 1-800-862-9310

### STATE GAME COMMISSION

Jim McClintic, Chairman  
Albuquerque, NM

Sandy Buffett, Vice-Chairwoman  
Santa Fe, NM

Dr. Tom Arvas, Commissioner  
Albuquerque, NM

Alfredo Montoya, Commissioner  
Alcalde, NM

Kent A. Salazar, Commissioner  
Albuquerque, NM

M.H. "Dutch" Salmon, Commissioner  
Silver City, NM

Leo V. Sims, II, Commissioner  
Hobbs, NM

March 10, 2010

Patrick Malone, Project Manager  
National Park Service  
Denver Service Center  
12795 W. Alameda Parkway, Denver, CO 80225

Re: Amendment to General Management Plan for Chaco Park; NMDGF No. 13223

Dear Mr. Malone,

In response to your letter dated February 23, 2010, requesting a list of all federally listed threatened and endangered species, critical habitats, proposed species, or any other special status species that might occur in the park, the Department For your information has enclosed a list of sensitive, threatened and endangered species that occur in San Juan and McKinley Counties.

For more information on listed and other species of concern, contact the following sources:

1. BISON-M Species Accounts, Searches, and County lists: <http://www.bison-m.org>
2. Habitat Handbook Project Guidelines: [http://wildlife.state.nm.us/conservation/habitat\\_handbook/index.htm](http://wildlife.state.nm.us/conservation/habitat_handbook/index.htm)
3. For custom, site-specific database searches on plants and wildlife, go to <http://nhnm.unm.edu>, then go to Data, then to Free On-Line Data, and follow the directions
4. New Mexico State Forestry Division (505-476-3334) or <http://nmrareplants.unm.edu/index.html> for state-listed plants
5. For the most current listing of federally listed species **always** check the U.S. Fish and Wildlife Service at (505-346-2525) or <http://www.fws.gov/southwest/es/NewMexico/SBC.cfm>.

Thank you for the opportunity to review and comment on your project. If you have any questions, please contact Ross Morgan at (505) 222-4707 or [ross.morgan@state.nm.us](mailto:ross.morgan@state.nm.us).

Sincerely,

Terra Manasco  
Assistant Chief, Conservation Services Division  
Technical Guidance Section

TLM/rm

xc: Wally Murphy, Ecological Services Field Supervisor, USFWS  
Brian Gleadle, NW Area Operations Chief, NMDGF

## NEW MEXICO WILDLIFE OF CONCERN MCKINLEY COUNTY

For complete up-dated information on federal-listed species, including plants, see the US Fish & Wildlife Service NM Ecological Services Field Office website at <http://www.fws.gov/ifw2es/NewMexico/SBC.cfm>. For information on state-listed plants, contact the NM Energy, Minerals and Natural Resources Department, Division of Forestry, or go to <http://nmrareplants.unm.edu/>. If your project is on Bureau of Land Management, contact the local BLM Field Office for information on species of particular concern. If your project is on a National Forest, contact the Forest Supervisor's office for species information.

<u>Common Name</u>	<u>Scientific Name</u>	<u>NMGF</u>	<u>US FWS</u>	<u>critical habitat</u>
Zuni Bluehead Sucker	Catostomus discobolus yarrowi	E	C	
Bald Eagle	Haliaeetus leucocephalus	T	T	
Northern Goshawk	Accipiter gentilis	s	SOC	
Peregrine Falcon	Falco peregrinus	T	SOC	
Mountain Plover	Charadrius montanus	s	SOC	
Least Tern	Sterna antillarum	E	E	
Black Tern	Chlidonias niger surinamensis		SOC	
Yellow-billed Cuckoo	Coccyzus americanus	s	C	
Mexican Spotted Owl	Strix occidentalis lucida	s	T	Y
Burrowing Owl	Athene cunicularia		SOC	
Costa's Hummingbird	Calypte costae	T		
Southwestern Willow Flycatcher	Empidonax traillii extimus	E	E	Y
Loggerhead Shrike	Lanius ludovicianus	s		
Gray Vireo	Vireo vicinior	T		
Western Small-footed Myotis Bat	Myotis ciliolabrum melanorhinus	s		
Occult Little Brown Myotis Bat	Myotis lucifugus occultus	s		
Long-legged Myotis Bat	Myotis volans interior	s		
Fringed Myotis Bat	Myotis thysanodes thysanodes	s		
Long-eared Myotis Bat	Myotis evotis evotis	s		
Gunnison's Prairie Dog	Cynomys gunnisoni	s		
Red Fox	Vulpes vulpes	s		
Black-footed Ferret	Mustela nigripes		E	
Western Spotted Skunk	Spilogale gracilis	s		



## NEW MEXICO WILDLIFE OF CONCERN COUNTY SAN JUAN

For complete up-dated information on federal-listed species, including plants, see the US Fish & Wildlife Service NM Ecological Services Field Office website at <http://www.fws.gov/ifw2es/NewMexico/SBC.cfm>. For information on state-listed plants, contact the NM Energy, Minerals and Natural Resources Department, Division of Forestry, or go to <http://nmrareplants.unm.edu/>. If your project is on Bureau of Land Management, contact the local BLM Field Office for information on species of particular concern. If your project is on a National Forest, contact the Forest Supervisor's office for species information.

<u>Common Name</u>	<u>Scientific Name</u>	<u>NMGF</u>	<u>US FWS</u>	<u>critical habitat</u>
Roundtail Chub	<i>Gila robusta</i>	E	SOC	
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	E	E	Y
Razorback Sucker	<i>Xyrauchen texanus</i>	s	E	Y
California Kingsnake	<i>Lampropeltis getula californiae</i>	s		
Brown Pelican	<i>Pelecanus occidentalis</i>	E		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T	T	
Northern Goshawk	<i>Accipiter gentilis</i>	s	SOC	
Peregrine Falcon	<i>Falco peregrinus</i>	T	SOC	
Mountain Plover	<i>Charadrius montanus</i>	s	SOC	
Least Tern	<i>Sterna antillarum</i>	E	E	
Black Tern	<i>Chlidonias niger surinamensis</i>		SOC	
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	s	C	
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	s	T	Y
Burrowing Owl	<i>Athene cunicularia</i>		SOC	
Black Swift	<i>Cypseloides niger</i>	s		
Broad-billed Hummingbird	<i>Cynanthus latirostris</i>	T		
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	E	E	Y
Loggerhead Shrike	<i>Lanius ludovicianus</i>	s		
Gray Vireo	<i>Vireo vicinior</i>	T		
Baird's Sparrow	<i>Ammodramus bairdii</i>	T	SOC	
Western Small-footed Myotis Bat	<i>Myotis ciliolabrum melanorhinus</i>	s		
Yuma Myotis Bat	<i>Myotis yumanensis yumanensis</i>	s		
Little Brown Myotis Bat	<i>Myotis lucifugus carissima</i>	s		
Long-legged Myotis Bat	<i>Myotis volans interior</i>	s		
Fringed Myotis Bat	<i>Myotis thysanodes thysanodes</i>	s		
Long-eared Myotis Bat	<i>Myotis evotis evotis</i>	s		
Spotted Bat	<i>Euderma maculatum</i>	T		
Pale Townsend's Big-eared Bat	<i>Corynorhinus townsendii pallescens</i>	s	SOC	
Big Free-tailed Bat	<i>Nyctinomops macrotis</i>	s		
Yellow-bellied Marmot	<i>Marmota flaviventris</i>	s		
Gunnison's Prairie Dog	<i>Cynomys gunnisoni</i>	s		
Red Fox	<i>Vulpes vulpes</i>	s		
Black-footed Ferret	<i>Mustela nigripes</i>		E	
Western Spotted Skunk	<i>Spilogale gracilis</i>	s		



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
New Mexico Ecological Services Field Office  
2105 Osuna NE  
Albuquerque, New Mexico 87113  
Phone: (505) 346-2525 Fax: (505) 346-2542

October 12, 2010

Thank you for your recent request for information on threatened or endangered species or important wildlife habitats that may occur in your project area. The New Mexico Ecological Services Field Office has posted lists of the endangered, threatened, proposed, candidate and species of concern occurring in all New Mexico Counties on the Internet. Please refer to the following web page for species information in the county where your project occurs:

[http://www.fws.gov/southwest/es/NewMexico/SBC\\_intro.cfm](http://www.fws.gov/southwest/es/NewMexico/SBC_intro.cfm). If you do not have access to the Internet or have difficulty obtaining a list, please contact our office and we will mail or fax you a list as soon as possible.

After opening the web page, find New Mexico Listed and Sensitive Species Lists on the main page and click on the county of interest. Your project area may not necessarily include all or any of these species. This information should assist you in determining which species may or may not occur within your project area.

Under the Endangered Species Act of 1973, as amended (Act), it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with us further. Similarly, it is their responsibility to determine if a proposed action has no effect to endangered, threatened, or proposed species, or designated critical habitat. We do not provide concurrence with project proponent's "no effect" determinations.

If your action area has suitable habitat for any of these species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts. Please keep in mind that the scope of federally listed species compliance also includes any interrelated or interdependent project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects.

Candidates and species of concern have no legal protection under the Act and are included on the web site for planning purposes only. We monitor the status of these species. If significant declines are detected, these species could potentially be listed as endangered or threatened. Therefore, actions that may contribute to their decline should be avoided. We recommend that candidates and species of concern be included in your surveys.

Also on the web site, we have included additional wildlife-related information that should be considered if your project is a specific type. These include communication towers, power line safety for raptors, road and highway improvements and/or construction, spring developments and livestock watering facilities, wastewater facilities, and trenching operations.

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. We recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section

404 of the Clean Water Act if your proposed action could impact floodplains or wetlands. These habitats should be conserved through avoidance, or mitigated to ensure no net loss of wetlands function and value. The Migratory Bird Treaty Act (MBTA) prohibits the taking of migratory birds, nests, and eggs, except as permitted by the U.S. Fish and Wildlife Service. To minimize the likelihood of adverse impacts to all birds protected under the MBTA, we recommend construction activities occur outside the general migratory bird nesting season of March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until nesting is complete.

We suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding fish, wildlife, and plants of State concern.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area.

Sincerely,

/s/ Wally Murphy  
Field Supervisor

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Jim Von Haden, Natural Resource Program Manager

Barbara West, Superintendent

Don Whyte, Chief Ranger

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Gretchen Ward, Cultural Resource Specialist

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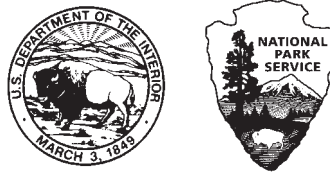
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