



Pecos National Historical Park

Integrated Resources Stewardship Strategy

Natural Resource Report NPS/PECO/NRR—2011/408



ON THE COVER

This historic sign from the Forked Lightning Ranch testifies to the long history of grazing which influenced the environment at Pecos National Historical Park. Photo by Cori Knudten.

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Natural Resource Report NPS/PECO/NRR—2011/408

National Park Service

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Executive Summary

Pecos National Historical Park

The ruins of Pecos Pueblo stand twenty-five miles southeast of Santa Fe, New Mexico. This location, situated along a major trading route between the southwestern plains and the Rio Grande Valley, made Pecos a powerful pueblo and also placed the inhabitants of the Upper Pecos Valley in the path of change. Franciscan priests built a mission by the pueblo when the area became a Spanish colony, the Santa Fe Trail wended its way past the stone and adobe walls, and soldiers marched by on their way to battle in the Civil War. In 1935, the State of New Mexico set aside the ruins of the pueblo and mission as a state monument to preserve this history. In 1965, President Lyndon Johnson signed a bill establishing the 341-acre site as a national monument and part of the National Park Service (NPS) system. The rich history of the area extended beyond the borders of the small monument, and, in 1990, Congress enacted two bills adding an additional 6,305 acres and renaming the site Pecos National Historical Park. Besides the ruins of Pecos Pueblo and the Spanish mission, the park now encompasses part of the Civil War battlefield of Glorieta Pass, many archaeological sites, the Forked Lightning Ranch, and numerous other resources. At the park, visitors can experience the full sweep of human history in the valley, from the first prehistoric peoples to the present day. The many resources—historic structures, cultural landscapes, the Pecos River, stands of piñon and juniper—communicate that history as part of an interconnected whole.

Resource Stewardship

As stewards of Pecos National Historical Park's resources, park management recognizes the importance of developing a comprehensive approach to resource management. Such an approach must be information based and also needs to engage the public about park issues through science and scholarship. The framework for developing the resource strategies at Pecos National Historical Park was informed by Director's Order 2-1 (NPS 2004), which mandates the preparation of a Resource Stewardship Strategy (RSS) to replace the Resource Management Plan at parks throughout the National Park System. The RSS is a program planning document that serves as a bridge between the qualitative statements of desired conditions established in the park's General Management Plan/Development Concept Plan (NPS 1996) and the Foundation for Planning and Management (referred to here as the "Foundation Statement"; NPS 2009) and the measurable goals and implementation actions determined through park strategic planning. The RSS is an analytical document that focuses on identifying and tracking indicators of desired conditions. It recommends comprehensive strategies to achieve and maintain desired conditions over time and provides the basis for assessing and updating these comprehensive strategies periodically, based on new information and the results of completed activities. The RSS provides the park with a plan for investing both human and fiscal resources in the management of resources. It also reports progress in attaining and maintaining desired resource conditions at the park.

Fundamental and Other Important Resources and Values

The first step in developing comprehensive strategies is to identify the resources and values that the NPS is responsible for preserving at Pecos National Historical Park. These resources and values are contained in Congressional direction to the NPS through legislation such as the park's enabling legislation (Public Laws 89-54, 101-313, and 101-536) and the NPS Organic Act (1916). The Foundation Statement for Pecos National Historical Park identified the Fundamental

Resources and Values and Other Important Resources and Values. These include resources related to the many different time periods represented at the park as well as the interpretive potential of these resources.

A Holistic Approach

In the RSS for Pecos National Historical Park, we have tried to overcome the artificial division common in many management documents between “natural” and “cultural” resources. We have not used the terms “natural” and “cultural” resources but simply “resources.” We have not divided our desired conditions or strategies into natural and cultural resource sections but have tried to approach each section from the basis of what makes the most sense to managers at Pecos National Historical Park, i.e., resource contexts and integrated desired conditions. Four Resource Contexts (Gateway, Pueblo/Precontact/Spanish Colonial, Santa Fe Trail/Civil War, and Ranching/Preservation) encompass the Fundamental Resources and Values of the park and demonstrate how they are related not only to the park’s significance statements and interpretive themes, but also to each other. Five landscape units (Pueblo/Precontact/Mission, Riparian/Riverine Corridors, Woodland, Ranching/Grassland, and Glorieta Unit; see Fig. 1-3) reflect spatial and interpretive groupings at Pecos National Historical Park and provide a reference unit for managers to conceptualize the holistic approach to resources.

Resource Contexts

Gateway Context

The Gateway Context reflects the importance of the Upper Pecos Valley’s geographical position and environment to the development of its history. The Upper Pecos Valley has served as a cultural crossroads for many different peoples and cultures, all of whom have been affected by the environment and, in turn, influenced the environment.

Pueblo/Precontact/Spanish Colonial Context

The Pueblo/Precontact/Spanish Colonial Context focuses on the pueblo and mission ruins on the mesilla (small mesa), as well as the corresponding landscape. Inhabited by the Pecos for centuries, the pueblo and its environment continue to hold cultural meaning for descendants of those who lived in and traveled through the Upper Pecos Valley. Together, the pueblo and mission ruins illustrate the cultural contact and conflict between Native Americans and Spanish colonists. Other significant resources connected with this context include prehistoric archaeological sites and many artifacts in the museum collection.

Santa Fe Trail/Civil War Context

The Santa Fe Trail/Civil War Context focuses on the cultural and environmental changes experienced by the Upper Pecos Valley because of the opening of the Santa Fe Trail through the Civil War and the arrival of the railroad in 1880. Many of the resources in the Glorieta Unit, associated with Battle of Glorieta Pass, are particularly significant to this context.

Ranching/Preservation Context

The Ranching/Preservation Context is associated primarily with the twentieth century and the Forked Lightning Ranch, under the ownership of Tex Austin and E. E. Fogelson. The preservation of the pueblo and mission ruins, and the eventual designation of Pecos National Monument, followed by Pecos National Historical Park, is also a focus of this context.

Desired Conditions

For the park's Fundamental Resources and Values and Other Important Resources and Values desired conditions were taken from the Foundation Statement. These are the resource conditions the NPS aspires to achieve and maintain over time and necessary for visitors to understand, enjoy, and appreciate those resources. Desired condition statements for each resource or value are provided by the park's Foundation Statement. In some cases, "landscape goals" were developed during the RSS process in order to provide a more specific starting point for determining attributes, indicators, and target values.

Status of Resource Knowledge

The next step in developing an RSS is reviewing and understanding the work that has been accomplished. The status of knowledge regarding resources was assessed to identify available information, research mandates, and data gaps. Key findings in this resource review section include:

- A great deal of information about archaeological sites and historic structures exists for Pecos National Historical Park, but much of it is scattered and inaccessible to park staff. This information needs to be compiled, useable databases need to be developed, and procedures need to be put in place for recording information derived from future projects and studies.
- The completion of a park-wide Cultural Landscape Report is an urgent need for Pecos National Historical Park. Currently, the park is relying on a Cultural Landscape Overview completed in 1998, which provides only a cursory description of cultural landscapes within the park and does not address management strategies.
- The park needs a useable database that compiles existing Geographic Information System (GIS) data. Spatial data will form an important component of many current and future projects, and park staff needs to be able to easily and readily access this information.

Indicator Selection and Condition Assessment

The development of comprehensive strategies also requires the following specific steps to identify indicators of resource conditions and to assess the status of resources using these indicators:

1. Identification of the attributes for each significant resource,
2. Consideration of beneficial influences and detrimental influences,
3. Determination of indicators for each attribute,
4. Specification of an ideal reference condition for each indicator that corresponds to desired conditions,
5. Determination of a management target value relative to the ideal reference condition,
6. Measurement or assessment of current condition, and

7. Comparison of management target and current condition.

As is the case throughout the RSS, a holistic approach was taken in developing indicators and attributes. In some cases, additional research and planning are needed to identify clear targets for indicators.

Comprehensive Strategies

The final step in the development of the RSS is the development of Comprehensive Strategies to ensure that the NPS is attaining and maintaining the desired conditions for all Fundamental Resources and Values and Other Important Resources and Values. As part of the process, park staff separated the desired conditions into several groups (a complete list of desired conditions for Pecos is provided in Chapter 3: Desired Conditions). One group includes desired conditions where significant progress had been made or was being made. These are presented in Table 5-1, but because strategies already exist for the achievement of these desired conditions, they are not dealt with at length in this RSS. Another group included non-prioritized desired conditions. In order to keep the RSS manageable, strategies were not developed for these desired conditions. As the RSS is updated in the future, these desired conditions will be prioritized and strategies will be addressed.

The remaining high-priority desired conditions that the park needed to develop strategies for were separated into priority groups I to III. At a workshop, the RSS team (see Appendix C for list of preparers) developed strategies for achieving these goals. The strategies comprise three categories: Information Needs, Planning Needs, and Implementation Needs. Reflecting the holistic nature of resource management, many strategies apply to multiple desired conditions. A Strategy Integration table (Table 5-18) expresses this integrated nature and demonstrates why managers must consider all resources when approaching individual activities and projects.

Two strategies were included to encourage the application of the holistic approach taken in the RSS to all management activities at the park. These strategies are:

- Maintain an interdisciplinary approach during all planning processes. As part of the process, communication should occur between natural and cultural resource disciplines. Where appropriate, information should be shared as various plans are developed. For example, the Cultural Landscape Report should inform the Vegetation Management Plan, Fire Management Plan, other plans and vice versa.
- Determine a uniform interdisciplinary approach to use at all management levels (Information, Planning, Implementation). An example is the project review process by an interdisciplinary team employed at the regional level.

The most critical strategies, which involve multiple desired conditions and are integral to the success of future projects are:

- Complete a park-wide Cultural Landscape Report;
- Compile existing GIS data into a useable, accessible database;

- Compile existing information on archaeological sites and create a useable database; and
- Compile existing information on stabilization history for historic structures and put in place a documentation strategy for future projects.

Electronic Field Manual

In order to ensure that the RSS can be updated and referred to easily, an electronic field manual was developed. The field manual is in the form of a database and allows park staff to track and update the status of projects as well as enter new projects and strategies as they arise. The database also tracks resource condition.



Visitor center at Pecos National Historical Park. Photo by Maren Bzedk.

References

(NPS) National Park Service. 2004. Draft Director’s Order 2-1: Resource Stewardship Planning.

_____. 1996. General Management Plan/Development Concept Plan: Environmental Impact Statement: Pecos National Historical Park. National Park Service, Denver Service Center, Denver, Colorado.

_____. 1998. Director’s Order 2.0: Park Planning.

_____. 2009. Foundation for Planning and Management: Pecos National Historical Park. On file, Pecos National Historical Park.

1 Purpose and Need for a Resource Stewardship Strategy

This Resource Stewardship Strategy (RSS) serves as a bridge between the qualitative statements of desired conditions established in the park's General Management Plan/Development Concept Plan (NPS 1996) or Foundation for Planning and Management (referred to as "Foundation Statement" in this document) (NPS 2009) and the measurable goals and implementation actions determined through the park's strategic planning. The RSS is not a decision-making document. Instead, it is an analytical document that focuses on identifying and tracking indicators of desired conditions, recommending Comprehensive Strategies to achieve and maintain desired conditions over time, and assessing and updating these Comprehensive Strategies periodically based on new information and the results of completed activities. This provides the park with a strategy for investing both human and fiscal resources in the stewardship of all park resources. It also reports accountability of the progress made in attaining and maintaining desired conditions at the park.

Implementation of the RSS and its Comprehensive Strategies will outline a reasonable range of activities to attain and maintain desired conditions. These implementation activities will be the subject of appropriate environmental planning and compliance documentation when specific actions or undertakings are considered. The authority of the RSS as a management document is given in Director's Order 2.0 (NPS 1998a; NPS Park Planning) and draft Director's Order 2-1 (NPS 2004a; Resource Stewardship Strategy). Strategies contained within the RSS will be prioritized within future Pecos National Historical Park strategic plans and ultimately incorporated into the park's future implementation plans, along with the associated National Environmental Policy Act (NEPA) requirements as needed.

1.1 Relationship of Resource Stewardship Strategy to Other Park Plans

A General Management Plan for Pecos National Historical Park was completed in 1996. Because the General Management Plan is dated, Pecos National Historical Park staff completed a Foundation Statement in May 2009 to serve as a link between the General Management Plan and the RSS. The Foundation Statement identified Fundamental and Other Resources and Values and desired conditions, which serve as the cornerstone for RSS development. The Comprehensive Strategies recommended through this RSS are consistent with the Foundation Statement and General Management Plan and provide the best science- and scholarship-based approaches to achieving and maintaining the park's desired conditions. This RSS will function as the guidance document for the development of a new General Management Plan for Pecos.

Park-level strategic planning remains a critical step in decision-making by park management on the allocation of the park's financial and human resources. The park's five-year and annual performance plans (strategic planning) describe what realistically can be achieved based on foreseeable financial and human resources. The RSS provides five- to ten-year Comprehensive Strategies for a logical, long-term investment in achieving and maintaining these desired conditions. The activities comprising these Comprehensive Strategies inform the sequence, duration, and association between more detailed recurring and non-recurring actions that would be considered during park strategic and implementation planning.

Several resource overviews provided information necessary to this RSS. The Natural Resource Condition Assessment (Johnson et al. 2011) provided current data on resource conditions at Pecos. Crossroads of Change: An Environmental History of Pecos National Historical Park

(Knutten and Bzdek 2010) was used to develop resource contexts and informed the holistic approach taken in the RSS. The Cultural Landscape Overview (Cowley et al. 1998) also informed the development of landscape categories.

The park already possessed or currently had in preparation a number of implementation plans at the time this RSS was developed (Table 1-1). These include the park’s Comprehensive Interpretive Plan (NPS 2005) and Fire Management Plan (NPS 2004b). The Comprehensive Interpretive Plan (NPS 2005) links directly to the RSS through primary park themes and resource-condition dependent visitor experiences. The condition of the resources plays a significant role in the effectiveness of the resource in supporting the themes. Where appropriate, information included in these implementation plans has been incorporated into this RSS.

Core Operations and Park Business Plans are analysis tools for examining fiscal resources and setting management priorities within the mission of the park. They differ from the RSS in that they are not a simple extension of the General Management Plan. The RSS may serve to inform the Core Operations and Park Business Plans.

Table 1-1. Relevant planning documents

Plans	Status	Citation
Foundation Statement	Completed in 2009	National Park Service. 2009. Foundation for Planning and Management: Pecos National Historical Park.
General Management Plan	Completed in 1996, needs updating	National Park Service. 1995. General Management Plan/Development Concept Plan: Environmental Impact Statement: Pecos National Historical Park. National Park Service, Denver Service Center, Denver, Colorado.
Strategic Plan	Completed in 2008	National Park Service. 2008. Strategic Plan: Pecos National Historical Park.
Fire Management Plan	Completed in 2004 and updated annually, needs revision to include RSS information	National Park Service. 2004. Fire Management Plan: Pecos National Historical Park.
Integrated Pest Management Plan	Completed in 1998, needs updating	National Park Service. 1998. Integrated Pest Management Plan: Pecos National Historical Park.
Collections Management Plan	The last plan dates to 1989 and is outdated, a project to update it is tentatively funded for FY2014	National Park Service. 1989. Collections Management Plan: Pecos National Historical Park.
Comprehensive Interpretive Plan	Completed in 2005	National Park Service. 2005. Comprehensive Interpretive Plan: Pecos National Historical Park.

1.2 Park Purpose and Significance

Park purpose statements reaffirm the reasons for which a national park was set aside as a unit of the national park system and provide the foundation for national park management and use. Pecos National Historical Park is a 6,670 acre unit of the National Park System situated in the Upper Pecos River Valley and the foothills of the Sangre de Cristo Mountains, approximately twenty-five miles southeast of Santa Fe, New Mexico. The park lies close to the terminus of the

southern Rocky Mountains and near the entrance to Glorieta Pass, which connects the Rio Grande valley to the high plains and short-grass prairie of eastern New Mexico.

The ruins and mission located within Pecos National Historical Park were added to the National Park System by Public Law 89-54 in 1965 as a 341.3-acre national monument. In 1990, the unit (then Pecos National Monument) was expanded and re-designated as Pecos National Historical Park to include 5,500 acres of the Forked Lightning Ranch (P.L. 101-313). The park was further expanded in late 1990 by 682 acres to add key sites of the Civil War Battle of Glorieta Pass to the park (P.L. 101-536) bringing the total acreage to approximately 6,670 acres.

The purpose of Pecos National Historical Park is to:

- Preserve, protect, and interpret the 12,000 year history of the area, including the cultural interaction and lifeways among diverse groups of people of the Pecos area and its “gateway” role between the plains and the Rio Grande valley.
- Preserve and protect cultural and natural resources and enhance visitor understanding of the many archeological and historical sites, the Civil War Battlefield at Glorieta Pass, and the Forked Lightning Ranch.

Park significance statements capture the essence of a national park’s importance to our country’s heritage. Significance statements do not inventory national park resources, but instead answer questions about why a park’s resources are distinctive and how they contribute to our heritage. Defining a national park’s significance helps managers make decisions that preserve the resources and values necessary to accomplish that park’s purpose. The significance statements appear in the Foundation Statement (NPS 2009):

Significance Statement #1: *The Upper Pecos River Valley is a multi-cultural crossroads where trade, commerce, settlement, and conflict occurred. The region represents the heritage of the Southwest during the last 12 millennia. The geographic corridor through Glorieta Pass contains ancient trade routes connecting the Rio Grande with the western Plains. The historic Santa Fe Trail, stagecoach lines, railroads, Route 66, and interstates have traveled through the pass connecting New Mexico with destinations in the East.*

Significance Statement #2: *The area of Pecos Pueblo, in use from ancient times to the present, is a living place still valued and used for traditional practices by [descendants] of those who traveled through the area and settled here.*

Significance Statement #3: *Landmark excavations by [Alfred V.] Kidder (1915–1929) at Pecos provided the foundation for modern southwest archeology and resulted in a world-class multi-cultural museum collection of artifacts and documents with scientific and cultural values.*

Significance Statement #4: *The natural resources of the park, including the Pecos River and its tributaries and plant and animal communities, in combination with the park’s geographic location resulted in a natural environment that was suitable for the settlement and interaction of multiple groups in the area. These resources were important to people living in the region in the past and still continue to be enjoyed by people today.*

Significance Statement #5: *The Glorieta Unit of the park encompasses the Glorieta Battlefield, where the Civil War Battle of Glorieta Pass occurred. This battle profoundly affected the future of the Southwest and the nation.*

Significance Statement #6: *The historic and architecturally significant Forked Lightning Ranch provides visitors opportunities to experience the evolution of ranching in Northern New Mexico.*

Significance Statement #7: *The expedition of Coronado started the expansion of power and influence of Spanish culture in the Southwest. The park contains the remains of a pueblo and a historic mission which illustrates the conflict and accommodation of cultural contact between Native Americans and Spanish Colonists. Archeological evidence documents the construction of four churches, one of which was the largest church in 17th Century New Mexico.*

1.3 Interpretive Themes

Comprehensive interpretive planning includes research that analyzes visitor experience resulting from the interpretive process. The results help interpreters to facilitate a physical, intellectual, and emotional experience for the visitor based on the purpose, significance, and Fundamental and Other Important Resources and Values. These serve as the basis from which park-wide interpretive themes are established and identified. Resource condition can directly impact desired visitor experiences, just as human interactions with the resources can affect resource condition. Interpretation and education ultimately strive to encourage visitors to develop a commitment to resource stewardship . Visitors will care about park resources when they find personal meanings in the interpretive themes based on those resources. Therefore, specific interpretive themes that have a clear connection to resource conditions are considered in the resource contexts and Comprehensive Strategies of the RSS. The interpretive themes for Pecos National Historical Park, as listed in the Foundation Statement (NPS 2009a), are:

- *The Pecos Pueblo story of an aboriginal homeland reflects an indigenous people and their encounters with a variety of cultures that resulted in gradual cultural disruption, devastation, and on-going retention of way-of-life.*
- *The natural features of the landscape, including the Pecos River and its tributaries, established the backdrop against which people (past and present) adapt their survival strategies.*
- *The overlay of numerous significant trade routes from pre-contact through [the] Santa Fe Trail, railroad and interstate systems through the Pecos Valley illuminates the importance of this physical location.*
- *The Santa Fe Trail extended the international trade passing through the Pecos Valley, diversifying people, ideas, values, language, ideologies, and material goods.*
- *As a result of the Battle of Glorieta Pass, Union presence was solidified in the Southwest changing the social, economic, and political dynamics of the region; the future of the people of New Mexico territory was forever altered.*

- *The multi-cultural crossroads of what is now New Mexico has been challenged many times throughout history, bringing diverse communities together in both conflict and peace.*
- *The Pecos Missions provide the opportunity to consider the impact of Spanish culture on the daily life (including traditional religion, social structure, and technology) of the Pueblo people.*
- *The Kidder excavations at Pecos Pueblo set a precedent for applying archeological methods that promote scientific study, education, appreciation, and understanding of Southwestern archeology.*

1.4 Taking a Holistic Approach

When Pecos National Historical Park began planning its RSS in January 2010, several national parks already had completed RSS documents. Drawing from comments about those documents, as well as other resource management initiatives in the National Park Service (NPS), Pecos National Historical Park management made a conscious effort to reintegrate natural and cultural resources in the RSS rather than separating them. Hopefully, this approach will be useful to the park and also provide a format that other sites may also find beneficial.

A recent report about the lessons learned from pilot RSSs recognized that these documents need to better integrate natural and cultural resources to ensure that long-term resource management needs are met (Malone and Cahill 2008). Many RSS documents started moving towards integration, and the Pecos National Historical Park RSS continues this trend. Although it is true that some resources may contain strong natural or cultural elements, ultimately all resources represent a blending of the two. Cultural landscapes are perhaps the most obvious representation of this blending. Cultural landscapes are the result of human activities and adaptations and comprise a distinct environment. The environment influenced the development of the cultural landscape, just as human activities altered the environment. All resources have both natural and cultural elements. The inclusion of rivers, forests, and animals in a national park—even those in remote areas—guarantees that cultural meanings have been attached to them and that humans are interacting with them in some way, even if that interaction is a decision to try to remove evidence of human influence. Conversely, historic structures, sacred sites, archaeological sites exist in the natural world and are affected by natural processes.

By separating “natural” and “cultural” resources, planning documents remove resources from their contexts. In practice, managers do not deal with resources in a vacuum. Parks are managed as coupled human and natural systems. Every resource exists in relation to the other resources of the park and has its own distinct history. The most effective management takes place when professionals from a variety of disciplines come together to discuss the various influences acting upon a resource and to cooperate on possible management decisions. In many parks, this interaction occurs on a daily basis, yet planning documents keep resources separated.

In the RSS for Pecos National Historical Park, we have tried to overcome this artificial division. We have not used the terms “natural” and “cultural” resources but simply “resources.” We have not divided our desired conditions or strategies into natural and cultural resource sections but have tried to approach each section from the basis of what makes the most sense to park

managers, i.e., resource contexts and integrated desired conditions. At each workshop and meeting, we made a constant effort to stop and ask ourselves if we were moving towards a holistic approach and to consider how the resources interacted with each other (Figs. 1-1 and 1-2).

Because we needed to approach many of the elements of an RSS in a different way in order to achieve integration, a few of our concepts and terms require discussion. In the following section, we explain the terms that are used throughout the document (see Appendix D: Glossary for abbreviated definitions).

1.5 The Idea of Resource Contexts

Although planning documents usually give a brief overview of specific resources and discuss their current condition, the history of those resources is often ignored. The history of a resource does not simply mean facts like when a historic home was constructed, but the entire history of the resource, i.e., how it has changed over time. All resources have a history, including natural resources. A river exists today in its current state because of events in the past—floods, the construction of irrigation ditches or dams, the introduction of exotic species, etc. In order to understand the current condition of a resource and which management actions are appropriate, managers need to comprehend the history of that resource. The study of human-nature interactions through time is the purpose of the discipline of environmental history. Environmental historians ask questions about past and present environmental change. Environmental histories are concerned with synthesis. They focus on understanding the multiplicity of interrelated human and non-human factors that contribute to change as opposed to reducing explanations to one or a few variables. Although human-nature interactions may be more evident at a park like Pecos, which has the purpose of interpreting and preserving artifacts of human history, all landscapes and environments have a history, whether or not people have played a direct role in shaping them.

Researchers from Colorado State University recently completed an environmental history report for Pecos (Knudten and Bzdek 2010), in conjunction with a Natural Resource Condition Assessment (Johnson et al. 2011). Drawing from the information presented in the environmental history, we have created four resource contexts for the RSS: the Gateway, Pueblo/Precontact/Spanish Colonial, Santa Fe Trail/Civil War, and Ranching/Preservation contexts (discussed in detail in Chapter 2: Resource Contexts). These four contexts encompass the Fundamental Resources and Values of the park and demonstrate how they are related not only to the park's significance statements and interpretive themes, but also to each other. Each resource context includes an overview of the history pertinent to the context, a description of major influences on resource condition over time, and a list of the resources relevant to the context. The contexts correspond roughly to the chronological history of the Upper Pecos Valley and the "Gateway" context provides a broader overview that highlights the importance of Pecos's geographical location and its environment, which provided the foundation for the future changes that occurred at Pecos. Beyond providing valuable information about the resources, the contexts also seek to avoid the reductionist impulse of many planning documents, which isolate resources from each other and provide little context for understanding resources as they exist in their environment.

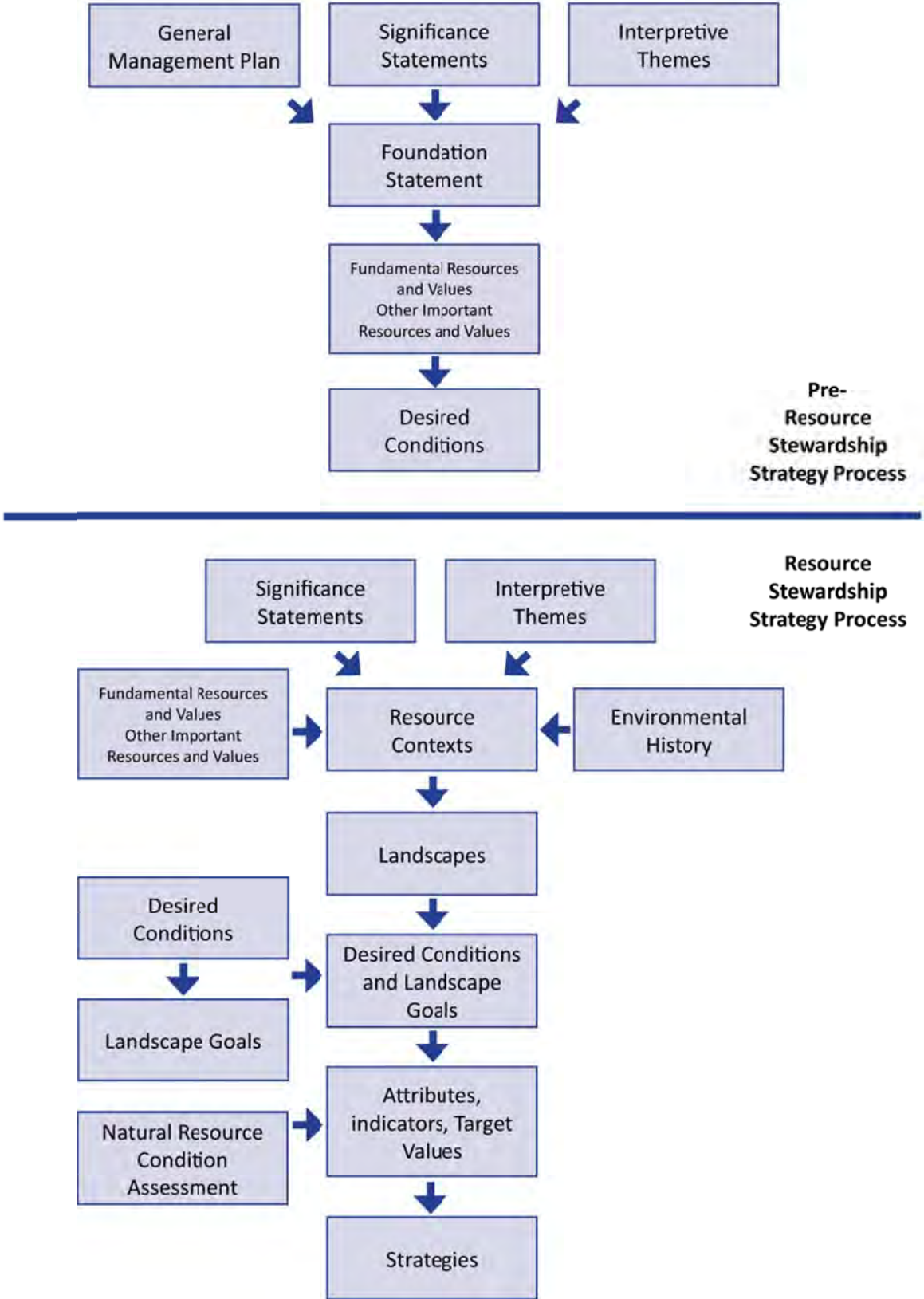


Figure 1-1. Resource Stewardship Strategy process at Pecos National Historical Park.

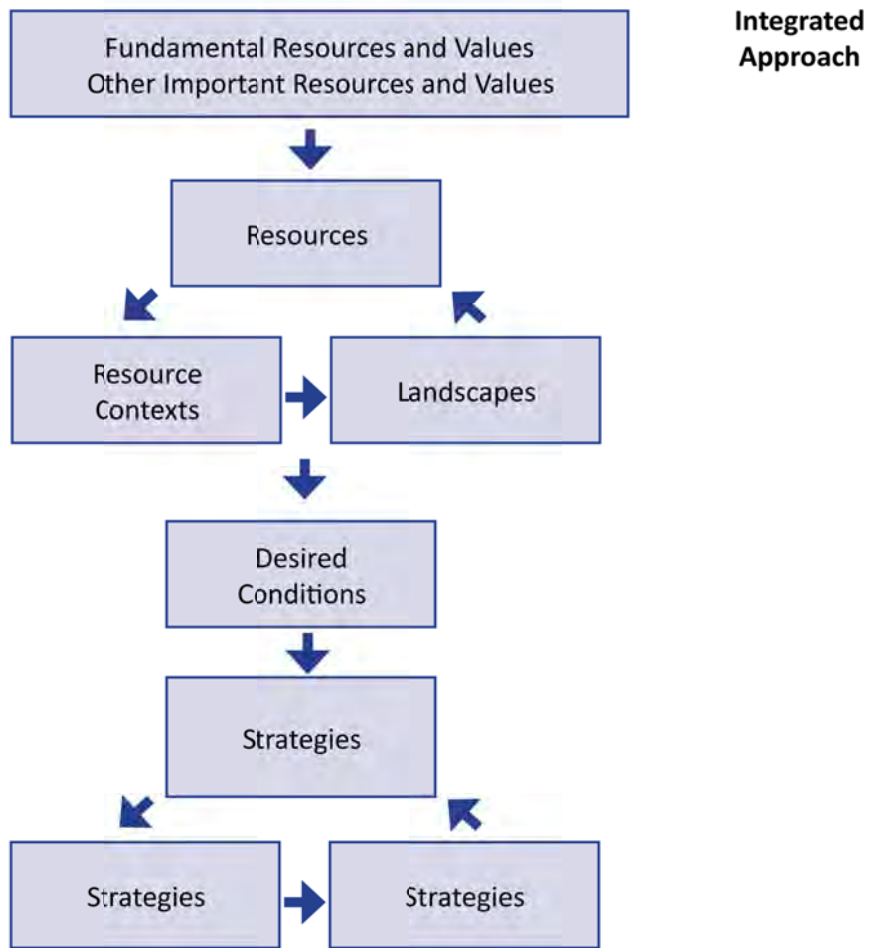
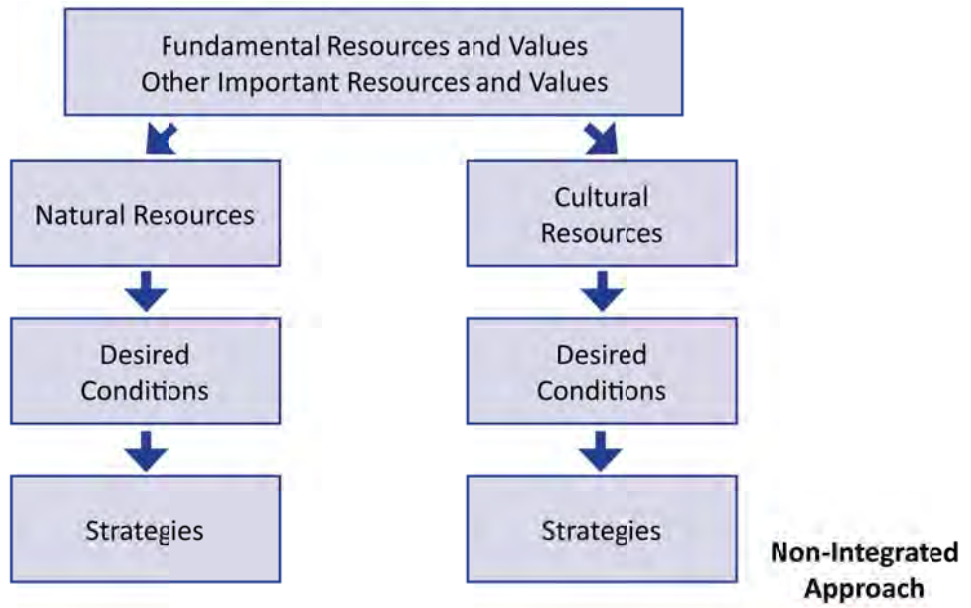


Figure 1-2. An integrated approach versus a non-integrated approach.

We have made reference to the four resource contexts throughout the document to ensure that readers remember how the various resources relate to each other. By threading the resource contexts through the entire document, we hope to remind readers how the resources contribute to the park’s significance and form one, interrelated whole.

1.6 Landscapes

As the RSS team began to discuss the desired conditions for Pecos, it was difficult to avoid the habit of dividing resources into “natural” and “cultural” categories. We started with a traditional list of categories, e.g., flora, fauna, surface water, cultural landscapes, historic structures. We decided that our more holistic approach required new categories that encompassed both the natural and cultural resources. Because resources exist in a distinct landscape, we have used the category of “landscape” to achieve integration. The term “landscape” is used in a variety of disciplines, from landscape architecture to geography to ecology. In this RSS, we are using the term at its broadest definition to mean systems of interrelated resources. A landscape should not be equated with the term “environment.” Although humans are part of the environment, a landscape also exists on one level apart from human actions and existence. The environment is part of a landscape, but a landscape is considered a cultural construction.¹ The fundamental resources identified in the park’s Foundation Statement (NPS 2009a) are included within the various landscape categories and are enumerated in the resource contexts.

We developed an overall, park-wide landscape category to reflect desired conditions relevant to all parts of the park, followed by five separate landscape categories that reflect spatial and interpretive groupings at Pecos: the Riverine/Riparian Corridor landscape, the Ranching/Grassland landscape, the Woodland landscape, the Pueblo/Precontact/Mission landscape, and the Glorieta Unit landscape (Fig. 1-3). The RSS landscapes include historic structures, archaeological sites, flora, fauna, water, and other resources. The landscapes coalesce around groupings of resources and management strategies, but the boundaries of the landscapes are permeable. For example, some of the largest and most visible archaeological sites from the Puebloan and Spanish Colonial periods are clustered together on a small mesa. Park staff focuses interpretation efforts on history at this location. We designated this area the “Pueblo/Precontact/Mission landscape.” This designation does not mean that resources pertinent to this history are not located elsewhere in the park. By focusing on a specific area, resource issues and context are more easily conceptualized.

Our use of the term “landscapes” encompasses what traditionally have been called cultural landscapes with the explicit recognition that that they include desired conditions from both the natural and cultural realms, such as maintaining a healthy riparian habitat or maintaining the integrity of historic structures. The landscapes used in the RSS include component landscapes identified in a park Cultural Landscape Overview (Cowley et al. 1998; Fig. 1-4). However, the RSS landscapes—although they reflect many of the same clusters of resources and historic significance outlined in the Cultural Landscape Overview—do not necessarily have the same boundaries as Cultural Landscape Overview component landscapes. The RSS landscapes were

¹ For one discussion on the definition and use of the term “landscape” see Alan R. H. Baker, *Geography and History: Bridging the Divide* (New York: Cambridge University Press, 2003), 109–155. For a discussion of the term “landscape” in the discipline of historical ecology see William Balée, “Historical Ecology: Premises and Postulates,” in *Advances in Historical Ecology*, ed. William Balée (New York: Columbia University Press, 1998), 13-29.

developed for the purpose of discussing and managing resources in a holistic manner and should not be equated with those cultural landscapes identified through a Cultural Landscape Overview or Cultural Landscape Inventory which follow specific National Register of Historic Places guidelines.

In some cases, the desired conditions identified in the Foundation Statement needed to be expressed as more specific “landscape goals” to help with developing strategies, as explained in the section on desired conditions.

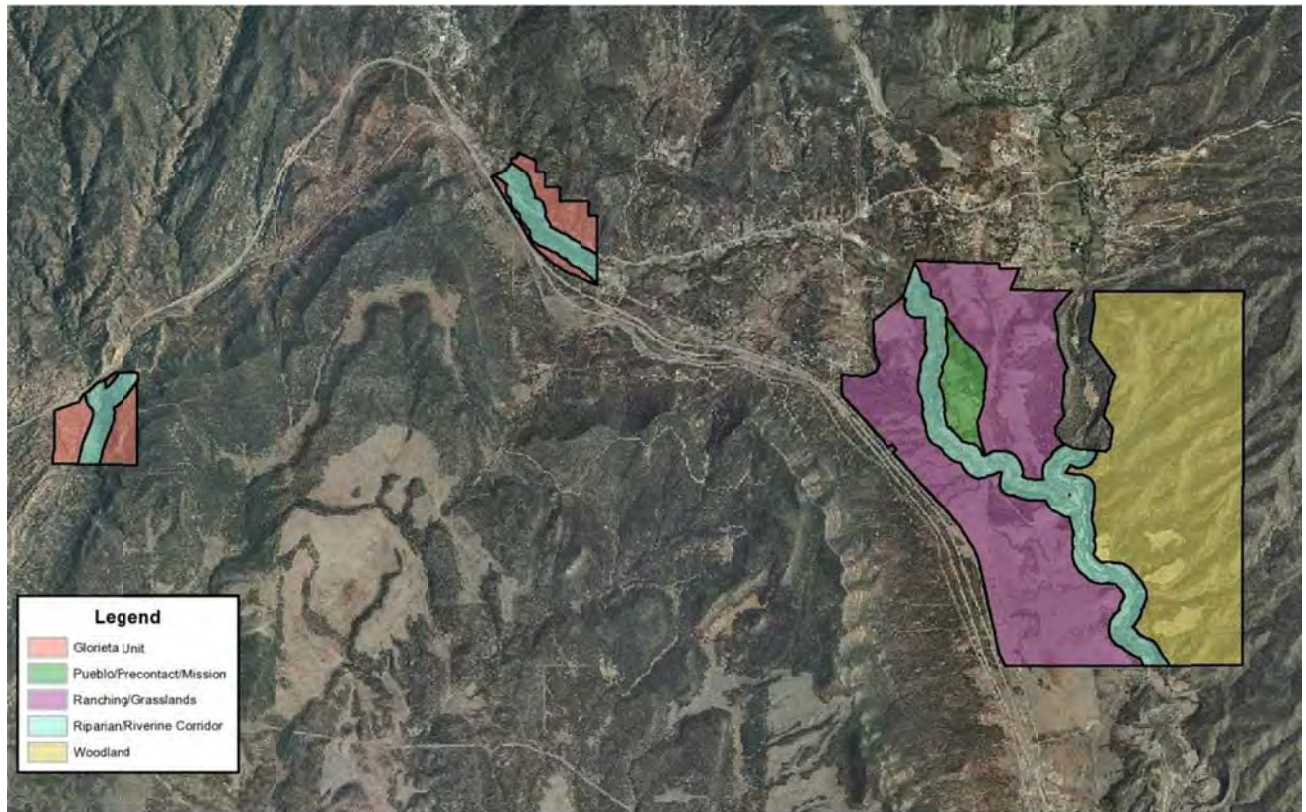
Because organizing resources and desired conditions into reference tables requires reductionist categorization to some degree, we did maintain some traditional categories: historic structures, archaeological sites, museum collections, and ethnographic resources. Much like the parkwide “landscape” category, these refer to resources found throughout the park. We also recognized that existing laws, mandates, and inventory and monitoring protocols often treat resources separately. For these purposes, it is necessary to separate resources in some sections. However, even within these traditional categories we tried to find ways to suggest the physical reality of integration, such as considering whether any historic structures also provide important habitat for certain species in the park.

1.7 Strategy Integration

Expressing how resources interact and relate to one another is only the first step—managers must also take a holistic approach in the day-to-day management of the park. Although some activities may be resource-specific, often monitoring, mitigation, and management must take multiple resources into account. In the Pecos RSS, we have tried to show how management strategies should operate together to attain desired conditions. We felt that it was not enough to define a linear sequence of strategies that built on the completion of previous strategies. Instead, we wanted to demonstrate how multiple strategies, completed simultaneously or in succession, could accomplish one or more desired conditions. Often, the strategy itself might be oriented towards a specific resource, yet in combination with other strategies, it could work to achieve a desired condition that spanned several resources. Combining strategies to accomplish the desired condition promotes efficiency and strengthens funding proposals. The strategy integration section is also intended to suggest innovative ways that various funding sources can be applied to the same project.

1.8 Conclusion

Throughout the RSS process, we recognized that this approach is simply a starting point—hopefully the NPS will continue to explore ways in which resources can be approached holistically in both management documents and on the ground, improving on the methods we have used here. These methods also may suggest ways to bring a holistic approach to other planning documents beyond the RSS. The NPS recognizes the importance of integrating the disciplines involved in cultural and natural resource management. The resources themselves always have been integrated and our stewardship must reflect this reality.



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Figure 1-3. Resource Stewardship Strategy Landscapes. The boundaries of the RSS landscapes are not spatially precise. They are meant to imply certain resource and contextual groupings, but overlap between resources and contexts occurs throughout the park.

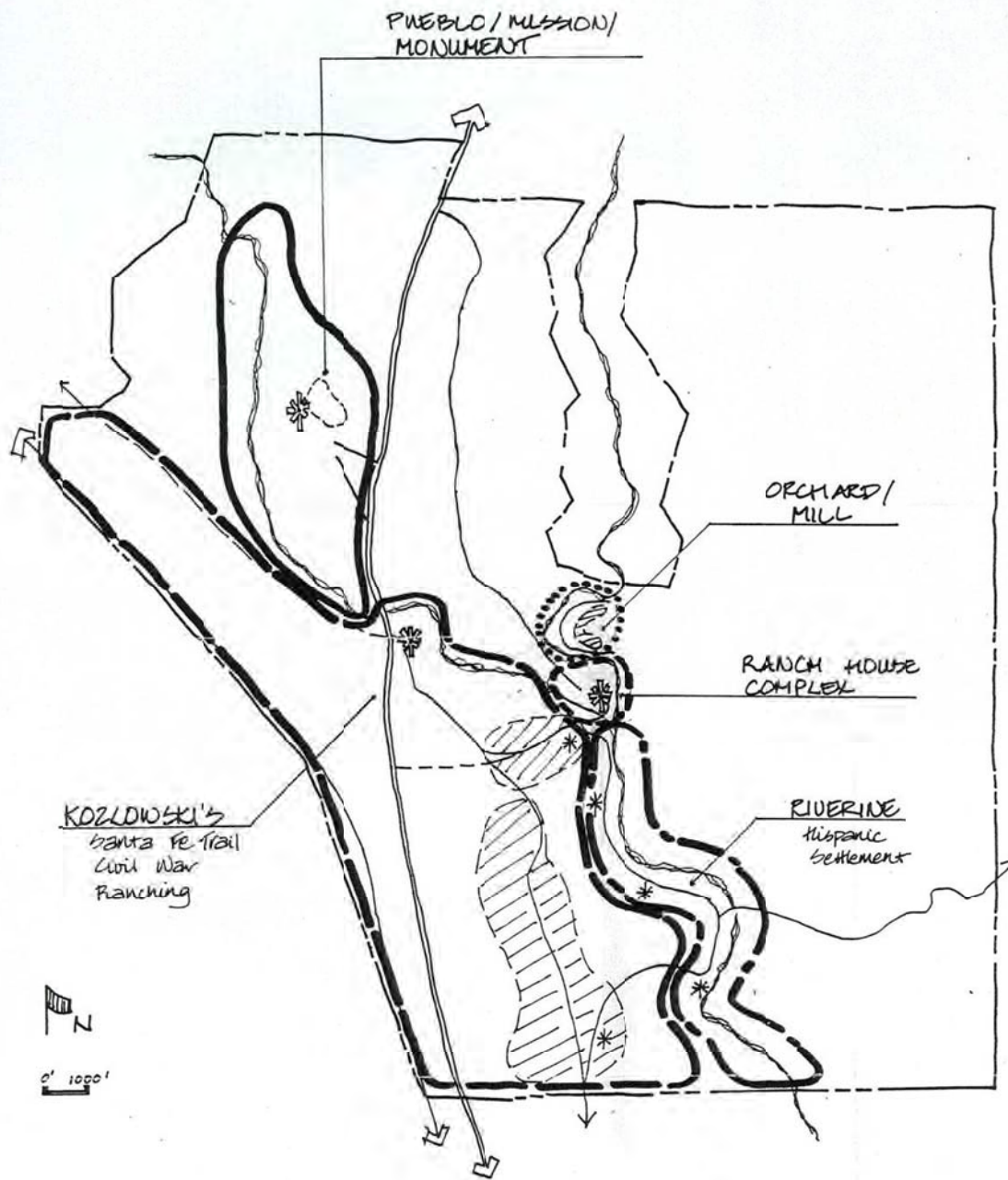


Figure 1-4. Component landscapes for the Pecos Unit from the 1998 Cultural Landscapes Overview which are encompassed in the RSS landscape units. The component landscapes “Kozlowski’s” and “Ranch House Complex” are situated within the RSS Ranching/Grassland landscape. The “Riverine” and “Orchard/Mill” component landscapes are within the Riparian/Riverine Corridor RSS landscape. The Pueblo/Mission/Monument component landscape is part of the RSS Pueblo/Precontact/Mission landscape.

2 Resource Contexts

Information for the resource contexts was taken from the Pecos National Historical Park environmental history completed in 2010 (Knudten and Bzdek 2010). For more in-depth descriptions of the environment and current conditions, see the park's Natural Resource Condition Assessment (Johnson et al. 2011).

2.1 Resource Context: Gateway

2.1.1 Context Description

As a natural pass from the plains to the Rio Grande drainage, the Pecos area's geographical position always has brought a variety of people and cultures to the valley. The geology of the area created an environment conducive to human settlement, trade, and contact. The Upper Pecos Valley is formed by the Glorieta Mesa on the west and the Tecolote range on the east. The Pecos River flows down the east side of the valley, descending through a narrow canyon from its headwaters in the Sangre de Cristo Mountains to the north. Glorieta Creek begins at Glorieta Pass, which curves around the northern end of Glorieta Mesa and leads into the Rio Grande Valley. The creek flows along the west side of a small mesa (*mesilla*) in the center of the valley before joining the Pecos River.

The environment of the Upper Pecos Valley also attracted people to the area and provided them with the means to survive. Located in the Rocky Mountain conifer vegetation zone, Pecos National Historical Park includes a diverse variety of habitats. Piñon and juniper covers much of the park, interspersed with grassland and transitions to ponderosa pine and Douglas fir. Riparian corridors along the Pecos River and Glorieta Creek provide habitat for a variety of plants, including willows and cottonwoods. Mule deer, elk, coyotes, Stellar's jays, and many other species live in the region.

People adapted their cultures and lives to the Upper Pecos Valley environment, often changing that environment in the process. Although over time residents of the valley no longer depended on the resources of the area to the same extent as did the Pecos and early settlers, the environment remains a critical part of the local culture and attractive to the many people who visit or travel through the area. The landscape and environment of the Upper Pecos Valley functions as the clay from which the interaction between natural systems and human adaptations is fashioned over time. The Pecos area environment has undergone constant change and will continue to do so in the future.

2.1.2 Significance Statement(s) Supporting this Context

Significance Statement #1: The Upper Pecos River Valley is a multi-cultural crossroads where trade, commerce, settlement, and conflict occurred. The region represents the heritage of the Southwest during the last 12 millennia. The geographic corridor through Glorieta Pass contains ancient trade routes connecting the Rio Grande with the western Plains. The historic Santa Fe Trail, stagecoach lines, railroads, Route 66, and interstates have traveled through the pass connecting New Mexico with destinations in the East.

Significance Statement #4: The natural resources of the park, including the Pecos River and its tributaries and plant and animal communities, in combination with the park's

geographic location resulted in a natural environment that was suitable for the settlement and interaction of multiple groups in the area. These resources were important to people living in the region in the past and still continue to be enjoyed by people today. (NPS 2009a)

2.1.3 Primary Interpretive Themes:

- *The natural features of the landscape, including the Pecos River and its tributaries, established the backdrop against which people (past and present) adapt their survival strategies.*
- *The overlay of numerous significant trade routes from pre-contact through [the] Santa Fe Trail, railroad and interstate systems through the Pecos Valley illuminates the importance of this physical location.*
- *The multi-cultural crossroads of what is now New Mexico has been challenged many times throughout history, bringing diverse communities together in both conflict and peace. (NPS 2009a)*

2.1.4 Major Agents of Historical Change that Influenced the Gateway Context

Many factors have influenced the environment of the Upper Pecos Valley over time. Large-scale processes such as climate change have operated in conjunction with short-term events such as fires and floods. The creation of the current range of ecosystems at Pecos occurred over the span of thousands of years. During the Paleo-Indian period between 10,000 Before the Common Era (BCE) and 5,500 BCE, the climate became drier and warmer, although it was still wetter and cooler than today. During the Archaic period (5,500 BCE–600 Common Era [CE]), the climate continued to become more arid. Desert species established themselves as woodland species withdrew. By the 1200s, when substantial human settlement in the Upper Pecos Valley began, the species composition and vegetation in the valley had settled into a fairly stable pattern—no radically different species or habitats were present at prehistoric Pecos as opposed to today. Climatic fluctuations continued to occur. From 1500 through the 1700s, a period known as the Little Ice Age, the climate was in general wetter and cooler. A severe drought from 1880 to 1900 affected much of western North America. At Pecos, the drought was followed by twenty years of unusually high precipitation. Another severe drought struck in the 1950s.

Once humans settled in the Upper Pecos Valley their activities became one of the driving forces of change in the Pecos area environment. As the dominant human cultures in Pecos shifted over time, perceptions and uses of the land changed as well. The Pecos Indians lived communally and did not practice individual ownership or control of land in the same manner as Europeans. The arrival of the Spanish introduced livestock and other exotic species to the environment, along with new perceptions about how land should be controlled. For a time in the 1700s, Spanish control was usurped by the Comanches, who in effect turned the Pecos environment into a colonial satellite from which they drew resources. The reassertion of control by the Spanish by the early 1800s brought Hispanic settlers to the region who practiced a form of both communal and individual land ownership. When New Mexico became an American territory in 1848, Anglo notions of the predominance of private property started to exert an increasing influence over the Valley environment. In the late 1800s, the federal government assumed control of much of the

land around Pecos, taking over the old Hispanic communal lands. During the twentieth century, a pattern of private ownership and federal control of land persisted.

Many of the human effects on the Pecos area environment are described in other contexts in regards to particular landscapes. Yet a number of human activities, particularly as the human population in the valley increased, had widespread impacts on the Pecos environment. Hunting, for example, impacted animal populations throughout the valley. When the population of Pecos at the pueblo peaked in the mid to late 1400s, large mammals in the area declined as hunters strove to support the pueblo's inhabitants. As human population at the pueblo dropped, mammal populations recovered. The arrival of the railroad in the 1880s signaled another intense period of over-hunting. Hunters supplying meat for railroad workers decimated populations of elk, deer, and bighorn sheep around Pecos. Elk and bighorn sheep were locally extinct by the early 1900s, although elk were reintroduced into the area from Wyoming in 1915. Wolves and grizzly bears were also hunted to extirpation around Pecos. As the twentieth century progressed, subsistence hunting increasingly became less important. Sport hunting, though, remains a popular pursuit in the Pecos area. Sport fishing around Pecos in the twentieth century encouraged the State of New Mexico to build a fish hatchery and release brown and rainbow trout into the river, which altered the composition of native fish species.

Timber cutting and livestock grazing also had varying degrees of influence on the Pecos area environment over time. Pecos settlers cut timber in the area for construction and firewood. Because population density remained low until the late nineteenth century, timber cutting impacted areas immediately around settlements but did not affect the larger region. Again, the construction of the railroad in the 1880s changed this. Railroad construction required large-scale timber harvesting, and numerous tie camps and lumbering operations sprang up around Pecos. These operations, many of which were located in the Upper Pecos canyon, seriously affected the Pecos River watershed as loggers harvested thousands of trees. Timber cutting remained important to the area economy through the 1930s. Impacts from livestock grazing also became more severe on a region-wide scale in the late 1800s. Although livestock numbers had been high in the immediate vicinity of the Pecos Pueblo in the 1600s, in the 1800s, settlement was widespread with numerous large ranches that possessed thousands of head of stock. Many of these herds grazed in the national forest that encompassed much of the Pecos River watershed, exacerbating erosion and vegetation loss. The US Department of Agriculture Forest Service attempted, often unsuccessfully, to curb overgrazing.

The Forest Service also enacted a policy of fire suppression when it took control of the Santa Fe National Forest after the agency's inception in 1905. The influence of anthropogenic fire on the forests around Pecos before this time is unknown. The Pecos and later settlers may have undertaken periodic burning to clear vegetation, but it is unclear how the use of fire changed over time. Lightning-caused fires are common in the Southwest, however, and no doubt burned in the forests around Pecos. The blanket fire suppression of the twentieth century altered landscape dynamics by excluding all types of fires.

The introduction and proliferation of exotic species have also affected the landscape on a region-wide scale. Some exotics have become accepted parts of the landscape. Maize, for example, became a staple of the Pueblo Indians' lifestyle after being introduced from Mexico in the Archaic period. The Spanish brought numerous European cultivars with them, including wheat

and alfalfa. Other weedy species were introduced unintentionally. The proliferation of exotic species intensified in the nineteenth and twentieth centuries as more people and animals came to the Upper Pecos Valley. The increase in livestock caused substantial problems with overgrazing. Some exotics were introduced intentionally, such as salt cedar (tamarisk). Salt cedar was first valued for its ability to thrive in the arid climate but that was later classified as an intrusive weed. It is often difficult to pinpoint exactly when exotics arrived at Pecos but nonnative plants flourished in the area by the twentieth century.



Kochia scoparia, an exotic species, proliferates on the ruins of Pecos Pueblo. Photo by Cori Knudten.

2.1.5 Gateway Context Resources and Values

Table 2-1 lists the Fundamental Resources and Values relevant to the Gateway Context. Some fundamental resources are subsumed under a particular landscape unit. Because the landscape unit is used as the primary category in other sections of the RSS, this table serves to connect the RSS to the Foundation Statement, which identified Fundamental Resources and Values.

Table 2-1. Resources and values associated with the Gateway Resource Context

Resource Stewardship Strategy Resources and Values	Associated Foundation Statement Fundamental Resources and Values
Landscape: Pueblo/Precontact/ Mission	<ul style="list-style-type: none"> • Flora • Fauna • Soils • Air Quality • Archaeological sites • Historic structures • Ethnographic Resources
Landscape: Riparian/Riverine Corridors	<ul style="list-style-type: none"> • Surface water (Pecos River, Glorieta Creek, Galisteo Creek) • Riparian corridors • Soils • Flora • Fauna • Air Quality • Topography/Geology • Archaeological sites • Historic structures • Ethnographic resources <p>Component landscapes from the Cultural Landscape Overview (1998) :</p> <ul style="list-style-type: none"> • Orchard/Mill landscape • Riverine landscape • All riparian corridors
Landscape: Ranching/Grassland	<ul style="list-style-type: none"> • Soils • Flora • Fauna • Air Quality • Historic pastures • Archaeological sites • Historic structures • Ethnographic resources <p>Component landscapes from the Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • Ranching component landscape (including Ranch House complex and Trading Post complex) • All grasslands • Grassland/piñon-juniper areas within the Pecos Unit

Table 2-1. Cont'd.

Resource Stewardship Strategy Resources and Values	Associated Foundation Statement Fundamental Resources and Values
Landscape: Glorieta Unit	<ul style="list-style-type: none"> • Flora • Fauna • Air Quality • Topography/Geology • Archaeological sites • Historic structures • Ethnographic resources <p>Component landscapes from the Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • Pigeon's Ranch Subunit • Cañoncito subunit • Camp Lewis • Corridor between camp and activity sites
Sensory Environment (Viewshed/Night Skies/Soundscapes)	Sensory Environment (Viewshed/Night Skies/Soundscapes)
Educational Opportunities	Educational Opportunities



This view, looking northwest from the ruins of Pecos Pueblo, shows Glorieta Mesa on the upper left. Glorieta Pass curves around the northern tip of Glorieta Mesa, leading into the Rio Grande drainage. Photo by Cori Knudten.

2.2 Resource Context: Pueblo/Precontact/Spanish Colonial

2.2.1 Context Description

The Pueblo/Precontact/Spanish Colonial context focuses on the pueblo and mission ruins on the mesilla, as well as the corresponding landscape. Inhabited by the Pecos for centuries, the pueblo and its environment continue to hold cultural meaning for descendants of those who lived in and traveled through the Upper Pecos Valley. Together, the pueblo and mission ruins illustrate the cultural contact and conflict between Native Americans and Spanish colonists. Significant features of this context extend beyond the immediate surroundings of the ruins. The many prehistoric archaeological sites throughout the park also demonstrate the long history of human presence in the valley. Much of the park's museum collection, with artifacts from Alfred V. Kidder's landmark excavations at the pueblo and mission, also demonstrates the human history of the valley and the cultural interaction that has occurred there.

2.2.2 Significance Statement(s) Supporting this Context

Significance Statement #2: The area of Pecos Pueblo, in use from ancient times to the present, is a living place still valued and used for traditional practices by [descendants] of those who traveled through the area and settled here.

Significance Statement #3: Landmark excavations by [Alfred V.] Kidder (1915–1929) at Pecos provided the foundation for modern southwest archeology and resulted in a world-class multi-cultural museum collection of artifacts and documents with scientific and cultural values.

Significance Statement #7: The expedition of Coronado started the expansion of power and influence of Spanish culture in the Southwest. The park contains the remains of a pueblo and a historic mission which illustrates the conflict and accommodation of cultural contact between Native Americans and Spanish Colonists. Archeological evidence documents the construction of four churches, one of which was the largest church in 17th Century New Mexico. (NPS 2009a)

2.2.3 Major Agents of Historical Change that Influenced the Pueblo/Precontact/Spanish Colonial Context

Evidence for long-term, intensive human settlement in the Upper Pecos Valley begins in the Coalition Period (1,200 CE–1,325 CE). Although people had lived in the valley prior to this period, the population increased after 1200 and several pueblos were built in the Valley, including Forked Lightning, Rowe, and the Black-on-White House. By 1450, Pecos Pueblo was completed and population aggregated at the pueblo. The Pecos employed a diverse subsistence strategy that influenced the surrounding environment. Cutting and gathering timber for fuel, harvesting piñon nuts and other wild plants, and hunting contributed to the survival and prosperity of the Pecos. The Pecos depended on agriculture for the bulk of their food, however, and cultivated numerous plots of land throughout the valley. Although the majority of their fields were located to the northeast of the pueblo by the Pecos River, they also kept fields along Glorieta Creek and in dry-farmed plots around the mesilla. During the height of the Pecos Pueblo's population (1450–1475), local resources were pushed to their limit. Populations of large mammals in the vicinity fell, and by the time the Spanish arrived in 1540, the Pecos had cleared the mesilla of trees in a one-and-a-half mile radius around the pueblo.



Looking up out of a restored kiva within Pecos Pueblo. Photo by Maren Bzdek.

Functioning as a gateway between the southwestern plains and the Rio Grande valley, the Pecos area began attracting traders and travelers early in its history. The archaeological record shows that around 1450 interaction and trade between the Pecos and Apaches became substantial and sustained. Apaches usually arrived for an annual trade fair at Pecos in the autumn. The Pecos traded maize and pottery for bison hides and meat. They also carried out an extensive trade with pueblos in the Rio Grande valley. With the arrival of the Spanish, another culture was added to the milieu that met at Pecos. When the Spanish were driven out in the Pueblo Revolt of 1680, the Pecos probably traded Spanish horses to the Apaches, and the horses spread to other Native American groups.

The arrival of the Spanish introduced numerous changes into the Pecos' life and environment. After 1620 when a Franciscan mission was established at Pecos, the Spanish friars brought livestock and other exotic cultivars to the pueblo. Livestock numbered in the hundreds during the seventeenth century. The Spanish also attempted to force the Pecos to adopt Christianity, which further disrupted the Pecos way-of-life. New diseases also came with the Spanish and after contact, population at Pecos entered into a steady decline as sickness ravaged the pueblo's inhabitants.

During the eighteenth century, the Spanish adopted a policy of cultural accommodation, driven in part by the growing power of the Comanches on the southwestern plains. Being a center of trade, which helped to make Pecos a prosperous pueblo, meant that Pecos also was an attractive

target for raids. Apaches raided Pecos in the seventeenth century, and Comanches frequently attacked the pueblo in the eighteenth century. Comanche raiding severely impacted Pecos from the 1730s through the 1780s. Livestock numbers fell precipitously and, as the Pecos were forced to remain behind the walls of their pueblo, human and animal effects on the surrounding environment declined. The remains of a possible presidio next to the mission date to this period. Comanche raiding in New Mexico became so severe that many communities, including Pecos, became isolated as the danger of traveling increased. After 1786, when the Spanish achieved peace with the Comanche, Pecos again became a center of trade, but only for a brief time. Hispanic settlers established the community of San Miguel del Vado to the southeast of Pecos, which replaced the pueblo as the gateway into New Mexico from the Plains.

As the pueblo and mission fell into ruin, grazing continued on the mesilla. Hispanic population grew rapidly in the valley, and following New Mexico's incorporation as an American territory in 1848, new economic opportunities encouraged Pecos inhabitants to increase their livestock herds. Even as resource exploitation in the valley intensified, preservationist impulses developed. By the late 1800s and early 1900s, the ruins had become a popular tourist destination. Archaeological investigations, particularly those undertaken by A. V. Kidder from 1915 to 1929, also brought attention to the ruins. In 1935, the ruins were established as a state monument. Active management did not begin until the 1940s, at which time fencing around the mesilla finally halted grazing in the immediate vicinity. In 1965, the ruins became a national monument under the administration of the NPS, and became part of Pecos National Historical Park in 1990.

2.2.4 Primary Interpretive Themes

- *The Pecos Pueblo story of an aboriginal homeland reflects an indigenous people and their encounters with a variety of cultures that resulted in gradual cultural disruption, devastation, and ongoing retention of way-of-life.*
- *The Pecos missions provide the opportunity to consider the impact of Spanish culture on the daily life (including traditional religion, social structure, and technology) of the Pueblo people.*
- *The Kidder excavations at Pecos Pueblo set a precedent for applying archaeological methods that promote scientific study, education, appreciation, and understanding of Southwest archaeology. (NPS 2009a)*



Following the cessation of grazing in the late twentieth century, riparian vegetation along Glorieta Creek recovered. Photo by Cori Knudten.

2.2.5 Pueblo/Precontact/Spanish Colonial Context Resources and Values

Table 2-2 lists the Fundamental Resources and Values relevant to the Pueblo/Precontact/Spanish Colonial Context. Some fundamental resources are subsumed under a particular landscape unit. Because the landscape unit is used as the primary category in other sections of the RSS, this table serves to connect the RSS to the Foundation Statement, which identified Fundamental Resources and Values.

Table 2-2. Resources and values associated with the Pueblo/Precontact/Spanish Colonial Resource Context

Resource Stewardship Strategy Resources and Values	Associated Foundation Statement Fundamental Resources and Values
Landscape: Pueblo/Precontact/Mission	<ul style="list-style-type: none"> • Flora • Fauna • Soils • Air Quality • Archaeological sites • Historic structures • Ethnographic Resources
Landscape: Ranching/Grassland	<ul style="list-style-type: none"> • Soils • Flora • Fauna • Air Quality • Historic pastures • Archaeological sites • Historic structures • Ethnographic resources <p>Component landscapes from the Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • Ranching component landscape (including Ranch House complex and Trading Post complex) • All grasslands • Grassland/piñon-juniper areas within the Pecos Unit
Landscape: Riparian/Riverine Corridor	<p>Surface water (Pecos River, Glorieta Creek, Galisteo Creek)</p> <ul style="list-style-type: none"> • Riparian corridors • Soils • Flora • Fauna • Air Quality • Topography/Geology • Archaeological sites • Historic structures • Ethnographic resources <p>Component landscapes from the Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • Orchard/Mill landscape • Riverine landscape • All riparian corridors

Table 2-2. Cont'd.

Resource Stewardship Strategy Resources and Values	Associated Foundation Statement Fundamental Resources and Values
Landscape: Woodland	<ul style="list-style-type: none"> • Flora • Fauna • Soils • Air Quality • Archaeological Sites • Ethnographic Resources <p>Component landscapes from the Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • Area east of Riverine/Riparian landscape within Pecos Unit, which is the same as the Woodland component landscape
Historic Structures (North and South Pueblos, Mission Churches)	Historic Structures (North and South Pueblos, Mission Churches)
Archaeological Sites (Pueblo and Spanish Colonial sites on mesilla, other prehistoric pueblos in area, other associated sites)	Archaeological Sites (Pueblo and Spanish Colonial sites on mesilla, other prehistoric pueblos in area, other associated sites)
Museum Collections	Museum Collections
Sensory Environment (Viewshed/Night Skies/Soundscapes)	Sensory Environment (Viewshed/Night Skies/Soundscapes)
Ethnographic	Ethnographic
Educational Opportunities	Educational Opportunities

2.3 Resource Context: Santa Fe Trail/Civil War

2.3.1 Context Description

When Mexico achieved independence in 1821, Pecos's position once again put it in the path of trade and cultural contact. American merchants, eager to trade with the friendly Mexican nation, came to Santa Fe. They established the Santa Fe Trail which passed through the Upper Pecos Valley. The Trail attracted people to the valley, and Kozlowski's Trading Post, Pigeon's Ranch, and Johnson's Ranch were all established as hostelrys along the Trail. Fur trappers followed the Trail to New Mexico and trapped out the beaver in the Pecos River. The United States Army followed the Trail in 1846, and after New Mexico became a U.S. Territory, many others traveled the Santa Fe Trail, seeking new homes and opportunities in the Southwest.

The westward expansion of the United States triggered debates over how the land and resources should be used. The debate, which centered on the question of slavery led to the Civil War. In 1861, Confederate General Henry Hopkins Sibley led an invasion of New Mexico and Union troops marched southward to stop him. They encountered each other near the ruins of Pecos Pueblo. The Battle of Glorieta Pass, fought on March 26–28, 1862, raged over the ground of Apache Canyon and in the valley by Pigeon's Ranch. The Union victory, which halted the Confederate advance, had long-term consequences for both the outcome of the Civil War and the future of the Southwest. The landscape of the Battle of Glorieta Pass, which is included in Pecos National Historical Park, gives visitors the opportunity to understand how the events of the battle unfolded. Because Glorieta Pass is the natural passageway to Santa Fe, Union and Confederate troops both followed the route of the Santa Fe Trail. The landscape includes the historic structure of Pigeon's Ranch and associated archaeological sites, including Camp Lewis adjacent to Kozlowski's Trading Post and the location of the Confederate Army's camp at Cañoncito. Substantial vegetation growth has occurred on the landscape since the Civil War, and many historic fields and pastures are overgrown.

Settlement and expansion increased after the Civil War. In 1880, the construction of the Atchison, Topeka, and Santa Fe railroad became the driving force in population growth and resource exploitation. It brought many new people to the Upper Pecos River Valley and also caused intensive resource use as thousands of trees were cut down to build the railroad and animals were over-hunted to feed railroad workers. The arrival of the railroad signaled an end to Santa Fe Trail period, as it replaced the Trail as the main transportation route through Pecos.

2.3.2 Significance Statement(s) Supporting this Context

Significance Statement #1: The Upper Pecos River Valley is a multi-cultural crossroads where trade, commerce, settlement, and conflict occurred. The region represents the heritage of the Southwest during the last 12 millennia. The geographic corridor through Glorieta Pass contains ancient trade routes connecting the Rio Grande with the western Plains. The historic Santa Fe Trail, stagecoach lines, railroads, Route 66, and interstates have traveled through the pass connecting New Mexico with destinations in the East.

Significance Statement #5: The Glorieta Unit of the park encompasses the Glorieta Battlefield, where the Civil War Battle of Glorieta Pass occurred. This battle profoundly affected the future of the Southwest and the nation. (NPS 2009a)

2.3.3 Major Agents of Historical Change that Influenced the Santa Fe Trail/Civil War Context

Extensive wagon trains traveled along the Santa Fe Trail, often with hundreds of head of stock. The heavy traffic caused erosion alongside the Trail and degraded riparian environments. Fur trappers also followed the Trail and hunted beaver in New Mexico. By the early 1820s, beaver had been trapped out of the Upper Pecos watershed. After the Mexican–American War, the presence of the U.S. Army in the Southwest encouraged economic growth. Farmers and ranchers increased their acreage of cultivated land and their livestock herds to supply the Army. Both Alexander Valle, the owner of Pigeon’s Ranch, and Martin Kozlowski, who owned Kozlowski’s Trading Post, probably came to the Upper Pecos River Valley because of the opportunities presented by the Santa Fe Trail trade and the presence of the Army. Both were there to witness the onset of the Civil War and its effects on Pecos.

The actual battle of Glorieta Pass itself, although disruptive for inhabitants of the Upper Pecos River Valley, did not have any long-term impacts on the landscape. However, many of the reasons behind the Civil War, as well as the outcome of the war, did have significant implications for the people and environment of the Valley. American imperialism—the drive to conquer western land and incorporate it into the United States—led to an increase in American military forces in the Southwest following the Treaty of Guadalupe Hidalgo in 1848, which brought an end to the Mexican–American War and transferred much of the Southwest to the United States. The growth of the military in the area fostered numerous economic opportunities for area residents. Livestock herds grew, more land was cultivated, and the population increased. Because of these new economic opportunities, resource exploitation in the Upper Pecos River Valley intensified. American imperialism and the conquest of Western land also introduced the question of whether that land would be open to slavery. The debate over this question caused sectional divisions that ultimately led to secession and war.

Following Union victory, American settlement of the Southwest proceeded under a model sanctioned by the federal government. The government surveyed land, provided grants to homesteaders and railroads, and approved the acquisition of private property and resource exploitation. By the end of the nineteenth century, however, changes in national politics and culture created support for increased government regulation of land and the conservation of natural resources. The Pecos area experienced the population growth and tremendous resource exploitation that followed the arrival of the railroad in the post-Civil War era. The creation of the Pecos Forest Reserve in 1892, which later became the Santa Fe National Forest, introduced the principles of professional resource management under the auspices of a federal agency to the Upper Pecos River Valley. The creation of the Pecos National Monument and then Pecos National Historical Park in the twentieth century increased the influence of the federal government in the Upper Pecos River Valley and the amount of protected land.



This adobe building is the last standing structure of Pigeon’s Ranch, which served as a hostelry on the Santa Fe Trail and also figured prominently in the Civil War Battle of Glorieta Pass. Photo by Cori Knudten.

2.3.4 Primary Interpretive Themes

- *The Santa Fe Trail extended the international trade passing through the Pecos Valley, diversifying people, ideas, values, language, ideologies, and material goods.*
- *As a result of the Battle of Glorieta Pass, Union presence was solidified in the Southwest changing the social, economic, and political dynamics of the region; the future of the people of New Mexico territory was forever altered. (NPS 2009a)*

2.3.5 Santa Fe Trail/Civil War Context Resources and Values

Table 2-3 lists the Fundamental Resources and Values relevant to the Santa Fe Trail/Civil War Context. Some fundamental resources are subsumed under a particular landscape unit. Because the landscape unit is used as the primary category in other sections of the RSS, this table serves to connect the RSS to the Foundation Statement, which identified Fundamental Resources and Values.

Table 2-3. Resources and values associated with the Santa Fe Trail/Civil War Resource Context

Resource Stewardship Strategy Resources and Values	Associated Foundation Statement Resources and Values
Landscape: Riparian/Riverine Corridor	<ul style="list-style-type: none"> • Surface water (Pecos River, Glorieta Creek, Galisteo Creek) • Riparian corridors • Soils • Flora • Fauna • Air Quality • Topography/Geology • Archaeological sites • Historic structures • Ethnographic resources <p>Component landscapes from the Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • Orchard/Mill landscape • Riverine landscape • All riparian corridors
Landscape: Ranching/Grasslands	<ul style="list-style-type: none"> • Soils • Flora • Fauna • Air Quality • Historic pastures • Archaeological Sites • Historic structures • Ethnographic resources <p>Component landscapes from the Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • Ranching component landscape (including Ranch House complex and Trading Post complex) • All grasslands • Grassland/piñon-juniper areas within the Pecos Unit
Landscape: Woodland	<ul style="list-style-type: none"> • Flora • Fauna • Soils • Air Quality • Archaeological sites • Ethnographic resources <p>Component landscapes from the Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • Area east of Riverine/Riparian landscape within Pecos Unit, which is the same as the Woodland component landscape

Table 2-3. Cont'd.

Resource Stewardship Strategy Resources and Values	Associated Foundation Statement Fundamental Resources and Values
Landscape: Glorieta Unit	<ul style="list-style-type: none"> • Flora • Fauna • Air Quality • Topography/Geology • Archaeological sites • Historic structures • Ethnographic resources <p>Component landscapes from Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • Pigeon's Ranch Subunit • Cañoncito subunit • Camp Lewis • Corridor between camp and activity sites
Historic Structures (Kozlowski's Trading Post, Pigeon's Ranch, Texas monument, Colorado monument)	Historic Structures (Kozlowski's Trading Post, Pigeon's Ranch, Texas monument, Colorado monument)
Museum Collections (artifacts related to Santa Fe Trail, Civil War)	Museum Collections (artifacts related to Santa Fe Trail, Civil War)
Archaeological Sites (Santa Fe Trail ruts, Civil War sites, Hispanic homesteads)	Archaeological Sites (Santa Fe Trail ruts, Civil War sites, Hispanic homesteads)
Sensory Environment (Viewshed/Night Skies/Soundscapes)	Sensory Environment (Viewshed/Night Skies/Soundscapes)
Educational Opportunities	Educational Opportunities

2.4 Resource Context: Ranching/Preservation

2.4.1 Context Description

The railroad ushered in change in 1880, but it was replaced by highways as automobile ownership increased in the twentieth century. The change corresponded with the growth of the tourism industry in the Southwest. The tourism industry had grown during the railroad era and became increasingly important to the Southwest economy during the twentieth century. Route 66, which passed through Pecos, became a highway associated with tourism and led people to the Land of Enchantment. In the postwar era, Route 66 faded in importance and Interstate 25 became the predominant transportation corridor through the region. Federal agencies such as the Forest Service increasingly became involved in tourism and recreation and began managing the forests for multiple uses. The National Park Service became an important presence in Pecos when it took over the Pecos National Monument in 1965 and expanded into Pecos National Historical Park in 1990.

The historic Forked Lightning Ranch, started in the 1920s by Tex Austin, operated as a working ranch but also functioned as a tourist attraction and vacation home. Ranching and farming continue to be a primary way of life in the region, and the Forked Lightning Ranch provides an opportunity to explore and understand ranching history in the area. In 1941, E. E. “Buddy” Fogelson purchased the ranch which served as both a vacation home and a working cattle operation. His wife, Greer Garson Fogelson, helped Buddy turn the ranch into a romantic western getaway. Historic pastures, many of which are being encroached upon by piñon-juniper, the Forked Lightning Ranch house, and Kozlowski’s Trading Post provide visual evidence of the ranching history. Archaeological remains of Hispanic settlements also testify to earlier human occupation and use of the environment. These landscapes allow visitors to experience the evolution of ranching in northern New Mexico and understand how land use patterns in the valley changed over time.

2.4.2 Significance Statement(s) Supporting this Context

Significance Statement #1: The Upper Pecos River Valley is a multi-cultural crossroads where trade, commerce, settlement, and conflict occurred. The region represents the heritage of the Southwest during the last 12 millennia. The geographic corridor through Glorieta Pass contains ancient trade routes connecting the Rio Grande with the western Plains. The historic Santa Fe Trail, stagecoach lines, railroads, Route 66, and interstates have traveled through the pass connecting New Mexico with destinations in the East.

Significance Statement #6: The historic and architecturally significant Forked Lightning Ranch provides visitors opportunities to experience the evolution of ranching in Northern New Mexico. (NPS 2009a)

2.4.3 Major Agents of Historical Change that Influenced the Ranching/Preservation Context

The Forked Lightning Ranch landscape was used and occupied by prehistoric peoples and also by the Pecos, but it was not until the nineteenth century that humans began to significantly alter the landscape. After the Spanish government awarded the Los Trigos and Alexander Valle land grants in 1815, Hispanic settlers began moving into the Upper Pecos River Valley. Despite the fact that the land which later became the Forked Lightning Ranch remained part of the Pecos

Pueblo land grant, which was supposedly reserved for the pueblo's inhabitants, settlers began encroaching on the grant and building homesteads along the Pecos River. Several homesteads were located on the future Forked Lightning Ranch.

Although herds owned by the Franciscan friars at the Pecos mission had grazed in the environment since the seventeenth century, grazing intensified during the 1800s. The owners of the small homesteads along the Pecos River probably only possessed a few livestock, but more affluent inhabitants of the Upper Pecos River Valley owned substantial herds, and these were allowed to graze on the riverbanks and mesas. The Hispanic settlers also undertook some small-scale cultivation, planting crops and kitchen gardens. An apple orchard and a grist mill, although probably dating to early in the twentieth century, also represent the ranching and farming history of the valley.

In the late 1800s, substantial portions of the Pecos Pueblo grant passed into private ownership. The chain of title and land possession eventually resulted in Tex Austin's purchase of about 6,000 acres in 1925, where he created the Forked Lightning Ranch. Austin kept cattle and horses on his ranch. He also turned the Forked Lightning into a resort for tourists that offered accommodations, meals, horseback riding, hunting, and other diversions. Austin went bankrupt during the Depression, and in 1941, E. E. Fogelson purchased the Forked Lightning Ranch. Fogelson and his wife, Greer Garson Fogelson, kept the Forked Lightning as a vacation home but also raised Santa Gertrudis cattle on the ranch. In conjunction with the ranching operation, substantial pasture clearing operations were undertaken in the late 1960s. Grazing ended on the Forked Lightning in 1988. In 1993, the ranch became part of Pecos National Historical Park. Beginning in 2005, the NPS began to reduce wildland fire hazardous fuel loading by clearing piñon-juniper which also restored historic pastures.

The presence of the NPS and the Forest Service and their control of large amounts of land allowed for the dissemination and implementation of new theories of land management at Pecos in the late twentieth century. Federal mandates such as the National Environmental Policy Act (NEPA) required agencies to consider the environmental impact of their decisions. Through these actions, theories of ecology and ecosystem management slowly filtered through the agency's culture. Tourism remained important to the area economy and also influenced land management. The NPS worked to restore Glorieta Creek and control exotics and also built a visitor center and developed interpretive programs. The construction of Interstate 25 in the 1960s more closely tied Pecos to the surrounding region. As Santa Fe grew, development crept towards Pecos and became a concern for the NPS as it tried to maintain the integrity of historic landscapes.



Forked Lightning Ranch barns and corrals. NPS photo.

2.4.4 Ranching/Preservation Context Resources and Values

Table 2-4 lists the Fundamental Resources and Values relevant to the Ranching/Preservation Context. Some fundamental resources are subsumed under a particular landscape unit. Because the landscape unit is used as the primary category in other sections of the RSS, this table serves to connect the RSS to the Foundation Statement, which identified Fundamental Resources and Values.

Table 2-4. Resources and values associated with the Ranching/Preservation Resource Context.

Resource Stewardship Strategy Resources and Values	Associated Foundation Statement Fundamental Resources and Values
Landscape: Riparian/Riverine Corridors	<ul style="list-style-type: none"> • Surface water (Pecos River, Glorieta Creek, Galisteo Creek) • Riparian corridors • Soils • Flora • Fauna • Air Quality • Topography/Geology • Archaeological sites • Historic structures • Ethnographic resources <p>Component landscapes from the Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • Orchard/Mill landscape • Riverine landscape • All riparian corridors
Landscape: Ranching/Grassland	<ul style="list-style-type: none"> • Soils • Flora • Fauna • Air Quality • Historic pastures • Archaeological Sites • Historic structures • Ethnographic resources <p>Component landscapes from the Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • The Ranching component landscape (including Ranch House complex and Trading Post complex) • All grasslands • Grassland/piñon-juniper areas within the Pecos Unit
Landscape: Woodland	<ul style="list-style-type: none"> • Flora • Fauna • Soils • Air Quality • Archaeological sites • Ethnographic resources <p>Component landscapes from the Cultural Landscape Overview (1998):</p> <ul style="list-style-type: none"> • Area east of Riverine/Riparian landscape within Pecos Unit, which is the same as the Woodland component landscape
Historic Structures (Forked Lightning Ranch House, Ranch Stable, Casita, Pump House, Skeet Range, Root Cellar, Ranch Fence, Ranch Bridge, Kozlowski's Trading Post, Trading Post Barn, Trading Post Workshop, Trading Post Tack Barn)	Historic Structures (Forked Lightning Ranch House, Ranch Stable, Casita, Pump House, Skeet Range, Root Cellar, Ranch Fence, Ranch Bridge, Kozlowski's Trading Post, Trading Post Barn, Trading Post Workshop, Trading Post Tack Barn)

Table 2-4. Cont'd.

Resource Stewardship Strategy Resources and Values	Associated Foundation Statement Fundamental Resources and Values
Archaeological sites (Sites associated with Tex Austin or Fogelsons, grist mill, some Hispanic homesteads)	Archaeological sites (Sites associated with Tex Austin or Fogelsons, grist mill, some Hispanic homesteads)
Museum Collections (artifacts relating to Forked Lightning Ranch)	Museum Collections (artifacts relating to Forked Lightning Ranch)
Sensory Environment (Viewshed/Night Skies/Soundscapes)	Sensory Environment (Viewshed/Night Skies/Soundscapes)
Educational Opportunities	Educational Opportunities



The National Park Service has cleared piñon and juniper from several areas in the park, both as a means of fire protection and to preserve historic pastures of the Forked Lightning Ranch. Photo by Cori Knudten.

3 Desired Conditions

Desired conditions are a qualitative description of the integrity and character for a set of resources and values, including visitor experiences, that the NPS has committed to achieve and maintain. The Foundation Statement for Pecos, which is linked to the General Management Plan, specifies desired conditions for the park’s Fundamental Resources and Values. In some cases, the RSS team took broad desired conditions from the Foundation Statement and narrowed them into more concrete “landscape goals” (see Table 3-1). The landscape goals are consistent with the desired conditions but provided a more specific starting place from which to develop indicators, target values, and strategies. For the remainder of the resources, we used the desired condition from the Foundation Statement. The desired conditions and landscape goals for each Fundamental Resource and Value are presented in Table 3-3.

Table 3-1. Development of landscape goals from broad desired conditions related to the Resource Stewardship Strategy landscapes

Desired Condition	Landscape Goal	Relevant Landscapes
Natural and cultural landscapes are preserved, protected, and receive treatment consistent with their significance and interpretive value.	Landscapes are documented, preserved, protected, and receive treatment consistent with their historic and ecological significance and interpretive value.	All
A balance of historic and ecological integrity of the landscape.		
Native plant communities relative to species composition in former range are restored and woody stem densities and fuel loading are managed.	Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire.	All
Nonnative, invasive species are absent in the park’s ecosystem, or if present, are effectively controlled.	Healthy, sustainable, biotic communities are maintained and restored to protect/enhance park resources.	All
Native plant communities relative to species composition in former range are restored and woody stem densities and fuel loading are managed.		
Erosion is diminished or under control and the health of the river and surrounding watershed is sustainable and supports a healthy riparian and upland habitat.	Erosion resulting in unacceptable degradation of resources is diminished or under control.	All
	The health of the river and creeks and the surrounding watershed is maintained and a healthy riparian habitat is supported, with particular consideration of its role as wildlife habitat and a wildlife travel corridor.	Riparian/Riverine Corridors
Historic grasslands of the area are maintained and the biological diversity is enhanced.	Historic grasslands of the area are maintained and the biological diversity is enhanced.	Ranching/Grasslands
Healthy, sustainable, grass dominated communities within the piñon-juniper woodland are restored to stabilize soils and protect cultural resources.	Healthy, sustainable, grass dominated communities within the piñon-juniper woodland are restored to stabilize soils and protect cultural resources.	Ranching/Grasslands, Woodland

Table 3-2. Desired Conditions and Landscape Goals for each Resource Stewardship Strategy Resource and Value

Resource Stewardship Strategy Resources and Values	Desired Conditions and Landscape Goals
Landscape: Parkwide	<p>Historic corridors and routes are identified, evaluated, and interpreted in a manner that will foster visitor appreciation of the human history of the region. (Desired Condition)</p> <hr/> <p>Landscapes are documented, preserved, protected, and receive treatment consistent with their historic and ecological significance and interpretive value. (Landscape Goal)</p>
<p>Landscape: Riparian/Riverine corridors</p> <p>Includes: The Orchard/Mill and Riverine component landscapes, and riparian corridors (Pecos River, Glorieta Creek, Galisteo Creek)</p>	<p>The Pecos River is managed to wild and scenic river standards. (Desired Condition)</p> <p>Component landscapes are documented, preserved, protected, and receive treatment consistent with their historic and ecological significance and interpretive value. (Landscape Goal)</p> <hr/> <p>The health of the river and creeks and the surrounding watershed is maintained and a healthy riparian habitat is supported, with particular consideration of its role as wildlife habitat and a wildlife travel corridor. (Landscape Goal)</p> <hr/> <p>Erosion resulting in unacceptable degradation of resources is diminished or under control. (Landscape Goal)</p>
<p>Landscape: Ranching/Grasslands</p> <p>Includes: The Ranching component landscape (incl. Ranch House complex, Trading Post complex), and all grasslands/ grassland piñon-juniper mix areas within the Pecos Unit</p>	<p>Component landscapes are documented, preserved, protected, and receive treatment consistent with their historic and ecological significance and interpretive value. (Landscape Goal)</p> <hr/> <p>Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire. (Landscape Goal)</p> <hr/> <p>Historic grasslands of the area are maintained and the biological diversity is enhanced. (Landscape Goal)</p> <hr/> <p>Healthy, sustainable, grass dominated communities within the piñon-juniper woodland are restored to stabilize soils and protect cultural resources. (Landscape Goal)</p> <hr/> <p>Erosion resulting in unacceptable degradation to resources is diminished or under control. (Landscape Goal)</p>
<p>Landscape: Woodland</p> <p>Includes: Area east of Riverine/Riparian landscape within Pecos Unit, which is the same as the Woodland component landscape</p>	<p>Landscape is documented, preserved, and protected, and receives treatment consistent with its historic and ecological significance and interpretive value. (Landscape Goal)</p> <hr/> <p>Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire. (Landscape Goal)</p> <hr/> <p>Healthy, sustainable, grass dominated communities within the piñon-juniper woodland are restored to stabilize soils and protect cultural resources. (Landscape Goal)</p> <hr/> <p>Erosion resulting in unacceptable degradation to resources is diminished or under control. (Landscape Goal)</p>
<p>Landscape: Pueblo/Precontact/Mission</p>	<p>Landscape is documented, preserved, and protected, and receives treatment consistent with its historic and ecological significance and interpretive value. (Landscape Goal)</p> <hr/> <p>Erosion resulting in unacceptable degradation to resources is diminished or under control. (Landscape Goal)</p> <hr/> <p>Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire. (Landscape Goal)</p> <hr/> <p>Healthy, sustainable, biotic communities are maintained and restored to protect/enhance park resources. (Landscape Goal)</p>

Table 3-2. Cont'd.

Resource Stewardship Strategy Resources and Values	Desired Conditions and Landscape Goals
<p>Landscape: Glorieta Unit</p> <p>Includes: Pigeon's Ranch Subunit, Cañoncito subunit, Camp Lewis, and corridor between camp and activity sites</p>	<p>Landscape is documented, preserved, and protected, and receives treatment consistent with its historic and ecological significance and interpretive value. (Landscape Goal)</p> <p>Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire. (Landscape Goal)</p> <p>Erosion resulting in unacceptable degradation to resources is diminished or under control. (Landscape Goal)</p> <p>Healthy, sustainable, biotic communities are maintained and restored to protect/enhance park resources. (Landscape Goal)</p>
<p>Sensory Environment (Viewshed/Soundscapes/Night Skies)</p>	<p>Important scenic vistas and scenic features are not significantly diminished by development. (Desired Condition)</p> <p>Current levels of natural soundscapes are maintained or reduced. (Desired Condition)</p> <p>Current levels of night sky visibility are maintained. (Desired Condition)</p>
<p>Historic Structures and Complexes</p>	<p>Historic structures and complexes are managed in a manner that sustains their character-defining features and significance while continuing to serve NPS management and visitor needs. (Desired Condition)</p>
<p>Archaeological Sites</p>	<p>Archaeological sites, artifacts, pictographs, and petroglyphs are identified, evaluated for their significance, and protected in place. (Desired Condition)</p>
<p>Museum Collections</p>	<p>Museum collections are preserved and protected by meeting NPS museum standards. (Desired Condition)</p> <p>The contents of the collection are accessible to researchers and the public, e.g., through the use of exhibits, internet, and other mediums. (Desired Condition)</p>
<p>Ethnographic</p>	<p>A balance of traditional use access and resource protection is identified, maintained, and/or improved. (Desired Condition)</p> <p>All affiliated tribes feel welcome at Pecos and understand and appreciate their connections to the park. (Desired Condition)</p> <p>Official tribal government and stakeholder connections to the park and its resources are fostered and maintained. (Desired Condition)</p>
<p>Educational Opportunities</p>	<p>The public understands the value and significance of traditional practices. (Desired Condition)</p> <p>Visitors understand and appreciate the area's human history and the interconnectedness with its natural features. (Desired Condition)</p> <p>The public understands and appreciates the significance of collected objects and their connections to the park. (Desired Condition)</p> <p>A diverse range of safe visitor experiences exist within the context of the natural and cultural resources associated with the Battle of Glorieta. (Desired Condition)</p> <p>The visitor contact station and museum for the Glorieta Battlefield is established and in operation. (Desired Condition)</p> <p>The park is active in educating the local communities about the battle. (Desired Condition)</p> <p>A diverse range of safe visitor experiences exist within the context of the resources associated with the Forked Lightning Ranch unit. (Desired Condition)</p> <p>Visitors have an understanding of the relationship between the Native American and Spanish Colonial culture and traditions from initial contact to present day. (Desired Condition)</p>

3.1 Indicator Selection and Condition Assessment

A methodical process was used to derive Comprehensive Strategies (Figure 3-1). The steps were to:

1. Identify attributes or characteristics of each significant resource;
2. Consider influences that can impact attributes or resource conditions;
3. Determine indicators, measurable attributes or attribute parameters that best indicate resource conditions, taking into account effectiveness of the resource conditions in supporting interpretive themes and resource integrity;
4. Specify a target value for each indicator that represents desired conditions;
5. Measure current conditions using the indicators;
6. Assess the difference between current conditions and desired conditions; and
7. Build a logical sequence of broad activities that will allow the desired conditions to be attained in a reasonable time frame.

A synopsis of the results of these steps appears in Table 3-3. Indicators were selected from current research and indices. Once indicators were identified, a reference condition and a management target were defined based on current science and in consultation with subject matter experts (see Appendix C: List of Preparers and Reviewers). This process also involved assessing the status of each resource against these indicators to determine whether or not the management targets have been met. In some cases, not enough information is available to establish targets and we identified the steps needed to gather this information.

Resource Stewardship Strategy: Planning Components and Process

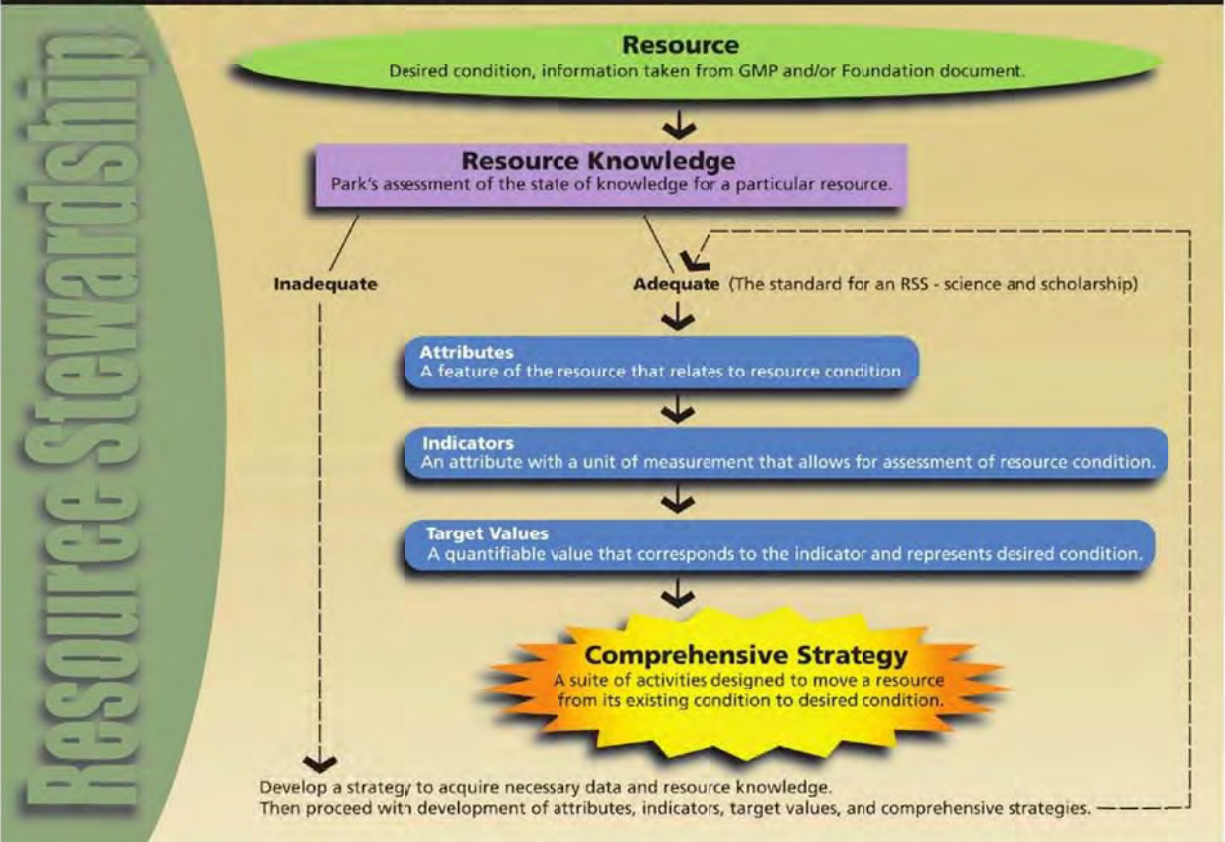


Figure 3-1. Resource Stewardship Strategy planning components and process (provided by the NPS-Denver Service Center Planning Department).



The Pecos River. Photo by Cori Knudten.

Table 3-3. Desired conditions and landscape goals for Pecos National Historical Park resources and values

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Parkwide	Landscapes are documented, preserved, protected, and receive treatment consistent with their historic and ecological significance and interpretive value. (Landscape Goal)	Gateway	Ecological health	Cumulative ecological indicators	Cumulative "Good"	TBD
			Historic integrity(location, setting, design, materials, workmanship, feeling, association, species composition, community structure, land management techniques)	Cumulative historic integrity and condition	Cumulative "Retain integrity" and "Good"	TBD
			Condition	For historic corridors and routes: Historic integrity and condition of <ul style="list-style-type: none"> • Santa Fe trail ruts • Current Santa Fe Trail / Route 66 / Hwy 63 and 50 travel corridors • Other, TBD 	Retain integrity and "Good" condition	TBD
	Historic corridors and routes are identified, evaluated, and interpreted in a manner that will foster visitor appreciation of the human history of the region. (Desired Condition)		Documentation/ Treatment Documents	Documentation/ Treatment Documents complete and current	Incomplete	

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
<p>Landscape: Riparian/ Riverine corridors</p> <p>Includes: The Orchard/Mill and Riverine component landscapes, and riparian corridors (Pecos River, Glorieta Creek, Galisteo Creek)</p>	<p>Component landscapes are documented, preserved, protected, and receive treatment consistent with their historic and ecological significance and interpretive value. (Landscape Goal)</p>	<p>Gateway</p> <p>Pueblo/ Precontact/ Spanish Colonial</p> <p>Santa Fe Trail/Civil War</p> <p>Ranching/ Preservation</p>	<p>Historic integrity (location, setting, design, materials, workmanship, feeling, association, species composition, community structure, land management techniques)</p>	<p>Integrity and condition of:</p> <ul style="list-style-type: none"> • Spatial relationships (e.g., fence remains, historic agricultural field traces) • Constructed water features (e.g., acequia, remains of water diversion in river) • Circulation patterns and features (e.g., Colonias Bridge, swing bridge, River road trace, Orchard Pasture road trace) • Historic vegetation (e.g., riparian vegetation patterns, orchard trees) • Small-scale features (e.g., mill remains, grinding stone) • Other contributing elements to be identified in Cultural Landscape Report (CLR) <p>See sections below for Views/Vistas, Historic Structures, and ethnobotanical vegetation</p>	<p>Historic integrity of National Historical Landmark (NHL) resources is high.</p> <p>Historic integrity of National Register eligible resources is retained.</p>	<p>NHL integrity– TBD</p> <p>Overall integrity is retained (“moderate”, Cultural Landscape Overview)</p>
				<p>% and compatibility of non-contributing elements</p>	<p>100% compatible</p>	<p>TBD</p>

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Riparian/Riverine corridors, cont'd.	The health of the river and creeks and the surrounding watershed is maintained and a healthy riparian habitat is supported, with particular consideration of its role as wildlife habitat and a wildlife travel corridor. (Landscape Goal)	Gateway	Condition	Cultural Landscape indicator: Good, Fair, Poor	100% Landscapes in Good condition	TBD
		Pueblo/ Precontact/ Spanish Colonial	Habitat quality	Bioassessment criteria—Mountain Stream Condition Index (M-SCI) used by NMED Surface Water Quality Bureau	Very Good (100-78.3)	TBD
		Santa Fe Trail/Civil War	Stream morphology/physical stability	Stability of the physical system: 17 hydrologic, vegetation, soil, and geomorphology elements ("A User Guide to Assessing the Proper Functioning Condition and the Supporting Science for Lotic Areas" [Prichard 2003])	Maintain proper functioning condition	Pecos River: in proper functioning condition Lower Glorieta Creek: Functional—At Risk (Downward Trend) due to presence of levee, removal recommended
		Ranching/ Preservation	Human impacts	Presence/absence of unauthorized trails, vegetation trampling, evidence of bank degradation, litter, and human waste.	No presence of trails, vegetation trampling, bank degradation, litter, and human waste	Negligible or minor evidence of negative human impact
			Exotic Species (i.e., woody species, grasses, scotch thistle, feral dogs, etc.)	Spatially defined presence or absence of high priority species.	TBD	TBD—possibility of rapid assessment with Southern Inventory and Monitoring Plains Network

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Riparian/Riverine corridors, cont'd.	The Pecos River is managed to wild and scenic river standards. (Desired Condition)	Gateway Pueblo/ Precontact/ Spanish Colonial Santa Fe Trail/Civil War Ranching/ Preservation	Water Quantity	Discharge (USGS Station 08378500)	Interim value: 149 cfs monthly average in growing season; 43 cfs monthly average in non-growing season—values are for sections of the Pecos River closer to the headwaters (Muldavin et al. 1993)	Need instream flow evaluation 174 cfs average for growing months 39 cfs monthly average for non-growing season (Data based on monthly average streamflow from 1990–2009 from USGS gauging station 'Pecos River near Pecos, NM')
			Water Quality	Total Phosphorous	≤18 µg/L (EPA ecoregion interim value until a park-specific value can be determined)	TBD
				Bacteria	Monthly geometric mean of E. coli bacteria (min of 5 samples collected within 30 day period): ≤ 126 cfu/100 mL; single sample ≤ 235 cfu/100 mL (NMED)	Pecos River: Exceeded limits at sampling station in Village of Pecos (NMED) Glorieta Creek: Within limits (NMED)

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Riparian/Riverine corridors cont'd		Gateway Pueblo/ Precontact/ Spanish Colonial Santa Fe Trail/Civil War Ranching/ Preservation		Temperature	≤20° C coldwater fishery (NMED)	Pecos River: 10.7-24.9 July (measured 2001), exceedances common during summer months Glorieta Creek: exceedances common during summer months
				Turbidity	≤10 ntu (NMED)	Pecos River: 37.2, 62.8, 26 (measured 2001) Glorieta Creek: 16.4, 17.7, 20.7 (measured 2001)
				pH	6.6-8.8 (NMED)	Pecos River: Median 8.3, Mean 8.1 (Porter and Longley 2009; Johnson et al. 2011) Glorieta Creek: Median 8.1, mean 8.1 (Porter and Longley 2009; Johnson et al. 2011)

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Riparian/Riverine corridors cont'd		Gateway		Total Nitrogen	≤10 mg/l (NMED)	Pecos River: Within limits (NMED)
		Pueblo/ Precontact/ Spanish Colonial				Glorieta Creek: Exceeded limit at sampling site below Conference Center (NMED)
		Santa Fe Trail/Civil War				
		Ranching/ Preservation	Water Rights [Surface and Groundwater]	Ownership of water rights	Obtain water rights (NPS Water Rights Division): Secure Pecos River water right for irrigation of 70 acres Secure permits to withdraw groundwater from Forked Lightning Ranch House well, Trading Post well, Visitor Center well	Possible water right for irrigating 70 acres from Pecos River Permit for Headquarters well No permits for Forked Lightning Ranch House well, Trading Post well, and Visitor Center well
		Aquifer characterization	Elevation of the water table	TBD	TBD	
	Erosion resulting in unacceptable degradation of resources is diminished or under control. (Landscape Goal)		Soil Quality and Function	Pedestals, exposed plant roots, rills, gullies, wind scours, and soil deposition (assessed qualitatively)	Minimize soil loss and disturbance and ensure that soils retain their productivity and ability to properly function.	TBD (need soil survey and rangeland health condition assessment)

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
<p>Landscape: Ranching/ Grasslands</p> <p>Includes: The Ranching component landscape (incl. Ranch House complex, Trading Post complex), and all grasslands/ grassland piñon-juniper mix areas within the Pecos Unit</p>	<p>Component landscapes are documented, preserved, protected, and receive treatment consistent with their historic and ecological significance and interpretive value. (Landscape Goal)</p>	<p>Gateway</p> <p>Pueblo/ Precontact/ Spanish Colonial</p> <p>Santa Fe Trail/Civil War</p> <p>Ranching/ Preservation</p>	<p>Historic integrity (location, setting, design, materials, workmanship, feeling, association, species composition, community structure, land management techniques)</p>	<p>Integrity and condition of:</p> <ul style="list-style-type: none"> • Spatial relationships (e.g., fence remains) • Circulation patterns and features (e.g., Fogelson Road, Horse Pasture Road, Austin Road, trace, other ranch roads, Ninas trail, bridge over Glorieta Creek) • Historic vegetation (e.g., within Trading Post courtyard and around buildings, within Ranch House courtyard and around buildings IF not invasive, historic forage species IF not invasive or ecologically detrimental) • Small-scale features (e.g., Santa Gertrudis sign, Ranch house hitching post, Ninas trail sign, remains of ranching windmills/watering troughs) • Other contributing elements to be identified in CLR See sections below for views/vistas, historic structures, and ethnobotanical vegetation 	<p>Historic integrity of National Historical Landmark resources is high</p> <p>Historic integrity of National Register eligible resources is retained</p>	<p>NHL integrity TBD</p> <p>Overall Integrity is retained (“moderate to high”, Cultural Landscape Overview)</p>

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition	
Landscape: Ranching/ Grasslands, .cont'd		Gateway		% and compatibility of non-contributing elements	100% compatible	TBD	
		Pueblo/ Precontact/ Spanish Colonial	Condition	Cultural Landscape Inventory condition: Good, Fair, Poor	100% Landscapes in Good condition	TBD	
	Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire. (Landscape Goal)	Santa Fe Trail/Civil War	Fuels composition	Fuels that are likely to carry unwanted fire	Absence of fuels that are likely to carry unwanted fire	Fuels likely to carry unwanted fire are absent	
		Ranching/ Preservation	Spatial organization of open areas	Coincidence of current pastures and historic open areas	TBD	TBD	
	Historic grasslands of the area are maintained and the biological diversity is enhanced. (Landscape Goal)		Location of historic grasslands	TBD (Interim management = continue current strategies until documentation/planning with compliance determined)	Determine planning needs; complete appropriate planning processes	TBD	
			Biological diversity				
	Healthy, sustainable, grass dominated communities within the piñon-juniper woodland are restored to stabilize soils and protect cultural resources. (Landscape Goal)			Community composition, health, and integrity	Wet deposition of Nitrogen	<1 kg/ha/yr (Good)	1.86 kg/ha/yr (Moderate)
					Ozone levels	≤ 60ppb (Good; EPA will probably revise in 2010)	71.3 ppb (Moderate)
					Key native grassland species	Presence of key native grassland species	TBD
					Nonnative, invasive species	Absence or effective control of nonnative, invasive species that do not have cultural significance	Southern Plains Inventory and Monitoring Network observed multiple exotic species Possibility of rapid assessment TBD (what species have cultural significance?)

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Ranching/ Grasslands, cont'd.		Gateway Pueblo/ Precontact/ Spanish Colonial		Grassland monitoring protocol/fire effects monitoring.	Continuation of grassland monitoring protocol/fire effects monitoring.	Grassland monitoring and fire effects monitoring currently underway.
		Santa Fe Trail/Civil War Ranching/ Preservation	Soil Quality and Function	Combination of 17 indicators measuring soil/site stability, hydrologic function, and the integrity of the biotic community (Rangeland Health Indicator Evaluation Matrix)	Maintain significant historic landscape resources by conserving soils consistent with maintenance of the associated historic practices, and by minimizing soil erosion to the extent possible.	TBD (need soil survey and rangeland health condition assessment)
	Erosion resulting in unacceptable degradation to resources is diminished or under control. (Landscape Goal)		Soil Quality and Function	Pedestals, exposed plant roots, rills, gullies, wind scours, and soil deposition (assessed qualitatively)	Minimize soil loss and disturbance and ensure that soils retain their productivity and ability to properly function	TBD (need soil survey and rangeland health condition assessment)

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition	
Landscape: Woodland Includes: Area east of Riverine/Riparian landscape within Pecos Unit, which is the same as the Woodland component landscape	Landscape is documented, preserved, and protected, and receives treatment consistent with its historic and ecological significance and interpretive value. (Landscape Goal)	Pueblo/ Precontact/ Spanish Colonial Ranching/ Preservation	Historic integrity (location, setting, design, materials, workmanship, feeling, association, species composition, community structure, land management techniques)	Integrity and condition of: <ul style="list-style-type: none"> • Spatial relationships (e.g., fence remains) • Circulation patterns and features (e.g.. Colonias Road segment) • Historic vegetation if present • Small-scale features if present • Other contributing elements to be identified in CLR See sections below for Views/Vistas, Historic Structures, and ethnobotanical vegetation.	Historic integrity of National Historical Landmark resources is high Historic integrity of National Register eligible resources is retained	National Historic Landmark integrity TBD National Register integrity TBD	
				% and compatibility of non-contributing elements	100% compatible	TBD	
				Condition	Cultural Landscape Inventory condition: Good, Fair, Poor	Landscape in Good condition	TBD
				Fuels composition	Fuels that are likely to carry unwanted fire	Absence of fuels that are likely to carry unwanted fire	TBD
	Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire. (Landscape Goal)	Spatial organization of open areas	Coincidence of current pastures and historic open areas	TBD	TBD		

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Woodland, cont'd.	Healthy, sustainable, grass dominated communities within the piñon-juniper woodland are restored to stabilize soils and protect cultural resources. (Landscape Goal)	Pueblo/ Precontact/ Spanish Colonial Ranching/ Preservation	Community composition, health, and integrity	Wet deposition of Nitrogen	<1 kg/ha/yr (Good)	1.86 kg/ha/yr (Moderate)
				Ozone levels	≤ 60 ppb (Good, EPA will probably revise in 2010)	71.3 ppb (Moderate)
				Key native grassland species	Presence of key native grassland species	TBD
				Nonnative, invasive species	Absence or effective control of nonnative, invasive species that do not have cultural significance	Southern Plains Inventory and Monitoring Network observed multiple exotic species Possibility of rapid assessment TBD (What species have cultural significance?)
				Grassland monitoring protocol/fire effects monitoring	Continuation of grassland monitoring protocol/fire effects monitoring	Grassland monitoring protocol/fire effects monitoring currently underway
		Soil Quality and Function	Combination of 17 indicators measuring soil/site stability, hydrologic function, and the integrity of the biotic community (Rangeland Health Indicator Evaluation Matrix)	Maintain significant historic landscape resources by conserving soils consistent with maintenance of the associated historic practices, and by minimizing soil erosion to the extent possible.	TBD (need soil survey and rangeland health condition assessment)	

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Woodland, cont'd.	Erosion resulting in unacceptable degradation to resources is diminished or under control. (Landscape Goal)	Pueblo/ Precontact/ Spanish Colonial Ranching/ Preservation		Pedestals, exposed plant roots, rills, gullies, wind scours, and soil deposition (assessed qualitatively)	Minimize soil loss and disturbance and ensure that soils retain their productivity and ability to properly function	TBD (need soil survey and rangeland health condition assessment)
Landscape: Pueblo/ Precontact/ Mission	Landscape is documented, preserved, and protected, and receives treatment consistent with its historic and ecological significance and interpretive value. (Landscape Goal)	Pueblo/ Precontact/ Spanish Colonial	Historic integrity (location, setting, design, materials, workmanship, feeling, association, species composition, community structure, land management techniques)	Integrity and condition of: <ul style="list-style-type: none"> • Spatial relationships (e.g., relationship between settlements and field houses, relationship of meadow where traders used to camp to pueblo and mission complex) • Circulation patterns and features (e.g., trade route corridor, trails) • Historic vegetation (e.g., ethnobotanical—see section below) • Small-scale features (commemorative plaques) • Other contributing elements to be identified in CLR See sections below for Views/Vistas, Historic Structures, and ethnobotanical	Historic integrity of National Historical Landmark resources is high Historic integrity of National Register eligible resources is retained	National Historical Landmark integrity TBD Overall Integrity is retained (“moderate”, Cultural Landscape Overview)
				% and compatibility of non-contributing elements	100% compatible	TBD

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Pueblo/ Precontact/ Mission, cont'd.		Pueblo/ Precontact/ Spanish Colonial	Condition	Cultural Landscape Inventory condition: Good, Fair, Poor	Landscape in Good condition	TBD
	Erosion resulting in unacceptable degradation to resources is diminished or under control. (Landscape Goal)		Soil Quality and Function	Pedestals, exposed plant roots, rills, gullies, wind scours, and soil deposition (assessed qualitatively)	Minimize soil loss and disturbance and ensure that soils retain their productivity and ability to properly function	TBD (need soil survey and rangeland health condition assessment)
	Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire. (Landscape Goal)		Fuels composition	Fuels that are likely to carry unwanted fire	Absence of fuels that are likely to carry unwanted fire	Fuels likely to carry unwanted fire are absent
	Healthy, sustainable, biotic communities are maintained and restored to protect/enhance park resources. (Landscape Goal)		Spatial organization of open areas	Coincidence of current pastures and historic open areas	TBD	TBD
			Community composition, health, and integrity	Wet deposition of Nitrogen	<1 kg/ha/yr (Good)	1.86 kg/ha/yr (Moderate)
				Ozone levels	≤ 60 ppb (Good, EPA will probably revise in 2010)	71.3 ppb (Moderate)
				Key native species	Presence of key native species	TBD
			Nonnative, invasive species	Absence or effective control of nonnative, invasive species that do not have cultural significance	Possibility of rapid assessment TBD (what species have cultural significance?)	

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Pueblo/ Precontact/ Mission, cont'd.		Pueblo/ Precontact/ Spanish Colonial	Soil Quality and Function	Combination of 17 indicators measuring soil/site stability, hydrologic function, and the integrity of the biotic community (Rangeland Health Indicator Evaluation Matrix)	Maintain significant historic landscape resources by conserving soils consistent with maintenance of the associated historic practices, and by minimizing soil erosion to the extent possible.	TBD (need soil survey and rangeland health condition assessment)

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
<p>Landscape: Glorieta Unit</p> <p>Includes: Pigeon's Ranch Subunit, Cañoncito subunit, Camp Lewis, and corridor between camp and activity sites</p>	<p>Landscape is documented, preserved, and protected, and receives treatment consistent with its historic and ecological significance and interpretive value. (Landscape Goal)</p>	<p>Gateway</p> <p>Santa Fe Trail/Civil War</p>	<p>Historic integrity (location, setting, design, materials, workmanship, feeling, association, species composition, community structure, land management techniques)</p>	<p>Integrity and condition of:</p> <ul style="list-style-type: none"> • Spatial relationships (e.g., relationship between battle movements, and topography, arrangement/location of Pigeon's ranch functions) • Constructed water features (e.g., "well") • Circulation patterns and features (e.g., Santa Fe Trail corridor) • Historic vegetation (e.g., open meadow to northwest of Pigeon's Ranch structure, cedar tree near the well) • Small-scale features • Other contributing elements to be identified in CLR <p>Indicators for Cañoncito Subunit are TBD</p> <p>See sections below for Views/Vistas, Historic Structures, Riparian corridor, and ethnobotanical vegetation</p>	<p>Historic integrity of National Historical Landmark resources is high</p> <p>Historic integrity of National Register eligible resources is retained</p>	<p>Pigeon's Ranch Subunit: Integrity is retained (Cultural Landscape Inventory 2010)</p> <p>Cañoncito Subunit: TBD</p>

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Glorieta Unit, cont'd.		Gateway Santa Fe Trail/Civil War		% and compatibility of non-contributing elements	100% compatible	Pigeon's Ranch Subunit: Highway 50, encroaching development threaten integrity (Cultural Landscape Inventory 2010) Cañoncito Subunit: TBD
			Condition	Cultural Landscape Inventory condition: Good, Fair, Poor	Landscapes in Good condition	Pigeon's Ranch Subunit: Fair condition (Cultural Landscape Inventory 2010) Cañoncito Subunit: TBD
	Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire. (Landscape Goal)		Fuels composition	Fuels that are likely to carry unwanted fire	Absence of fuels that are likely to carry unwanted fire	TBD
			Spatial organization of open areas	Coincidence of current pastures and historic open areas	TBD	TBD
	Erosion resulting in unacceptable degradation to resources is diminished or under control. (Landscape Goal)		Soil Quality and Function	Pedestals, exposed plant roots, rills, gullies, wind scours, and soil deposition (assessed qualitatively)	Minimize soil loss and disturbance and ensure that soils retain their productivity and ability to properly function	TBD (need soil survey and rangeland health condition assessment)
	Healthy, sustainable, biotic communities are maintained and restored to protect/enhance park resources. (Landscape Goal)		Community composition, health, and integrity	Wet deposition of Nitrogen	<1 kg/ha/yr (Good)	1.86 kg/ha/yr (Moderate)
				Ozone levels	≤ 60 ppb (Good, EPA will probably revise in 2010)	71.3 ppb (Moderate)
				Key native species	Presence of key native species	TBD

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Landscape: Glorieta Unit, cont'd.		Gateway		Nonnative, invasive species	Absence or effective control of nonnative, invasive species that do not have cultural significance	TBD, possibility of rapid assessment
		Santa Fe Trail/Civil War				TBD (What species have cultural significance?)
			Soil Quality and Function	Combination of 17 indicators measuring soil/site stability, hydrologic function, and the integrity of the biotic community. (Rangeland Health Indicator Evaluation Matrix)	Maintain significant historic landscape resources by conserving soils consistent with maintenance of the associated historic practices, and by minimizing soil erosion to the extent possible.	TBD (need soil survey and rangeland health condition assessment)
Sensory Environment (Viewshed/ Soundscapes/ Night Skies)	Important scenic vistas and scenic features are not significantly diminished by development. (Desired Condition)	Gateway	Setting	Integrity of the historic setting	Integrity of setting is retained	TBD
		Pueblo/ Precontact/ Spanish Colonial	Quality	Incompatible visual intrusion as determined by context	Maintain existing scene or reduce intrusions	TBD
		Santa Fe Trail/Civil War	Integrity	Visibility levels	< 2 dv (Good)	4.44 dv (Moderate)
	Current levels of natural soundscapes are maintained or reduced. (Desired Condition)	Ranching/ Preservation		Knowledge of current and historic sound regime conditions	Soundscape Inventory completed	Ambient sound level measurements in process
				Sound level as expressed by hourly decibel (dB) level; daytime and nighttime	Maintain or reduce current decibels levels, as practicable (TBD through monitoring)	TBD

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Sensory Environment, cont'd.	Current levels of night sky visibility are maintained. (Desired Condition)		Setting	New Mexico night sky standards	100% of light sources in park meet shielded light source and New Mexico night sky standards.	TBD
			Air Quality			
			Integrity	Zenith sky brightness (magnitudes per square arcsecond) as measured by Sky Quality Meter	Keep at current or below current levels (specific measurements TBD)	TBD
				Total sky brightness (magnitudes per square arcsecond)	Keep at current or below current levels (specific measurements TBD)	TBD
			Threshold criteria for Air Quality Related Values (AQRVs) and applicable national ambient air quality standards (NAAQS)	Ozone concentration: ≤ 60 ppb (good) Wet deposition of N or S: <1 kg/ha/yr (good) Visibility: <2 dv (good)	69.2 ppb (moderate) N: 1.65 kg/ha/yr (moderate) 4.2 dv (moderate)	

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Historic Structures and Complexes	Historic structures and complexes are managed in a manner that sustains their character-defining features and significance while continuing to serve NPS management and visitor needs. (Desired Condition)	Pueblo/ Precontact/ Spanish Colonial (North and South Pueblo, Mission Churches, Casas Reales)	Historic Integrity	The following are indicators for Historic Integrity: <ul style="list-style-type: none"> • Location • Setting • Design • Materials • Workmanship • Feeling • Association 	Integrity retained National Historical Landmark integrity high	TBD
		Santa Fe Trail/Civil War (Pigeon's Ranch, Kozlowski's Trading Post)	Condition	List of Classified Structures condition definition: Good, Fair, Poor	43% (9 of 21) structures in Good condition (specifically the Convento, North and South Pueblos, 17th and 18th century Spanish churches, defensive wall, Casas Reales, Trading Post workshop, Forked Lightning Ranch pump house) None (for moldering structures such as Route 66 cabins, fencing, etc.); allow natural deterioration	9 of 21 structures in Good condition, 11 in Fair, 1 in Poor
		Ranching/ Preservation (Forked Lightning Ranch, Kozlowski's Trading Post, Route 66 Structures)	Accountability (including baseline documentation, National Register nomination, condition assessments)	Documentation/ Treatment Documents presence or absence	Documentation and treatment plans complete and current for all structures	Incomplete
			Compatible Current Uses	Secretary of Interior Standards for compatibility of current/proposed uses	Current uses meet compatibility standards	Compatibility standards met

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Historic Structures and Complexes, cont'd.				Destructive flora or fauna	TBD (for example, 100% reduction of kochia)	TBD
				Use of structures for habitation	Only compatible co-habitation	TBD
				Soil/Site stability	Maintain significant historic landscape resources by conserving soils consistent with maintenance of the associated historic practices, and by minimizing soil erosion to the extent possible.	TBD (need soil survey and rangeland health condition assessment)

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Archaeological Sites	Archaeological sites, artifacts, pictographs, and petroglyphs are identified, evaluated for their significance, and protected in place. (Desired Condition)	Pueblo/ Precontact/ Spanish Colonial (Pueblo and Spanish Colonial sites, other prehistoric pueblos in area, other associated sites) Santa Fe Trail/Civil War (Santa Fe Trail ruts, Civil War sites, Hispanic homesteads, other associated sites) Ranching/ Preservation (Sites associated with Tex Austin or Fogelsons, grist mill, some Hispanic homesteads, other associated sites)	Condition/Stability Integrity	Archaeological Sites Management Information System Condition, Good, Fair, Poor	41% (278 of 678) archaeological sites in Good condition.	39% (261 of 678) sites in Good condition
				Vegetation cover is stabilizing, non-threatening to site stability (vegetation cover stabilizes soils, does not create significant subsurface disturbance, e.g., not contributing to loss of archaeological integrity), and managed to minimize threat of intensive, long-duration wildfire	Threat/loss of significant archaeological values due to threatening vegetation cover will be mitigated	TBD
				Soil stability (e.g., soil erosion, pedestals, surface channeling, downcutting, or deflation is diminished or under control)	Threat/loss of archaeological values due to soil instability will be mitigated	TBD
				Human disturbances (visitor, park management) do not result in impacts to site	Sites within the park will be managed in a manner that results in no adverse impacts as a result of present day human activities	TBD

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Archaeological Sites, cont'd.			Accountability (including baseline documentation, National Register nominations, current condition assessments, and identification and development of needed treatment plans)	% of sites identified and documented, % National Register of Historic Places evaluated and nominated, and % condition assessed	100% of sites identified and documented, National Register of Historic Places nominated if appropriate, and with current condition assessments	<p>Surveys of main unit, Pigeon's Ranch Subunit, and Cañoncito Subunit complete</p> <p>Unknown number of subsurface sites identified</p> <p>Baseline documentation is complete and meets standards</p> <p>Determination of eligibility and subsequent National Register of Historic Places nomination needs to be completed on all 678 sites</p> <p>Current/updated condition assessments needed for 266 of 678 sites</p>

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Museum Collections	Museum collections are preserved and protected by meeting NPS museum standards. (Desired Condition)	Gateway	Condition	Applicable Preservation and Protection Standards	56% (122 of 216) standards met	56% 122 of 216 met
		Pueblo/ Precontact/ Spanish Colonial	Accountability	% of collection catalogued	100% of collection catalogued	Backlog of over 76,000 items
	Santa Fe Trail/Civil War	Accessibility	% of research requests responded to	100% research requests responded to	Approximately 30 requests received and responded to each year (100%)	
	The contents of the collection are accessible to researchers and the public, e.g., through the use of exhibits, internet, and other mediums. (Desired Condition)	Ranching/Preservation				
Ethnographic	A balance of traditional use access and resource protection is identified, maintained, and/or improved. (Desired Condition)	Pueblo/ Precontact/ Spanish Colonial	Accountability (including resource identification and knowledge of customs/traditional uses)	Ethnographic study	Ethnographic overview and assessment complete	Overview and assessment complete
				Significant species (status and trend)	All significant species identified and monitored	TBD
				Species distribution (vegetation map)	Vegetation map completed	In process (Johnson et al. 2011)
			Accessibility based on management guidelines	Public Access Plan (addresses front-country and backcountry)	Public Access Plan complete	Needed
			Integrity of ethnographically significant resources	Archaeological Sites Management Information System Condition	Acknowledged sites are in agreed upon condition	Sites that are acknowledged by ethnographic groups are in agreed upon condition

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition	
Ethnographic, cont'd				Ethnographic overview and assessment, and/or consultation	Ethnographic overview and assessment complete	Ethnographic overview and assessment complete	
	All affiliated tribes feel welcome at Pecos and understand and appreciate their connections to the park. (Desired Condition)		Accessibility based on management guidelines	Traditionally-associated populations are accessing the site	Traditionally-associated populations are accessing the site	Traditionally-associated populations are accessing the site	
	Official tribal government and stakeholder connections to the park and its resources are fostered and maintained. (Desired Condition)			Compliance/ Consultation	Meetings and events	Meetings and events held as necessary	Meetings and events are held as necessary
					Communication	Compliance consultations	All compliance consultations completed
				Stakeholder communications	Stakeholders notified	Stakeholders are notified	
				NAGPRA compliance	NAGPRA compliance complete	NAGPRA inventories and repatriation complete NAGPRA summaries require further consultation	

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Educational Opportunities	The public understands the value and significance of traditional practices. (Desired Condition)	Gateway Pueblo/ Precontact/ Spanish Colonial Santa Fe Trail/Civil War Ranching/ Preservation	Visitor Access	Comprehensive Interpretive Plan	Comprehensive Interpretive Plan completed and updated on schedule	Updated in 2005
			Visitor Understanding			
			Appropriate Facilities	Visitor Survey Cards	85% of visitors understand the significance of the park	75% (FY98–03)
			Interpretive Programs		96% of visitors are satisfied with park facilitated programs	TBD
	Visitors understand and appreciate the area's human history and the interconnectedness with its natural features. (Desired Condition)		Public Access Plan	Public Access Plan completed	Needed	
				97% of visitors are satisfied with appropriate park facilities, services, and recreational opportunities	Above 95% (FY99–03)	
	The public understands and appreciates the significance of collected objects and their connections to the park. (Desired Condition)		Visitor Facilities	Appropriate facilities are present	TBD	
	A diverse range of safe visitor experiences exist within the context of the natural and cultural resources associated with the Battle of Glorieta. (Desired Condition)					

Table 3-3. Cont'd.

Resources and Values	Desired Condition or Landscape Goal	Context	Important Attributes	Indicator	Target Value	Current Condition
Educational Opportunities, cont'd	The visitor contact station and museum for the Glorieta Battlefield is established and in operation. (Desired Condition)	Gateway				
	The park is active in educating the local communities about the battle. (Desired Condition)	Pueblo/ Precontact/ Spanish Colonial				
	A diverse range of safe visitor experiences exist within the context of the resources associated with the Forked Lightning Ranch unit. (Desired Condition)	Santa Fe Trail/Civil War				
	Visitors have an understanding of the relationship between the Native American and Spanish Colonial culture and traditions from initial contact to present day. (Desired Condition)	Ranching/ Preservation				

Sources:

NPS. 2009. Pigeon's Ranch, Pecos National Historical Park. Cultural Landscape Inventory. National Park Service: Cultural Landscapes Inventory website database. Hardcopy available from NPS Intermountain Region Office, Santa Fe, New Mexico.

Cowley, J., M. Joseph, and D. Rhodes. 1998. Cultural Landscape Overview, Pecos National Historical Park, New Mexico. Report on file, Pecos National Historical Park, New Mexico.

Muldavin, E., B. Sims, and L. Johnson. 1993. Pecos Wild and Scenic River Instream Flow Report. New Mexico Natural Heritage Program, University of New Mexico, Albuquerque.

Porter, S. D. and G. Longley. 2009. Water Quality Issues and Trends in the Pecos River and Glorieta Creek, Pecos National Historical Park, National Park Service: 1994–2009. Edwards Aquifer Research and Data Center, Texas State University, San Marco, Texas.

Johnson, K., T. Neville, and R. E. Bennetts. 2011. Natural Resource Condition Assessment for Pecos National Historical Park. Natural Resource Technical Report NPS/SOPN/NRTR-2011/XXX. Fort Collins: National Park Service.

Prichard, Don. 2003. A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas. TR 1737-16. Denver: Bureau of Land Management.

Notes: TBD = To Be Determined; EPA = Environmental Protection Agency; NMED = New Mexico Environment Department; NAGPRA = Native American Graves Protection and Repatriation Act; USGS = US Geological Survey. Shading added to assist with readability.

4 Status of Resource Knowledge

Appropriate knowledge of park resources is essential for the NPS to effectively meet its resource stewardship responsibilities. This knowledge is provided through basic resource inventories, long-term monitoring of resource conditions, investigations and research, and integration or synthesis of scientific and scholarly resource information. To meet the NPS resource stewardship responsibilities, “appropriate knowledge” is achieved when the quality of resource information is complete enough to be useful and reliable for stewardship decision-making needs. Remediation of shortfalls in resource knowledge is integrated into Comprehensive Strategies in this RSS. Specific, focused investigations may be required to provide the level of resource knowledge necessary to manage complex issues. When the need is identified, such investigations are integrated into the Comprehensive Strategies in the RSS.

In contrast to the other sections of this RSS, the information in this section is presented in the traditional categories of cultural and natural resources. Because inventories, reports, and planning divide along these lines, reflecting both management practice and boundaries between disciplines, attempting to create a new organization would obscure more than illuminate.

See Table 4-1 for a list of relevant inventories and reports. For more extensive descriptions of natural resources and condition, see the park’s Natural Resource Condition Assessment (Johnson et al. 2011).

4.1 Air Quality

Two air quality monitoring stations are located near Pecos National Historical Park: visibility monitoring sites for the Interagency Monitoring of Protected Visual Environments (IMPROVE) Program are located at Bandelier National Monument and Wheeler Peak in New Mexico. A National Atmospheric Deposition Program/National Trends Network (NADP/NTN) site monitors precipitation chemistry at Bandelier National Monument. Mercury wet deposition monitoring stations are located at Valles Caldera National Preserve in Sandoval County NM and Navajo Lake in Rio Arriba County, New Mexico (Johnson et al. 2011). Current air quality data and condition status is available on the NPS Air Resources Division website (www.nature.nps.gov/air/planning/). The NPS Air Resources Division completed a summary report of air quality for parks in the Southern Plains Inventory & Monitoring Network in 2005. The NPS Air Resources Division Annual Performance and Progress Report for 2009 is also available.

4.2 Archaeological Sites

Numerous archaeological sites are located throughout the park. A total of 678 site records are entered in the Archaeological Sites Management Information System (ASMIS) database. These include other prehistoric pueblos, lithic scatters, rock shelters, Hispanic homesteads, and trash dumps. A total of 278 sites are presently recorded as being in “Good” condition, 269 are in “Fair” condition, 108 are in “Poor” condition, and 38 are in an unknown condition. A total of 272 records are missing required data fields. The quality of this data from ASMIS is questionable and it may not accurately reflect current conditions and the intended ASMIS definitions are in question.

The vast majority of the sites within the park have been identified as a result of several large-scale archaeological surveys. The original monument and the portions of the Forked Lightning Ranch added to the park in 1990 were surveyed in the 1970s and later in the 1990s by NPS personnel. These survey efforts are reported in Nordby's (1993) archaeology management summary and a Cultural Resources Inventory (Head and Orcutt 2002). Both subunits of the Glorieta Unit have also been subject to archaeological inventories; Gerow (2010) reported on the Pigeon's Subunit survey and the Cañoncito Subunit final report is expected in early 2011. Numerous other archaeological investigations (e.g., small-scale clearance survey, subsurface testing, site monitoring, metal detecting, architectural documentation, and artifact analyses) have been conducted in response to specific research questions or management needs. These investigations have contributed to a variety of research questions concerning prehistoric (pre-Puebloan), Puebloan, Hispanic, and nineteenth- and twentieth-century Euroamerican occupation, the Civil War, the Santa Fe Trail, and the development of regional travel and trade patterns.



Site of the Tererro Mine, which operated during the early twentieth century. Although not part of Pecos National Historical Park, the mine was an important influence on the history of the area and minerals leaching into the surface and groundwater impacted water quality in the Pecos River and its watershed. Photo by Maren Bzdek.

Although most of the park has been surveyed, and a great deal of information exists concerning archaeological sites, the information is scattered and difficult to retrieve. An accessible database of all information relating to archaeological sites needs to be developed. A database of all GIS/locational data is also crucial for archaeological site management.

4.3 Cultural Landscapes

A Cultural Landscapes Overview for the main park unit, which serves as a preliminary Cultural Landscapes Report, was completed in 1998 (Cowley et al. 1998). The Cultural Landscapes Overview covered the Pecos Unit and the Pigeon's Ranch Subunit. It identified five component landscapes within the Pecos Unit. These landscapes are the Pueblo/Mission/Monument, the Riverine/Hispanic Settlement, the Kozlowski's Trading Post, the Orchard/Mill, and the Ranch House. In addition, the Pigeon's Ranch Subunit and the Cañoncito Subunit are also component landscapes.

A Cultural Landscapes Inventory was completed for the Pigeon's Ranch Subunit (NPS 2009b). Cultural Landscape Inventories are needed for the other six component landscapes; a Cultural Landscape Inventory is scheduled to begin in 2011 for the Forked Lightning Ranch. During completion of the remaining Cultural Landscape Inventories and component landscape boundaries, a discrete portion of the landscape which can be further subdivided into individual features, will be reconsidered and may be changed. A parkwide Cultural Landscape Report is an especially urgent need for the park in order to determine how the landscapes should be managed.

4.4 Ethnography

Strengthening, maintaining, and creating new long-term, ongoing relationships with tribes and stakeholders is an opportunity for the park and consultation with associated tribes is an ongoing activity. Levine et al. (1994) completed an ethnographic overview of Pecos National Historical Park. The park has received an increasing number of requests from tribes for access to the park for traditional ceremonial use and also receives requests for the harvesting of certain flora for traditional and ceremonial purposes. Balancing these needs with resource protection is an issue that needs to be addressed.

4.5 Fauna

Mammals. Only one comprehensive survey of mammals has been conducted at the park (Parmenter and Lightfoot 1994). The list of mammal species detected from all sources includes thirty-four species from thirteen families. The list of likely mammal species compiled by Parmenter and Lightfoot (1994) includes thirty-three species from twelve families. This single mammal survey was conducted seventeen years ago; updated information is needed (Johnson et al. 2011).

Birds. Birds are the most thoroughly studied animal group at the park, with four surveys completed. Mukai (1989) conducted a thorough survey of the Forked Lightning Ranch before it became part of the park. More recently, researchers conducted surveys of the main unit were in 2002, 2008, and 2009. The NPS began a long-term bird monitoring program at the park in 2009, with surveys conducted in 2009 and 2010. In addition, a Breeding Bird Survey route starts in the town of Pecos and proceeds south along State Route 63 through some of the high grassland habitat of the main unit. The Breeding Bird Survey started in 1973 and continues every year.

In spite of multiple bird surveys conducted in the park over the past twenty years, several conspicuous data gaps exist. The back country area encompasses primarily piñon-juniper, with small amounts of ponderosa pine and Douglas fir vegetation types. This reporting unit has received almost no survey effort, but it covers approximately forty-four percent of the main unit.

The Gray Vireo, one of only two listed bird species known to occur in the park, has not been observed in any of the recent surveys. This species is of particular importance because their primary habitat is piñon-juniper, much of which has not been surveyed in the park (Johnson et al. 2011).

4.6 Historic Structures

Pigeon's Ranch. As of 2008, both the Pigeon's Ranch building and well were considered to be in Fair condition according to the List of Classified Structures.

A Historic Structures Report was completed in 2009 for Pigeon's Ranch. A separate condition assessment was completed in 2002.



Exterior of the Forked Lightning Ranch House. Photo by Maren Bzdek.

Forked Lightning Ranch. As of 2008, the Forked Lightning Ranch House, Casita, Pump House, Skeet Range, and Root Cellar were in Fair condition. The Ranch Stable was in Poor condition, and the Ranch Fence and Ranch Bridge were in Good condition according to the List of Classified Structures.

A Historic Structures Report was completed in 2002 for the Forked Lightning Ranch house and Pump House. The report should be updated or a new Historic Structures Report should be completed. A Historic Furnishings Report is an identified need.

Kozlowski's Trading Post. As of 2008, the Trading Post, Trading Post Barn, Workshop, Root Cellar and Tack Barn were all in Fair condition according to the List of Classified Structures.

A Historic Structures Report was completed in 2002 for the Trading Post. The report should be updated or a new Historic Structures Report should be completed. The park plans to begin updating the Historic Structures Report and preparing a National Register of Historic Places nomination for the Trading Post in 2011.

Mission/Pueblo complex. The Convento, South Pueblo, North Pueblo, Eighteenth-Century Church, Seventeenth-Century Church, Casas Reales, and Defensive Wall are all in Good condition according to the List of Classified Structures.

A Historic Structures Report was completed in 1996 for the mission and pueblo complex, but the report may need to be updated or a new Historic Structures Report may need to be completed.

As with archaeological sites, much of the information regarding previous stabilization and preservation work on historic structures is not readily available. This information needs to be compiled and a documentation plan for future preservation work developed.

4.7 Interpretation

A Comprehensive Interpretive Plan was completed in 2005. Along with the park's Annual Implementation Plans and Interpretive Database, the plan has guided the development of the interpretive program at the park. The plan is due to be updated in the near future.

4.8 Museum Collections

A Collections Management Plan was completed in 1989 and is very outdated, particularly as it was written before the park's expansion and does not include the current storage facility. A project to complete a new Collections Management Plan is tentatively scheduled to be funded in Fiscal Year (FY) 2014. Recommendations that will be documented in a new Collections Management Plan will include the need for Housekeeping Plans for all museum facilities, a Collection Storage Plan, a Fire Protection Survey, a Security Survey, a Museum Emergency Operation Plan, update current Integrated Pest Management Plan (NPS 1998b), and improve needed to the exhibit and storage areas. A Collections Condition Survey has not been completed for the park. Projects have been submitted to the Servicewide Comprehensive Call (SCC) for funding these needs in the future.

4.9 Riparian

Several studies and assessments have been made of riparian habitat at Pecos. These include a riparian and wetlands survey by Esteban Muldavin (1991) and a report on the evaluation of the functional condition of the Pecos River and lower reaches of Glorieta Creek by Joel Wagner and Michael Martin (2010).

Pecos National Historical Park is currently undertaking a pilot catch and release fishing program on the Pecos River. The General Management Plan (1996) provided the direction for this program, stating: "Fishing would be allowed by permit only and would be strictly managed to preserve and protect this sensitive riparian habitat, cultural resources, and public health." The park will soon be initiating the NEPA compliance process addressing public access to the Forked

Lightning Ranch. The pilot fishing program will be reviewed and finalized as part of that process.



Glorieta Creek after a rain event. NPS photo.

4.10 Sensory Environment

4.10.1 Viewshed/Night Skies/Soundscapes

Congress passed the National Parks Air Tour Management Act of 2000 to regulate commercial air tour operations over units of the National Park System. The Volpe Center's Acoustics and Air Quality Facilities are supporting the Federal Aviation Administration and Western Pacific Region, and are working cooperatively with the NPS in the development of Air Tour Management Plans for all national parks with commercial air tours. The objective of the ATMPs is to develop acceptable and effective measures to mitigate or prevent significant adverse impacts from air tours on the resources, visitor experiences, and tribal lands within the parks. Pecos National Historical Park will need an Air Tour Management Plan.

A major component of establishing noise impacts is the determination of representative baseline sound levels, or ambient levels, for the park. The Volpe Center performed sound level measurements at the park from July to September 2010. This study used specially designed low-level measurement systems deployed at multiple sites within the park and collected continuous

sound level data over a period of several weeks. As of this writing, the park has not received the results of this study.

Inventories of both soundscapes and critical viewsheds in the park are needed. Night sky measurements are needed to establish baseline data.

4.11 Soils

A soil survey was completed in 1997 however it does not meet National Cooperative Soil Survey standards.

4.12 Surface Water Quality and Quantity

The Baseline Water Quality Data Inventory and Analysis for Pecos National Historical Park addressed water quality at the park up to 1995 (NPS 1995a). The most comprehensive, recent water quality survey of the Pecos River and Glorieta Creek was conducted by the New Mexico Environment Department in 2001. The 2010 data was collected by New Mexico Environment Department and may already be available. Park personnel have been collecting water quality data on a more limited set of measures from 1994 through the present. Data from 1994 through 2009 has recently been summarized and reviewed by Porter and Longley (2009). These studies provide the most recent data available to assess current condition for water quality parameters at Pecos. New Mexico Environment Department plans to sample the area again in 2010.

Park personnel have collected data within park boundaries since 1994. Data were collected at three stations: in Glorieta Creek upstream of the confluence with the Pecos River, in the river near the Forked Lightning Ranch House, and in the river about 1.3 miles downstream from the confluence with Glorieta Creek. Collections occurred on monthly to bi-monthly intervals. In 2010, the Southern Plains Inventory & Monitoring Network instituted a water monitoring program at the park.

No long-term discharge record exists for Glorieta Creek. A US Geological Survey gauging station (08378500) nine miles upriver from the town of Pecos collects Pecos River discharge data; no other station exists in or closer to the park. The discharge data from the US Geological Survey Pecos station do not reflect actual flow rates within the park, due to the unknown inputs and outputs, which are difficult or impossible to accurately assess. The lack of water quantity data from the park's primary water source constitutes an important data gap that could be addressed by placing a gauging station at the northern boundary of the park. Similar data gaps exist for discharges from Glorieta Creek, Galisteo Creek, and the five springs. Galisteo Creek flows intermittently and Glorieta Creek discharges are highly influenced by conference center effluent; thus, acquiring discharge data from the Pecos River is likely a priority over data from the creeks. The Water Resource Management Plan (NPS 1995b) recommended that the park conduct a full inventory of wells and springs, including water rights, quality, and supply. These data gaps have not yet been addressed (Johnson et al. 2011).



Severe erosion is a concern at Pecos National Historical Park. NPS photo.

4.13 Vegetation

A vegetation survey conducted between 1992 and 1994 resulted in 354 species of vascular plants, 57 of which were exotic species (Sivinski 1995). With assistance of the Bandelier National Monument Fire Effects Monitoring Module, the fire program at Pecos National Historical Park completed some vegetation monitoring at the park. Beginning in 2010, the Southern Plains Inventory & Monitoring Network started vegetation monitoring and will soon collaborate with the Bandelier Fire Effects Monitoring Module and Pecos National Historical Park fire program. The Southern Plains Inventory & Monitoring Network also will monitor exotics to a limited extent as well as riparian vegetation.

4.14 Visitor Use and Access

An interpretive trail on the Pigeon's Ranch section of the Glorieta Battlefield was completed in 2009 and the construction of another is scheduled to begin in 2011. The Cañoncito Unit and much of the Forked Lightning Ranch remain closed to public access while park staff determines appropriate management strategies for these units, and their interpretive potential has not been realized. An Environmental Assessment for a Public Access Plan for Pigeon's Ranch has been drafted. Work on a Public Access Plan for the Forked Lightning Ranch area is scheduled to begin in the near future.



A visitor stops at an interpretive marker to read the corresponding trail guide while hiking the recently opened trail on the Glorieta Pass battlefield. Photo by Cori Knudten.

Table 4-1. Relevant reports and inventories to resource knowledge

Type or Title	Status	Notes or Citation
Archaeological Overview and Assessment	Some subsurface sites needed	<p>Oakes, Y. R. 1995. Pigeon's Ranch and the Glorieta Battlefield: An Archeological Assessment. Archaeology Notes 123, with contributions from Don E. Alberts and Betsy Swanson. Museum of New Mexico, Office of Archaeological Studies, Santa Fe, New Mexico.</p> <p>Nordby, L. V. 1993. Pecos Archeological Survey: A Management Summary. Manuscript on file, Pecos National Historical Park, Pecos, New Mexico.</p> <p>Haecker, C. M. 1998. Archaeological Remote Sensing Survey of the Civil War Site of Camp Lewis, Pecos National Historic Park, San Miguel County, New Mexico. Report on file, Pecos National Historical Park, Pecos, New Mexico.</p>
Cultural Resource Inventories	Complete	<p>Cañoncito Unit Cultural Resource Inventory starts in 2010</p> <p>Head, G. N., and J. D. Orcutt, eds. 2002. From Folsom to Fogelson: The Cultural Resources Inventory Survey of Pecos National Historical Park. 2 vols. Intermountain Cultural Resources Management Paper No. 66. National Park Service, Intermountain Region Support Office, Santa Fe, New Mexico.</p> <p>Torres-Nez, J. 2007. Cultural Resource Inventory of the Glorieta Battlefield Interpretive Trail Project, Pecos NHP, Pecos New Mexico. Copy of report on file, Pecos National Historical Park, Pecos, New Mexico.</p> <p>Gerow, P. A. 2010. Cultural Resources Inventory of Pigeon's Ranch Subunit, Pecos National Historical Park, Santa Fe, New Mexico. Report on file, Pecos National Historical Park, Pecos, New Mexico.</p>
Cultural Resource Bibliography	Incomplete	Preliminary bibliography prepared in 1992.
Cultural Landscape Inventories (Cultural Landscape Inventory)	Needed	<p>NPS. 2009. Pigeon's Ranch, Pecos National Historical Park. Cultural Landscape Inventory. National Park Service: Cultural Landscapes Inventory website database. Hardcopy available from NPS Intermountain Region Office, Santa Fe, New Mexico.</p> <p>Cultural Landscape Inventories needed for other six component landscapes</p>
Cultural Landscape Reports	Needed	Cowley, J., M. Joseph, and D. Rhodes. 1998. Cultural Landscape Overview, Pecos National Historical Park, New Mexico. Report on file, Pecos National Historical Park, New Mexico. (Document serves as preliminary Cultural Landscape Report).

Table 4-1. Cont'd.

Type or Title	Status	Notes or Citation
Historic Structure Reports	Complete	<p>Spude, R. L. 2008. Pigeon's Ranch Historic Structure Report. Intermountain Cultural Resource Management Paper No. 74. Santa Fe, New Mexico: National Park Service, Intermountain Region Support Office.</p> <p>Sloan, D. 2002. Historic Structures Report: Trading Post, Forked Lightning Ranch House, Forked Lightning Pump House: Pecos National Historical Park. Report on file, Pecos National Historical Park, Pecos, New Mexico.</p> <p>Ivey, J. E. 1996. "Unique in All Respects": The Structural History of Pecos National Historical Park. Intermountain Cultural Resources Management Professional Paper No. 59. Draft report on file, Pecos National Historical Park, Pecos, New Mexico.</p>
List of Classified Structures	Ongoing	Updates to internal List of Classified Structures database" Mission/Pueblo complex last assessed 2006; Forked Lightning Ranch structures last assessed 2008; Pigeon's Ranch structures last assessed 1998.
National Register of Historic Places	Needs updating	Existing nominations need to be updated and new nominations may need to be completed.
Park Administrative History	Incomplete	Ivey, J. E. 1987. A History of the Establishment of Pecos National Monument. Report on file, Pecos National Historical Park, Pecos, New Mexico.
Environmental History	Complete	Knudten and Bzdek. 2010. Crossroads of Change: An Environmental History of Pecos National Historical Park. With two chapters by Maren Bzdek. Colorado State University, Public Lands History Center, Fort Collins, Colorado.
Collection Condition Survey	Needed	—
Scope of Collections Statement	Complete	Completed 2010
Interior Collections Management System (ICMS)	Ongoing	Total of 625 accession records and 32,359 catalog records.
Archeological Site Management Information System (ASMIS)	Incomplete	Total of 679 records; 272 records are missing the required data fields that need to be completed
Ethnographic Overview and Assessment	Complete	Levine, F., M. Norcini, and M. Foster. 1994. An Ethnographic Overview of Pecos National Historical Park. Report on file, Pecos National Historical Park, Pecos, New Mexico.
Natural Resource Bibliography	Ongoing	Continually updated as new documents are completed
GIS Data	Needed	Although GIS data for the park exists, it needs to be collected into an accessible database for park staff.
Geologic Resources Inventory	In Process	Report planned after 2011 (Southern Plains Inventory & Monitoring Network)
Soil Survey	In Process	<p>Johnson, K., T. Neville, and R. E. Bennetts. 2011. Natural Resource Condition Assessment for Pecos National Historical Park. Natural Resource Technical Report NPS/SOPN/NRTR-2011/XXX. National Park Service, Fort Collins, Colorado.</p> <p>NPS Soil Resources Inventory is currently in negotiation with the USDA Natural Resources Conservation Service to update the soils information and ecological site descriptions as part of the Inventory and Monitoring Program. Update should be initiated in the fall of 2012.</p>

Table 4-1. Cont'd.

Type or Title	Status	Notes or Citation
Weather Data	Ongoing	<p>Available 1988–present</p> <p>Davey, Christopher A., Kelly T. Redmond, and David B. Simeral. 2007. Weather and Climate Inventory: Southern Plains Network. Natural Resource Technical Report NPS/SOPN/NRTR—2007/040. Fort Collins, CO: National Park Service, 2007.(</p>
Air Quality Data	Needs updating	<p>National Park Service. 2010. Air Quality in National Parks: 2009 Annual Performance and Progress Report. Natural Resource Report NPS/NRPC/ARD/NRR—2010/266. Air Resources Division, Denver, Colorado.</p>
Water Quality Data	Ongoing	<p>Baseline water quality data (inventory completed by Southern Plains Inventory & Monitoring Network)</p> <p>National Park Service. 1995. Baseline Water Quality Data Inventory and Analysis, Pecos National Historical Park. Technical Report NPS/NRWRD/NRTR-95/66. Water Resources Division, Fort Collins, Colorado.</p> <p>Jacobi, G. Z. and D. M. Jacobi. 1998. Water Quality Assessment of the Pecos River and Glorieta Creek, Pecos National Historical Park, New Mexico. Santa Fe: National Park Service, Southwest Regional Office, Santa Fe, New Mexico.</p> <p>Porter, S. D. and G. Longley. 2009. Water Quality Issues and Trends in the Pecos River and Glorieta Creek, Pecos National Historical Park, National Park Service: 1994–2009. Edwards Aquifer Research and Data Center, Texas State University, San Marco, Texas.</p> <p>New Mexico Environment Department, some data</p> <p>Park monitoring</p>
Water Resources	In Process	<p>National Park Service. Water Resources Scoping Report. 1995.</p> <p>Edwards Aquifer Research and Data Center. 2007. Review of and Recommendations for Hydrologic-Monitoring Activities in Southern Plains Network, National Park Service. Texas State University, San Marco, Texas.</p> <p>Johnson, K., T. Neville, and R. E. Bennetts. 2011. Natural Resource Condition Assessment for Pecos National Historical Park. Natural Resource Technical Report NPS/SOPN/NRTR-2011/XXX. National Park Service, Fort Collins, Colorado.</p> <p>Stream Condition Index: Park needs to work with New Mexico Environment Department to conduct surveys (M-SCI) in the Pecos River to evaluate stream condition</p>
Vegetation Map	In Process	<p>Southern Plains Inventory & Monitoring Network</p>

Table 4-1. Cont'd.

Type or Title	Status	Notes or Citation
Wetlands and Riparian Area Inventories/Assessments	Incomplete	<p>Muldavin, E. 1991. Riparian and Wetlands Survey: Pecos National Historical Park. University of New Mexico, Albuquerque.</p> <p>Wagner, J. and M. Martin. 2010. Trip Report on evaluation of the functioning condition of the Pecos River and Glorieta Creek. Copy of report on file, Pecos National Historical Park, Pecos, New Mexico.</p>
Floodplains		Federal Emergency Management Agency flood insurance maps—community panels 350132-0091A and 350069-0275B
Large Mammal Inventories	Complete	Parmenter, R. R. and D. C. Lightfoot. 1994. Field Survey of the Faunal Resources on the Pecos National Historical Park, Pecos, New Mexico. Report on file, Pecos National Historical Park, Pecos, New Mexico.
Small Mammal Inventories	Complete	Parmenter, R. R. and D. C. Lightfoot. 1994. Field Survey of the Faunal Resources on the Pecos National Historical Park, Pecos, New Mexico. Report on file, Pecos National Historical Park, Pecos, New Mexico.
Bird Inventories	In Process	<p>Lock, R., R. E. Bennetts, and H. Sosinski. 2010. Landbird monitoring in the Southern Plains Network: annual report, 2010. Natural Resource Technical Report, NPS/SOPN/NRTR—2010/XXX. National Park Service, Fort Collins, Colorado.</p> <p>For a complete list of other inventories, see: Johnson, K., T. Neville, and R. E. Bennetts. 2011. Natural Resource Condition Assessment for Pecos National Historical Park. Natural Resource Technical Report NPS/SOPN/NRTR-2011/XXX. National Park Service, Fort Collins, Colorado.</p>
Fish Inventories	In Process	<p>Pittinger, J. S. 1997. Fish community structure and aquatic habitat at Glorieta Creek, Pecos National Historical Park, San Miguel, New Mexico.</p> <p>Patten, K. A. and E. Frey. 2004, 2007, and 2010. Fishery assessment and regulation recommendations for the Pecos River within Pecos National Historical Park. (Future surveys planned every three years).</p>
Reptile and Amphibians Inventories	Incomplete	<p>Parmenter, R.R. and D. C. Lightfoot. 1994. Field Survey of the Faunal Resources on the Pecos National Historical Park, Pecos, New Mexico. Report on file, Pecos National Historical Park, Pecos, New Mexico.</p> <p>Johnson, K., G. Sadoti, G. Rácz, J. Butler, and Y. Chauvin. 2003. Southern Plains Network Inventory Report for New Mexico Parks. National Park Service.</p>
Vascular Plant Inventory—native	In Process	<p>Sivinski, R. 1995. A Botanical Inventory of Pecos National Historical Park, New Mexico. New Mexico Forestry and Natural Resource Division, Cooperative Agreement No. CA7029-2-0018, Report on file, Pecos National Historical Park, Pecos, New Mexico.</p> <p>Johnson, K., T. Neville, and R. E. Bennetts. 2011. Natural Resource Condition Assessment for Pecos National Historical Park. Natural Resource Technical Report NPS/SOPN/NRTR-2011/XXX. National Park Service, Fort Collins, Colorado.</p>

Table 4-1. Cont'd.

Type or Title	Status	Notes or Citation
Vascular Plant Inventory—exotic	In Process	<p>Sivinski, R. 1995. A Botanical Inventory of Pecos National Historical Park, New Mexico. New Mexico Forestry and Natural Resource Division, Cooperative Agreement No. CA7029-2-0018, Report on file, Pecos National Historical Park, Pecos, New Mexico.</p> <p>Johnson, K., G. Sadoti, G. Rácz, J. Butler, and Y. Chauvin. 2003. Southern Plains Network Inventory Report for New Mexico Parks. National Park Service.</p> <p>2009: Inventory by Southern Plains Inventory & Monitoring Network</p>
Soundscape Inventory	In Process	Volpe Center performed ambient sound level measurements in 2010.
Critical Viewshed Inventory and Analysis	Needed	—
Aquifer Characterization	Needed	—

Notes: SOPN = Southern Plains Inventory & Monitoring Network



The Cañoncito Subunit remains closed to the public while the National Park Service works to acquire the remaining inholdings and develop a Public Access Plan. Photo by Cori Knudten.

5 Comprehensive Strategies

Comprehensive strategies are a sequence of activities or actions based on adequate science and scholarship that enables the park to achieve or maintain desired conditions for the affected resource. Comprehensive strategies in this RSS were developed by first examining the difference between current conditions and desired conditions/landscape goals. The comprehensive strategies were designed to “bridge the gap” where gaps in condition existed. Next, a logical sequence of activities was designed to attain desired conditions and landscape goals in a reasonable time frame. The activities focus on acquiring data and improving resource knowledge, developing resource management and enhancement projects, and monitoring resource condition over time.

5.1 Existing Strategies

The staff at Pecos currently is undertaking a variety of management actions that support the goals expressed in the desired conditions and landscape goals. Table 5-1 lists desired conditions that are of high priority for the park and for which significant progress and/or effort already has been made or is being (and will continue to be) made towards achieving target values.

Table 5-1. Desired conditions and landscape goals achieved or nearly achieved

Resources and Values	Desired Condition or Landscape Goal	Strategy	Plan Years
Landscape: Parkwide	Historic corridors and routes are identified, evaluated, and interpreted in a manner that will foster visitor appreciation of the human history of the region.	Cultural Resources Inventory at Cañoncito Subunit	FY10
		Annual archeological site condition assessment and ASMIS update	Ongoing
		Preservation program	Ongoing
		Compliance program	Ongoing
		Interpretive programs	Ongoing
		Partnerships, including tribal consultation	Ongoing
		Civil War weekend	Annual
		Interpretive media (brochures, website, waysides)	Ongoing
		Visitor Center Operations	Ongoing
Landscape: Riparian/Riverine Corridors	The health of the river and creeks and the surrounding watershed is maintained and a healthy riparian habitat is supported, with particular emphasis on its role as wildlife habitat and a wildlife travel corridor	Water quality monitoring	Ongoing
		Fish population monitoring	Ongoing
		Fishing program monitoring	Ongoing
		Stream Condition Index	Ongoing
		Wetlands restoration—remove remaining man-made levees along lower Glorieta Creek	Awaiting re-funding
		Beaver exclosures near Pecos River	Ongoing
		Limited exotic species inventory (SOPN)	2009–2013
Limited vegetation inventory (SOPN)	FY10		

Table 5-1. Cont'd.

Resources and Values	Desired Condition/ Landscape Goal	Strategy	Plan Years
Landscape: Ranching/Grasslands	Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire	Listed species inventory at Glorieta Unit	FY10
		Gypsy Moth study	Ongoing
		Exotic plant management and woody species)	Ongoing
		Hazardous fuels reduction (pastures)	2005–2015
Landscape: Ranching/Grasslands	Historic grasslands of the area are maintained and the biological diversity is enhanced	Hazardous fuels reduction (pastures)	FY10
		Listed species inventory at Glorieta Unit	FY10
		Limited vegetation inventory (SOPN)	FY10
		Limited exotic species inventory (SOPN)	FY10
		Curriculum-based education programs	Ongoing
		Glorieta Unit exotics removal	FY11
Landscape: Ranching/Grasslands	Healthy, sustainable, grass-dominated communities within the piñon-juniper woodland are restored to stabilize soils and protect cultural resources	Hazardous fuels reduction (pastures)	FY10
		Listed species inventory at Glorieta Unit	FY10
		Limited vegetation inventory (SOPN)	FY10
		Limited exotic species inventory (SOPN)	FY10
		Visitor Center operations	Ongoing
		Glorieta Unit exotics removal	FY11
		Interpretive programs	Ongoing
		Interpretive media	Ongoing
Ethnographic	A balance of traditional use access and resource protection is identified and maintained.	Preservation program	Ongoing
		Annual site condition assessment and ASMIS update	Annual
		Compliance program	Ongoing
		Pecos Pathways	Ongoing
		Interpretive programs	Ongoing
		Summer weekend cultural demonstrators	Ongoing
Ethnographic	All affiliated tribes feel welcome at Pecos and understand and appreciate their connections to the park.	Summer weekend cultural demonstrators	Ongoing
		Pecos Pathways	Ongoing
		Pecos Conference	Recurring
		Visitor Center operations	Ongoing
		Interpretive programs	Ongoing
		Interpretive media	Ongoing
Ethnographic	Official tribal government and stakeholder connections to the park and its resources are fostered and maintained	Interpretive media	Ongoing

Table 5-1. Cont'd.

Resources and Values	Desired Condition/Landscape Goal	Strategy	Plan Years
Educational Opportunities	The public understands the value and significance of traditional practices.	Curriculum-based education programs	Ongoing
		Pecos Pathways	Ongoing
		Summer Day Camp	Ongoing
		Visitor Center operations	Ongoing
		Interpretive programs	Ongoing
		Interpretive media	Ongoing
Educational Opportunities	Visitors understand and appreciate the area's human history and the interconnectedness with its natural features	Curriculum-based education programs	Ongoing
		Summer weekend cultural demonstrators	Ongoing
		Summer Day Camp	Ongoing
		Pecos Conference	Recurring
		Visitor Center operations	Ongoing
		Interpretive programs	Ongoing
		Interpretive media	Ongoing
		Pecos Pathways	Ongoing
		Civil War weekend	Ongoing
Ruins Trail wayside replacement	FY11		
Educational Opportunities	The public understands and appreciates the significance of collected objects and their connections to the park	Visitor Center operations	Ongoing
		Pecos Pathways	Ongoing
		Summer Day Camp	Ongoing
Educational Opportunities	The park is active in educating the local communities about the battle	Civil War Weekend	Annual
		Summer Day Camp	Ongoing
		Visitor Center operations	Ongoing
		Interpretive programs	Ongoing
		Interpretive media	Ongoing
Educational Opportunities	Visitors have an understanding of the relationship between the Native American and Spanish Colonial culture and traditions from initial contact to present day	The Pecos Conference is held every five years	Recurring
		Visitor Center operations	Ongoing
		Interpretive programs	Ongoing
		Interpretive media	Ongoing
Museum Collections	Museum collections are preserved and protected	Preservation program	Ongoing
		Compliance program	Ongoing

Notes: ASMIS = Archaeological Sites Management Information System; SOPN = Southern Plains Inventory & Monitoring Network; FY = Fiscal Year.

5.2 Future Strategies

After reviewing the high-priority desired conditions and landscape goals towards which significant progress was being made, park staff prioritized the remaining high-priority desired conditions and landscape goals into three groups: Priority Group I, II, and III. At a workshop, the RSS team developed strategies for achieving these desired conditions and goals, which are listed below. The strategies are separated into three categories: Knowledge, Planning, and Implementation. In some cases, strategies need to be coordinated with other strategies or cannot begin until another strategy is completed and the term “dependencies” is used to express this relationship. Following the each is a table demonstrating the ways in which many of the

strategies are integrated and span multiple desired conditions. The purpose of this table is to show how resource management can be approached holistically.

5.3 Priority Group I

1) Landscapes: Parkwide

Landscapes are documented, preserved, protected, and receive treatment consistent with their historic and ecological significance and interpretive value.

a) Information Needs

- i) Work with the NPS Intermountain Region to develop useable database for spatial and Geographic Information System (GIS) data. This includes existing and future data for resources, facilities, management, and planning. The data manager for the Southern Plains Inventory & Monitoring Network should be consulted regarding data compiled by the network. As part of the project, a systematic method of data collection will be developed so that GIS and spatial information can be continually updated.

Strategy year: FY11 or FY12

Funding: \$30,000 Natural Resource Preservation Program (NRPP)

- ii) Develop a cumulative species list through the Southern Plains Inventory & Monitoring Network in preparation for developing vegetation management plan.

Strategy year: FY11

Funding: Existing

- iii) Characterize the aquifer.

Strategy year: FY12 or FY13

Funding: Possibilities include technical assistance request or Cooperative Ecosystem Studies Unit (CESU) cooperative agreement

b) Planning Needs

- i) Maintain an interdisciplinary approach during all planning processes. As part of the process, communication should occur between natural and cultural resource disciplines. Where appropriate, information should be shared as various plans are developed. For example, the Cultural Landscape Report should inform the Vegetation Management Plan, Fire Management Plan, and vice versa.

Strategy year: Ongoing

- ii) Complete a parkwide Cultural Landscape Report.

Strategy year: FY12–FY15

Funding: \$200,000–\$250,000 (dependent on the Cultural Landscape Inventory status). Immediately pursue funding from Cultural Resource Preservation Program (CRPP) while investigating other sources

Dependencies: Coordinate with other resource plans and the Comprehensive Interpretive Plan.

- iii) Undertake scoping sessions with relevant parties in preparation for completing the Exotic Plant Management Plan.
Strategy year: FY12
Funding: Park base/ Operation of the National Park Service (ONPS)
 - iv) Revise Fire Management Plan to incorporate RSS components.
Strategy year: FY12
Funding: Existing, in cooperation with Bandelier National Monument
Dependencies: Coordinate with Cultural Landscape Report.
 - v) Complete Pecos National Historical Park Climate Change Scenario Planning to evaluate the latest climate driver projections and identify implications associated with the projected climate futures, along with actions for consideration.
Strategy year: FY12
Funding: Park base/ONPS
 - vi) Complete comprehensive Exotic Plant Management Plan
Strategy year: FY13
Funding: \$50,000–\$60,000; possible NRPP or cooperative agreement
Dependencies: Need to coordinate with Cultural Landscape Report
 - vii) Update Integrated Pest Management Plan
Strategy year: FY14
Funding: \$50,000; NRPP and/or museum fund source, limited Project Management Information System (PMIS) statement already drafted
 - viii) Complete Vegetation Management Plan
Strategy year: FY17
Funding: \$75,000
- c) Implementation Needs
- i) Determine a uniform interdisciplinary approach to use at all management levels (Information, Planning, Implementation). An example is the project review process by an interdisciplinary team employed at the regional level.
Strategy year: FY11
 - ii) Continue groundwater rights and instream flow rights (Pecos River and Glorieta Creek) research.
Strategy year: Ongoing
Funding: Water Resource Division Water Rights Branch
 - iii) Exotic plant management and limited monitoring
Strategy year: Ongoing
Funding: Park base/ONPS
 - iv) Preservation program
Strategy year: Ongoing

Funding: Park base/ONPS

- v) Compliance program
Strategy year: Ongoing
Funding: Park base/ONPS
- ix) Feral Dog Trapping
Strategy year: Ongoing
Funding: Park base/ONPS plus \$20,000 in FY12
- x) Gypsy Moth monitoring
Strategy year: Ongoing
Funding: NPS Program
- xi) Boundary fence monitoring (repair and reconstruction as necessary)
Strategy year: Ongoing
Funding: Park base/ONPS, Repair/Rehabilitation, NRPP \$250,000
- xii) Keep communication open with relevant offices in regards to climate change
Strategy year: Ongoing

Table 5-2. Priority Group I: Landscape: Parkwide strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Develop Geographic Information System (GIS)/Spatial database										
	Develop cumulative species list										
	Aquifer characterization										
Planning	Maintain an interdisciplinary approach in all planning processes										
	Complete Cultural Landscape Report										
	Exotic Plant Management Plan scoping sessions										
	Revise Fire Management Plan										
	Climate Change Scenario Planning										
	Complete Comprehensive Exotic Plant Management Plan										
	Update Integrated Pest Management Plan										
	Complete Vegetation Management Plan										
Implementation	Determine uniform interdisciplinary approach										
	Groundwater rights and instream flow rights research										
	Current exotic plant management and limited monitoring										
	Preservation Program										
	Compliance Program										
	Feral dog trapping										
	Gypsy moth monitoring										
	Boundary fence monitoring										

Strategy	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Keep communication open re: climate change										

a) Landscape: Ranching/Grassland

Component landscapes are documented, preserved, protected, and receive treatment consistent with their historic and ecological significance and interpretive value.

i) Information Needs

- i) Work with the Intermountain Region to develop useable database for spatial and GIS data. This includes existing and future data for resources, facilities, management, and planning. Data manager for the Southern Plains Inventory & Monitoring Network should be consulted regarding data compiled by the network. As part of the project, a systematic method of data collection will be developed so that GIS and spatial information is continually updated.

Strategy year: FY11 or FY12

Funding: \$30,000 NRPP

- ii) Complete Cultural Landscape Inventory

Strategy year: Coordinate with the Southwest Regional for scheduling

Funding: \$30,000

- iii) Update National Register of Historic Places documentation, complete new nominations if necessary, and obtain definitive determinations of eligibility for all component landscapes. This may be included within the Cultural Landscape Report depending on funding and timeframe.

Strategy year: FY14

Funding: Possibilities include a term position, cooperative agreement, or contract

Dependencies: Cultural Landscape Inventories should be completed and data on stabilization history and archaeological sites should be assembled before updating nominations or starting new nominations.

b) Planning Needs

- i) Undertake scoping sessions with relevant parties in preparation for completing Exotic Plant Management Plan

Strategy year: FY12

Funding: Park base/ONPS

- ii) Complete parkwide Cultural Landscape Report

Strategy year: FY12–FY15

Funding: \$200,000–\$250,000 (dependent on Cultural Landscape Inventory status). Immediately pursue funding from CRPP by investigate other sources

Dependencies: Coordinate with other resource plans and the Comprehensive Interpretive Plan

- iii) Revise Fire Management Plan to incorporate RSS components
Strategy year: FY12
Funding: Existing, in cooperation with Bandelier National Monument
Dependencies: Coordinate with the Cultural Landscape Report
 - iv) Consult with the Southern Plains Inventory & Monitoring Network on the Prairie Restoration Project
Strategy year: FY12
Funding: Existing
 - v) Complete comprehensive Exotic Plant Management Plan
Strategy year: FY13
Funding: \$50,000–\$60,000; possible NRPP or cooperative agreement
Dependencies: Coordinate with Cultural Landscape Report
 - vi) Complete Vegetation Management Plan
Strategy year: FY17
Funding: \$75,000
Dependencies: Coordinate with Cultural Landscape Report
- c) Implementation Needs
- i) Continue existing management of historic pastures and revise if necessary upon completion of Cultural Landscape Report
Strategy year: Ongoing
Funding: Park base/ONPS and NPS Fire
 - ii) Complete rapid assessments through the Southern Plains Inventory & Monitoring Network to monitor exotic species
Strategy year: Ongoing
Funding: Existing
 - iii) Continue existing exotic plant management
Strategy year: Ongoing
Funding: Park base/ONPS
 - iv) Continue current condition assessments and monitoring
Strategy year: Ongoing
Funding: Park base/ONPS

Table 5-3. Priority Group I: Landscape: Ranching/Grasslands (Historic and Ecological Integrity) strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Develop GIS/Spatial database										
	Complete Cultural Landscape Inventory										
	Update National Register of Historic Places/Obtain Determination of Eligibility										
Planning	Exotic Plant Management Plan scoping sessions										
	Complete Cultural Landscape Report										
	Revise Fire Management Plan										
	Consult with SOPN on prairie restoration project										
	Complete Comprehensive Exotic Plant Management Plan										
	Complete Vegetation Management Plan										
Implementation	Continue existing management of historic pastures										
	Rapid Assessments for exotic species monitoring										
	Continue existing exotic plant management										
	Continue current condition assessments and monitoring										

Notes: SOPN = Southern Plains Inventory & Monitoring Network

3) Historic Structures and Complexes

Historic structures and complexes are managed in a manner that sustains their character-defining features and significance while continuing to serve NPS management and visitor needs.

a) Information Needs

- i) Testing/research on structural history at the Trading Post
Strategy year: Winter FY11
Funding: Existing
- ii) Consult with a historical architect in Intermountain Region to determine if a new Historic Structures Report is needed for the Trading Post or if updating the current Historic Structures Report is sufficient.
Strategy year: Winter FY11
- iii) Compile stabilization information, including documentation and history, for each structure. This baseline information is needed to plan for future projects. The project would include digitizing records, setting up a photo management system,

and putting a documentation strategy in place for future projects. Preservation and stabilization plans would be extended to all structures as part of this project.

Strategy year: FY11 and FY12

Funding: Term GS-7 position. Possible sources for funding are park base, Vanishing Treasures, and grants.

- iv) Update Historic Structure Reports for all structures. Reports for the Trading Post and Forked Lightning Ranch House are the most urgent and others will be completed on a project-to-project basis.
Strategy year: FY12 and as necessary
Funding: CRPP funding
- v) List of Classified Structures Update. Adding several unlisted prehistoric sites may be a possibility.
Strategy year: FY13
Dependencies: Data on archaeological sites needs to be compiled before List of Classified Structures updated is considered.
- vi) Update National Register of Historic Places documentation, complete new nominations if necessary, and obtain definitive determinations of eligibility for all structures. This may be included as part of a Historic Structures Report depending on funding and timeframe.
Strategy year: FY14
Funding: Possibilities include a term position or cooperative agreement
Dependencies: Cultural Landscape Inventories and the List of Classified Structures update should be completed and data on stabilization history and archaeological sites should be assembled before updating nominations or completing new nominations.

b) Planning Needs

- i) Complete a Historic Furnishings Plan for the Forked Lightning Ranch House
Strategy year: FY16
Funding: \$40,000 to 50,000; CRPP fund source

c) Implementation Needs

- i) Preserve and maintain 18th century adobe church. This project will serve as a model to develop a documentation strategy for work on historic structures so that records of preservation and stabilization work are readily accessible.
Strategy year: Future funded
Funding: \$72,000
- ii) Complete Phase III Rehabilitation of Trading Post
Strategy year: FY11
Funding: Existing
Dependencies: Coordinate with Cultural Landscape Inventories

- iii) Restore Pigeon’s Ranch Historic Log and Stucco Cabin
Strategy year: FY11
Funding: Existing
- iv) Complete Phase IV Rehabilitation of Trading Post
Strategy year: FY12
Funding: Existing
- v) Cultural Cyclic: Perform preservation treatment on seven prehistoric and historic Buildings and Structures
Strategy year: FY12
Funding: Existing
- vi) Continue monitoring and condition assessments of all historic structures
Strategy year: Ongoing
Funding: Park base/ONPS
- vii) Maintain the List of Classified Structures
Strategy year: Ongoing
Funding: Park base/ONPS

Table 5-4. Priority Group I: Historic Structures strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Testing/research at Trading Post										
	Consultation with Regional Office re: Historic Structures Report										
	Compile stabilization information										
	Update Historic Structures Reports										
	List of Classified Structures Update										
	Update National Register of Historic Places/Obtain Determination of Eligibility										
Planning	Historic Furnishings Plan for Forked Lightning Ranch House										
Implementation	Phase III rehab of Trading Post										
	Restore Pigeon’s Ranch historic log/stucco cabin										
	Preserve/maintain 18th century church (model for documentation)										
	Phase IV rehab of Trading Post										
	Cultural Cyclic: Preservation on seven structures										
	Continue monitoring and condition assessments										
	List of Classified Structures maintenance										

4) Landscape: Pueblo/Precontact/Mission

Landscape is documented, preserved, and protected, and receives treatment consistent with its historic and ecological significance and interpretive value.

a) Information Needs

- i) Work with Region to develop useable database for spatial and GIS data. This includes existing and future data for resources, facilities, management, and planning. The Data manager for the Southern Plains Inventory & Monitoring Network should be consulted regarding data compiled by the network. As part of the project, a systematic method of data collection will be developed so that GIS and spatial information is continually updated.
Strategy year: FY11 or FY12
Funding: \$30,000 NRPP
- ii) Complete Cultural Landscape Inventory
Strategy year: Coordinate with Regional Office for scheduling
Funding: \$30,000
- iii) Update National Register of Historic Places documentation, complete new nominations if necessary, and obtain definitive determinations of eligibility for all component landscapes. This may be completed as part of a Cultural Landscape Report depending on funding and timeframe
Strategy year: FY14
Funding: Possibilities include a term position, cooperative agreement, or contract
Dependencies: Cultural Landscape Inventories should be completed and data on stabilization history and archaeological sites should be assembled before updating nominations or completing new nominations.
- iv) Planning Needs
Undertake scoping sessions with relevant parties in preparation for completing the Exotic Plant Management Plan.
Strategy year: FY12
Funding: Park base
- v) Complete parkwide Cultural Landscape Report
Strategy year: FY12–FY15
Funding: \$200,000–\$250,000 (dependent on Cultural Landscape Inventory status). Immediately pursue funding from CRPP while investigating other sources
Dependencies: Coordinate with other resource plans and Comprehensive Interpretive Plan
- vi) Complete comprehensive Exotic Plant Management Plan
Strategy year: FY13
Funding: \$50,000–\$60,000; possible NRPP or cooperative agreement
Dependencies: Coordinate with Cultural Landscape Report
- vii) Update the Integrated Pest Management Plan. This is particularly urgent for this landscape.

Strategy year: FY14
Funding: \$50,000; NRPP and or/museum fund source, limited PMIS statement already drafted

viii) Complete Vegetation Management Plan

Strategy year: FY17

Funding: \$75,000

Dependencies: Coordinate with Cultural Landscape Report

b) Implementation Needs

i) Complete rapid assessments through the Southern Plains Inventory & Monitoring Network to monitor exotic species

Strategy year: Ongoing

Funding: Existing

ii) Continue existing exotic plant management

Strategy year: Ongoing

Funding: Park base/ONPS

iii) Continue current condition assessments and monitoring

Strategy year: Ongoing

Funding: Park base/ONPS

Table 5-5. Priority Group I: Landscape: Pueblo/Precontact/Mission strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Develop Geographic Information System (GIS)/Spatial database										
	Complete Cultural Landscape Inventory										
	Update National Register of Historic Places/Obtain Determination of Eligibility										
Planning	Exotic Plant Management Plan scoping sessions										
	Complete Cultural Landscape Report										
	Complete Comprehensive Exotic Plant Management Plan										
	Update Integrated Pest Management Plan										
	Complete Vegetation Management Plan										
Implementation	Rapid Assessments for exotic species monitoring										
	Continue existing exotic plant management										
	Continue current condition assessments and monitoring										

5) Landscape: Glorieta Unit

Landscape is documented, preserved, and protected, and receives treatment consistent with its historic and ecological significance and interpretive value.

a) Information Needs

- i) Work with the Intermountain Region to develop useable database for spatial and GIS data. This includes existing and future data for resources, facilities, management, and planning. The data manager for the Southern Plains Inventory & Monitoring Network should be consulted regarding data compiled by the network. As part of the project, a systematic method of data collection will be developed so that GIS and spatial information is continually updated.
Strategy year: FY11 or FY12
Funding: \$30,000 NRPP
- ii) Complete Cultural Landscape Inventory for Cañoncito Unit
Strategy year: Coordinate with the Intermountain Region for scheduling
Funding: \$30,000
- iii) Update National Register of Historic Places documentation, complete new nominations if necessary, and obtain definitive determinations of eligibility for all component landscapes. This may be completed as part of a Cultural Landscape Report depending on funding and timeframe.
Strategy year: FY14
Funding: Possibilities include a term position or cooperative agreement
Dependencies: Cultural Landscape Inventories should be completed and data on stabilization history and archaeological sites should be assembled before updating nominations or completing new nominations.

b) Planning Needs

- i) Undertake scoping sessions with relevant parties in preparation for completing a Exotic Plant Management Plan
Strategy year: FY12
Funding: Park base/ONPS
- ii) Complete parkwide Cultural Landscape Report
Strategy year: FY12–FY15
Funding: \$200,000–\$50,000; Immediately pursue funding from CRPP while investigating other sources
Dependencies: Coordinate with other resource plans and Comprehensive Interpretive Plan
- iii) Complete comprehensive Exotic Plant Management Plan
Strategy year: FY13
Funding: \$50,000–\$60,000; possible NRPP or cooperative agreement
Dependencies: Need to coordinate with Cultural Landscape Report
- iv) Update Integrated Pest Management Plan

Strategy year: FY14
Funding: \$50,000; NRPP and/or museum fund source, limited PMIS statement already drafted

- v) Complete Vegetation Management Plan
Strategy year: FY17
Funding: \$75,000
Dependencies: Coordinate with Cultural Landscape Report

c) Implementation Needs

- i) Complete rapid assessments through the Southern Plains Inventory & Monitoring Network to monitor exotic species
Strategy year: Ongoing
Funding: Existing
- ii) Continue existing exotic plant management
Strategy year: Ongoing
Funding: Park base/ONPS
- iii) Continue current condition assessments and monitoring
Strategy year: Ongoing
Funding: Park base/ONPS
- iv) Pursue completion of Land Protection Plan and acquisition of all property within legislative boundaries
Strategy year: Ongoing
Funding: TBD; possibilities include Battlefield Protection Fund and Civil War Preservation Trust

Table 5-6. Priority Group I: Landscape: Glorieta Unit strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Develop Geographic Information System (GIS)/Spatial database										
	Complete Cultural Landscape Inventory										
	Update National Register of Historic Places/Obtain Determination of Eligibility										
Planning	Exotic Plant Management Plan scoping sessions										
	Complete Cultural Landscape Report										
	Complete Comprehensive Exotic Plant Management Plan										
	Update Integrated Pest Management Plan										
	Complete Vegetation Management Plan										
Implementation	Rapid Assessments for exotic species monitoring										
	Continue existing exotic plant										

Strategy	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
management										
Continue current condition assessments and monitoring										
Pursue completion of Land Protection Plan										

5.4 Priority Group II

6) Landscape: Riparian/Riverine Corridors

Component landscapes are documented, preserved, protected, and receive treatment consistent with their historic and ecological significance and interpretive value.

a) Information Needs

- i) Work with the Intermountain Region to develop useable database for spatial and GIS data. This includes existing and future data for resources, facilities, management, and planning. Data manager for the Southern Plains Inventory & Monitoring Network should be consulted regarding data compiled by the network. As part of the project, a systematic method of data collection will be developed so that GIS and spatial information is continually updated.
Strategy year: FY11 or FY12
Funding: \$30,000 NRPP
- ii) Complete Cultural Landscape Inventory
Strategy year: Coordinate with Regional Office for scheduling
Funding: \$30,000
- iii) Complete rapid condition assessment of Galisteo Creek and remaining portion of Glorieta Creek
Strategy year: FY12
Funding: Technical assistance request to NPS Water Resources Division Wetlands Program
- iv) Update National Register of Historic Places documentation, complete new nominations if necessary, and obtain definitive determinations of eligibility for all component landscapes.
Strategy year: FY14
Funding: Possibilities include a term position or cooperative agreement
Dependencies: Cultural Landscape Inventories should be completed and data on stabilization history and archaeological sites should be assembled before updating nominations or completing new nominations.
- v) Collect bacteria and nutrients data for Pecos River (due to potential/possible sewage outflows)
Strategy year: Ongoing
Funding: Southern Plains Inventory & Monitoring Network (current)

b) Planning Needs

- i) Assess pilot fishing program in regards to relevant NPS policies and its impacts on native species in order to plan how to balance recreational opportunities while also mitigating the impact of brown trout on native species. An assessment of the fishing program will be included in the Environmental Assessment that is being prepared for the Public Access Plan for the Forked Lightning Ranch and the backcountry. A first step in this process will be consultation with relevant parties in regards to the fishing program.
Strategy year: FY11 or FY12
Funding: Park base/ONPS
- ii) Undertake scoping sessions with relevant parties in preparation for completing the Exotic Plant Management Plan
Strategy year: FY12
Funding: Park base/ONPS
- iii) Complete parkwide Cultural Landscape Report. A treatment plan for the orchard is a particularly urgent need for this landscape.
Strategy year: FY12–FY15
Funding: \$200,000–\$250,000 (dependent on Cultural Landscape Inventory status). Immediately pursue funding from CRPP while investigating other sources
Dependencies: Coordinate with other resource plans and the Comprehensive Interpretive Plan
- iv) Complete comprehensive Exotic Plant Management Plan
Strategy year: FY13
Funding: \$50,000–\$60,000; possible NRPP or cooperative agreement
Dependencies: Coordinate with Cultural Landscape Report
- v) Update Integrated Pest Management Plan. Particularly urgent for this landscape
Strategy year: FY14
Funding: \$50,000; NRPP and/or museum fund source, limited PMIS statement already drafted
- vi) Vegetation Management Plan
Strategy year: FY17
Funding: \$75,000
Dependencies: Coordinate with Cultural Landscape Report

c) Implementation Needs

- i) Implement Public Use Impact Monitoring Protocols for Pecos River corridor
Strategy year: Begin FY11
Funding: Park base/ONPS
- ii) Complete Glorieta Creek restoration
Strategy year: FY12

Funding: PMIS statement written, awaiting funding

- iii) Establish in-park gauging station
Strategy year: FY12
Funding: Work with the Southern Plains Inventory & Monitoring Network
- iv) Continue tri-annual fish surveys
Strategy year: Next in FY13
Funding: State of New Mexico
- v) Continue stabilization of orchard
Strategy year: Ongoing
Funding: Park base/ONPS
- vi) Continue beaver exclosure/cottonwood protection
Strategy year: Ongoing
Funding: Park base/ONPS
- vii) Maintain scoping form information for annual pilot fishing program
Strategy year: Ongoing
Funding: Park base/ONPS
- viii) Continue to share data and consult with the New Mexico Department of Environmental Quality in regards to New Mexico Mountain Stream Condition Index
Strategy year: Every seven years
Funding: State of New Mexico
- ix) Complete rapid assessments through the Southern Plains Inventory & Monitoring Network to monitor exotic species
Strategy year: Ongoing
Funding: Existing
- x) Continue existing exotic plant management
Strategy year: Ongoing
Funding: Park base/ONPS
- xi) Continue in-park water quality monitoring with assistance from the Southern Plains Inventory & Monitoring Network
Strategy year: Ongoing
Funding: Park base/ONPS

Table 5-7. Priority Group II: Landscape: Riparian/Riverine Corridors strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Develop Geographic Information System (GIS)/Spatial database	█									
	Complete Cultural Landscape Inventory		█	█							
	Complete Rapid Assessment of Galisteo Creek and remaining portion of Glorieta Creek		█								
	Obtain data on brown trout impacts to native fish species	█	█								
	Update National Register of Historic Places/Obtain Determination of Eligibility				█						
	Collect bacteria and nutrients data for Pecos River	█	█	█	█	█	█	█	█	█	█
		█	█	█	█	█	█	█	█	█	█
Planning	Exotic Plant Management Plan scoping sessions		█								
	Assess fishing program	█	█								
	Complete Cultural Landscape Report		█	█	█	█					
	Comprehensive Exotic Plant Management Plan			█							
	Update Integrated Pest Management Plan				█						
	Vegetation Management Plan							█			
Implementation	Implement Public Use Impact Monitoring Protocols for Pecos River corridor	█	█	█	█	█	█	█	█	█	█
	Complete Glorieta Creek restoration		█								
	Establish in-park gauging station		█								
	Continue tri-annual fish surveys			█			█			█	
	Continue stabilization of orchard	█	█	█	█	█	█	█	█	█	█
	Continue beaver exclosure/cottonwood protection	█	█	█	█	█	█	█	█	█	█
	Maintain scoping form for pilot fishing program	█	█	█	█	█	█	█	█	█	█
	Continue consultations with New Mexico Department of Environmental Quality						█				
	Rapid Assessments to monitor exotics	█	█	█	█	█	█	█	█	█	█
	Continue existing exotic plant management	█	█	█	█	█	█	█	█	█	█
	Continue in-park water quality monitoring	█	█	█	█	█	█	█	█	█	█

7) Educational Opportunities

A diverse range of safe visitor experiences exist within the context of the resources associated with the Forked Lightning Ranch unit.

a) Information Needs

- i) Work with the Intermountain Region to develop useable database for spatial and GIS data. This includes existing and future data for resources, facilities, management, and planning. The data manager for the Southern Plains Inventory & Monitoring Network should be consulted regarding data compiled by the network. As part of the project, a systematic method of data collection will be developed so that GIS and spatial information is continually updated.

Strategy year: FY11 or FY12

Funding: \$30,000 NRPP

- ii) Compile existing data on archaeological sites into an accessible database. Possibly a GS-7 archaeological technician would complete archival/literature search and database design and input as first step.

Strategy year: FY12

Funding: Possibilities include base funding, PMIS, or Vanishing Treasures

b) Planning Needs

- i) Complete a Public Access Plan for Forked Lightning Ranch area (requires Environmental Assessment)

Strategy year: FY12 (or on completion of Pigeon's Ranch Environmental Assessment)

Funding: \$30,000–\$50,000

- ii) Update Comprehensive Interpretive Plan as necessary

Strategy year: FY13

Funding: Park base/ONPS

- iii) Exhibit Plan for Forked Lightning Ranch House

Strategy year: FY17

Funding: \$40,000–\$60,000; Interpretation media funding

Table 5-8. Priority Group II: Educational Opportunities (Forked Lightning Ranch) strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Develop Geographic Information System (GIS)/Spatial database										
	Compile existing arch sites data into accessible database										
Planning	Public Access Plan										
	Update Comprehensive Interpretive Plan										
	Exhibit Plan for Forked Lightning Ranch House										

8) Archaeological Sites

Archaeological sites, artifacts, pictographs, and petroglyphs are identified, evaluated for their significance, and protected in place.

a) Information Needs

- i) Subsurface investigations in Pigeon’s Ranch Subunit
Strategy year: FY11
Funding: Existing
- ii) Work with the Intermountain Region to develop useable database for spatial and GIS data. This includes existing and future data for resources, facilities, management, and planning. The data manager for the Southern Plains Inventory & Monitoring Network should be consulted regarding data compiled by the network. As part of the project, a systematic method of data collection will be developed so that GIS and spatial information is continually updated.
Strategy year: FY11 or FY12
Funding: \$30,000 NRPP
- iii) Compile existing data on archaeological sites into an accessible database. Possibly a GS-7 archaeological technician would complete archival/literature search and database design and input as first step.
Strategy year: FY12
Funding: Possibilities include base funding, PMIS, or Vanishing Treasures
- iv) Update National Register of Historic Places documentation, complete new nominations if necessary, and obtain definitive determinations of eligibility for all sites.
Strategy year: FY14
Funding: Possibilities include a term position or cooperative agreement
Dependencies: Cultural Landscape Inventories should be completed and data on stabilization history and archaeological sites should be assembled before updating nominations or completing new nominations.

b) Planning Needs

- i) Complete Monitoring Plan
Strategy year: FY13
Funding: Possibilities include park base or other sources
- ii) Complete Site Management Plan
Strategy year: FY13
Funding: Possibilities include park base or other sources
Dependencies: Determination of Eligibility would affect priorities
- c) Implementation Needs
 - i) Continue monitoring and condition assessments
Strategy year: Ongoing
Funding: Park base/ONPS

Table 5-9. Priority Group II: Archaeological Sites strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Subsurface investigations—Pigeon's Ranch										
	Develop Geographic Information System (GIS)/Spatial database										
	Compile existing data into accessible database										
	Update National Register of Historic Places/Obtain Determination of Eligibility										
Planning	Complete Monitoring Plan										
	Complete Site Management Plan										
Implementation	Continue monitoring and condition assessments										

9) Landscape: Pueblo/Precontact/Mission

Healthy, sustainable, biotic communities are maintained and restored to protect/enhance park resources.

a) Information Needs

- i) Develop cumulative species list through the Southern Plains Inventory & Monitoring Network in preparation for developing vegetation management plan.
Strategy year: FY11
Funding: Existing

b) Planning Needs

- i) Undertake scoping sessions with relevant parties in preparation for completing Exotic Plant Management Plan
Strategy year: FY12
Funding: Park base/ONPS

- ii) Complete comprehensive Exotic Plant Management Plan
Strategy year: FY13
Funding: \$50,000–\$60,000; possible NRPP or cooperative agreement
Dependencies: Coordinate with Cultural Landscape Report
- iii) Vegetation Management Plan
Strategy year: FY17
Funding: \$75,000
Dependencies: Coordinate with Cultural Landscape Report

c) Implementation Needs

- i) Continue vegetation and soil monitoring through the Southern Plains Inventory & Monitoring Network
Strategy year: Ongoing
Funding: Existing

Table 5-10. Priority Group II: Landscape: Pueblo/Precontact/Mission (Biotic Communities) strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Develop cumulative species list										
Planning	Exotic Plant Management Plan scoping sessions										
	Comprehensive Exotic Plant Management Plan										
	Vegetation Management Plan										
Implementation	Continue existing exotic species management										

10) Landscape: Ranching/Grassland

Erosion resulting in unacceptable degradation to resources is diminished or under control.

a) Information Needs

- i) Soil Survey. Coordinate with the State of New Mexico New Mexico soil scientist and NPS Soil Program.
Strategy year: Possibly FY12 or FY13
Funding: TBD
- ii) Seek small funding sources to synthesize existing data on erosion (historic photographs, archaeological data, spatial data, etc.)
Strategy year: FY14
Funding: Possibilities include Western National Parks Association, NRPP, Vanishing Treasures

b) Planning Needs

- i) Coordinate erosion control strategies with archaeological site management plans, Comprehensive Interpretive Plan, and Visitor Use plans.
Strategy year: Ongoing
- c) Implementation Needs
 - i) Work with the Southern Plains Inventory & Monitoring Network to develop soil monitoring at high priority sites
Strategy year: FY12
Funding: Park base/ONPS
 - ii) Continue vegetation and soil monitoring through the Southern Plains Inventory & Monitoring Network
Strategy year: Ongoing
Funding: Existing

Table 5-11. Priority Group II: Landscape: Ranching/Grasslands (Erosion) strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Soil Survey										
	Synthesize data on erosion										
Implementation	Develop monitoring at high priority sites										
	Continue vegetation and soil monitoring										

11) Landscape: Glorieta Unit

Healthy, sustainable, biotic communities are maintained and restored to protect/enhance park resources

- a) Information Needs
 - i) Develop cumulative species list through the Southern Plains Inventory & Monitoring Network in preparation for developing vegetation management plan.
Strategy year: FY11
Funding: Existing
- b) Planning Needs
 - i) Undertake scoping sessions with relevant parties in preparation for completing Exotic Plant Management Plan
Strategy year: FY12
Funding: Park base/ONPS
 - ii) Complete comprehensive Exotic Plant Management Plan
Strategy year: FY13
Funding: \$50,000–60,000; possible NRPP or cooperative agreement
Dependencies: Need to coordinate with Cultural Landscape Report

- iii) Complete Vegetation Management Plan
Strategy year: FY17
Funding: \$75,000
Dependencies: Need to coordinate with Cultural Landscape Report

c) Implementation Needs

- i) Continue existing exotic species management
Strategy year: Ongoing
Funding: Park base
- ii) Discuss with the Southern Plains Inventory & Monitoring Network the possibility of including Pigeon’s Ranch Subunit and Cañoncito Subunit in long-term vegetation monitoring
Strategy year: FY11
- iii) Set-up outreach and communication with local landowners concerning exotic species
Strategy year: FY12
Funding: TBD

Table 5-12. Priority Group II: Landscape: Glorieta Unit (Biotic Communities) strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Develop cumulative species list										
Planning	Exotic Plant Management Plan scoping sessions										
	Comprehensive Exotic Plant Management Plan										
	Vegetation Management Plan										
Implementation	Continue existing exotic species management										
	Discuss Glorieta Unit monitoring with Southern Plains Inventory & Monitoring Network										
	Outreach and communication re: exotics										

5.5 Priority Group III

12) Landscape: Woodlands

Erosion resulting in unacceptable degradation to resources is diminished or under control.

a) Information Needs

- i) Soil Survey. Coordinate with the State of New Mexico soil scientist and NPS Soil Program.
Strategy year: Possibly FY12 or FY13
Funding: TBD

- ii) Seek small funding sources to synthesize existing data on erosion (historic photographs, archaeological data, spatial data, etc.)

Strategy year: FY14

Funding: Possibilities include Western National Parks Association, NRPP, Vanishing Treasures

b) Planning Needs

- i) Coordinate erosion control strategies with archaeological site management plans, Comprehensive Interpretive Plan, and Visitor Use plans.

Strategy year: Ongoing

c) Implementation Needs

- i) Work with Southern Plains Inventory & Monitoring Network to develop soil monitoring at high priority sites

Strategy year: FY12

Funding: Park base/ONPS

- ii) Continue vegetation and soil monitoring through Southern Plains Inventory & Monitoring Network

Strategy year: Ongoing

Funding: Existing

Table 5-13. Priority Group III: Landscape: Woodlands (Erosion) strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Soil survey										
	Synthesize data on erosion										
Implementation	Develop monitoring at high priority sites										
	Continue vegetation and soil monitoring										

13) Landscape: Glorieta Unit

Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire

a) Information Needs

- i) Work with the Intermountain Region to develop useable database for spatial and GIS data. This includes existing and future data for resources, facilities, management, and planning. The data manager for the Southern Plains Inventory & Monitoring Network should be consulted regarding data compiled by the Southern Plains Inventory & Monitoring Network. As part of the project, a systematic method of data collection will be developed so that GIS and spatial information is continually updated.

Strategy year: FY11 or FY12

Funding: \$30,000 NRPP

b) Planning Needs

- i) Revise Fire Management Plan to incorporate RSS components
Strategy year: FY12
Funding: Existing—in cooperation with Bandelier National Monument
Dependencies: Need to coordinate with Cultural Landscape Report.

Table 5-14. Priority Group III: Landscape: Glorieta Unit (Fuels) strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Develop GIS/Spatial database										
Planning	Revise Fire Management Plan										

14) Landscape: Glorieta Unit

Erosion resulting in unacceptable degradation to resources is diminished or under control.

a) Information Needs

- i) Complete Soil Survey. Coordinate with the State of New Mexico soil scientist and NPS Soil Program.
Strategy year: Possibly FY12 or FY13
Funding: TBD
- ii) Seek small funding sources to synthesize existing data on erosion (historic photographs, archaeological data, spatial data, etc.)
Strategy year: FY14
Funding: Possibilities include Western National Parks Association, NRPP, Vanishing Treasures

b) Planning Needs

- i) Coordinate erosion control strategies with archaeological site management plans, Comprehensive Interpretive Plan, and Visitor Use plans.
Strategy year: Ongoing

c) Implementation Needs

- i) Work with the Southern Plains Inventory & Monitoring Network to develop soil monitoring at high priority sites
Strategy year: FY12
Funding: Park base/ONPS
- ii) Continue vegetation and soil monitoring through the Southern Plains Inventory & Monitoring Network
Strategy year: Ongoing
Funding: Existing

Table 5-15. Priority Group III: Landscape: Glorieta Unit (Erosion) strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Soil Survey										
	Synthesize data on erosion										
Implementation	Develop monitoring at high priority sites										
	Continue vegetation and soil monitoring										

15) Educational Opportunities

A diverse range of safe visitor experiences exist within the context of the natural and cultural resources associated with the Battle of Glorieta.

a) Information Needs

- i) Evaluate two structures at Cañoncito Subunit
Strategy year: FY13
Funding: Park base/ONPS
Dependencies: Coordinate with List of Classified Structures update and Historic Structure Reports
- ii) Revisit and resolve the Highway 50 study in order to determine what alternatives are feasible in regards to highway location and reduction of traffic through the Pigeon’s Ranch Unit.
Strategy year: FY17
Funding: TBD

b) Planning Needs

- i) Update Comprehensive Interpretive Plan as necessary
Strategy year: FY13
Funding: Park base/ONPS
- ii) Complete Visitor Use Plan for Sleepy Eye structure
Strategy year: FY15
Funding: Park base/ONPS

c) Implementation Needs

- i) Open Gateway Trail (opening dependent on completion of archaeological testing and EA). Rocky Mountain Youth Corps is scheduled for trail work in summer of 2011.
Strategy year: FY12
Funding: \$50,000–\$60,000
- ii) Conduct visitor use monitoring once Gateway Trail is open
Strategy year: FY12-ongoing

Funding: Park base/ONPS

- iii) Rebuild/build fence around both subunits to delineate park property.
Strategy year: FY13 or FY14
Funding: \$30,000; NRPP
- iv) Open Sleepy Eye structure for visitor use
Strategy year: FY16
Funding: \$350,000; PMIS statement already exists
- v) Plan Highway improvements in cooperation with New Mexico Department of Transportation
Strategy year: FY17
Funding: TBD
Dependencies: Coordinate with Cultural Landscape Report
- vi) Hold Civil War Weekend
Strategy year: Ongoing
Funding: Park Base/ONPS

Table 5-16. Priority Group III: Educational Opportunities (Glorieta Unit) strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Evaluate two structures at Cañoncito Subunit										
	Revisit/Resolve Highway 50 study										
Planning	Update Comprehensive Interpretive Plan										
	Visitor Use Plan for Sleepy Eye structure										
Implementation	Open Gateway Trail										
	Conduct visitor use monitoring on Gateway Trail										
	Rebuild/build fence around both subunits to delineate park property										
	Open Sleepy Eye structure for visitor use										
	Highway Improvements										
	Civil War Weekend										

16) Landscape: Pueblo/Precontact/Mission

Erosion resulting in unacceptable degradation to resources is diminished or under control.

a) Information Needs

- i) Soil Survey. Coordinate with New Mexico soil scientist and NPS Soil Program
Strategy year: Possibly FY12 or FY13
Funding: TBD

- ii) Seek small funding sources to synthesize existing data on erosion (historic photographs, archaeological data, spatial data, etc.)
Strategy year: FY14
Funding: Possibilities include Western National Parks Association, NRPP, Vanishing Treasures

b) Planning Needs

- i) Develop preservation plans for those high priority sites being impacted by erosion, particularly the middens
Strategy year: FY13
Funding: Possibilities include park base or other sources
- ii) Coordinate erosion control strategies with archaeological site management plans, Comprehensive Interpretive Plan, and Visitor Use plans.
Strategy year: Ongoing

c) Implementation Needs

- i) Work with SOPN to develop soil monitoring at high priority sites
Strategy year: FY12
Funding: Park base/ONPS
- ii) Continue vegetation and soil monitoring through the Southern Plains Inventory & Monitoring Network
Strategy year: Ongoing
Funding: Existing

Table 5-17. Priority Group III: Landscape: Pueblo/Precontact/Mission (Erosion) strategy timeline

Strategy		FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Information	Soil survey										
	Synthesize data on erosion										
Planning	Develop preservation plans for high priority sites										
Implementation	Develop monitoring at high priority sites										
	Continue vegetation and soil monitoring										

5.6 Strategy Integration

Table 5-18. Integration of strategies and Desired Conditions/Landscape Goals

Type	Desired Conditions/Landscape Goals for Priorities I to III	Strategies that accomplish multiple objectives
Implementation Need	All Desired Conditions and Landscape Goals	Determine a uniform interdisciplinary approach to use at all management levels
Planning Need	All Desired Conditions and Landscape Goals	Maintain an interdisciplinary approach during all planning processes
Information Need	<p>All five landscape units: Landscapes are documented, preserved, protected, and receives treatment consistent with their historic and ecological significance and interpretive value</p> <p>Healthy, sustainable, biotic communities are maintained and restored to protect/enhance park resources (Landscape: Pueblo/Precontact/Mission)</p> <p>Healthy, sustainable, biotic communities are maintained and restored to protect/enhance park resources (Landscape: Glorieta Unit)</p> <p>Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire (Landscape: Glorieta Unit)</p>	Complete parkwide Cultural Landscape Report
Planning Need	<p>All five landscape units: Landscapes are documented, preserved, protected, and receives treatment consistent with their historic and ecological significance and interpretive value</p> <p>Healthy, sustainable, biotic communities are maintained and restored to protect/enhance park resources (Landscape: Pueblo/Precontact/Mission)</p> <p>Healthy, sustainable, biotic communities are maintained and restored to protect/enhance park resources (Landscape: Glorieta Unit)</p> <p>Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire (Landscape: Glorieta Unit)</p>	<p>Revise Fire Management Plan</p> <p>Complete comprehensive Exotic Species Management Plan</p> <p>Complete Vegetation Management Plan</p>
Information Need	<p>All five landscape units: Landscapes are documented, preserved, protected, and receives treatment consistent with their historic and ecological significance and interpretive value (Landscape: Park-wide)</p> <p>A diverse range of safe visitor experiences exist within the context of the resources associated with the Forked Lightning Ranch unit (Educational Opportunities)</p> <p>Archaeological sites, artifacts, pictographs, and petroglyphs are identified, evaluated for their significance, and protected in place (Archaeological Sites)</p> <p>Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire (Landscape: Glorieta Unit)</p>	Work with Intermountain Region to develop useable database for spatial and Geographic Information System (GIS) data.

Table 5-18. Cont'd.

Type	Desired Conditions/Landscape Goals for Priorities I to III	Strategies that accomplish multiple objectives
Information Need	<p>All five landscape units: Landscapes are documented, preserved, protected, and receives treatment consistent with their historic and ecological significance and interpretive value (Landscape: Park-wide)</p> <p>Historic structures and complexes are managed in a manner that sustains their character-defining features and significance while continuing to serve NPS management and visitor needs (Historic Structures and Complexes)</p> <p>Archaeological sites, artifacts, pictographs, and petroglyphs are identified, evaluated for their significance, and protected in place (Archaeological Sites)</p>	Update National Register of Historic Places documentation and obtain definitive determinations of eligibility.
Information Need	<p>Archaeological sites, artifacts, pictographs, and petroglyphs are identified, evaluated for their significance, and protected in place (Archaeological Sites)</p> <p>A diverse range of safe visitor experiences exist within the context of the resources associated with the Forked Lightning Ranch unit (Educational Opportunities)</p>	Compile existing data on archaeological sites into an accessible database.
Information Need Implementation Need	Erosion resulting in unacceptable degradation to resources is diminished or under control (Landscape: Glorieta Unit, Ranching/Grasslands, Woodlands, Pueblo/Precontact/Mission)	<p>Complete Soil Survey</p> <p>Work with SOPN to develop soil monitoring at high priority sites</p> <p>Continue vegetation and soil monitoring through SOPN</p>

Notes: SOPN = Southern Plains Inventory & Monitoring Network

5.7 Non-Prioritized

The remaining desired conditions and landscape goals, although important, are not of the highest priority. In order to keep the RSS from becoming too unwieldy and to ensure that it is of immediate use to park managers, strategies were not developed for these desired conditions and goals at this time. As the RSS is updated in the future, strategies for these desired conditions and goals can be developed as necessary and incorporated into other planning documents. See Table 5-19 for a summary of non-prioritized Desired Conditions and Landscape Goals.

Table 5-19. Non-prioritized Desired Conditions and Landscape Goals

Resources and Values	Desired Condition/Landscape Goal
Landscape: Riparian/Riverine Corridors	The Pecos River is managed to wild and scenic river standards
Landscape: Riparian/Riverine Corridors	Erosion resulting in unacceptable degradation to resources is diminished or under control
Landscape: Woodlands	Landscape is documented, preserved, protected, and receives treatment consistent with its historic and ecological significance and interpretive value
Landscape: Woodlands	Fuels are managed to protect park neighbors, visitors, and resources from unwanted fire
Landscape: Woodlands	Healthy, sustainable, grass dominated communities within the piñon-juniper woodland are restored to stabilize soils and protect cultural resources
Sensory Environment	Important scenic vistas and scenic features are not significantly diminished by development.
Sensory Environment	Current levels of natural soundscapes are maintained or reduced
Sensory Environment	Current levels of night sky visibility are maintained
Museum Collections	The contents of the collection are accessible to researchers and the public, e.g., through the use of exhibits, internet, and other mediums
Educational Opportunities	The visitor contact station and museum for the Glorieta Battlefield is established and in operation

6 Electronic Field Manual

To ensure that the RSS can be updated and referred to easily, an electronic field manual was developed. The field manual is in the form of a database and allows park staff to update the status of projects and funding as well as enter new projects and strategies as they arise. The database also tracks the condition of resources.

The database fulfills the potential of the RSS as a living document. The RSS has set out the broad goals for resources and their underlying significance. With the database, staff will be able to develop new strategies and input specific information in response to changing conditions and the availability of new data relevant to the resources and resource management.



Civil War reenactors provide interpretation to visitors during a special event at Pecos National Historical Park. Photo by Maren Bzdek.

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Appendix A: Current Funding Allocation and Staff Organization

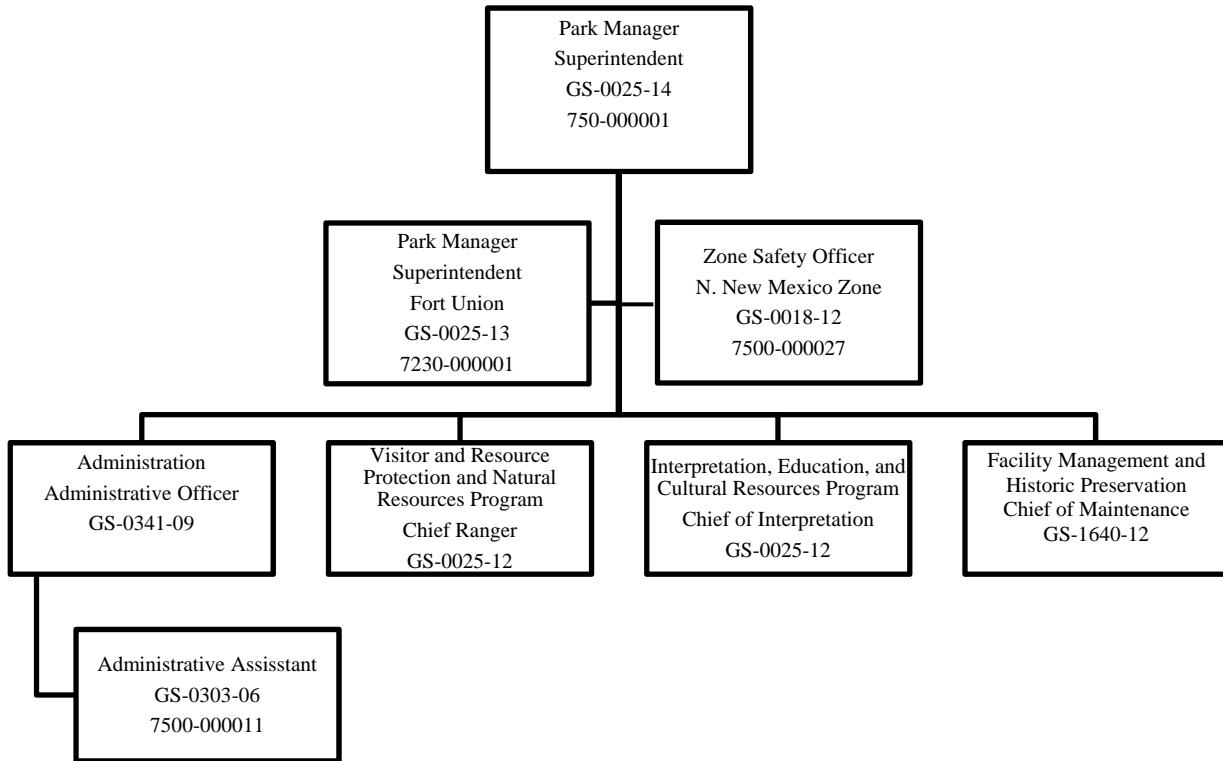


Figure A-1. Pecos National Historical Park organizational chart, May 2011.

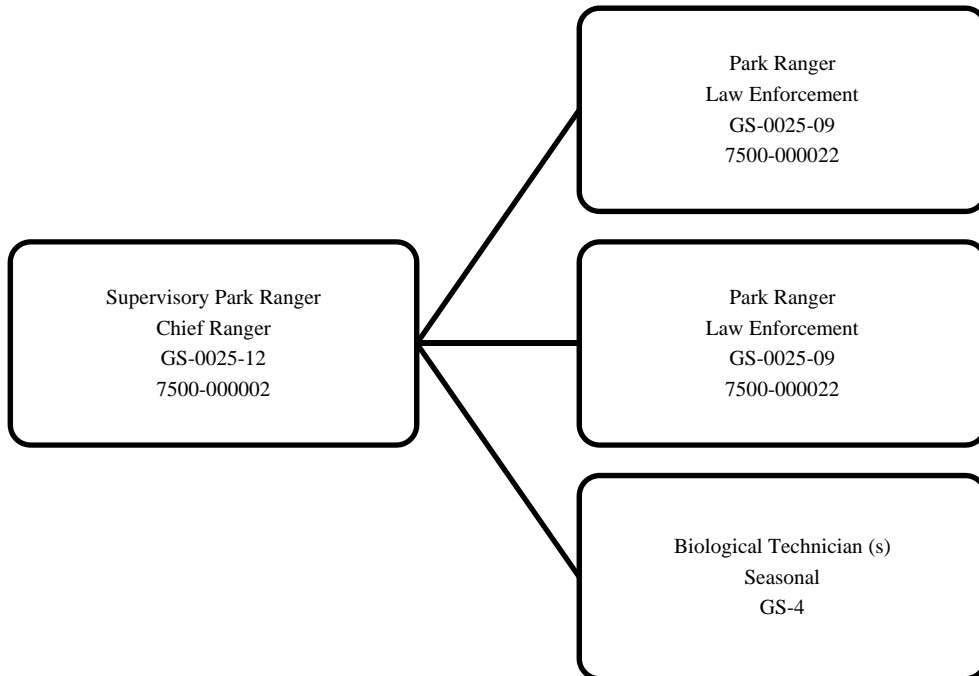


Figure A-2. Visitor and Resource Protection and Natural Resource Program organizational chart, May 2011.

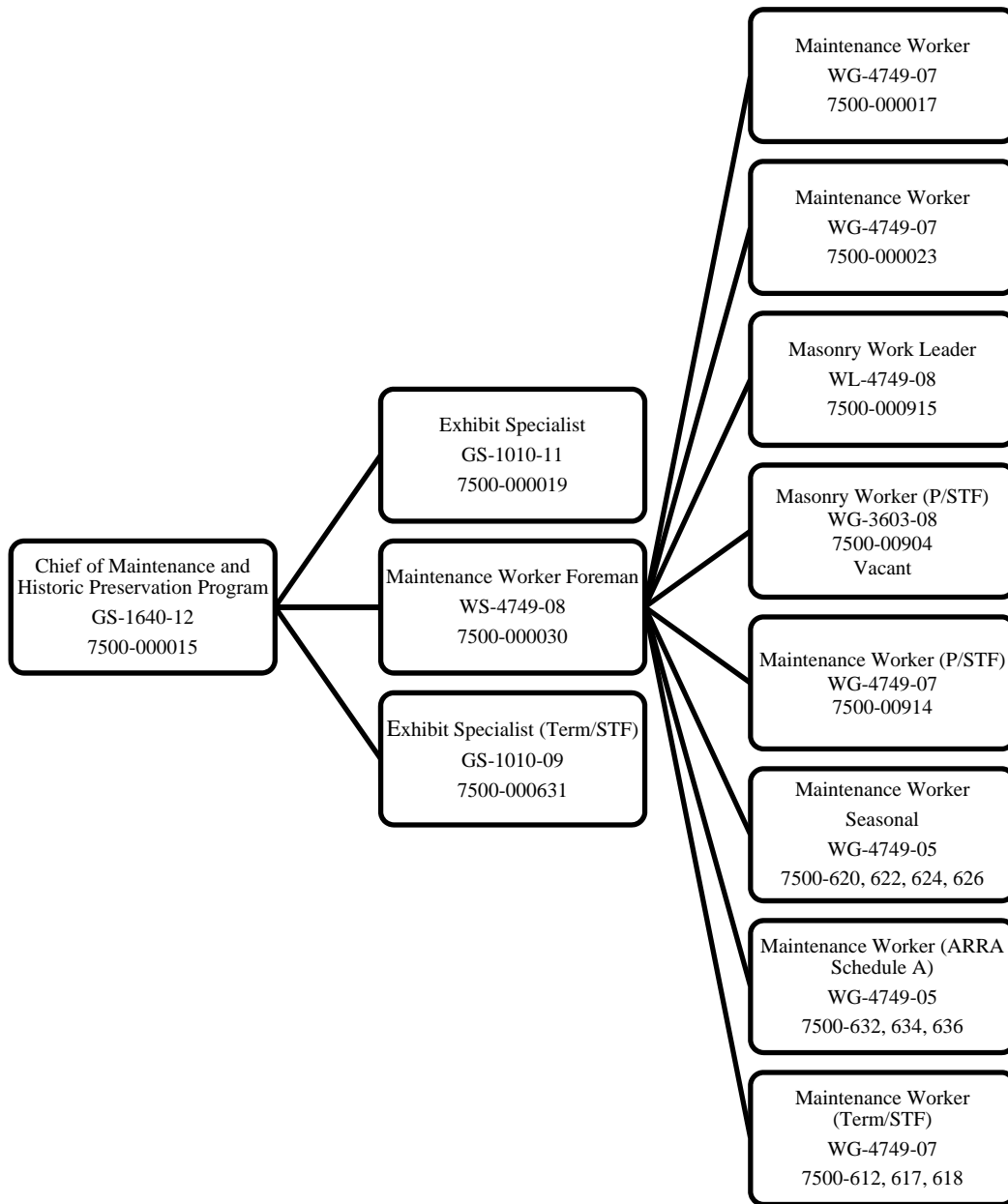


Figure A-3. Facility Management and Historic Preservation Program organizational chart, May 2011.

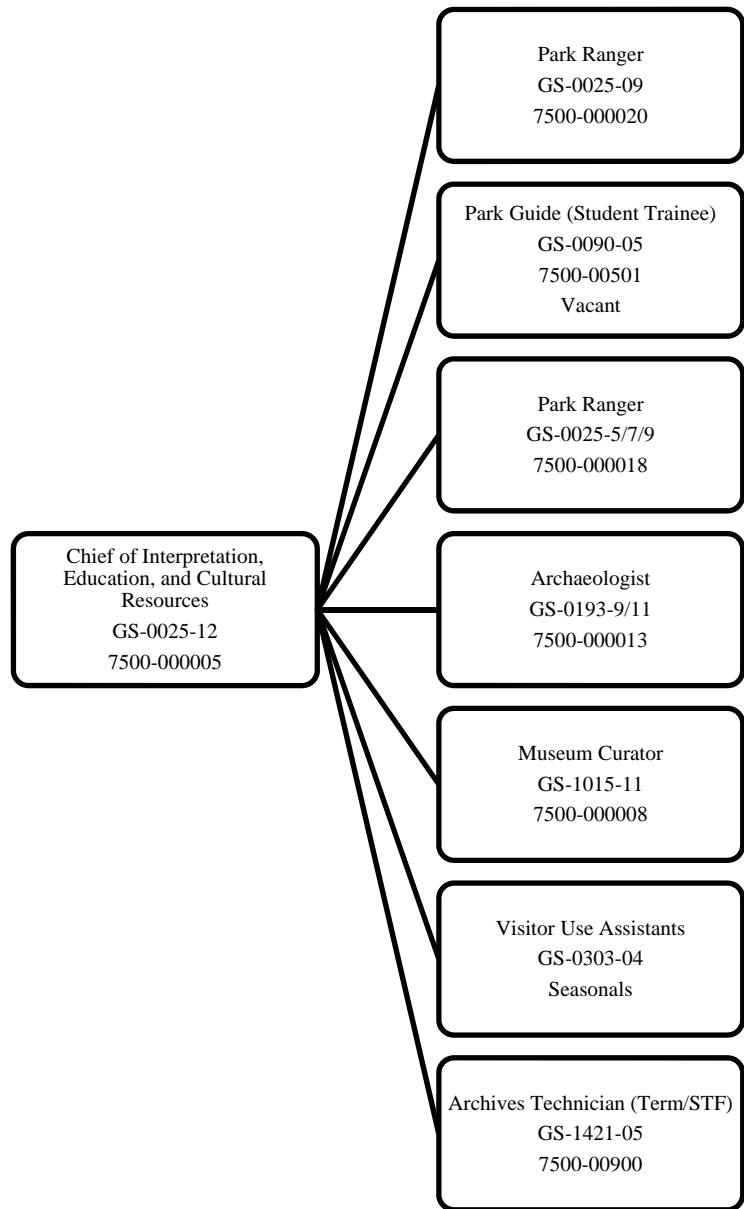


Figure A-4. Interpretation, Education, and Cultural Resources Program organizational chart, May 2011.

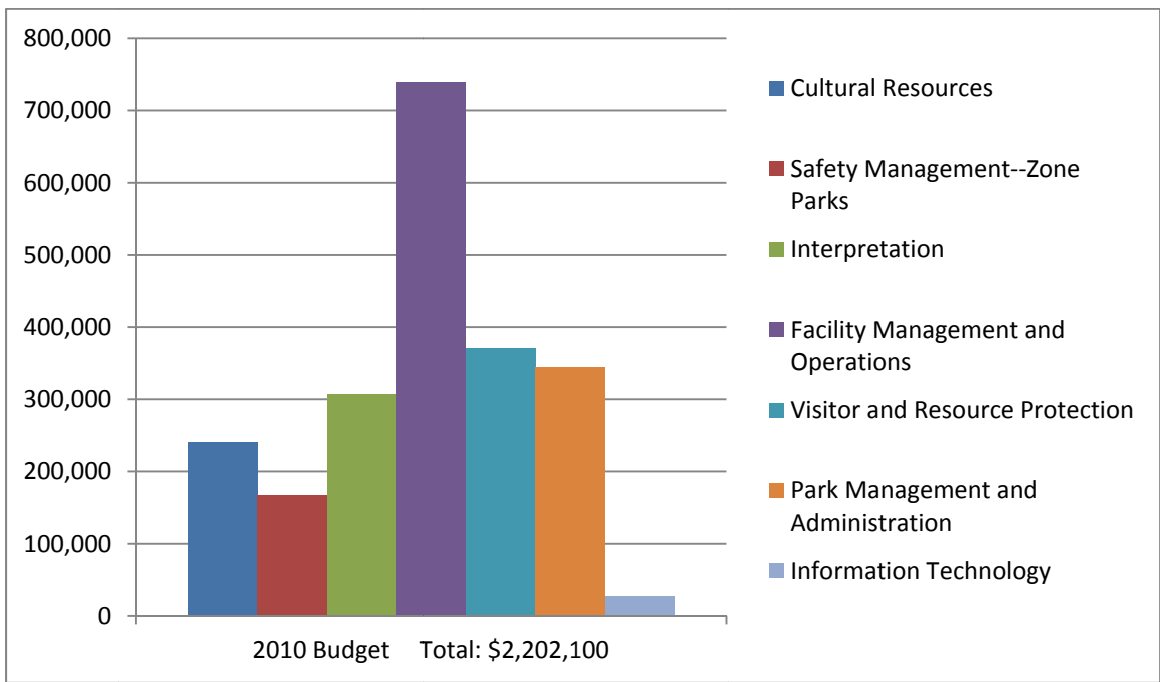
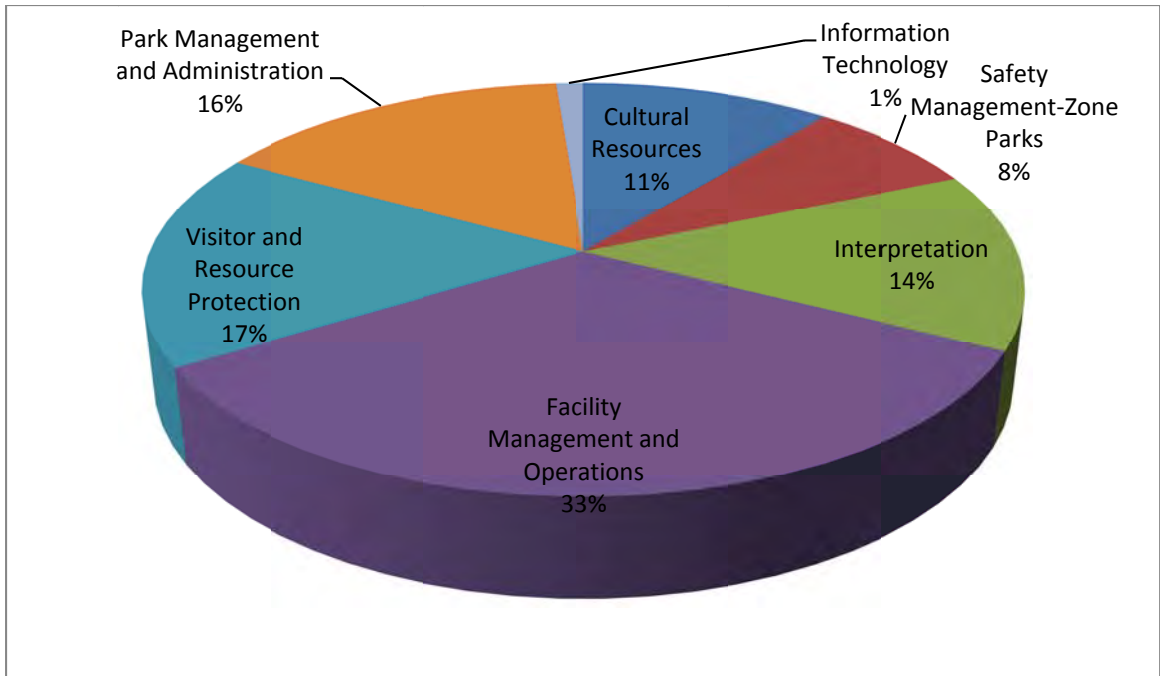


Figure A-5. Funding amounts and allocation for Pecos National Historical Park, FY2010

Appendix B: Indices Identified and Used

Existing indices were employed to provide a measure of resource conditions, but it was recognized that some attributes may require more than one index of condition to fully describe desired and current conditions.

Archeological Sites Management Information System (ASMIS)

The Archeological Sites Management Information System (ASMIS) records contain data onsite location, description, significance, condition, threats to, and management requirements for known park archeological sites. It serves as a tool to support improved archeological resources preservation, protection, planning, and decision-making by parks, and support offices.

Cultural Landscape Inventory

The Cultural Landscape Inventory is an evaluated inventory of all cultural landscapes and component landscapes having historic significance in which the National Park Service (NPS) has or plans to acquire legal interest. The Cultural Landscape Inventory provides baseline information for park cultural landscape resources, including landscape history, contributing and noncontributing landscape elements, significance, condition assessment, integrity, and eligibility for the National Register of Historic Places. Cultural Landscape Inventories assist management in determining potential impacts of projects on cultural landscape resources and in developing National Register nominations or amendments. Cultural Landscape Inventory completion requires concurrence from State Historic Preservation Offices.

Cultural Landscape Report

A Cultural Landscape Report is the primary guide to the treatment and use of a cultural landscape. Based on thorough documentation and analysis of landscape history, existing conditions, and landscape characteristics (presented in more detailed than a Cultural Landscape Inventory), the Cultural Landscape Report recommends an overall treatment approach for the landscape based on Secretary of the Interior Standards (for preservation, rehabilitation, restoration, or reconstruction) and provides specific treatment recommendations for landscape areas, features, and uses. While not a National Environmental Policy Act document, a Cultural Landscape Report often involves stakeholder interviews and review. Treatment recommendations in the Cultural Landscape Report provide guidance on how to maintain historic integrity and achieve desired conditions.

Historic Integrity

The National Register traditionally recognizes a property's integrity through seven aspects or qualities: location, design, setting, materials, workmanship, feeling, and association.

Location: the place where the historic property was constructed or the place where the historic event took place.

Design: the composition of elements that constitute the form, plan, space, structure, and style of a property.

Setting: the physical environment of a historic property that illustrates the character of the place.

Materials: the physical elements combined in a particular pattern or configuration to form the aid during a period in the past.

Workmanship: the physical evidence of the crafts of a particular culture or people during any given period of history.

Feeling: the quality that a historic property has in evoking the aesthetic or historic sense of a past period of time.

Association: the direct link between a property and the event or person for which the property is significant.

Three additional criteria have been developed specifically for landscapes, but are not National Register Criteria. These are:

Species Composition: Plant and animal species present, focusing on the dominant native and introduced species.

Community Organization/Structure: The size, structure, and distribution of each of its plant and animal populations, plus the cyclical patterns in these characteristics.

Land Management Techniques: Agricultural, horticultural, silviculture and other land management systems employed to manage species composition and community organization.

List of Classified Structures

The List of Classified Structures is an evaluated inventory of all historic and prehistoric structures that have historical, architectural, and/or engineering significance within parks of the National Park System in which the NPS has, or plans to acquire, any legally enforceable interest. The assignment of condition should be based on the goal of maintaining the character, material, and stability of the structure as acquired, excavated, or existing. The assessments, as presented in the List of Classified Structures, are an appropriate, although not comprehensive, description of current condition. The List of Classified Structures also assesses impact levels of an agent or series of agents having a negative effect on the significant characteristics or integrity of a structure, and for which some form of mitigation or preventative action is possible. This aspect of the assessment was not employed in the Resource Stewardship Strategy (RSS), but could be considered for future use or as a secondary step in determining a course of action to attain desired condition.

Mountain Stream Condition Index

Stream condition indices are used as indicators of ecosystem health and to identify impairment with respect to the reference (or natural) condition. The Mountain Stream Condition Index was developed specifically for wadeable streams in New Mexico.

See: Jacobi, G. Z., M. D. Jacobi and M. T. Barbour. 2006. Benthic Macroinvertebrate Stream Conditions Indices for New Mexico Wadeable Streams. New Mexico Environment Department, Santa Fe, New Mexico. .

New Mexico Night Sky Standards

The New Mexico Night Sky Protection Act [74-12-1 to 74-12-10 NMSA 1978] regulates outdoor night lighting fixtures to preserve and enhance the state's dark sky while promoting safety, conserving energy and preserving the environment for astronomy.

Proper Functioning Condition

To determine the condition of the Pecos River and Glorieta Creek riparian zones, "A User Guide to Assessing the Proper Functioning Condition and the Supporting Science for Lotic Areas" (Prichard 2003) was used. For this method, the "proper functioning condition" of a riparian area refers to the stability of the physical system, which in turn is dictated by the interaction of geology, soil, water, and vegetation. For this method, an interdisciplinary team of technical experts evaluates 17 hydrologic, vegetation, soil and geomorphology elements for each riparian assessment area.

Prichard, Don. 2003. A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas. TR 1737-16. Denver: Bureau of Land Management.

Rangeland Health Indicator Evaluation Matrix

This process relies on the use of a qualitative (i.e., non-measurement) procedure to assess the functional status of each indicator of rangeland health. A combination of 17 indicators are used to assess soil/site stability, hydrologic function, and the integrity of the biotic community.

Water Quality Standards

Water quality standards used are based on the Environmental Protection Agency's standards. The standards specify the water use classification for streams and upper levels of concentration for various constituents are set based on safe limits for the indicated use.

Appendix C: List of Preparers and Reviewers

Preparers

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Andrea Stacy, NPS, Air Resources Division

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Joel Wagner, NPS, Water Resources Division

Don Weeks, NPS, Water Resources Division

Appendix D: Glossary

Accountability

Managing resources in accordance with relevant laws and guidelines. Completing necessary documentation as stipulated by management guidelines. Assembling required knowledge so that resources can be managed appropriately.

Annual Work Plan

A comprehensive plan for allocating budget and personnel to accomplish work for the next year according to priority.

Archeological Sites Management Inventory System (ASMIS)

The Archeological Sites Management Inventory System (ASMIS) is a service-wide database that provides management information on archeological sites in National Park Service units. The database contains descriptive, significance, condition, threat, disturbance, bibliographic, locational, and management information for sites at a park unit. The database information may be used as a source of condition assessment information.

Assessment of Condition

Analysis of the state of a resource intended for protection, preservation, or conservation. This term usually refers to the resource's current condition.

Attribute

A feature of a resource that contributes to its description of condition.

Comprehensive Strategy

A logically organized sequence of actions designed to achieve and maintain the desired conditions established by a park's Foundation Statement and other foundation documents.

Component Landscape

A discrete portion of the landscape which can be further subdivided into individual features. Used in Cultural Landscape Inventories and National Register of Historic Places nominations.

Cultural Landscape

A geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity or person, or exhibiting other cultural or aesthetic values.

Cultural Landscape Inventory

The Cultural Landscape Inventory is an evaluated inventory of all cultural landscapes and component landscapes having historic significance in which the NPS has or plans to acquire legal interest. The Cultural Landscape Inventory provides baseline information for park cultural landscape resources, including landscape history, contributing and noncontributing landscape elements, significance, condition assessment, integrity, and eligibility for the National Register of Historic Places. Cultural Landscape Inventories assist management in determining potential impacts of projects on cultural landscape resources and in developing National Register nominations or amendments.

Cultural Landscape Report

A Cultural Landscape Report is the primary guide to treatment and use of a cultural landscape. Based on thorough documentation and analysis of landscape history, existing conditions, and landscape characteristics (more detailed than a Cultural Landscape Inventory), the Cultural Landscape Report recommends an overall treatment approach for the landscape based on Secretary of the Interior Standards (preservation, rehabilitation, restoration, or reconstruction) and provides specific treatment recommendations for landscape areas, features, and issues. While not a NEPA document, a Cultural Landscape Report often involves stakeholder interviews and review. Treatment recommendations in the Cultural Landscape Report provide guidance on how to maintain historic integrity and achieve desired conditions.

Desired Condition

A park's resource conditions (including natural and cultural) that the NPS aspires to achieve and maintain over time, and the conditions necessary for visitors to understand, enjoy, and appreciate those resources.

Determination of Eligibility

Determination of Eligibility, made by the State Historic Preservation Office or Keeper of the National Register Office, as to whether a resource is eligible for the National Register of Historic Places.

EPA

Acronym: Environmental Protection Agency.

Ethnographic Resources

Objects and places, including sites, structures, landscapes, and natural resources, with traditional cultural meaning and value to traditionally associated peoples.

Exotic Plant

A plant species not native to the region, ecosystem, or habitat.

Expert Review

Review of a document by qualified experts to ensure the accuracy and currency of information as well as the consideration of current scientific and other scholarly information.

Facility Management Software System (FMSS)

An information system which provides consistent and quantifiable information on NPS assets. The Facility Management Software System allows managers to track asset condition and maintenance information as a tool for making management decisions and investment.

Fundamental Resources and Values

Those resources identified a critical to achieving the park's purpose and maintaining its significance. These include systems, processes, features, visitor experiences, sounds, and views among others.

General Management Plan

A document which provides a qualitative understanding between NPS management and the public about the types of resource conditions and visitor experiences that will best meet the purpose of the park.

Indicator of Resource Condition

A measurable parameter associated with attributes of a resource. These are objective measures established by park resource managers to monitor the achievement of desired resource condition.

Influences

Stressors—either beneficial or detrimental—that affect resource condition.

Interpretive Themes

The most important ideas of concepts to be communicated to the public about the park.

Invasive Plant

An invasive is a nonnative plant which grows and spreads rapidly. The natural controls of these plants, such as herbivores, parasites, and diseases, may not be present in new environments, permitting their unrestricted growth. This unrestricted growth allows an invasive to displace existing, native vegetation reducing biodiversity.

Landscape

A system of interrelated Fundamental Resources and Values and Other Important Resources and Values. As a management and interpretive unit, a landscape is situated within particular resource contexts that provide the background and significance of the resources and inform management decisions.

Landscape Goal

A statement derived from a broad Desired Condition that provides a more specific starting point from which to develop attributes, indicators, and target goals. Landscape goals are consistent with the Pecos National Historical Park Foundation Statement and General Management Plan.

List of Classified Structures

An inventory of all historic structures that have historical, architectural, or engineering significance in which the NPS has a legal interest. The List of Classified Structures assists park managers in planning, programming, and recording decisions of treatment and consists of a database, forms, and attachments. The List of Classified Structures also tracks assessments of condition and integrity of structures.

New Mexico Environment Department (NMED)

The New Mexico Environment Department's mission is to provide the highest quality of life throughout the state by promoting a safe, clean and productive environment. The New Mexico Environment Department monitors numerous environmental parameters, including air and water quality.

National Park Service Organic Act (1916)

The Organic Act (1916) established the National Park Service, developing a single system to manage all parks, monuments and designated sites. The Organic Act also provided the National

Park Service with the mandate to preserve and protect a park and its resources while also providing for the enjoyment of the resources by the public.

National Register of Historic Places

The National Register of Historic Places is the nation's official list of historic places worthy of preservation. The National Register was authorized by the National Historic Preservation Act of 1966 and is administered by the National Park Service. There are currently over 80,000 listings on the Register.

Natural Resource Condition Assessment (NRCA)

Natural Resource Condition Assessments (NRCA) evaluate existing data and in some cases collect new data in order to understand the state of knowledge and condition of natural resources within and adjacent to park units

NMED

Acronym: New Mexico Environment Department

National Resources Program Center (NRPC)

The National Resources Program Center (NRPC) identifies and mitigates threats that endanger animals, plants, air, water, and geologic features or processes in our national parks. The NRPC's professional staff helps NPS field managers care for and restore these interrelated natural systems. Through education, the NRPC helps the public understand that human actions directly affect the health of our national parks and associated ecosystems.

ONPS

Acronym: Operation of the National Park Service.

Reference Condition

The optimal state of a resource.

Resource Context

A description of the history and historical influences for interrelated Fundamental Resources and Values that corresponds with the relevant significance statements and interpretive themes.

Resource Stewardship Strategy (RSS)

A planning document which provides linkage between the qualitative desired conditions defined by the General Management Plan and other foundation documents and the measurable outcomes and actions identified in strategic plans. These linkages are defined in Comprehensive Strategies and activities / projects that provide park managers with a logical sequence of activities to achieve desired conditions.

Significance

Statements of why the park's resources and values are important enough—within a regional, national, or system-wide context—to justify designation as an NPS unit and/or to justify eligibility to the National Register of Historic Places.

Soundscape

The aggregate of all the natural, nonhuman-caused sounds as well as human or historic sounds that occur in the park, together with the physical capacity for transmitting sounds.

Southern Plains Inventory & Monitoring Network

Pecos National Historical Park is included within this network. The Inventory & Monitoring networks collect, organize, and make available natural resource data and contribute to the NPS's institutional knowledge by facilitating the transformation of data into information through analysis, synthesis, and modeling.

Subject Matter Experts

Technical experts in scientific or scholarly disciplines which are relevant to the RSS.

Target Value

The value of an indicator which represents park management's objectives relative to the ideal Desired Condition.

Viewshed

A viewshed is the area of land, water or other environmental elements that are visible from a fixed vantage point or set of points.

Visitor

Anyone who physically visits the park for recreational, educational or scientific purposes, or who otherwise uses the park's interpretive and educational services, regardless of where such use occurs (e.g., via internet access, a library)

Vital Signs

A set of indicators that give a general measure of resource health.

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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National Park Service
U.S. Department of the Interior



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