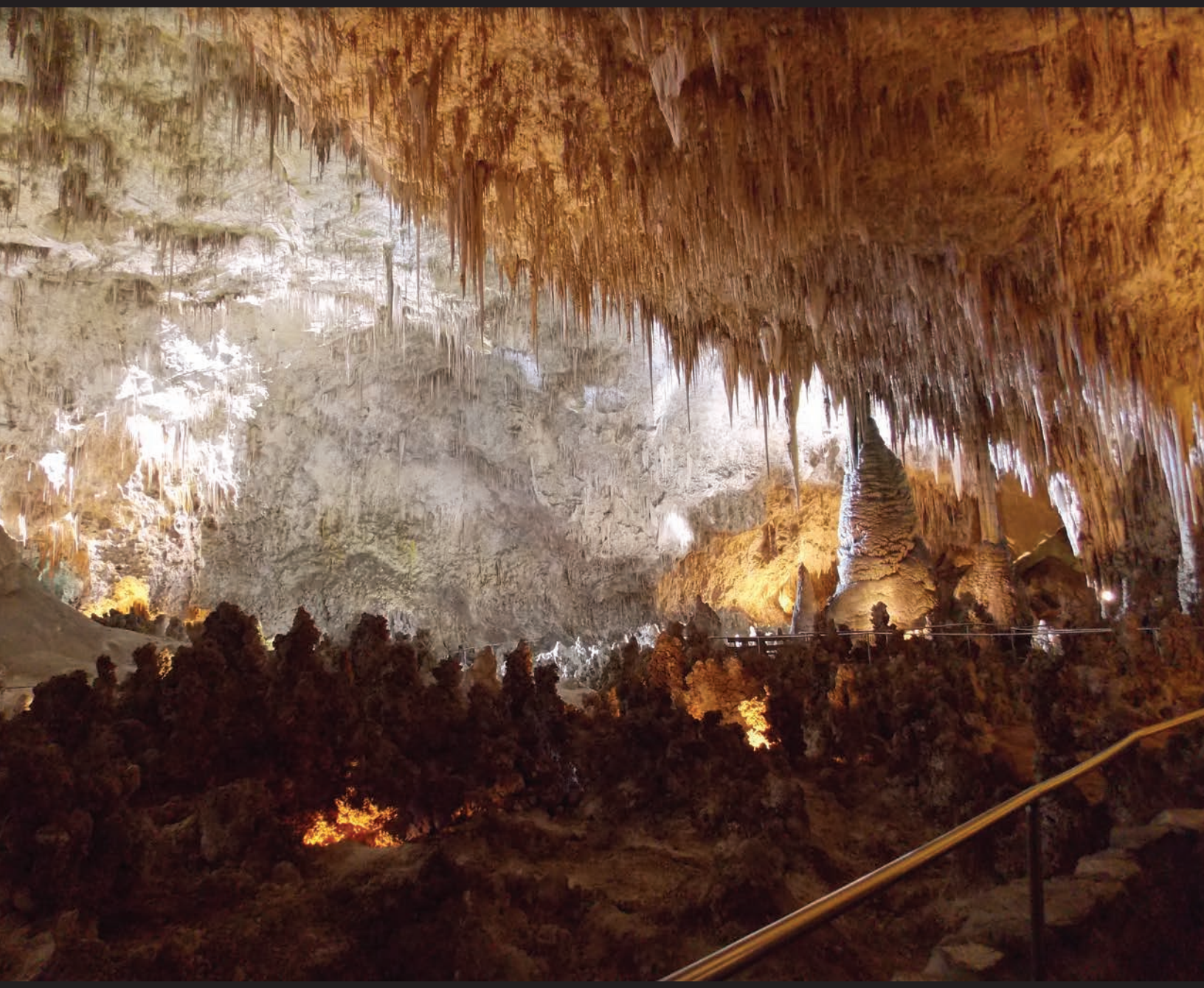
NATIONAL PARK SERVICE • U.S. DEPARTMENT OF THE INTERIOR

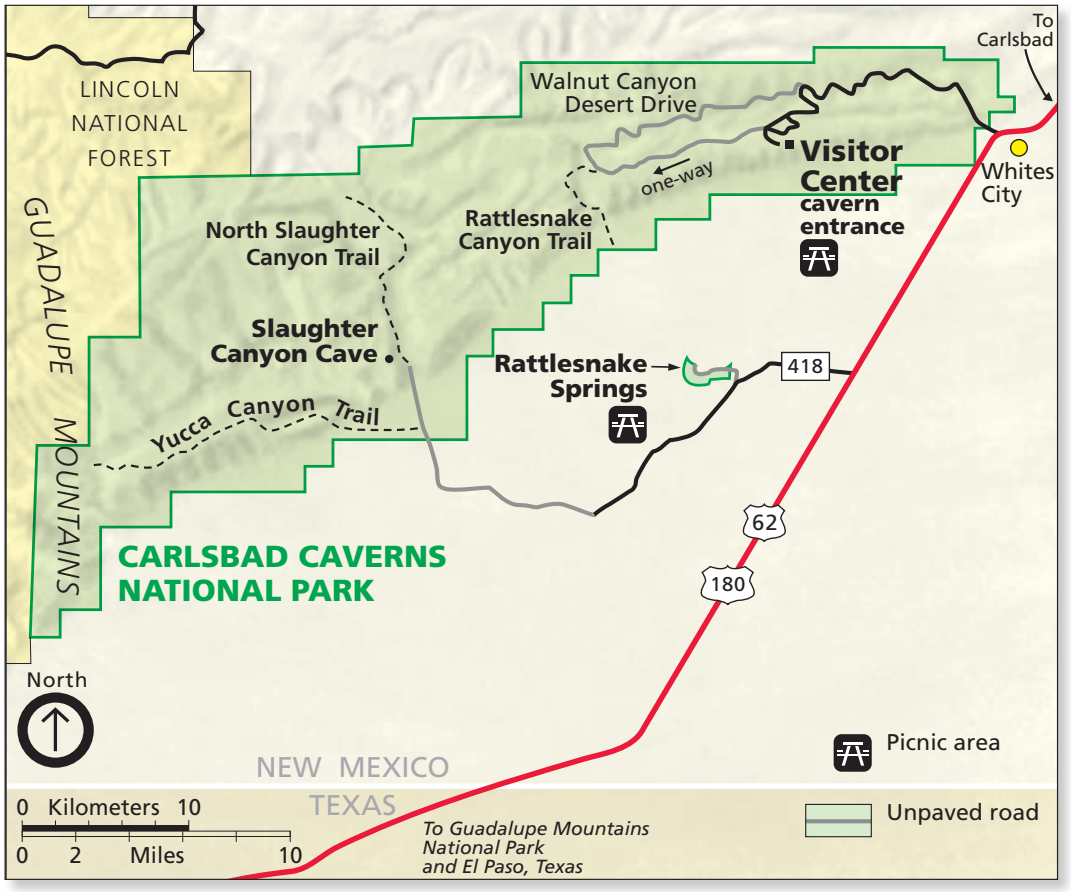
Foundation Document

Carlsbad Caverns National Park

New Mexico

February 2017




LINCOLN
NATIONAL
FOREST
GUADALUPE MOUNTAINS
Walnut Canyon
Desert Drive
one-way
Visitor
Center
cavern
entrance
To
Carlsbad
Whites
City
North Slaughter
Canyon Trail
Rattlesnake
Canyon Trail
Slaughter
Canyon Cave
Rattlesnake
Springs
418
Yucca Canyon Trail
CARLSBAD CAVERNS
NATIONAL PARK
62
180
North
NEW MEXICO
TEXAS
0 Kilometers 10
0 2 Miles 10
To Guadalupe Mountains
National Park
and El Paso, Texas
Picnic area
Unpaved road

Contents

Mission of the National Park Service 1

Introduction. 2

Part 1: Core Components 3

Brief Description of the Park. 3
Park Purpose 4
Park Significance 5
Fundamental Resources and Values 6
Other Important Resources and Values 8
Interpretive Themes 9

Part 2: Dynamic Components 10

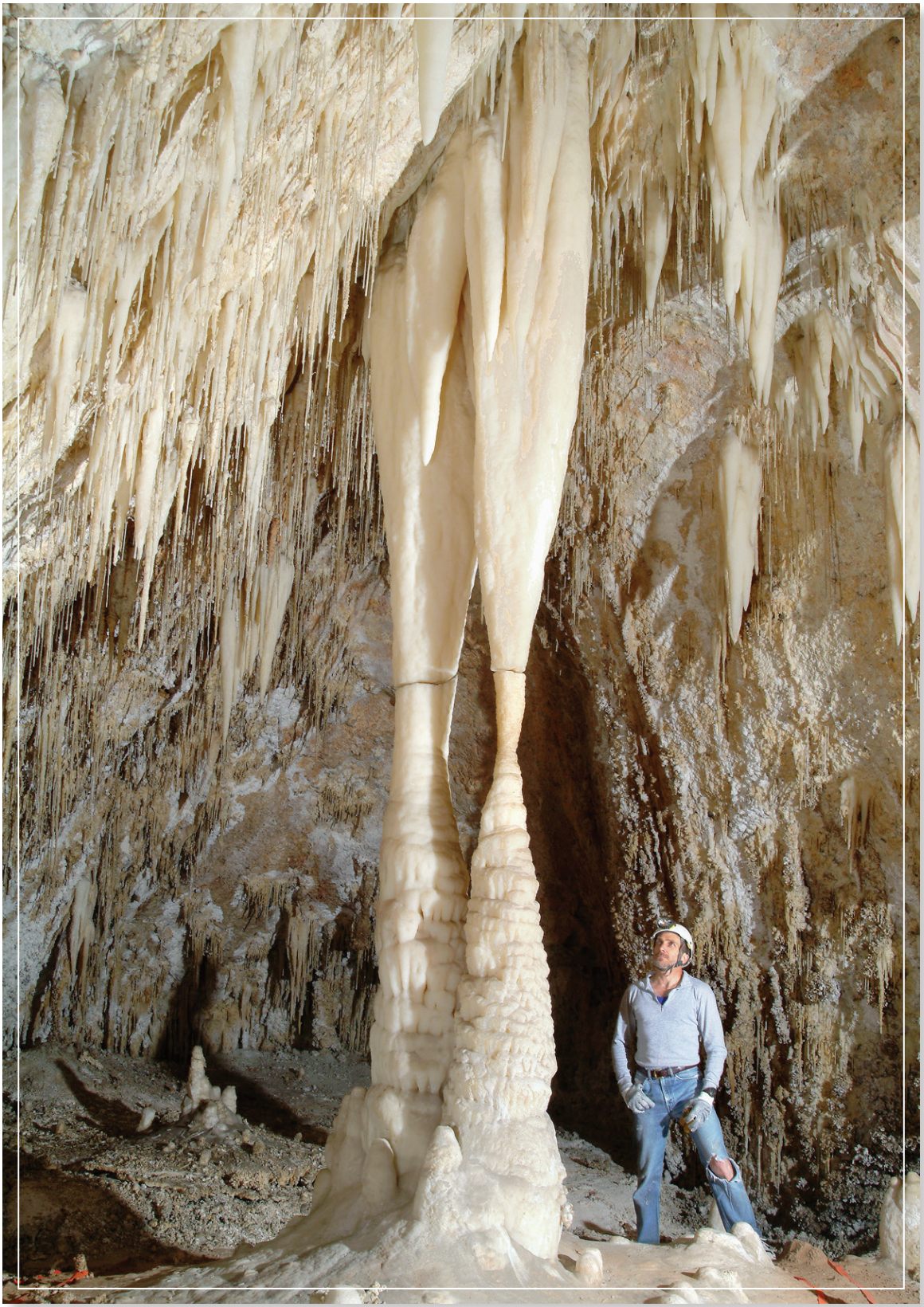
Special Mandates and Administrative Commitments 10
Assessment of Planning and Data Needs 10
Analysis of Fundamental Resources and Values 10
Analysis of Other Important Resources and Values 26
Identification of Key Issues and Associated Planning and Data Needs . . . 37
Planning and Data Needs 39

Part 3: Contributors 44

Carlsbad Caverns National Park 44
NPS Intermountain Region 44
Other NPS Staff 44
Photo Credits 44

Appendixes 45

Appendix A: Presidential Proclamation and Legislative Acts for Carlsbad Caverns National Park 45
Appendix B: Inventory of Special Mandates, Special Designations, and Administrative Commitments 51
Appendix C: Past and Ongoing Park Planning and Data Collection Efforts 54
Appendix D: Traditionally Associated American Indian Tribes. 59



Mission of the National Park Service

The National Park Service (NPS) preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The National Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

The NPS core values are a framework in which the National Park Service accomplishes its mission. They express the manner in which, both individually and collectively, the National Park Service pursues its mission. The NPS core values are:

- **Shared stewardship:** We share a commitment to resource stewardship with the global preservation community.
- **Excellence:** We strive continually to learn and improve so that we may achieve the highest ideals of public service.
- **Integrity:** We deal honestly and fairly with the public and one another.
- **Tradition:** We are proud of it; we learn from it; we are not bound by it.
- **Respect:** We embrace each other's differences so that we may enrich the well-being of everyone.

The National Park Service is a bureau within the Department of the Interior. While numerous national park system units were created prior to 1916, it was not until August 25, 1916, that President Woodrow Wilson signed the National Park Service Organic Act formally establishing the National Park Service.

The national park system continues to grow and comprises more than 400 park units covering more than 84 million acres in every state, the District of Columbia, American Samoa, Guam, Puerto Rico, and the Virgin Islands. These units include, but are not limited to, national parks, monuments, battlefields, military parks, historical parks, historic sites, lakeshores, seashores, recreation areas, scenic rivers and trails, and the White House. The variety and diversity of park units throughout the nation require a strong commitment to resource stewardship and management to ensure both the protection and enjoyment of these resources for future generations.

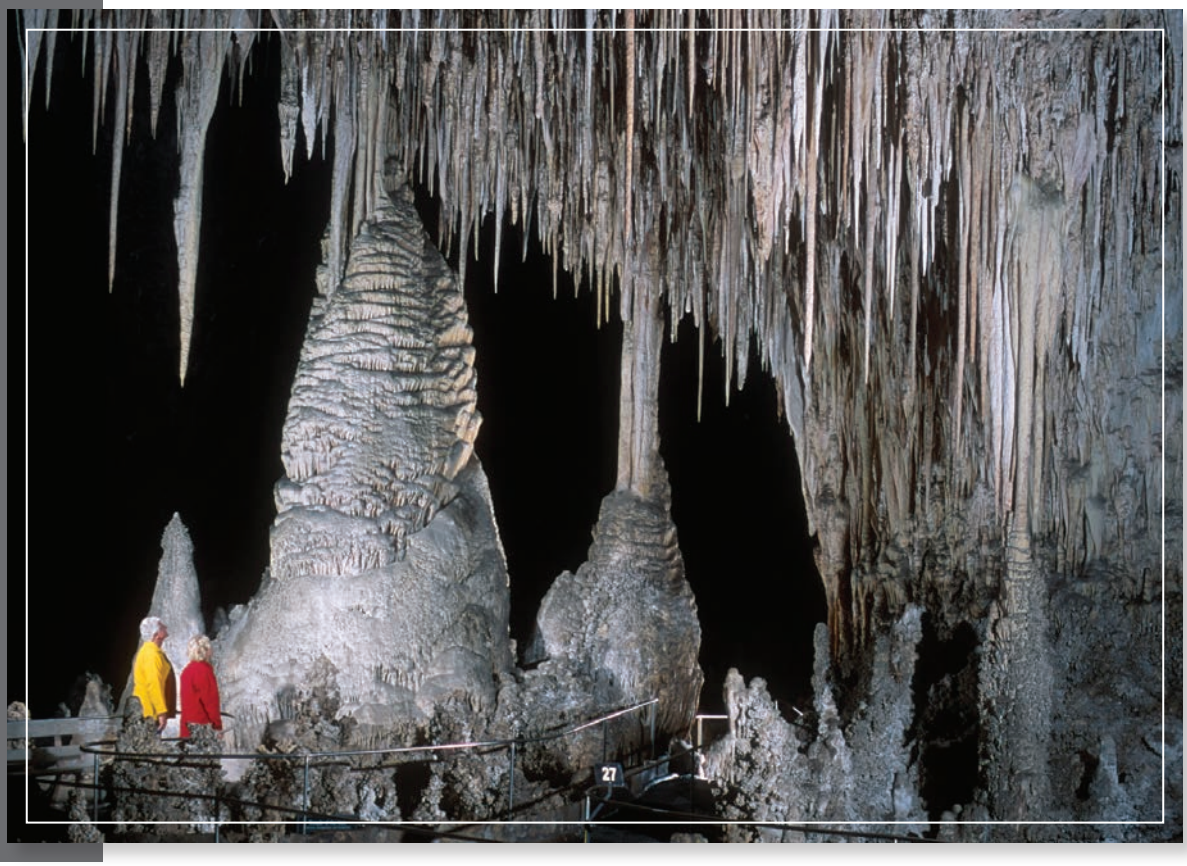
The arrowhead was authorized as the official National Park Service emblem by the Secretary of the Interior on July 20, 1951. The sequoia tree and bison represent vegetation and wildlife, the mountains and water represent scenic and recreational values, and the arrowhead represents historical and archeological values.

Introduction

Every unit of the national park system will have a foundational document to provide basic guidance for planning and management decisions—a foundation for planning and management. The core components of a foundation document include a brief description of the park as well as the park's purpose, significance, fundamental resources and values, other important resources and values, and interpretive themes. The foundation document also includes special mandates and administrative commitments, an assessment of planning and data needs that identifies planning issues, planning products to be developed, and the associated studies and data required for park planning. Along with the core components, the assessment provides a focus for park planning activities and establishes a baseline from which planning documents are developed.

A primary benefit of developing a foundation document is the opportunity to integrate and coordinate all kinds and levels of planning from a single, shared understanding of what is most important about the park. The process of developing a foundation document begins with gathering and integrating information about the park. Next, this information is refined and focused to determine what the most important attributes of the park are. The process of preparing a foundation document aids park managers, staff, and the public in identifying and clearly stating in one document the essential information that is necessary for park management to consider when determining future planning efforts, outlining key planning issues, and protecting resources and values that are integral to park purpose and identity.

While not included in this document, a park atlas is also part of a foundation project. The atlas is a series of maps compiled from available geographic information system (GIS) data on natural and cultural resources, visitor use patterns, facilities, and other topics. It serves as a GIS-based support tool for planning and park operations. The atlas is published as a (hard copy) paper product and as geospatial data for use in a web mapping environment. The park atlas for Carlsbad Caverns National Park can be accessed online at: http://insideparkatlas.nps.gov/.



Part 1: Core Components

The core components of a foundation document include a brief description of the park, park purpose, significance statements, fundamental resources and values, other important resources and values, and interpretive themes. These components are core because they typically do not change over time. Core components are expected to be used in future planning and management efforts.

Brief Description of the Park

Established as a unit of the national park system in 1923, Carlsbad Caverns National Park preserves Carlsbad Cavern and more than 120 other known caves including Lechuguilla Cave, the nation's second deepest limestone cave at 1,604 feet and the world's seventh longest cave. The caves formed over the last 20 million years as sulfuric acid dissolved the surrounding limestone of the ancient reef. The park also protects an extraordinary and unique ecological association of bats, cave climate, speleothems, hydrology, cave fauna, and microbes. In 1995, the United Nations recognized the worldwide significance of the spectacular resources of Carlsbad Caverns National Park by designating it as a World Heritage Site. Visitation at the park totaled more than 440,000 in 2015.

Carlsbad Caverns National Park is located in the Guadalupe Mountains, a mountain range that runs from west Texas into southeastern New Mexico. The Guadalupe Mountains are the uplifted portion of an ancient reef that thrived along the edge of an inland sea more than 250 million years ago during the geologic time period known as the Permian Period.

The park encompasses 46,766 acres in the Chihuahuan Desert of southeastern New Mexico, with more than 33,000 acres designated by Congress as wilderness in 1978. The park is one of the few places where portions of this desert are preserved and protected.

The park supports a diverse ecosystem, including habitat for many plants and animals that are at the geographic limits of their ranges. For example, the ponderosa pine reaches its extreme eastern limit here and several species of reptiles are at the edges of their distributions. The park also provides important habitat for top predators such as cougars, and is home to what is perhaps the largest colony of cave swallows in the northern hemisphere. The Bat Cave area in Carlsbad Cavern provides important habitat for a large colony of Brazilian free-tailed bats as a place to give birth and raise young, as well as a stopover from migration.

The park's cultural resources represent a long and varied continuum of human use and adaptation to the Chihuahuan Desert environment dating to the late Pleistocene Epoch. Twelve to fourteen thousand years ago, American Indians lived in the Guadalupe Mountains; some of their cooking ring sites and pictographs have been found within the present day boundaries of the park. By the 1500s, Spanish explorers were passing through present-day west Texas and southeastern New Mexico. Spain claimed the southwest until 1821 when Mexico revolted and claimed independence. Mexico lost the southwest to the United States at the end of the Mexican-American War in 1848. For the next 40 years, conflict persisted in the Carlsbad area between several American Indian tribes and the U.S. government. Human activities, including prehistoric and historic American Indian occupations, homesteading and ranching, guano mining, and resource preservation and tourism, have contributed to the rich and diverse history of the area.

The park has two historic districts in the National Register of Historic Places—the Carlsbad Caverns Historic District and the Rattlesnake Springs Historic District, which include 30 historic structures. The park museum, including the park archives, contains approximately 1 million cultural resource artifacts.

Park Purpose

The purpose statement identifies the specific reason(s) for establishment of a particular park. The purpose statement for Carlsbad Caverns National Park was drafted through a careful analysis of its enabling legislation and the legislative history that influenced its development. The park was established by presidential proclamation on October 25, 1923 (see appendix A for presidential proclamation and legislative acts). The purpose statement lays the foundation for understanding what is most important about the park.

The purpose of Carlsbad Caverns National Park, a World Heritage Site, is to preserve and protect an internationally recognized Permian reef, superlative cave and karst resources, ecosystems, wilderness, and diverse cultural heritage for the enjoyment of the people.

Park Significance

Significance statements express why a park's resources and values are important enough to merit designation as a unit of the national park system. These statements are linked to the purpose of Carlsbad Caverns National Park, and are supported by data, research, and consensus. Statements of significance describe the distinctive nature of the park and why an area is important within a global, national, regional, and systemwide context. They focus on the most important resources and values that will assist in park planning and management.

The following significance statements have been identified for Carlsbad Caverns National Park. (Please note that the sequence of the statements does not reflect the level of significance.)

1. Carlsbad Caverns National Park, a World Heritage Site, protects more than 120 known caves that are outstanding because of their size, exploration potential, mode of origin, unique biology, and the abundance, diversity and beauty of its speleothems (cave formations).

2. Carlsbad Cavern attracts visitors from around the world to see spectacular speleothems, the largest and most easily visited cave room in the United States, and the wildlife viewing experience of the Brazilian free-tailed bat flight.

3. Lechuguilla Cave is the second deepest limestone cave in the United States and the seventh longest cave in the world. Continuing exploration and research reveals rare and diverse microbes and speleothems, including impressive and iconic gypsum chandeliers.

4. Carlsbad Caverns National Park protects a portion of the Chihuahuan Desert ecosystem that supports extraordinary biodiversity within a small geographic area, providing important refuges within the larger desert ecoregion.

5. Seventy-one percent (33,125 acres) of the park is federally designated as Carlsbad Caverns Wilderness where visitors may experience a natural acoustic environment, clear night skies, clean air and expansive vistas, and opportunities for solitude in a steep, rugged desert environment.

6. The park's cultural heritage represents a continuum of human use from prehistory to present of the desert environment and caves as represented by hundreds of surface and subsurface archeological sites, longstanding and ongoing relationships with 14 American Indian tribes, two national register historic districts, two cultural landscapes, and nearly 1 million museum objects.

7. Carlsbad Caverns National Park protects a portion of the Permian Age Capitan Reef, one of the world's best preserved and accessible reef complexes with unique opportunities to view the reef from the inside.

8. Past environments and climates can be understood at Carlsbad Caverns National Park by studying fossil resources and conducting paleoclimate research using speleothems.

Fundamental Resources and Values

Fundamental resources and values (FRVs) are those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to warrant primary consideration during planning and management processes because they are essential to achieving the purpose of the park and maintaining its significance. Fundamental resources and values are closely related to a park's legislative purpose and are more specific than significance statements.

Fundamental resources and values help focus planning and management efforts on what is truly significant about the park. One of the most important responsibilities of NPS managers is to ensure the conservation and public enjoyment of those qualities that are essential (fundamental) to achieving the purpose of the park and maintaining its significance. If fundamental resources and values are allowed to deteriorate, the park purpose and/or significance could be jeopardized.

The following fundamental resources and values have been identified for Carlsbad Caverns National Park:

- **Cave and Karst Resources.** Carlsbad Caverns National Park contains more than 120 known limestone caves. The Big Room of Carlsbad Cavern is the largest cave chamber in North America, and Lechuguilla Cave (the seventh longest known cave in the world and the second deepest limestone cave in the United States) has an unusually high cave passage density. The park's caves contain a huge abundance and diversity of speleothems including cave pearls, soda straws, draperies, popcorn, and many rare and unique formations such as subaqueous helictites, rusticles, and outstanding gypsum chandeliers. The caves' distinctive genesis by sulfuric acid dissolution differentiates them from most of the other caves in the world.
- **Chihuahuan Desert and Other Ecosystems.** Carlsbad Caverns National Park contains a large number of vegetation types and more than 900 vascular plant taxa. The park is one of the few places where the rich biodiversity of the northern Chihuahuan Desert is preserved and protected, making it an important year-round refuge for reptiles, insects, birds, and mammals of the region, including large colonies of migratory cave swallows and Brazilian free-tailed bats. Two taxa of cacti and two of birds found in the park are federally listed as endangered or threatened. The park's underground environments serve as habitat for distinctive invertebrate communities as well as rare and mysterious microorganisms that have great potential for future scientific research.

- **Capitan Reef.** Carlsbad Caverns National Park protects one of the best preserved exposed Permian-age fossil reefs in the world. The park's deep canyons and caves provide visitors and scientists with unique opportunities to view and study this fossil reef from the inside.
- **Designated Wilderness.** Carlsbad Caverns National Park contains more than 33,000 acres of federally designated wilderness where visitors can experience solitude and primitive and unconfined recreation and the landscape is largely in its natural condition and untrammeled by man. With relatively little artificial noise, the park exhibits a prominently natural soundscape and acoustic environment, and the protection of air quality and views afforded by its Class I airshed benefit visitors and support park resources. The night sky at Carlsbad Caverns National Park is dark enough for visitors to experience stars and other night sky resources as seen from the wild desert environment.
- **Exploration and Research.** Ongoing research of caves and surface resources at the park frequently leads to new scientific discoveries. Many volunteers work with park staff and researchers to contribute thousands of hours to cave exploration, survey, inventory, and cartography. Current surface studies monitor nonnative plant species, inventory seeps and springs, and seek to understand the complex hydrology of the surface and subsurface environments.
- **Opportunities for Connection to the Resources.** Human visitation of the park has gone through several chapters since discovery, from prehistoric occupation, to candlelit and kerosene lantern expeditions, to elevators and paved Civilian Conservation Corps (CCC) trails. Today, the Big Room of Carlsbad Caverns is one of the most easily accessed cave chambers in the world, and the amphitheater at the cave's mouth provides an opportunity for up to 1,000 people to witness the awe-inspiring nightly bat flight. Visitors of all ages and backgrounds can explore and discover the park through a broad spectrum of recreational cave tours, above ground hiking, backcountry camping, and educational and interpretive programs.

Other Important Resources and Values

Carlsbad Caverns National Park contains other resources and values that are not fundamental to the purpose of the park and may be unrelated to its significance, but are important to consider in planning processes. These are referred to as "other important resources and values" (OIRV). These resources and values have been selected because they are important in the operation and management of the park and warrant special consideration in park planning.

The following other important resources and values have been identified for Carlsbad Caverns National Park:

- **Carlsbad Caverns Historic District and Cultural Landscape.** The Carlsbad Caverns Historic District and Cultural Landscape at the mouth of Carlsbad Caverns encompasses the early NPS, CCC, and Mission 66 development with a 1900–1972 period of significance, as well as the entrance road, archeological sites, the quarry, the visitor center, and the historic parking area. The centerpiece of the district is the natural entrance to the cavern.
- **Rattlesnake Springs, Including Its Historic District and Cultural Landscape.** Rattlesnake Springs, designated an Important Birding Area by the Audubon Society, draws more than 300 species of birds—including state and federally listed species—as well as local and international birdwatchers. The pond and riparian areas provide important habitat for mammals, reptiles, amphibians, and insects as well as a vital water supply for the park. Rattlesnake Springs Historic District and cultural landscape has a number of pre-contact archeological sites, and the area has been reshaped, terraced, watered, planted, and tended by people for more than 100 years. Several archeological sites and historic CCC structures at the springs are in very good condition.

- **Prehistoric Cultural Resources.** Approximately 12,000 to 14,000 years ago, American Indians lived in the Guadalupe Mountains; some of their cooking ring sites and pictographs have been found within the present day boundaries of the park. Carlsbad Caverns protects more than 200 surface and subsurface pictographs, including examples of rock art that are unusual in the deep-cave dark zone.
- **Museum and Archival Collections.** Primary documentation and museum collections contribute to the understanding of historic events and natural resources associated with Carlsbad Caverns National Park. The exceptionally important museum and archival collections are intrinsically tied to the park and allow for interpretation based on accurate historical evidence. The collections protect prehistoric pottery and lithic specimens that demonstrate the use of the land potentially as far back as 10,000 years, as well as historic artifacts that show a continued use of the area, including the caverns, since the 1800s.
- **Continuing Connections and Consultation with Associated Tribes.** Fourteen American Indian tribes have longstanding and ongoing relationships with the Carlsbad Caverns-Guadalupe Mountain landscape that is now Carlsbad Caverns National Park.

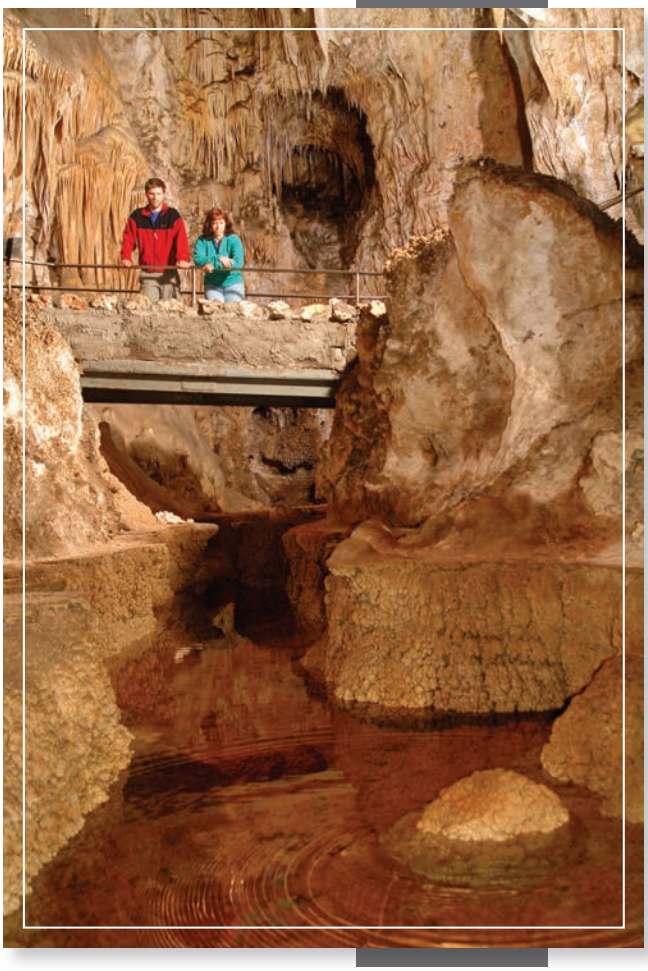
Interpretive Themes

Interpretive themes are often described as the key stories or concepts that visitors should understand after visiting a park—they define the most important ideas or concepts communicated to visitors about a park unit. Themes are derived from, and should reflect, park purpose, significance, resources, and values. The set of interpretive themes is complete when it provides the structure necessary for park staff to develop opportunities for visitors to explore and relate to all park significance statements and fundamental and other important resources and values.

Interpretive themes are an organizational tool that reveal and clarify meaning, concepts, contexts, and values represented by park resources. Sound themes are accurate and reflect current scholarship and science. They encourage exploration of the context in which events or natural processes occurred and the effects of those events and processes. Interpretive themes go beyond a mere description of the event or process to foster multiple opportunities to experience and consider the park and its resources. These themes help explain why a park story is relevant to people who may otherwise be unaware of connections they have to an event, time, or place associated with the park.

The following interpretive themes have been identified for Carlsbad Caverns National Park:

- The awe-inspiring caves of Carlsbad Caverns National Park began 250 million years ago when a living reef formed in a Permian sea. Phases in the speleogenesis have included uplift of the reef, dissolution of chambers by sulfuric acid, and decoration by the slow drip of calcium carbonate-laden waters.
- The continuing discovery and study of organisms in Carlsbad Caverns National Park, such as the "microbial forest" of Lechuguilla Cave and the Brazilian free-tailed bat colony of Carlsbad Cavern, invite greater understanding of how seemingly inconsequential and misunderstood life-forms play significant roles in natural processes that affect our lives.
- The natural and cultural resources of the Northern Chihuahuan Desert, as preserved within Carlsbad Caverns National Park and Wilderness, reveal how plants, animals, and people have adapted to an arduous environment.
- The relationship between the surface and subsurface environments of Carlsbad Caverns National Park provides unique opportunities to explore the sometimes surprising interactions of these seemingly disparate worlds.
- Historical and ongoing discoveries at Carlsbad Caverns National Park exemplify human curiosity and the innate desire to overcome challenges and explore new frontiers.
- The ongoing story of providing access to and preserving resources at Carlsbad Caverns National Park reveals how humans value and showcase heritage and continue to learn how to protect it.



Part 2: Dynamic Components

The dynamic components of a foundation document include special mandates and administrative commitments and an assessment of planning and data needs. These components are dynamic because they will change over time. New special mandates can be established and new administrative commitments made. As conditions and trends of fundamental and other important resources and values change over time, the analysis of planning and data needs will need to be revisited and revised, along with key issues. Therefore, this part of the foundation document will be updated accordingly.

Special Mandates and Administrative Commitments

Many management decisions for a park unit are directed or influenced by special mandates and administrative commitments with other federal agencies, state and local governments, utility companies, partnering organizations, and other entities. Special mandates are requirements specific to a park that must be fulfilled. Mandates can be expressed in enabling legislation, in separate legislation following the establishment of the park, or through a judicial process. They may expand on park purpose or introduce elements unrelated to the purpose of the park. Administrative commitments are, in general, agreements that have been reached through formal, documented processes, often through memorandums of agreement. Examples include easements, rights-of-way, arrangements for emergency service responses, etc. Special mandates and administrative commitments can support, in many cases, a network of partnerships that help fulfill the objectives of the park and facilitate working relationships with other organizations. They are an essential component of managing and planning for Carlsbad Caverns National Park.

For more information about the existing special mandates and administrative commitments for Carlsbad Caverns National Park, please see appendix B.

Assessment of Planning and Data Needs

Once the core components of part 1 of the foundation document have been identified, it is important to gather and evaluate existing information about the park's fundamental and other important resources and values, and develop a full assessment of the park's planning and data needs. The assessment of planning and data needs section presents planning issues, the planning projects that will address these issues, and the associated information requirements for planning, such as resource inventories and data collection, including GIS data.

There are three sections in the assessment of planning and data needs:

1. analysis of fundamental and other important resources and values
2. identification of key issues and associated planning and data needs
3. identification of planning and data needs (including spatial mapping activities or GIS maps)

The analysis of fundamental and other important resources and values and identification of key issues leads up to and supports the identification of planning and data collection needs.

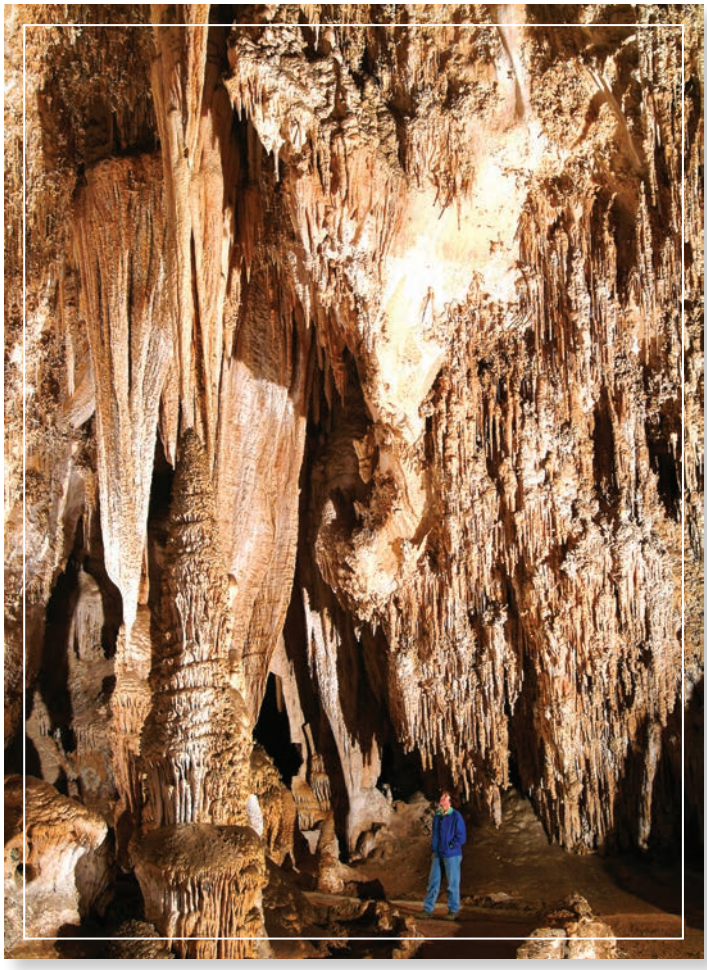
Analysis of Fundamental Resources and Values

The fundamental resource or value analysis table includes current conditions, potential threats and opportunities, planning and data needs, and selected laws and NPS policies related to management of the identified resource or value.

Fundamental Resource or Value	Cave and Karst Resources
Related Significance Statements	Significance statements 1, 2, and 3
Current Conditions and Trends	**Conditions** • Caves where public guided tours are offered (e.g., Spider Cave, Slaughter Cave, and Lower Cave) exhibit moderate impacts from visitation. • Lechuguilla Cave is in excellent condition. • The developed parts of Carlsbad Cavern are highly impacted due to development inside and above the cave (including the lunchroom, restrooms, and sewage systems). • Speleothems are generally in good condition, although areas with a longer history of tourism show damage from visitation and tour-related infrastructure. • Cave biota and ecosystem are generally in good condition, although bats and biota near some tour areas face additional issues (see threats below). • Nonnative algae and cyanobacteria growth caused by cave lighting (lampenflora) is widespread but localized in lighted tour areas of the caves. • Dust and lint from cave trails and tourists is widespread but localized in toured areas of the cave. Both dust and lint obscure and potentially threaten cave ecosystems and resources. Dust and lint impact cave aesthetics in heavily toured areas. • Oil and grit separators are in place to catch runoff and minimize contamination in Carlsbad Cavern. • Impacts vary in other park caves. **Trends** • Cave resources are generally well protected from damage and remain in good condition. Exceptions occur where visitation is leading to deterioration of some resources. • Pools inside the caves are being dried out due to multiple causes, though airlocks have improved humidity control. • Parking lots have increased the impervious area above the caves, impacting hydrologic processes in the caves.

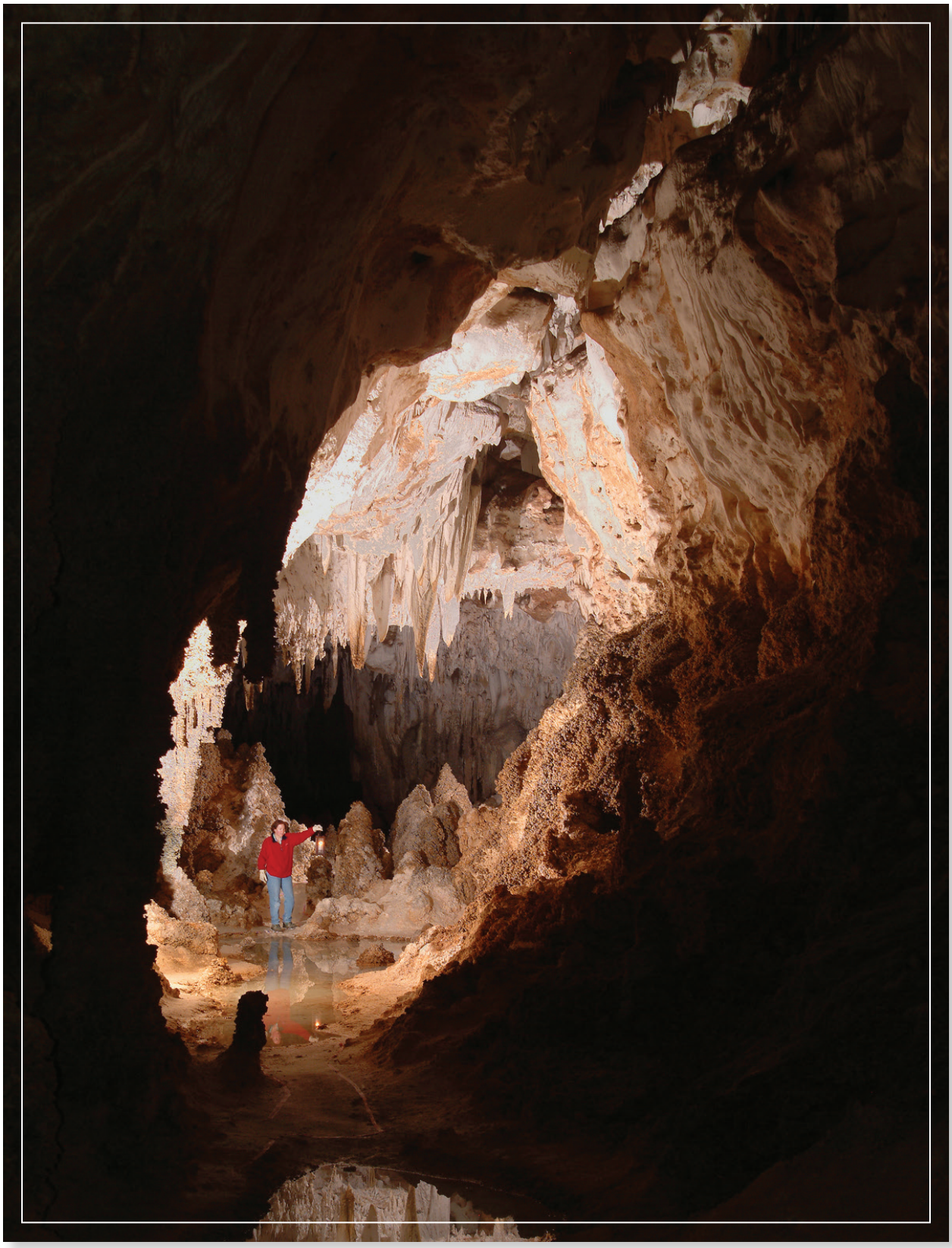
Fundamental Resource or Value	Cave and Karst Resources
Threats and Opportunities	**Threats** • Infiltration of contaminated water from parking lots and sewer lines has the potential to impact the entire ecosystem, destroying cave features and the habitat of the world-famous colony of migratory Brazilian free-tailed bats. • Localized impacts from authorized and unauthorized off-trail use within the caves and inappropriate visitor behavior such as defecation, touching formations, and other vandalism, resulting in degradation to associated cave resources (specifically in the Big Room of Carlsbad Cavern). In the past, as many as 2,000 speleothems each year were vandalized or stolen from Carlsbad Cavern. • Changes in climate through increased mean annual temperature and varied precipitation could alter cave conditions. • Air quality degradation (i.e., increased acid, particle, and mercury deposition) affect natural cave processes, features, and organisms. • Lampenflora, lint, and dust threaten cave ecosystems and visitor experiences in toured areas of caves. • Modifications to the natural airflow and humidity in the caves from elevator shafts may impact cave quality. • There is a shortage of staff to rove self-guided cave tours and monitor visitor actions. • There is a lack of cave specialists to monitor condition of cave resources. • Utility features indirectly impact resources (e.g., lighting systems, electrification of the cave, sewage systems). • The lunchroom in the Big Room of Carlsbad Cavern impacts the cave and encourages wildlife (e.g., ringtail cats) to enter the cave. • Nearby oil and gas activities threaten the caves in many ways, including directional drilling, off gassing, plugging voids with concrete, and reduced groundwater quality. Groundwater resources include the Capitan aquifer (only accessible in the park via the deep point of Lechuguilla Cave) and the Rattlesnake Springs aquifer (the source of the park's water). Both aquifers are susceptible to oil and gas stressors, as well as drought and over-pumping. • Unauthorized access to backcountry caves is a concern as the park lacks staff to manage or prevent such uses. • Main stressors for other caves are unauthorized access and oil and gas development. **Opportunities** • Research partnerships with academic institutions, state and federal agency partners, nongovernmental organizations, and private individuals in order to provide ongoing information for decision making and expand knowledge of karst systems. • Reevaluate infrastructure above the cave and take measures or prepare a plan to prevent contaminated water from entering the cave. • Continue enforcement of rules that visitors in the caves must follow to prevent the destruction of cave features and native microbes in Lechuguilla Cave. • Develop a stronger volunteer program for cave roving, cave mapping, documenting new caves and cave resources, supporting scientific efforts in caves, and restoring areas that have been impacted by visitor use in the caves. • Hire a cave specialist to better manage and monitor cave resources.
Data and/or GIS Needs	• Data on impacts of oil and gas extraction activities on caves. • Visitor impacts on the cave. • Formation breakage study. • Further exploration and survey into caves and cave passages; draft cave maps of surveyed areas; resurvey caves to current standards.

Fundamental Resource or Value	Cave and Karst Resources
Planning Needs	• Development concept plan. • Climate change action plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the FRV** • Paleontological Resources Preservation Act of 2009 • Clean Water Act of 1972 • Clean Air Act (42 USC 7470[2]) • Federal Cave Resources Protection Act of 1988 • Endangered Species Act of 1973, as amended • National Environmental Policy Act • National Historic Preservation Act of 1966, as amended (54 USC 300101 et seq.) • Archaeological Resources Protection Act of 1979 • National Parks Omnibus Management Act of 1998 • "Parks, Forests, and Public Property" (36 CFR 36) • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources" **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • NPS *Management Policies 2006* (§4.6.1, 4.6.2, 4.6.4 and 4.8.1.1) • NPS *Natural Resource Management Reference Manual* 77



Fundamental Resource or Value	Chihuahuan Desert and Other Ecosystems
Related Significance Statements	Significance statements 4 and 5
Current Conditions and Trends	**Conditions** • Carlsbad Caverns National Park is a park in two levels and supports rich, diverse, interconnected surface and subsurface ecosystems. The park covers 46,766 acres of grasslands, shrublands, woodlands, and Rattlesnake Springs. • There are many portions of the ecosystem where conditions and trends are not monitored or studied, therefore conditions are largely unknown. • More than 20 permanent springs and seeps occur within the park. Surface water is otherwise scarce, and riparian areas are limited to a few places along normally dry washes. • Current checklists for the park fauna identify 67 species of mammals (including 17 species of bats), 357 species of birds, 55 different reptiles and amphibians, 5 species of fish, and an incomplete list of more than 600 insects, with more identified each year. • Lowland areas such as Rattlesnake Springs are heavily birded and more than 300 species have been recorded there. Less information regarding bird species and ecology has been compiled for the remote, rugged, high elevation areas of the park. Previous work has revealed habitat use by numerous rare and state-listed species and several new species nesting records for the park. • Two areas of the park have been designated as Important Bird Areas (IBAs) by the National Audubon Society: Carlsbad Cavern Entrance IBA and Rattlesnake Springs/ Washington Ranch IBA. • More than 900 vascular plant taxa have been documented in the park, including 59 plant species that are nonnative. • The fire management plan dictates that fires will be allowed to burn as often as possible within certain parameters. **Trends** • Many ecosystem trends are unknown. • Temperature shows no statistically significant trend from 1950 to 2010, with some areas showing slight increases and others showing slight decreases. • Precipitation is increasing at a statistically significant rate of 51% per century for the park as a whole.
Threats and Opportunities	**Threats** • Loss/lack of personnel to study and monitor resources creates challenges for the preservation of park resources. The NPS Chihuahuan Desert Network Inventory and Monitoring program provides some support on key disciplines, but their efforts are spread across seven national park units. • Land use change and development near the park, including agriculture and oil and gas, produce point and non-point source pollution and runoff. These sources of pollution and runoff alter water chemistry and may introduce pollutants to the hydrologic systems of the park. • Air quality can be impacted by regional and local sources of air pollution such as industrial facilities, agriculture, urban developments, and oil and gas development. Arid ecosystems and grasslands are particularly vulnerable to changes caused by nitrogen deposition. Invasive grasses tend to thrive in areas with high nitrogen deposition, displacing native vegetation adapted to low nitrogen. • Changing availability, timing, and distribution of water resources in the park. Past warming has reduced snowfall and rainfall across southern New Mexico, which may continue to reduce summer streamflow and water supplies further south. • Intrusion of nonnative plants and animals. Nonnative plants of particular concern include the Russian olive and Johnsongrass.

Fundamental Resource or Value	Chihuahuan Desert and Other Ecosystems
Threats and Opportunities	**Opportunities** • Partner with academic institutions, state and federal agency partners, nongovernmental organizations, universities, park partners, and private individuals to provide opportunities to expand research and monitoring efforts. • Collaborate with the U.S. Fish and Wildlife Service regarding threatened and endangered species. • Continue reviewing and supporting important research and monitoring of plants and animals in the park. • Prioritize projects regarding nonnative plant eradication.
Data and/or GIS Needs	• Data regarding migratory patterns of Brazilian free-tailed bat. • Data on Southwestern willow flycatcher in the park, and monitoring of state endangered birds. • Analysis of climate and weather data. • Data on Mexican spotted owl location and breeding habitat in the park. • Comprehensive picture of ecosystem health, both inside and adjacent to the park. • Climate change vulnerability assessment.
Planning Needs	• Resource stewardship strategy. • Wilderness management plan. • Climate change action plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the FRV** • Endangered Species Act of 1973, as amended • National Invasive Species Act of 1996 • Lacey Act of 1900, as amended • Federal Noxious Weed Act of 1974, as amended • Clean Water Act of 1972 • The Clean Air Act (42 USC 7470[2]) gives federal land managers the responsibility for protecting air quality and related values, including visibility, plants, animals, soils, water quality, cultural resources, and public health, from adverse air pollution impacts • Federal Cave Resources Protection Act of 1988 • Executive Order 13112, "Invasive Species" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • Director's Order 18: *Wildland Fire Management* • NPS *Management Policies 2006* (§1.6, 4.1, 4.1.4, 4.4.1, 4.7.1, 4.7.2) provides general direction for managing park units from an ecosystem perspective • NPS *Reference Manual 18: Wildland Fire Management* • NPS *Natural Resource Management Reference Manual* 77



Fundamental Resource or Value	Capitan Reef
Related Significance Statements	Significance statements 7 and 8
Current Conditions and Trends	**Conditions** • Marine invertebrate fossils are critical to the determination of Permian reef environments, and the identification of surface exposures at Carlsbad Caverns. These fossils provide a remarkable outdoor laboratory to study this ancient ecosystem. In addition, exemplary Pleistocene fossils are found in several of the caves at the park. • The reef is one of the more robust, stable resources in the park. • There are occasional earthquakes, usually around 3 on the Richter scale. • The reef is accessible to visitors and researchers. **Trends** • Erosion causes natural fragmenting of the reef. • Traffic may have erosional impacts on the reef from roadways, particularly at switchbacks on the park road.
Threats and Opportunities	**Threats** • A portion of the reef is impacted by replacement of a water line. • University field trips may impact the reef through unauthorized collection of materials and resources. • The lack of a full time hydrologist/geologist means the park does not collaborate as much with universities for research and educational purposes. • Fracking may impact fault lines or increase earthquake events. • Oil and gas activities are affecting the reef within 100 feet of the park boundary in White's City. • Unknown potential effects of climate change. • Potential theft of paleontological resources. **Opportunities** • Hire hydrologists/geologist to work with universities on research and education activities. • Continue studying the reef for potential new scientific discoveries related to past climate change. • Continue gathering completed research and data collected during external organizations' studies in the park. • Continue study of Permian age fossils. • Continue outreach, education, and field studies with oil and gas industry and universities.
Data and/or GIS Needs	• Collection of scientific publications related to Capitan Reef research permits (such as master theses, etc.). • Continue updating and organizing cave GIS data, including gathering geologic mapping data from other sources.
Planning Needs	• Paleontological resource management plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the FRV** • Paleontological Resources Preservation Act of 2009 **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • NPS *Management Policies 2006* (§4.8.2.1)

Fundamental Resource or Value	Designated Wilderness
Related Significance Statements	Significance statement 5
Current Conditions and Trends	**Conditions** • Seventy-one percent of the park (33,125 acres) is designated as Carlsbad Caverns Wilderness. • Wilderness sees little visitation and recreation largely due to lack of water resources or designated campsites. • Wilderness recreation opportunities include hiking, camping, backpacking, and caving. • Trails exist in the wilderness but they are minimally maintained due to park policy. • Some remains of historic activities such as homesteading and horseback riding exist in the wilderness, impacting the undeveloped and untrammeled qualities of wilderness character. • Current vistas within the wilderness include the rugged desert canyons and landforms of the Guadalupe Mountains. The views range from nearly pristine to modified by the existence of nearby development and infrastructure such as oil and gas and other nearby intensive development. • Remote canyons provide an excellent opportunity to experience the wilderness as there are few viewshed impairments, while oil and gas development may be visible from other canyons. • Wilderness areas have been grazed in the past, impacting the natural quality of wilderness character. • Lechuguilla Cave and others are in the wilderness, adding a level of protection due to their remoteness. The park requires nonmechanized bolting in wilderness caves. • Currently there is an ozone monitoring station in the park, and ozone conditions do not meet the NPS Air Resource Division's recommended standards. • At one time there was an Interagency Monitoring of Protected Visual Environments station to monitor particulates in the wilderness but this is no longer in place. **Trends** • Visitation to wilderness is thought to be low, but data on trends are unavailable. The park does issue overnight permits, which could function as a tool to monitor use. • Limited monitoring or analysis is done in the wilderness, so trends about natural, untrammeled, and undeveloped qualities of wilderness character are also unknown. • Anecdotal evidence suggests additional noise in the wilderness due to increases in overflights and nearby oil and gas development. • Drought and fire are increasingly impacting the viewshed due to particulates from dust and smoke, and are affecting the growth of plants and their contributions to the viewshed.
Threats and Opportunities	**Threats** • Trails overgrown with acacia pressure visitors to use makeshift social trails, particularly in Slaughter Canyon. • Air quality and viewsheds in the park are sometimes obscured by haze from pollution and nearby oil and gas activities, representing a moderate concern. • Overflights and oil and gas development impact the soundscape. • The darkness of the night sky is impacted by nearby developments and oil and gas activities around the park. • Increased vehicle and truck traffic on nearby highways impacts the soundscape, viewshed, and air quality. • Cattle and other livestock occasionally trespass into the wilderness (and nonwilderness park areas) from bordering land.

Fundamental Resource or Value	Designated Wilderness
Threats and Opportunities	**Opportunities** • Continue to provide visitor access to wilderness for recreation opportunities. • Work to alleviate social trailing concerns. • Install trail registers at Slaughter Canyon trail head (outside wilderness) in order to quantify visitor use. • Work with oil and gas developers regarding light shielding to improve the viewshed, air quality, and night sky.
Data and/or GIS Needs	• Visitor use data. • Acquire baseline data on natural sounds and night skies from the NPS Natural Sounds and Night Skies Division. • Air quality monitoring. • Visual resource inventory. • Analysis of climate and weather data.
Planning Needs	• Wilderness management plan. • Visual resource management plan. • Resource stewardship strategy. • Climate change action plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the FRV** • Wilderness Act of 1964 • Clean Air Act (42 USC 7470[2]) • National Parks Air Tour Management Act of 2000 • National Parks Overflight Act of 1987 (Public Law 100-91) • "Audio disturbances" (36 CFR 2.12) **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • Director's Order 41: *Wilderness Stewardshi*p • Director's Order 47: *Soundscape Preservation and Noise Management* • NPS *Management Policies 2006* (chapter 6) "Wilderness Preservation and Management" • NPS *Management Policies 2006* (§1.4, 1.6, 3.1, 4.4.4.2, 4.7, 4.9, 4.10, 8.4, 8.2.3) • NPS *Keeping It Wild in the National Parks User Guide* • NPS *Reference Manual 18: Wildland Fire Management* • NPS *Reference Manual 41: Wilderness Stewardship* • NPS *Natural Resource Management Reference Manual* 77

Fundamental Resource or Value	Exploration and Research
Related Significance Statements	All significance statements
Current Conditions and Trends	**Conditions** • Research in the park is diverse, covering a wide range of surface and subsurface disciplines including (but not limited to) history, archeology, biology, geology, hydrology, speleology, and education. • Understanding how park resources respond to threats such as climate change, invasive species, and changes in surrounding land uses, and discovering potential ways to mitigate those threats, can only be accomplished through continued, in-depth, scientific research and discovery. • As a natural laboratory, the caves hold a very high potential for research, particularly in places not impacted by humans. • The park has a lot of inventory and monitoring research ongoing, including seeps and springs research, nonnative plant inventory and monitoring, monitoring of birds in the park, and hydrological monitoring at Rattlesnake Springs and the deep point of Lechuguilla Cave. • The park frequently receives research requests and has published descriptions of research protocol to orient researchers. • Volunteers contribute thousands of hours to the park for cave exploration, survey, inventory, and cartography. The quality of the caves inspires highly qualified people from all over the world to work and volunteer here. • Staff time is dedicated to exploration of the caves by coordinating research trips, processing permits, organizing cartography, accompanying some research teams, and providing orientation. **Trends** • Research trips have been reduced because of a lack of employees to work with researchers; the park often has to accompany research teams because they do not have the necessary caving skills. • Housing requests for researchers, interns, and volunteers frequently exceed the current available housing. • Only three Lechuguilla research trips took place in 2014 compared to eight trips per year in the past. • Cave surveying has become more accurate and of higher quality in the last few decades, largely due to cave resources standardization. • Monitoring for nonnative plants has increased, largely due to the occurrence of recent fires. • Monitoring of upland health is ongoing through the NPS Inventory and Monitoring Program. • Many research applications have been declined, due in a large part to lack of staff availability. These include mammal and fish monitoring activities, hydrological monitoring, endangered bird monitoring, and water infiltration studies.
Threats and Opportunities	**Threats** • At times, there is a significant backlog of research applications. Shortage of staff often makes it difficult for the park to process applications quickly. • Loss/lack of personnel to conduct research and facilitate research trips. In 2015, half of the positions in the park's Resource Stewardship and Science Division were vacant. • Due to the limited availability of research trips in the cave, qualified and interested parties may lose interest in proposing new studies. • Limited housing for researchers and volunteers makes coordinating research more challenging. • There is a significant backlog of applications for permits to conduct biological research and staff has limited time to process them. • The park has difficulty getting high quality final data from completed inventory and monitoring projects.

Fundamental Resource or Value	Exploration and Research
Threats and Opportunities	**Opportunities** • Expand research on biological resources. • Expand studies of Pleistocene fauna. • Collaborate with local high school students to provide assistance with volunteer projects, such as gathering water samples. • Continue cooperation with Cooperative Ecosystem Studies Units Network. • Continue using research and scholarly knowledge as part of the interpretive and educational programs at the park, including information from inventory and monitoring and resource briefs. • Expand research activities through the hiring of additional staff. • Work more with volunteers on exploration and research activities. • Continue researching the thousands of unexplored leads in Lechuguilla Cave and significant discoveries in Spider Cave and Carlsbad Cavern. • Share bat research with staff and the public through the iSWOOP pilot program (Interpreters and Scientists Working On Our Parks) and related interpretive and educational programs.
Data and/or GIS Needs	• Further exploration and survey into caves and cave passages; draft cave maps of surveyed areas; resurvey caves to current standards, including more accurate locations of cave entrances. • Continue updating and organizing cave GIS data, including gathering geologic mapping data from other sources. • Update research needs assessment.
Planning Needs	• None identified.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the FRV** • National Parks Omnibus Act of 1998 • National Historic Preservation Act of 1966, as amended (54 USC 300101 et seq.) • Antiquities Act of 1906 • Archeological and Historic Preservation Act of 1974 • Archaeological Resources Protection Act of 1979 • American Indian Religious Freedom Act of 1978 • Historic Sites Act of 1935 • Museum Properties Management Act of 1955, as amended • Paleontological Resources Preservation Act of 2009 • Federal Cave Resources Protection Act of 1988 • Endangered Species Act of 1973, as amended • National Invasive Species Act of 1996 • Lacey Act of 1900, as amended • Clean Water Act of 1972 • Clean Air Act (42 USC 7470[2]) • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • Executive Order 13007, "American Indian Sacred Sites" • Executive Order 13112, "Invasive Species" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources" • "Curation of Federally-Owned and Administered Archaeological Collections" (36 CFR 79) • "Protection of Historic Properties" (36 CFR 800)

Fundamental Resource or Value	Exploration and Research
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • Director's Order 24: *NPS Museum Collections Management* • Director's Order 28: *Cultural Resource Management* • Director's Order 28A: *Archeology* • Director's Order 77-2: *Floodplain Management* • NPS *Management Policies 2006* (§2.3.1.4, 4.2, 5.1, 8.10, 1.6, 4.1, 4.1.4, 4.4.1, 4.7.2) • NPS *Museum Handbook,* parts I, II, and III • *NPS-75 Natural Resources Inventory and Monitoring Guideline* • NPS *Natural Resource Management Reference Manual 77*

Fundamental Resource or Value	Opportunities for Connection to the Resources
Related Significance Statements	All significance statements
Current Conditions and Trends	**Conditions** • The park offers a wide variety of tours and recreational opportunities to immerse visitors in the park's resources. • The Big Room of Carlsbad Cavern is one of the most easily visited cave rooms in the United States, in part due to its elevator access. • The trails in Carlsbad Cavern are in good condition and are safe for visitors. • There are extensive opportunities for visitors to experience surface trails, although accessibility is an issue. • The park has night sky programs that provide opportunities for visitors to appreciate dark sky resources. • The bat flight program at the park is easily viewable and draws up to 1000 people per night. • Junior Ranger and other youth programs help foster environmental stewardship and give youth an opportunity to learn about the cave, Leave No Trace principles, and important local resources. • New exhibits have been installed in the visitor center and the first park film will be released in 2016. • Visitors have access to broad backcountry and wilderness resources, although they are minimally used relative to cave resources. **Trends** • The accessibility of trails is becoming more important at the park; Bat Cave Draw was recently modified to increase accessibility. • A decreasing budget limits the ability of park staff to perform certain duties (e.g., maintain trails, interpretation, educational outreach, and resource and visitor protection). • The Slaughter Cave tour is not offered year round any more due to staffing restrictions, and Left Hand Tunnel and Lower Cave tours are offered less frequently. • Kings Palace guided tours are frequently filled to capacity. • Visitation has been dropping since the peak years of the 1970s, however, visitation over the last five years has increased approximately five percent per year. • Youth and school groups regularly visit the park, including up to 300 students visiting per day.
Threats and Opportunities	**Threats** • Lack of funding and staffing will continue to impact the visitor experience (i.e., the variety and availability of cave and surface activities), safety, and park resources. • Air quality, visibility, and light pollution may continue to impact the visitor experience. Haze can obscure views; ozone and particulate matter can make breathing difficult for sensitive populations. • Changes in climate through increased mean annual temperature, varied precipitation, and extreme weather events could alter current visitation patterns. For example, roads and trails have been frequently closed for extended periods, due to more frequent storms and flooding. • The high cost of hotels in Carlsbad and the surrounding area makes it expensive to visit the park. • A lack of adequate staffing leads to fewer tours. • Loop road access is compromised by flood events and road disrepair. • There is no environmental education specialist on staff.

Fundamental Resource or Value	Opportunities for Connection to the Resources
Threats and Opportunities	**Opportunities** • Increase the use and appreciation of surface resources and trails within the parameters of compliance with law and policy. • Improve accessibility of surface nature trail and subsurface trails or provide alternatives to trail use, such as for wheelchair use. Expand access for people with reduced mobility or vision impairments and children with special needs, including picnic areas and facilities. • Develop electronic media outreach that aids in providing pre-arrival materials that help enrich the visitor in-park experience and enhance educational opportunities. • Coordinate school pre- and post-visit assessments to coincide with state requirements for field trips. • Expand community outreach to link underrepresented communities to the park. These outreach programs promote a more environmentally aware local constituency that can help protect the park and its resources. • Increase number of citizen science projects by working more with youth groups and retired people. Citizen science provides opportunities for visitors to make deep connections to the resources while also contributing to a better understanding of those resources. • Add more languages to visitor center exhibits and update audio-describe that reads the text of exhibits and placards and describes images and placement of images to hearing-impaired visitors.
Data and/or GIS Needs	• Visitor impacts on the cave. • Visitor use data. • Visitor carrying capacity study.
Planning Needs	• Update long-range interpretive plan. • Visitor use management plan. • Wayside exhibit plan and training. • Accessibility self-evaluation and transition plan for the cave, surface, and in the visitor center. • Visual resource management plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the FRV** • Americans with Disabilities Act of 1990 (PL 101-336) • Architectural Barriers Act of 1968 • "Accessibility Guidelines" (36 CFR 1191.1) • Rehabilitation Act of 1973 • NPS Concessions Management Improvement Act of 1998 • Clean Air Act (42 USC 7470[2]) • Endangered Species Act of 1973, as amended **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • Director's Order 6: *Interpretation and Education* • Director's Order 42: *Accessibility for Visitors with Disabilities in National Park Service Programs and Services* • NPS *Management Policies 2006* (chapters 7, 8, 9, and 10) • NPS *Transportation Planning Guidebook*

Analysis of Other Important Resources and Values

Other Important Resource or Value	Carlsbad Caverns Historic District and Cultural Landscape
Current Conditions and Trends	**Conditions** • Overall condition of the structures and landscape is fair to good although the utilities are deteriorating. • The historic district and landscape have limited Americans with Disabilities Act compliance. **Trends** • There is potential for new contributing resources in the historic district. • New sites have been added to the historic district as a result of a recent study. This represents a 30% increase in historic structures, archeological sites, and landscape features. • Infrastructure, such as the sewer system and other utilities, continues to deteriorate.
Threats and Opportunities	**Threats** • Historic context of the resources is not well understood. • Aging infrastructure within the historic district, including the CCC stonework, water system, etc. • Erosion undermines building foundations. • Vehicle collisions with structures threaten historic fabric and structural integrity. • New development may not be compatible with character-defining features of the historic district. • Hazardous materials, including asbestos, impede adaptive re-use of the historic structures. • Changes in climate through increased mean annual temperature, varied precipitation, and extreme weather events could impact cultural resources. **Opportunities** • Identify additional contributing resources through additional studies of the historic district and cultural landscape. • Adaptively re-use historic structures as a way to preserve structures. • Adaptively use historic structures in the park as a house museum, as appropriate. Encourage partnerships and continued historic preservation training opportunities with the NPS Intermountain Region programs related to cultural resources and landscapes. • Encourage training for park staff through the NPS Vanishing Treasures program. • Collaborate with the Western Center for Historic Preservation at Grand Teton National Park for technical assistance on wood preservation, or hire a park historic carpenter.
Data and/or GIS Needs	• Additional archeological surveys. • Update the Facility Management Software System to identify historic resources as historic assets and establish priorities. • Cultural landscape inventory of the cave. • Update the Archeological Sites Management Information System database. • Update the List of Classified Structures database. • Compile oral histories or initiate program to gather oral histories.
Planning Needs	• Historic structure report for Carlsbad Caverns Historic District. • Cultural landscape report for Carlsbad Caverns Historic District. • Historic American Buildings Survey / Historic American Engineering Record documentation. • Historic American Landscape Survey documentation.

Other Important Resource or Value	Carlsbad Caverns Historic District and Cultural Landscape
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the OIRV** • Antiquities Act of 1906 • Historic Sites Act of 1935 • National Historic Preservation Act of 1966, as amended (54 USC 300101 et seq.) • Archeological and Historic Preservation Act of 1974 • Archaeological Resources Protection Act of 1979 • Museum Properties Management Act of 1955, as amended • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" • "Curation of Federally-Owned and Administered Archaeological Collections" (36 CFR 79) • "Protection of Historic Properties" (36 CFR 800) **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • Director's Order 24: *NPS Museum Collections Management* • Director's Order 28: *Cultural Resource Management* • Director's Order 28A: *Archeology* • NPS *Management Policies 2006* (chapter 5) "Cultural Resource Management" • NPS *Museum Handbook*, parts I, II, and III • *The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*

Other Important Resource or Value	Rattlesnake Springs, Including Its Historic District and Cultural Landscape
Current Conditions and Trends	**Conditions** • Rattlesnake Springs is the sole water supply source for the park's developed area (staff and visitors) and provides a vital wetland habitat for several species including threatened or endangered birds and many other wildlife and plants. • Birds use the site for food, water, and habitat for breeding, migration stopovers, and year-round habitat. Many international and local birders use this area for recreation. • Vegetation is periodically stressed at Rattlesnake Springs from lack of water. The grassy picnic area at Rattlesnake Springs is watered on a regular basis during the growing season. The orchard is stressed from lack of water and is not maintained by the National Park Service, and may not be in the original location. • The park is currently letting natural revegetation proceed in order to preserve genetic integrity and provide for a stronger plant community in the long run. • There are some nonnative fish in the artificial pond, including largemouth bass and green sunfish. The park's repeated efforts to permanently remove them have not been successful. • Historic structures at Rattlesnake Springs, including the CCC-constructed ranger residence and well house, are in good condition. • The foundational remains of the homestead are treated as an archeological site. • Prehistoric archeological sites at Rattlesnake Springs are in fair to good condition. • The visitor use area is used for picnicking and grilling, birding, restrooms, etc. **Trends** • The water level in the pond has varied over the last few years due to drought and irrigation from nearby agriculture. If the water level is low enough, water cannot be exported to Washington Ranch or riparian areas. • Nonnative vegetation trends are generally unknown, though invasive Russian olives are increasing. • Bird species trends are unknown. Federally listed bird species arrived at Rattlesnake Springs in 2008. • There has been an increase in use at nearby Washington Ranch by visitors particularly during holidays and end-of-school-year picnics. • Many of the cultural resources are subterranean so trends are stable as long as there is no soil disturbance.
Threats and Opportunities	**Threats** • Drought, nearby agriculture, climate change, oil and gas development, and unauthorized diversion of water pose threats to water resources. A dwindling water supply in turn poses a threat to the plants and animals in the area that depend on the water source. • Contamination of the karst groundwater resources and groundwater flow paths continue to be management concerns. • Nonnative plants, especially Russian olive and Johnsongrass, are now major components of the vegetation at Rattlesnake Springs and may suppress the cottonwood willow riparian woodlands and native grasses that occur there. Bermuda grass is also a major nonnative threat, but it is not possible to eradicate from the wetland without major damage due to decades of root establishment. Efforts to control the Russian olive were curtailed when the federally endangered Southwest willow flycatcher arrived in the area. • Bird nesting and migration may be disturbed by the ability of visitors to wander the area without any protected areas. • Removal of nonnative fish species was difficult to sustain due to lack of staff time. • Nonnative Eastern fox squirrels have been present on the site for at least 10 years, threatening bird nests and young. Efforts to monitor and eradicate them have ended because of lack of staff in resources management and law enforcement divisions. • Invasive bullfrogs pose a threat to other amphibians, fish, and invertebrates.

Other Important Resource or Value	Rattlesnake Springs, Including Its Historic District and Cultural Landscape
Threats and Opportunities	**Threats (continued)** • The use of the wrong type of fencing at the site may injure deer and separate them from their young who cannot jump high enough. • Cars parking nearby in the ditch threaten its structural integrity and its historic quality as a contributing feature of the cultural landscape. • Visitors trampling cultural resources (such as the historic remnant concrete) may negatively impact them. **Opportunities** • Work with the NPS Water Resources Division to gather data and assist in monitoring of water resources. Testing of water condition is done periodically to adhere to state requirements, but more frequent testing may be useful. • Obtain complete data from Texas El Paso ground penetrating radar survey. • Finalize cooperative agreement with Washington Ranch for water quantity. The agreement should describe who is responsible for ditch maintenance, including the historic portions of the ditch. • Enter into an agreement with The Nature Conservancy regarding water quantity. • Work with the U.S. Fish and Wildlife Service and the New Mexico Division of Fish and Game for conservation efforts regarding the Southwest willow fly catcher. • Implement a buffer or protected area for nesting or migratory birds, if recommended by the U.S. Fish and Wildlife Service or New Mexico Department of Game and Fish. • Increase interpretation of the site (such as Rattlesnake Springs as a historic site, or regarding the significance of birding in the area).
Data and/or GIS Needs	• Compilation of all federal reserved water rights; increase water level monitoring outside of the ponds at Rattlesnake Springs. • Update research needs assessment. • Data on extent of nonnative plants at Rattlesnake Springs. • Visitor carrying capacity study. • Update historic structures inventory for Rattlesnake Springs. • Update the Archeological Sites Management Information System database. • GIS data on current vegetation at Rattlesnake Springs.
Planning Needs	• Cultural landscape report for Rattlesnake Springs. • Historic structure report for CCC structures. • Finalize Rattlesnake Springs management plan. • Resource stewardship strategy.
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the OIRV** • Antiquities Act of 1906 • Historic Sites Act of 1935 • National Historic Preservation Act of 1966, as amended (54 USC 300101 et seq.) • Archeological and Historic Preservation Act of 1974 • Archaeological Resources Protection Act of 1979 • Museum Properties Management Act of 1955, as amended • Endangered Species Act of 1973, as amended • National Invasive Species Act of 1996 • Lacey Act of 1900, as amended • Federal Noxious Weed Act of 1974, as amended • Clean Water Act of 1972

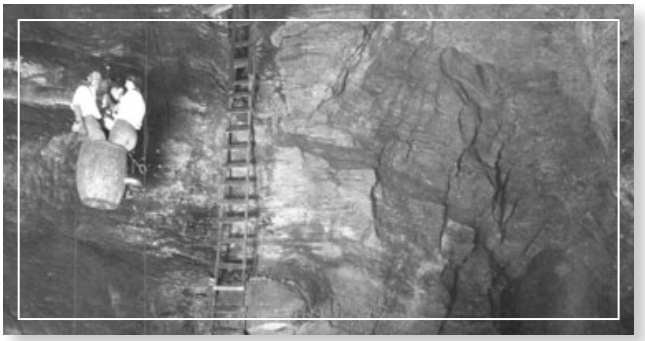
Other Important Resource or Value	Rattlesnake Springs, Including Its Historic District and Cultural Landscape
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the OIRV (continued)** • Clean Air Act (42 USC 7470[2]) • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • Executive Order 13112, "Invasive Species" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" • "Curation of Federally-Owned and Administered Archaeological Collections" (36 CFR 79) • "Protection of Historic Properties" (36 CFR 800) **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • Director's Order 18: *Wildland Fire Management* • Director's Order 24: *NPS Museum Collections Management* • Director's Order 28: *Cultural Resource Management* • Director's Order 28A: *Archeology* • NPS *Management Policies 2006* (chapter 5) "Cultural Resource Management" • NPS *Museum Handbook*, parts I, II, and III • NPS *Management Policies 2006* (§1.6, 4.1, 4.1.4, 4.4.1, 4.7.1, 4.7.2) provides general direction for managing park units from an ecosystem perspective • NPS *Reference Manual 18: Wildland Fire Management* • NPS *Natural Resource Management Reference Manual* 77 • *The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*

Other Important Resource or Value	Prehistoric Cultural Resources
Current Conditions and Trends	**Conditions** • Overall condition of prehistoric cultural resources is fair to good. Some erosion and other damage have been identified in the aftermath of recent fire. • All known archeological sites are documented in the Archeological Site Management Information System database, although currently, less than 10% of the park has been surveyed for prehistoric cultural resources. • The park's relationship with the New Mexico Historic Preservation Division has been good. **Trends** • Fire and resultant landscape clearing continue to result in new discoveries. • The knowledge base regarding prehistoric cultural resources continues to expand. • Impacts are more accelerated on the surface resources than those underground.
Threats and Opportunities	**Threats** • Changes in climate through increased mean annual temperature, varied precipitation, and extreme weather events such as flooding and fire pose threats to prehistoric cultural resources. Increased frequency of these events and continued erosion can be expected. • Damage to resources from visitor access, including vandalism and theft. An older plan recommended having a barrier to protect rock art, but this has not been accomplished. • Rock art sites are accessible but not monitored. • Publicly available maps include locations of sensitive sites. • Insufficient information about location of resources may cause unintentional harm by park staff during routine park operations. **Opportunities** • Limit access to sensitive resources in order to reduce damage. • Increase interpretation and education regarding the park's cultural resources, including public outreach. New waysides and interpretive media could be developed. • Continue systematic survey of the park's cultural resources under section 110 of the National Historic Preservation Act. • Conduct field schools with local universities. • Continue positive relationship with the New Mexico Historic Preservation Division. • Increase data sharing and strengthen partnerships between NPS entities and regions and state governments. • Continue to identify and work with traditionally associated American Indian tribes related to resources.

Other Important Resource or Value	Prehistoric Cultural Resources
Data and/or GIS Needs	• Additional archeological surveys. • Archeological overview and assessment.
Planning Needs	• Cultural resource management plan. • Cultural landscape report for prehistoric cultural resources.
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the OIRV** • Antiquities Act of 1906 • Historic Sites Act of 1935 • National Historic Preservation Act of 1966, as amended (54 USC 300101 et seq.) • Archeological and Historic Preservation Act of 1974 • American Indian Religious Freedom Act of 1978 • Archaeological Resources Protection Act of 1979 • Native American Graves Protection and Repatriation Act of 1990 • Museum Properties Management Act of 1955, as amended • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • Executive Order 13007, "Indian Sacred Sites" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" • "Curation of Federally-Owned and Administered Archaeological Collections" (36 CFR 79) • "Protection of Historic Properties" (36 CFR 800) **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • Director's Order 24: *NPS Museum Collections Management* • Director's Order 28: *Cultural Resource Management* • Director's Order 28A: *Archeology* • NPS *Management Policies 2006* (chapter 5) "Cultural Resource Management" • NPS *Museum Handbook*, parts I, II, and III • *The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*

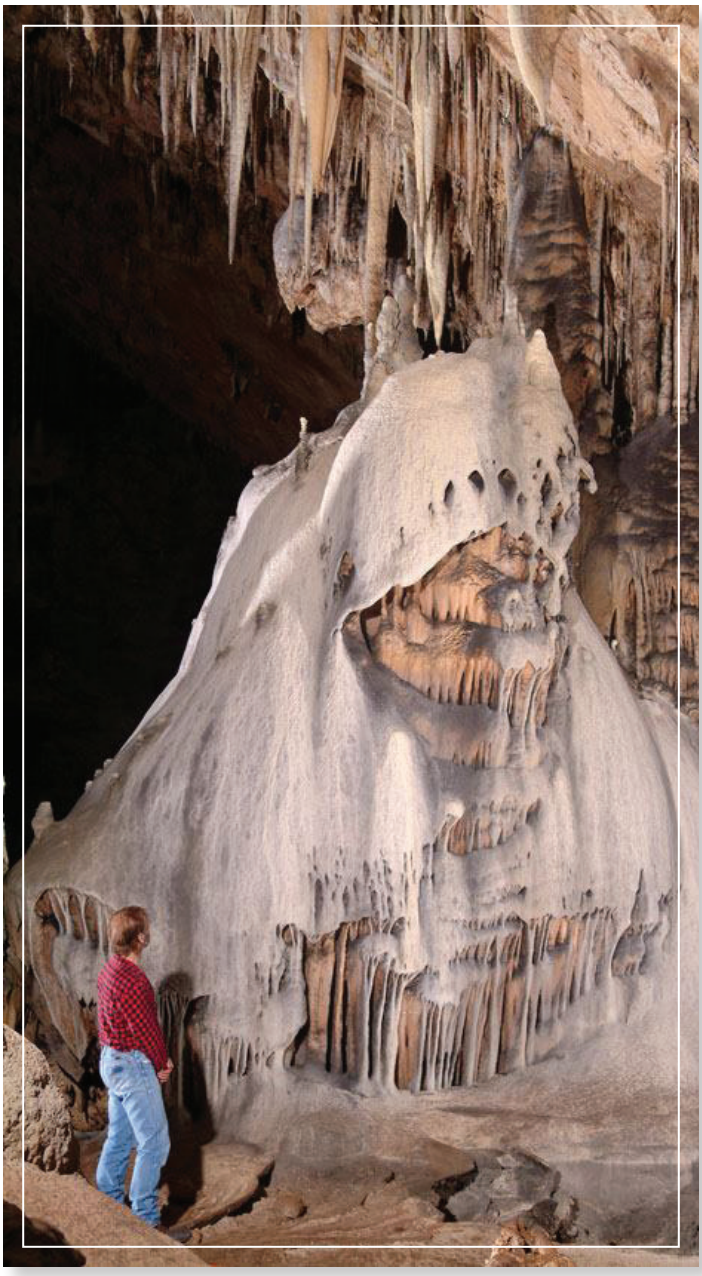
Other Important Resource or Value	Museum and Archival Collections
Current Conditions and Trends	**Conditions** • The park has more than 1 million items in the materials and archival collections. • More than 300,000 items have been catalogued and archived as of 2013 as part of an NPS Intermountain Region initiative to address the archives and collection backlog, though this was not done down to item level. • Collection storage facility is on site in the Bally storage facility. • Storage facility is up to date on museum standards and is in good condition, though the siting of the facility is not good due to occasional flooding (see below). • Some park objects are held in other repositories, such as the Texas Archeological Research Laboratory (University of Texas) and others. **Trends** • Because of the archives initiative, the collection is increasing yearly and the backlog is decreasing. • Artwork has been rotated for display at the visitor center. Historic and prehistoric items, as well as fossils, are on permanent display in the new visitor center.
Threats and Opportunities	**Threats** • The storage facility has experienced problems with temperature, humidity, and flooding in the past, sometimes taking months to get the humidity under control. The facility is technically not in the flood plain, but often experiences flooding events due to the design of the highway and drainage in the parking area. Large storms could threaten the collections. • Park staff time to devote to the museum and archival collections is limited. The park curator retired and the position remains vacant. Other staff members have taken on some collateral curation duties. • The storage for the collections is in a General Services Administration structure that is on leased land on a concrete pad. The future of this lease is unclear. **Opportunities** • Potentially move the collections to NPS Western Archeological and Conservation Center in Tucson. • Enlist help from a local university or from the Volunteers-in-Parks program to help with curation and cataloguing of the collections. • Continue using interns and interpreters to help with the backlog and the production of end of the year reports. Sort and catalog the backlog of historic photos.
Data and/or GIS Needs	• Update Interior Collections Management System database.
Planning Needs	• Update collections management plan. • Exhibit plan. • Update scope of collection statement for museum and archival collections.
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the OIRV** • National Historic Preservation Act of 1966, as amended (54 USC 300101 et seq.) • Antiquities Act of 1906 • Archeological and Historic Preservation Act of 1974 • Archaeological Resources Protection Act of 1979 • American Indian Religious Freedom Act of 1978 • Historic Sites Act of 1935 • Museum Properties Management Act of 1955, as amended • Native American Graves Protection and Repatriation Act of 1990

Other Important Resource or Value	Museum and Archival Collections
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the OIRV (continued)** • Paleontological Resources Preservation Act of 2009 • Federal Cave Resources Protection Act of 1988 • Endangered Species Act of 1973, as amended • National Invasive Species Act • Lacey Act of 1900, as amended • Federal Noxious Weed Act of 1974, as amended • Clean Water Act • Clean Air Act (42 USC 7470[2]) • Executive Order 13112, "Invasive Species" • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • Executive Order 13007, "American Indian Sacred Sites" • "Curation of Federally-Owned and Administered Archaeological Collections" (36 CFR 79) • "Protection of Historic Properties" (36 CFR 800) **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • Director's Order 24: *NPS Museum Collections Management* • Director's Order 28: *Cultural Resource Managemen*t • Director's Order 28A: *Archeology* • Director's Order 77-2: *Floodplain Management* • NPS *Management Policies 2006* (§1.6, 2.3.1.4, 4.1, 4.1.4, 4.2, 4.4.1, 4.7.2, 5.1, 8.10) • NPS *Museum Handbook,* parts I, II, and III • *NPS-75 Natural Resources Inventory and Monitoring Guideline* • NPS *Natural Resource Management Reference Manual* 77



Other Important Resource or Value	Continuing Connections and Consultations with Associated Tribes
Current Conditions and Trends	**Conditions** • The park currently consults with 14 traditionally associated American Indian tribes. • Primarily, the largest amount of communication is with the Hopi, the Apache, and the Ysleta del Sur. • As required by law, the park communicates with all the tribes regarding projects. • The park has an agreement with the Mescalero and the Hopi that streamlines the process of consultation. • The park has recently worked on Native American Graves Protection and Repatriation Act efforts with tribes, and has repatriated some items. • Some tribes (the Hopi and Mescalero) have agreed to let other tribes speak for them in consultations. • The park has performed recent outreach with the Apache, and took representatives to Slaughter Cave to view pictographs. **Trends** • None identified.
Threats and Opportunities	**Threats** • Changing tribal governments and contacts and changing personnel within the National Park Service leads to inconsistency in consultations. **Opportunities** • Increase engagement with traditionally associated tribes. • Expand on efforts being initiated with Mescalero Apache (in conjunction with Guadalupe Mountains National Park). • Participate in the larger NPS effort related to formalizing traditional use permits with associated tribes. • Increase interpretation of the contexts, stories, ways of life, and the American Indian side of the stories. • Increase opportunities or special events and programs for tribes to visit the park and participate in programs. • Gather and use research or master's theses related to tribes. • Work with the NPS Intermountain Region Indian Affairs and American Cultural staff.
Data and/or GIS Needs	• Ethnographic overview and assessment. • Compile oral histories or initiate program to gather oral histories. • Determine existing tribal treaties and formal agreements.
Planning Needs	• None identified.
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the OIRV** • Antiquities Act of 1906 • Historic Sites Act of 1935 • National Historic Preservation Act of 1966, as amended (54 USC 300101 et seq.) • Archeological and Historic Preservation Act of 1974 • American Indian Religious Freedom Act of 1978 • Archaeological Resources Protection Act of 1979 • Native American Graves Protection and Repatriation Act of 1990 • Museum Properties Management Act of 1955, as amended • Executive Order 11593, "Protection and Enhancement of the Cultural Environment"

Other Important Resource or Value	Continuing Connections and Consultations with Associated Tribes
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the OIRV (continued)** • Executive Order 13007, "Indian Sacred Sites" • "Curation of Federally-Owned and Administered Archaeological Collections" (36 CFR 79) • "Protection of Historic Properties" (36 CFR 800) **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • Director's Order 28: *Cultural Resource Management* • Director's Order 28A: *Archeology* • NPS *Management Policies 2006* (chapter 5) "Cultural Resource Management" • *The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*



Identification of Key Issues and Associated Planning and Data Needs

This section considers key issues to be addressed in planning and management and therefore takes a broader view over the primary focus of part 1. A key issue focuses on a question that is important for a park. Key issues often raise questions regarding park purpose and significance and fundamental and other important resources and values. For example, a key issue may pertain to the potential for a fundamental or other important resource or value in a park to be detrimentally affected by discretionary management decisions. A key issue may also address crucial questions that are not directly related to purpose and significance, but that still affect them indirectly. Usually, a key issue is one that a future planning effort or data collection needs to address and requires a decision by NPS managers.

The following are key issues for Carlsbad Caverns National Park and the associated planning and data needs to address them:

- **Developments and Uses Adjacent to the Park.** There has been significant development adjacent to the park in recent years. Oil and gas wells can be found within two miles of park boundaries and drilling activities are taking place approximately 100 feet north of the park boundary at White's City. Agriculture and fracking are impacting the quantity and quality of water resources in the area. The booming oil and gas industry is impacting the park's viewshed, soundscape, air quality, and biologic, cultural, and cave resources in diverse and not fully understood ways. The park needs to develop a scenario for addressing reasonably foreseeable development in the area.

  Extensive movement of vehicles on dirt roads in the areas surrounding the park disturb vegetation and soil surfaces and trigger dust emissions that degrade visibility and scenic vistas. Park vistas are often obscured by haze caused by fine particles in the air. A visual resource inventory from sensitive park vista points should be conducted, and a visual resource management plan completed. The park should open lines of communication with local industries to be notified about energy development initiatives within a certain distance of the park.

  The area traditionally exhibits high quality dark night skies, which are currently threatened by lights and flares from oil and gas operations. The highly regarded natural soundscapes and minimal anthropogenic noise at the park is threatened by increased vehicle activity and the process of fracking. The park should collaborate with the NPS Night Skies and Natural Sounds Division of the Natural Resource Stewardship and Science directorate to monitor the night skies and soundscapes at the park and measure trends against baseline data.

  Under the Clean Air Act, federal land managers for Class I areas have the responsibility to protect air quality-related values. Bats, scenic vistas, desert ecosystems, and biological diversity are a few of the resources at the park that may suffer from increased air pollution. Sulfur and nitrogen wet deposition warrant significant concern in the park; these contaminants are associated with oil and gas extraction operations and they can affect the distribution of native vegetation and encourage the growth of nonnative plants. Drilling and fracking contributes to air pollution from diesel fuel engines, evaporation of waste water, release of fracturing fluid, and the flaring of wells. At night, air pollution can make star gazing more difficult because it scatters artificial light and increases the impact of light pollution. Having an air quality monitoring station in the park would provide accurate data.

  Other miscellaneous trends associated with development adjacent to the park include decreasing groundwater levels in the Rattlesnake Springs and Capitan aquifers from agriculture and fracking use.

- **Climate Change and Associated Impacts.** Climate change presents several potential issues that could affect resources and visitor experiences across the park. Precipitation patterns, fire regimes, biologic communities, and visitation patterns all stand to be impacted.

  Precipitation is increasing at a statistically significant rate of 51% per century for the park as a whole. Changes in precipitation and land use in aquifer recharge areas, combined with changes in demand for groundwater over time, will affect groundwater availability in ways that are not well understood. Past warming has reduced snowfall and rainfall across northern New Mexico, which may continue to reduce summer streamflow and water supplies further south.

  Climate change is already contributing to an increase in wildfire frequency; from 1916 to 2003, climate controlled the extent of burned area across the western United States. Under high emissions scenarios, fire frequencies in the park could increase up to 25% by 2100. Wildfire smoke contains particulate matter and pollutants that can significantly degrade air quality and negatively impact human health and viewsheds. Climate change is also increasing the vulnerability of natural environments to ecosystem change and tree mortality through insect infestations, droughts, and disease outbreaks. Agave and yucca species have shown reduced germination rates under hotter temperatures in the southern Chihuahuan Desert, and continued increases in precipitation may contribute to further shrub encroachment in the Chihuahuan Desert.

  Extreme heat events threaten public health, and climate projections indicate that extreme heat events will be more frequent and intense in coming decades. Climate change may influence park visitation patterns based on altered seasonal life cycle events in plants and animals (e.g., blooming of flowers or bat migration timing). Other extreme weather events such as storms, floods, tornadoes, and hurricanes are projected to become more intense as the atmosphere continues to warm and could result in accelerated erosion or catastrophic damage to cultural assets. A climate change vulnerability assessment and action plan is recommended, in addition to the collection and analysis of key baseline data to better understand climate change-related trends.

- **Operational Sustainability of the Park.** Much of the park's infrastructure has aged to the point that it presents threats to the integrity of the cave and to the safety and wellbeing of visitors and staff. The park's general management plan indicates a need to reduce the impacts of infrastructure located on the Bat Cave Draw side of the cave catchment area. Several old structures on top of the cave, some of which are historic, are adaptively used as housing and office space. The complicated and deteriorating service utilities associated with these structures (e.g., corroded sewer lines) may pollute groundwater that seeps into the cave. A study needs to be conducted in the cave directly under the Mission 66 six-plex to better understand its impacts on the cave. Some structures will require significant repair, and the use of others may need to be discontinued to protect park resources.

  The problem of failing infrastructure is complicated by an increased demand for affordable staff housing. Rising costs associated with the local oil and gas boom make it more and more difficult to find reasonably priced housing in the area and any reductions in the amount of housing available at the park will exacerbate the issue. A development concept plan for establishing infrastructure off the cave needs to be developed.

  The park does not have certain key positions filled (e.g., cave specialist, hydrologist/geologist, cultural resources specialist, curator, bat biologist, education programs coordinator), negatively impacting park resources and the visitor experience. Insufficient numbers of "cave rovers" lead to inadequate interpretive services and monitoring of visitor behavior in the Big Room and natural entrance. Severe staffing limitations across all park divisions strain park staff and inhibit their ability to protect the resources and provide visitor services. Park divisions should work together to prioritize spending, attract and retain qualified staff, and improve the new employee training program. A business plan or financial sustainability plan would help inform future park decisions.

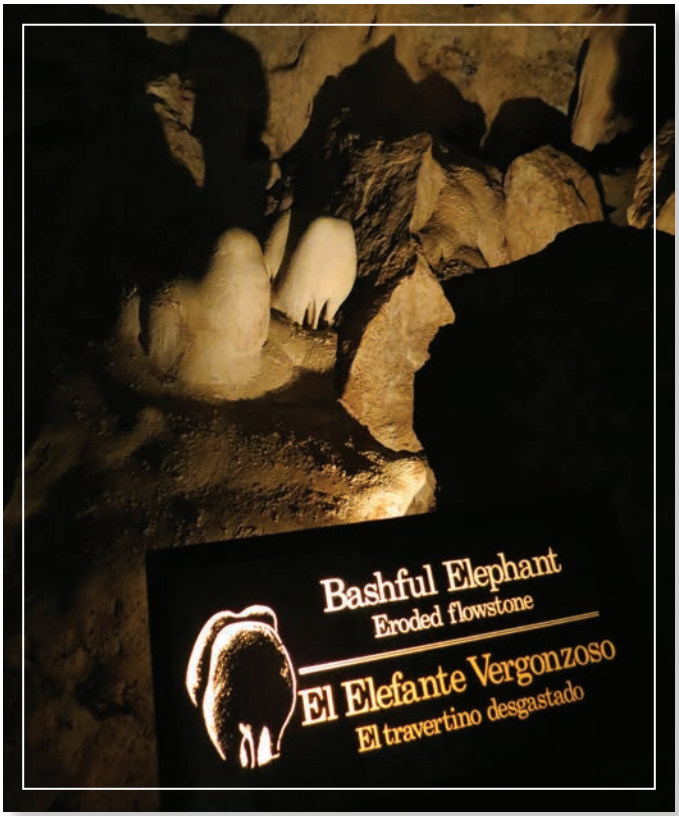
Planning and Data Needs

To maintain connection to the core elements of the foundation and the importance of these core foundation elements, the planning and data needs listed here are directly related to protecting fundamental resources and values, park significance, and park purpose, as well as addressing key issues. To successfully undertake a planning effort, information from sources such as inventories, studies, research activities, and analyses may be required to provide adequate knowledge of park resources and visitor information. Such information sources have been identified as data needs. Geospatial mapping tasks and products are included in data needs.

Items considered of the utmost importance were identified as high priority, and other items identified, but not rising to the level of high priority, were listed as either medium- or low-priority needs. These priorities inform park management efforts to secure funding and support for planning projects.

Planning Needs – Where A Decision-Making Process Is Needed			
Related to an FRV, OIRV, or Key Issue?	**Planning Needs**	**Priority (H, M, L)**	**Notes**
Cave and Karst Resources; Key Issue	Development concept plan	H	Concerns establishing infrastructure off of the cave.
Rattlesnake Springs; Designated Wilderness; Chihuahuan Desert	Resource stewardship strategy	H	This plan would describe desired future conditions of park natural and cultural resources. It would be parkwide in scope.
Designated Wilderness; Connection to the Resources; Key Issue	Visual resource management plan	H	
Key Issue	Business plan / financial sustainability plan	H	
Chihuahuan Desert; Designated Wilderness, Cave and Karst Resources; Key Issue	Climate change action plan	H	
Connection to the Resources	Visitor use management plan	M	
Carlsbad Caverns Historic District	Cultural landscape report for Carlsbad Caverns Historic District	M	This would help inform the development concept plan for moving infrastructure off of the top of the cave.
Prehistoric Cultural Resources	Cultural landscape report for prehistoric cultural resources	M	This report could include an ethnographic component.
Rattlesnake Springs	Finalize Rattlesnake Springs management plan	M	The plan is currently in draft form, and is awaiting completion of a biological assessment.
Key Issue	Reasonably foreseeable development scenario	M	This plan is developed by the Bureau of Land Management, but would need to be reviewed by the National Park Service. Review would probably be handled internally.
Connection to the Resources	Accessibility self-evaluation and transition plan for the cave, surface, and in the visitor center	M	
Prehistoric Cultural Resources	Cultural resource management plan	M	
Carlsbad Caverns Historic District	Historic American Buildings Survey / Historic American Engineering Record documentation	M	
Carlsbad Caverns Historic District	Historic American Landscape Survey documentation	M	
Connection to the Resources	Update long-range interpretive plan	M	Last long-range interpretive plan was completed in 2006. Updates are needed.
Museum and Archival Collections	Update scope of collection statement for museum and archival collections	M	

Planning Needs – Where A Decision-Making Process Is Needed			
Related to an FRV, OIRV, or Key Issue?	**Planning Needs**	**Priority (H, M, L)**	**Notes**
Chihuahuan Desert; Designated Wilderness	Wilderness management plan	M	The park needs to select wilderness character indicators and measures, assess them for baseline condition, and set up a long-term monitoring framework.
Rattlesnake Springs	Cultural landscape report for Rattlesnake Springs	L	This report would help make recommendations for treatment of the historic landscape resources.
Museum and Archival Collections	Exhibit plan	L	
Carlsbad Caverns Historic District	Historic structure report for Carlsbad Caverns Historic District	L	
Rattlesnake Springs	Historic structure report for CCC structures	L	This plan would address the pump house, ditch, pond, and house. The plan would prescribe future treatment and maintenance needs.
Capitan Reef	Paleontological resource management plan	L	This plan could potentially be appended to the cave and karst management plan.
Museum and Archival Collections	Update collections management plan	L	
Connection to the Resources	Wayside exhibit plan and training	L	



Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	**Data and GIS Needs**	**Priority (H, M, L)**	**Notes**
Cave and Karst Resources; Exploration and Research	Further exploration and survey into caves and cave passages; draft cave maps of surveyed areas; resurvey caves to current standards, including more accurate locations of cave entrances	H	This suite of data could be compiled and processed by staff members who coordinate volunteers in data collection and cartography.
Designated Wilderness; Key Issue	Visual resource inventory	H	These data would help inform the visual resource management plan.
Designated Wilderness; Key Issue	Air quality monitoring	H	Air quality monitoring station is currently based in Guadalupe Mountains National Park. Having an air quality monitoring station in the park would provide more accurate data.
Cave and Karst Resources	Data on impacts of oil and gas activities on caves	H	Data gathered would include particulate movement, water resources impacts, and prospecting/drilling.
Rattlesnake Springs	Compilation of all federal reserved water rights; increase water level monitoring outside of the ponds at Rattlesnake Springs	H	Observe water quality and quantity by doing a drawdown test on the artesian well in order to learn how well the aquifer is performing. This task would probably require outside assistance.
Chihuahuan Desert	Comprehensive picture of ecosystem health, both inside and nearby the park	M	
Carlsbad Caverns Historic District	Cultural landscape inventory of the cave	M	
Associated Tribes	Ethnographic overview and assessment	M	This information could build off of the 2004 ethnographic literature review.
Cave and Karst Resources	Formation breakage study	M	
Designated Wilderness; Key Issue	Acquire baseline data on natural sounds and night skies from the NPS Natural Sounds and Night Skies Division	M	Including more recent data after developments near the park, including night sky review and photography.
Chihuahuan Desert; Designated Wilderness; Key Issue	Analysis of climate and weather data	M	
Prehistoric Cultural Resources	Archeological overview and assessment	M	
Carlsbad Caverns Historic District; Affiliated Tribes	Compile oral histories or initiate program to gather oral histories	M	
Chihuahuan Desert	Data regarding migratory patterns of Brazilian free-tailed bat	M	
Cave and Karst Resources; Connection to the Resources	Visitor impacts on the cave	M	Methodology has already been established for this study and would be used.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	**Data and GIS Needs**	**Priority (H, M, L)**	**Notes**
Connection to the Resources; Designated Wilderness	Visitor use data	M	Visitor use data would include both frontcountry and wilderness use. Overnight permits issued for wilderness users could help quantify overnight use.
Chihuahuan Desert; Key Issue	Climate change vulnerability assessment	L	
Prehistoric Cultural Resources; Carlsbad Caverns Historic District	Additional archeological surveys	L	Currently, only 10% of the park has been systematically surveyed for archeological resources.
Rattlesnake Springs; Connection to the Resources	Visitor carrying capacity study	L	The visitor carrying capacity study would be informed by the data collected related to visitor impacts on the cave and visitor use.
Capitan Reef	Collection of scientific publications related to Capitan Reef research permits (such as master's theses, etc.)	L	
Chihuahuan Desert	Data on Mexican spotted owl location and breeding habitat in the park	L	
Rattlesnake Springs	Data on extent of nonnative plants at Rattlesnake Springs	L	
Chihuahuan Desert	Data on Southwestern Willow flycatcher in the park, and monitoring of state endangered birds	L	
Capitan Reef; Exploration and Research	Continue updating and organizing cave GIS data, including gathering geologic mapping data from other sources	L	Geologic mapping data is currently held at the University of Texas – Austin Bureau of Economic Geology.
Rattlesnake Springs	GIS data on current vegetation at Rattlesnake Springs	L	These data would help inform the cultural landscape report.
Carlsbad Caverns Historic District	Update the List of Classified Structures database	L	Required to be updated every five years.
Museum and Archival Collections	Update Interior Collections Management System database	L	Conduct updates regularly and include collections housed offsite.
Affiliated Tribes	Determine existing tribal treaties and formal agreements	L	Obtain from NPS Indian Affairs and American Culture. Enter into park administrative files or library collections.
Rattlesnake Springs; Carlsbad Caverns Historic District	Update the Archeological Sites Management Information System database	L	
Carlsbad Caverns Historic District	Update the Facility Management Software System to identify historic resources as historic assets and establish priorities	L	
Rattlesnake Springs	Update historic structures inventory for Rattlesnake Springs	L	
Rattlesnake Springs; Exploration and Research	Update research needs assessment	L	This would also include compiling all past research done on water resources.

Part 3: Contributors

Carlsbad Caverns National Park

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Appendixes

Appendix A: Presidential Proclamation and Legislative Acts for Carlsbad Caverns National Park

Summary of Legislative History of Carlsbad Caverns National Park

- Proclamation No. 1679, October 25, 1923 (43 Stat. 1929), established Carlsbad Caverns National Monument.
- Act of May 14, 1930 (P.L. 71-216, 46 Stat. 279), redesignated the area as a national park and enlarged park boundaries.
- Proclamation No. 2031, February 21, 1933 (47 Stat. 2556), expanded the boundary as described.
- Act of May 4, 1934 (P.L. 73-202, 48 Stat. 664), authorized exchange of described lands for guano mining privileges.
- Proclamation No. 2321, February 3, 1939 (53 Stat. 2523), expanded the boundary as described.
- Act of December 30, 1963 (P.L. 88-249, 77 Stat. 818), authorized the exchange of lands described.
- Act of November 10, 1978 (P.L. 92-625, 92 Stat. 3489), designated Carlsbad Caverns Wilderness within the park.
- Act of November 15, 1990 (P.L. 101-578, 104 Stat. 2858), established a Cave Research Program to include scholarly collection, analysis, and dissemination of research material related to caves in lands managed by the National Park Service including, but not limited to, Carlsbad Caverns National Park and the Capitan Reef area.
- Act of December 2, 1993 (P.L. 103-169, 107 Stat. 1983), also known as the "Lechuguilla Cave Protection Act of 1993," provided guidance for protecting Lechuguilla Cave and other resources and values in and adjacent to the park.
- Act of October 30, 1998 (P.L. 105-325, 112 Stat. 3038), authorized the Secretary of the Interior to lease or acquire a facility for the National Cave and Karst Research Institute, such facility to be located in the vicinity of Carlsbad Caverns National Park. However, the facility must not be located inside the boundary of the park. The Secretary may spend only such amount of Federal funds as is matched by an equal amount of funds from non-Federal sources.

Proclamation No. 1679, October 25, 1923 (43 Stat. 1929), established Carlsbad Caverns National Monument

October 25, 1923.

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

Carlsbad Cave National Monument, N. Mex. Preamble.

WHEREAS, there is located in section thirty-one, township twenty-four south, range twenty-five east, and section thirty-six, township twenty-four south, range twenty-four east of the New Mexico Principal Meridian, in southeastern New Mexico, near the town of Carlsbad, a limestone cavern known as the Carlsbad Cave, of extraordinary proportions and of unusual beauty and variety of natural decoration; and

WHEREAS, beyond the spacious chambers that have been explored, other vast chambers of unknown character and dimensions exist; and

WHEREAS, the soveral chambers contain stalactites, stalagmites, and other formations in such unusual number, size, beauty of form, and variety of figure as to make this a cavern equal, if not superior, in both scientific and popular interest to the better known caves; and

WHEREAS, it appears that the public interest would be promoted by reserving this natural wonder as a National Monument, together with as much land as may be needed for the protection, not only of the known entrance, but such other entrances as may be found.

National Monument, New Mexico. Vol. 34, p. 225.

NOW, THEREFORE, I, Calvin Coolidge, President of the United States of America, by authority of the power in me vested by section two of the act of Congress entitled, "An Act for the preservation of American antiquities," approved June eighth, nineteen hundred and six (34 Stat., 225) do proclaim that there is hereby reserved from all forms of appropriation under the public land laws, subject to all valid existing claims, and set apart as a National Monument to be known as the Carlsbad Cave National Monument all that piece or parcel of land in the County of Eddy, State of New Mexico, shown upon the diagram hereto annexed and made a part hereof, and more particularly described as follows: lots one and two, section thirty-one, township twenty-four south, range twenty-five

Description.

east, and section thirty-six, township twenty-four south, range twenty-four east of the New Mexico Principal Meridian.

Reserved from settlement, etc.

Warning is hereby expressly given to all unauthorized persons not to appropriate, injure, destroy or remove any feature of this Monument and not to locate or settle upon any of the lands thereof.

Supervision, etc., by Director of National Park Service. Vol. 39, p. 535.

The Director of the National Park Service, under the direction of the Secretary of the Interior, shall have the supervision, management, and control of this Monument as provided in the act of Congress entitled, "An Act to establish a National Park Service and for other purposes," approved August twenty-fifth, nineteen hundred and sixteen (39 Stat., 535) and Acts additional thereto or amendatory thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the United States to be affixed.

Done in the City of Washington this 25th day of October in the year of our Lord one thousand nine hundred and twenty-[SEAL.] three and of the Independence of the United States of America the one hundred and forty-eighth.

CALVIN COOLIDGE

By the President:

CHARLES E. HUGHES
Secretary of State.

Act of May 14, 1930 (P.L. 71-216, 46 Stat. 279), redesignated the area as a national park and enlarged park boundaries

CHAP. 272.—An Act To establish the Carlsbad Caverns National Park in the State of New Mexico, and for other purposes.

May 14, 1930.
[H. R. 9895.]
[Public, No. 216.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the tract of land heretofore known as the Carlsbad Cave National Monument, in the State of New Mexico, established and designated as a national monument under the Act of June 8, 1906, entitled "An Act for the preservation of American antiquities," and by presidential proclamation of October 25, 1923, be, and the same is hereby, declared to be a national park and dedicated as a public park for the benefit and enjoyment of the people under the name of the Carlsbad Caverns National Park, under which name the aforesaid national park shall be entitled to receive and to use all moneys heretofore or hereafter appropriated for the Carlsbad Cave National Monument.

Carlsbad Caverns National Park, N. Mex.
Name changed to.
Vol. 34, p. 225; Vol. 43, p. 1929, amended.
Post, p. 317.

Moneys for use of.

SEC. 2. That the administration, protection, and development of said Carlsbad Caverns National Park shall be exercised under the direction of the Secretary of the Interior by the National Park Service, subject to the provisions of the Act of August 25, 1916, entitled "An Act to establish a National Park Service, and for other purposes," and Acts supplementary thereto or amendatory thereof.

Administration by National Park Service.
Vol. 39, p 385.

SEC. 3. That the provisions of the Act of June 10, 1920, known as the Federal Water Power Act, shall not apply to or extend over the land hereby or hereafter reserved and dedicated as the Carlsbad Caverns National Park.

Water Power Act not applicable.
Vol. 41, p. 1063.

SEC. 4. That the boundaries of said Carlsbad Caverns National Park may be enlarged by subsequent proclamation or proclamations of the President upon the recommendations of the Secretary of the Interior, to include any or all of the following-described lands, to wit: Sections 1, 12, and 13, township 24 south, range 22 east; sections 1 to 18, inclusive, 20 to 28, inclusive, and 33 to 36, inclusive, township 24 south, range 23 east; the entire township 24 south, range 24 east; sections 6, 7, 18, and 19, and 27 to 34, inclusive, township 24 south, range 25 east; sections 24, 25, 35, and 36, township 25 south, range 22 east; the entire township 25 south, range 23 east; north half of township 25 south, range 24 east; sections 5, 6, 7, 8, 17, and 18, township 25 south, range 25 east; sections 1, 2, 11, 12, 13, and 14, and 19 to 36, inclusive, township 26 south, range 22 east; west half of township and sections 22 to 26, inclusive, township 26 south, range 23 east; all with respect to the New Mexico principal meridian.

Enlargement of boundaries authorized.

Description.

Approved, May 14, 1930.

Designation of the Carlsbad Caverns Wilderness (P.L. 92-625, 92 Stat. 3489) (November 10, 1978)

shore and, in addition, the waters surrounding said area to distances of one thousand feet in the Atlantic Ocean and up to four thousand feet in Great South Bay and Moriches Bay and, in addition, mainland terminal and headquarters sites, not to exceed a total of twelve acres, on the Patchogue River within Suffolk County, New York, all as delineated on a map identified as 'Fire Island National Seashore', numbered OGP–0004, dated May 1978. The Secretary shall publish said map in the Federal Register, and it may also be examined in the offices of the Department of the Interior.". Map, publication in Federal Register.

(b) Section 2 of such Act is amended by adding the following new subsection at the end thereof: Undeveloped tracts and property. 16 USC 459e–1.

"(g) The authority of the Secretary to condemn undeveloped tracts within the Dune District as depicted on map entitled 'Fire Island National Seashore' numbered OGP–0004 dated May, 1978, is suspended so long as the owner or owners of the undeveloped property therein maintain the property in its natural state. Undeveloped property within the Dune District that is acquired by the Secretary shall remain in its natural state.".

(c) Section 7(b) of such Act is amended by striking the phrase "Brookhaven town park at", and inserting in lieu thereof: "Ocean Ridge portion of". 16 USC 459e–6.

(d) Section 10 of such Act is amended by striking "$18,000,000". and inserting in lieu thereof "$23,000,000". 16 USC 459e–9.

CUMBERLAND ISLAND NATIONAL SEASHORE

SEC. 323. Section 1 of the Act of October 23, 1972 (86 Stat. 1066), is amended by changing the phrase "numbered CUIS–40,000B, and dated June 1971,", to read "numbered CUIS 40,000D, and dated January 1978,". 16 USC 459i.

TITLE IV—WILDERNESS

DESIGNATION OF AREAS

SEC. 401. The following lands are hereby designated as wilderness in accordance with section 3(c) of the Wilderness Act (78 Stat. 890; 16 U.S.C. 1132(c)), and shall be administered by the Secretary in accordance with the applicable provisions of the Wilderness Act: Administration. 16 USC 1132 note. 16 USC 1131 note.

(1) Buffalo National River, Arkansas, wilderness comprising approximately ten thousand five hundred and twenty-nine acres and potential wilderness additions comprising approximately twenty-five thousand four hundred and seventy-one acres depicted on a map entitled "Wilderness Plan, Buffalo National River, Arkansas", numbered 173–20,036–B and dated March 1975, to be known as the Buffalo National River Wilderness.

(2) Carlsbad Caverns National Park, New Mexico, wilderness comprising approximately thirty-three thousand one hundred and twenty-five acres and potential wilderness additions comprising approximately three hundred and twenty acres, depicted on a map entitled "Wilderness Plan, Carlsbad Caverns National Park, New Mexico," numbered 130–20,003–B and dated January 1978, to be known as the Carlsbad Caverns Wilderness. By January 1, 1980, the Secretary shall review the remainder of the park and shall report to the President, in accordance with section 3 (c) and (d) of the Wilderness Act (78 Stat. 891; 16 U.S.C. 1132 (c) and (d)), his recommendations as to the suitability or nonsuitability of any additional areas within the park for preservation as wilder- Report to President.

ness, and any designation of such areas as wilderness shall be accomplished in accordance with said subsections of the Wilderness Act.

16 USC 1131 note.

(3) Everglades National Park, Florida, wilderness comprising approximately one million two hundred and ninety-six thousand five hundred acres and potential wilderness additions comprising approximately eighty-one thousand nine hundred acres, depicted on a map entitled "Wilderness Plan, Everglades National Park, Florida", numbered 160-20,011 and dated June 1974, to be known as the Everglades Wilderness.

(4) Guadalupe Mountains National Park, Texas, wilderness comprising approximately forty-six thousand eight hundred and fifty acres, depicted on a map entitled "Wilderness Plan, Guadalupe Mountains National Park, Texas", numbered 166-20,006-B and dated July 1972, to be known as the Guadalupe Mountains Wilderness.

(5) Gulf Islands National Seashore, Florida, and Mississippi, wilderness comprising approximately one thousand eight hundred acres and potential wilderness additions comprising approximately two thousand eight hundred acres, depicted on a map entitled "Wilderness Plan, Gulf Islands National Seashore, Mississippi, Florida", numbered 635-20,018-A and dated March 1977, to be known as the Gulf Islands Wilderness.

(6) Hawaii Volcanoes National Park, Hawaii, wilderness comprising approximately one hundred and twenty-three thousand one hundred acres and potential wilderness additions comprising approximately seven thousand eight hundred and fifty acres, depicted on a map entitled "Wilderness Plan, Hawaii Volcanoes National Park, Hawaii", numbered 124-20,020 and dated April 1974, to be known as the Hawaii Volcanoes Wilderness.

(7) Organ Pipe Cactus National Monument, Arizona, wilderness comprising approximately three hundred and twelve thousand six hundred acres and potential wilderness additions comprising approximately one thousand two hundred and forty acres, depicted on a map entitled "Wilderness Plan, Organ Pipe Cactus National Monument, Arizona", numbered 157-20,001-B and dated October 1978, to be known as the Organ Pipe Cactus Wilderness.

(8) Theodore Roosevelt National Memorial Park, North Dakota, wilderness comprising approximately twenty-nine thousand nine hundred and twenty acres, depicted on maps entitled "Theodore Roosevelt National Memorial Park, North Dakota" (North Unit and South Unit) numbered 387-20,007-E and dated January 1978, to be known as the Theodore Roosevelt Wilderness.

MAP AND DESCRIPTION

Public availability.

SEC. 402. A map and description of the boundaries of the areas designated in this title shall be on file and available for public inspection in the office of the Director of the National Park Service, Department of the Interior, and in the Office of the Superintendent of each area designated in this title. As soon as practicable after this Act takes effect, maps of the wilderness areas and descriptions of their boundaries shall be filed with the Committee on Interior and Insular Affairs of the House of Representatives and the Committee on Energy and Natural Resources of the United States Senate, and such maps and descriptions shall have the same force and effect as if included in this Act: *Provided*, That correction of clerical and typographical errors in such maps and descriptions may be made.

Filing with congressional committees.

CESSATION OF CERTAIN USES

SEC. 403. Any lands which represent potential wilderness additions in this title, upon publication in the Federal Register of a notice by the Secretary that all uses thereon prohibited by the Wilderness Act have ceased, shall thereby be designated wilderness. Lands designated as potential wilderness additions shall be managed by the Secretary insofar as practicable as wilderness until such time as said lands are designated as wilderness.

Designation notice, publication in Federal Register. 16 USC 1131 note. Management.

ADMINISTRATION

SEC. 404. The areas designated by this Act as wilderness shall be administered by the Secretary of the Interior in accordance with the applicable provisions of the Wilderness Act governing areas designated by that Act as wilderness, except that any reference in such provisions to the effective date of the Wilderness Act shall be deemed to be a reference to the effective date of this Act, and, where appropriate, any reference to the Secretary of Agriculture shall be deemed to be a reference to the Secretary of the Interior.

SAVINGS PROVISIONS

SEC. 405. Nothing in this title shall be construed to diminish the authority of the Coast Guard, pursuant to sections 2 and 81 of title 14, United States Code, and title 1 of the Ports and Waterways Safety Act of 1972 (33 U.S.C. 1221), or the Federal Aviation Administration to use the areas designated wilderness by this Act within the Everglades National Park, Florida; and the Gulf Islands National Seashore, Florida and Mississippi, for navigational and maritime safety purposes.

TITLE V—ESTABLISHMENT OF NEW AREAS AND ADDITIONS TO NATIONAL TRAILS SYSTEM

Subtitle A—Parks, Seashores, Etc.

GUAM NATIONAL SEASHORE

SEC. 501. (a) The Secretary through the Director of the National Park Service, shall revise and update the National Park Service study of the Guam National Seashore and, after consultation with the Secretary of the Department of Defense and the Governor of Guam, shall transmit the revised study within two years to the Committee on Energy and Natural Resources of the Senate and the Committee on Interior and Insular Affairs of the House of Representatives including his recommendations and a series of options for congressional consideration each of which—

Study revision, transmittal to congressional committees.

(1) will encompass the area from Ajayan Bay to Nimitz Beach including Cocos and Anac Islands and extending inland as far as the Fena Valley Reservoir and Mount Sasalaguan, and

(2) if implemented, will afford protection to the natural and historic resources of the area as well as providing visitor access and interpretive services.

(b) The Secretary, and the Secretary of the Department of Defense, shall take such actions as they may deem appropriate within their existing authorities to protect the resource values of the submerged lands within the area of the study referred to in subsection (a) of this section.

Submerged lands resource values, protection.

Appendix B: Inventory of Special Mandates, Special Designations, and Administrative Commitments

Special Mandates

- **Designation of the Carlsbad Caverns Wilderness (P.L. 92-625) (November 10, 1978).** Section 401 designated the wilderness area. The wilderness area is part of the National Wilderness Preservation System and is subject to the requirements of the Wilderness Act (P.L. 88-577). The National Park Service is required to manage the Carlsbad Caverns Wilderness ". . . for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness . . . ." and to protect the area and its wilderness character (§2(a)). The act mandates what uses can occur and are prohibited, including recreational uses, commercial uses, and developments.

- **Designation of Carlsbad Caverns National Park as a Class I Airshed.** A major purpose of the Clean Air Act is "[T]o preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value" (Public Law 88-206; 42 USC 7470[2]). Accordingly, the 1977 amendments designated certain public lands as "class I" areas, which included national parks over 6,000 acres and national wilderness areas over 5,000 acres that were in existence when the amendments were enacted. Class I status is the highest level of air quality protection under the Clean Air Act and bestows an "affirmative responsibility" on the federal land managers to protect these areas from the adverse effects of air pollution. The goals of the act aim to protect visibility (i.e., scenery) and other resources sensitive to air pollution, including vegetation, animals, soils, and water in these special areas. In section 169A, Congress declared as a national goal the prevention of any future, and the remedy of any existing, visibility impairment in mandatory class I federal areas where impairment results from human-made air pollution.

- **Protection of Lechuguilla Cave through the Lechuguilla Cave Protection Act of 1993.** The Lechuguilla Cave Protection Act of 1993 created a cave protection zone around Lechuguilla Cave. Within the cave protection zone, access and the removal of cave resources may be limited or prohibited; existing leases may be cancelled with appropriate compensation; and the lands are withdrawn from mineral entry. This act protects the cave on both NPS land and on 2,000 acres of Bureau of Land Management land just north of the park boundary.

Special Designations

- **Designation of Carlsbad Caverns National Park as a World Heritage Site by the United Nations (1995).** The karst landscape, caves, and mineral formations of Carlsbad Caverns National Park and their universal value to humanity and continued scientific exploration led to the designation of the park as a world heritage site. This status is used to promote sustainable tourism and the preservation of the world's natural and cultural heritage.

- **Designation of Rattlesnake Springs and the Carlsbad Cavern Natural Entrance as Important Bird Areas.** Rattlesnake Springs, a rare desert wooded riparian area that has been designated an Important Bird Area (IBA) by the National Audubon Society, draws birders from around the world to see some of the more than 300 species that have been noted there. The Carlsbad Cavern Natural Entrance is also an Audubon IBA because of the large colony of cave swallows that resides and breeds there in the summer.

Administrative Commitments

Agreement Name	Type of Agreement	Stakeholders	Purpose
Cave Research Foundation	Memorandum of understanding	National Park Service (Mammoth Cave NP, Cumberland Gap NHM, Sequoia/ Kings Canyon NP, Carlsbad Caverns NP, Lava Beds NM, Ozark National Scenic Riverways); The Cave Research Foundation	Permitting the Cave Research Foundation to conduct scientific research, cartography, and interpretive activities on lands administered by the National Park Service.
National Speleological Society	Memorandum of understanding	National Park Service; National Speleological Society	Encouraging future participation by the National Speleological Society in the inventory, scientific study, management, planning, and protection of caves and cave resources located on lands administered by the National Park Service.
Cavern arts projects	Memorandum of understanding	Carlsbad Caverns NP; Cavern Arts Project	Agreement # G7170-06-0002. Create and display educational exhibits using certain federally owned personal property and images, and display these exhibits in federally owned buildings.
Noxious plant prevention, control, and eradication	Memorandum of understanding	City of Carlsbad; City of Artesia; Eddy County Commission; Carlsbad Irrigation District; Soil and Water Conservation Districts in Eddy County; NM State Highway & Transportation Dept. (District 2); NM Department of Game and Fish; NM Department of Energy, Minerals, and Natural Resources; NM State Land Office; Carlsbad Chapter Native Plant Society; Cooperative Extension Service, NMSU; Natural Resources Conservation Service; NPS; BLM; Bureau of Reclamation; USFS; DOE Carlsbad Area Office	Prevent introduction, control the spread of, and eradicate noxious plants through the coordinated efforts in Eddy County.
Collaboration and Coordination in Cave and Karst Resource Management	Interagency agreement	Department of the Interior (BLM, USFWS, USGS, NPS); Department of Agriculture (USFS)	Achieve more effective and efficient management of cave and karst resources through cooperative actions between the listed agencies.
Alamogordo Interagency Dispatch Center Annual Operating Plan	Cooperative agreement	USFS (Lincoln National Forest); BLM (Pecos District, Las Cruces District); USFWS (Bitter Lake National Wildlife Refuge, Dexter National Fish Hatchery, San Andres National Wildlife Refuge); NPS (Amistad NRA, Big Bend NP, Carlsbad Caverns NP, Chamizal NM, Ft. Davis NHS, Guadalupe Mountains NP, White Sands NM); Bureau of Indian Affairs (BIA) (Mescalero Agency); State of New Mexico (Forestry Division, Capitan District)	Fire protection assistance and cooperation.
Joint Powers Operating Plan for Pecos Zone	Cooperative agreement	NPS; BLM; BIA; USFWS; USFS; State of New Mexico (Energy, Minerals and Natural Resources Department, Forestry Division)	Wildland fire management and initial attack procedures for the Pecos Zone.

Agreement Name	Type of Agreement	Stakeholders	Purpose
Fair Share Agreement for Exclusive Use Helicopter in Pecos Zone	Interagency agreement	BIA (Mescalero Agency); NPS (Carlsbad Caverns NP, Guadalupe Mountains NP)	Wildfire suppression and pre-suppression activities within the New Mexico/Texas Pecos Zone utilizing an interagency funded helicopter.
Eddy County Regional Emergency Dispatch Authority	Memorandum of understanding	Carlsbad Caverns NP; Eddy County Sheriff's Department	Mutual law enforcement assistance in and near Carlsbad Caverns National Park.
Eddy County Law Enforcement Assistance	Memorandum of understanding	NPS (Carlsbad Caverns NP, Guadalupe Mountains NP); Eddy County Emergency Services Department	Mutual aid and assistance for occurrences of structural and wild land fires, search and rescue, emergency medical services and all risk incidents within the boundaries of the parks or within the response area of the department.
Interagency Fire Management Plan for the Guadalupe Mountains Ecosystem	Interagency agreement	Carlsbad Caverns NP; Guadalupe Mountains NP; Bureau of Indian Affairs	Interagency fire management, including availability of Bureau of Indian Affairs helicopter for fire incidents.
Smoke Monitoring with the State of New Mexico	Memorandum of understanding	Carlsbad Caverns NP; New Mexico Environment Department	Smoke monitoring.
Western National Parks Association	Memorandum of agreement	Carlsbad Caverns NP; Western National Parks Association	Manage and operate a Carlsbad Caverns -themed bookstore in the visitor center and provide Aide to Park funding for interpretation, education, and research.
Merchandise, Food and Beverage, and Kennel Services	Concessions contract	Carlsbad Caverns NP; Carlsbad Caverns Trading, LLC	Contract no. CC-CAVE001-08. Provision of merchandise, food and beverage, and kennel services at the park.
Park inholding	Inholding	N/A	320 acre inholding on the park boundary on western border of park.
GSA lease for museum and archives storage facility	GSA lease	Carlsbad Caverns NP; General Services Administration	Museum and archives storage facility in Carlsbad, New Mexico.
Southwestern Public Service Company right-of-way	Right-of-way	Carlsbad Caverns NP; Southwestern Public Service Company	Permit no. RW 7170-09-001. Operate and maintain an existing overhead electric line within the park.
Rights-of-way	Right-of-way	Carlsbad Caverns NP; State of New Mexico	P.L. 88-249 details rights-of-way in the park, including land for the construction of a state road.
Water rights at Rattlesnake Springs	Memorandum of understanding	Carlsbad Caverns NP; Washington Ranch	Improve communication and ensure proper and reliable flows for the use of the park and Washington Ranch.

Appendix C: Past and Ongoing Park Planning and Data Collection Efforts

Document Name	Date
Animal Life of the Carlsbad Cavern. V. Bailey.	1928
Master Plan Development Outline	1961
Amphibians and Reptiles of Carlsbad Caverns National Park, New Mexico, and Adjacent Guadalupe Mountains. F.R. Gehlbach.	1964
The Microclimate in Carlsbad Caverns, New Mexico. J.S. McLean.	1971
Wilderness Recommendation	1972
Capitan Aquifer Observation-Well Network; Carlsbad to Jal, New Mexico. W.L. Hiss.	1973
Proposed Wilderness / Final Environmental Statement	1973
Ecology of Fire, Carlsbad Caverns and Guadalupe Mountains National Parks. G.M. Ahlstrand.	1974
Identification and Ecology of Microflora in Caves of the National Park System. D.E. Gardner & B.J. Little.	1974
Identification of Possible Health Hazard of Cave Swallows in Carlsbad National Park. R.T. O'Brien & R.J. Raitt.	1974
Range Condition Survey and Wildlife Browse Analysis, Carlsbad Caverns and Guadalupe Mountains National Parks. M.R. Glass, R.E. Reisch, & G.M. Ahlstrand.	1974
Natural Resources Management Plan	1974
Master Plan	1975
Food Habits of Mule Deer on Foothills of Carlsbad Caverns National Park. W.H. Kittams, S.L. Evans, & D.C. Cooke.	1975
Alpha Radiation Project at Carlsbad Caverns: Two Years and Still Counting. G.M. Ahlstrand & P.L. Fry.	1976
Barbary Sheep Management Program for Carlsbad Caverns and Guadalupe Mountains National Parks / Environmental Assessment and Finding of No Significant Impact	1979
The Mammalian Fossils from Muskox Cave and Their Paleoecologic Implications. L.E. Logan.	1979
Silent Chambers, Timeless Beauty. J. Barnett.	1981
Wilderness Recommendation	1981
Road Inventory and Needs Study	1984
Control of Exotic Plants in Carlsbad Caverns	1984
*Mountain Lions (*Felis concolor) *in the Vicinity of Carlsbad Caverns National Park, NM and Guadalupe Mountains National Park, TX. An Ecological Study.* Harvey and Stanley Associates, Inc.	1984
The Rare and Sensitive Cacti of Carlsbad Caverns National Park. K.D. Heil.	1985
Research Study of Methodology to Count Free-Living Bats. Comar, Inc.	1985
Sneed and Lee Pincushion Cacti (*Coryphantha sneedii* var. *sneedii; Coryphantha sneedii var. leei*) (USFWS)	1986

Document Name	Date
Air Quality in the National Parks	1988
National Register of Historic Places Inventory—Nomination Form: Rattlesnake Springs Historic District	1988
National Register of Historic Places Inventory—Nomination Form: The Caverns Historic District	1988
Movements, Habitat Use, and Population Dynamics of Elk in Guadalupe Mountains and Carlsbad Caverns National Parks. D.B. Fagre, D.J. Schmidly, N.J. Silvy, & J. Carpenter.	1988
Report to the CCNP on arthropod species diversity in the Big Room and the environs	1988
Visitor Response to Concession Management Alternatives	1989
Pesticides in Mexican Free-Tailed Bats from Carlsbad Cavern: 1987 and 1988. K.N. Geluso.	1989
Four Year Update on Photo Monitoring in Rattlesnake Canyon of Lee and Sneed Pincushion Cactus.	1989
Rattlesnake Springs Management Plan / Finding of No Significant Impact	1989
Housing Management Plan	1990
Cave Management Plan	1990
Development Concept Plan: Carlsbad Flume Site	1990
Master List of Cave Invertebrates Found Within Carlsbad Caverns National Park. D.W. Ek.	1990
Behavior, Status and Ecology of the Cave Swallow (*Hirundo fulva*)	1991
Rodents of Carlsbad Caverns National Park. K.N. Geluso.	1992
Underground Concession / Environmental Assessment	1993
Watering the Land; The Turbulent History of the Carlsbad Irrigation District. M. Hufstetler & L. Johnson.	1993
Cytogenetic aberrancy and organochlorine pesticide accumulation in the Mexican free-tailed bat: A comparison between Oklahoma and New Mexico populations	1993
Archeological Testing for Determination of Significance at LA 105139. C.M. Haecker.	1994
Draft Dark Canyon / Environmental Impact Statement with Record of Decision (BLM)	1994
Decision to Remove Underground Concessions Operations	1994
*Rattlesnake Springs, Federal Endangered Avian Species Survey Report- Southwestern Willow Flycatcher (*Empidonax trailii extimus). W. Schreier.	1995
Interpretive Plan	1996
Replace Water Transmission and Storage Systems / Environmental Assessment with Finding of No Significant Impact	1997
Determining Water Infiltration Routes from Structures Located Above Carlsbad Cavern (International Ground Water Modeling Center)	1997
Research in Carlsbad Caverns National Park; Scientific Exploration and Research	1997
Strategic Plan, FY 1998–2002	1997

Document Name	Date
Promise Beheld and the Limits of Place; A Historic Resource Study of Carlsbad Caverns and Guadalupe Mountains National Parks and the Surrounding Areas. H.K. Rothman & D. Holder.	1998
Preliminary Assessment of Environmentally-sound Methods for Treating and/or Diverting Rainwater Run-off from Parking Lots and Roads in the Vicinity of Carlsbad Cavern. M. Bremer.	1998
Class III Archeological Survey Report for the United States Department of the Interior's National Park Service, Carlsbad Caverns National Park. J.E. Hunt.	1999
Morphometric Analysis of *Escobaria sneedii* var. *sneedii*, *E. sneedii* var. *leei*, and *E. guadalupensis* (Cactaceae)	2000
Wastewater Treatment Improvement Plan Evaluation (Living Machine)	2000
Full Study Plan for Vertebrate and Vascular Plant Inventory of the Chihuahuan Desert Network	2001
Resource Protection Implementation Plan / Environmental Assessment	2002
Fire History of Carlsbad Caverns National Park, New Mexico. B.S. Gebow & W.L. Halvorson.	2002
Biogeographic variation in nest placement: A case study with conservation implications	2002
Economic Impacts of Carlsbad Caverns National Park on the Local (Eddy County, NM) Economy, 2002. D.J. Stynes.	2003
Inventory of high elevation breeding birds at Carlsbad Caverns National Park	2003
A Vegetation Map of Carlsbad Caverns National Park, New Mexico	2003
Diverse microbial communities inhabiting ferromanganese deposits in Lechuguilla and Spider Caves	2003
Barbary Sheep and Carlsbad Caverns National Park	2003
Big summer for mammals at Carlsbad Caverns	2004
Ethnographic Literature Review and Assessment	2004
Comprehensive Interpretive Plan – Section One: Long-Range Interpretive Plan	2004
Cultural Landscapes Inventory—Rattlesnake Springs	2004
Archaeological Survey for Carlsbad Caverns National Park Entrance Road and Parking Area Rehabilitation	2005
Archaeological Survey for Carlsbad Caverns National Park Sewer Repair Rehabilitation	2005
Fire Management Plan / Environmental Assessment	2005
Road Inventory of Carlsbad Caverns National Park	2005
Impact of Commercial Activities on Macroinvertebrate Distribution and Foraging in Carlsbad Cavern. J.K. Krejca & G.R. Myers, III.	2005
Impact of commercial activities on macroinvertebrate distribution and foraging in Carlsbad Cavern	2005
Cave and Karst Management Plan / Environmental Assessment	2006
Determination of Significance for Ogle Cave Guano Mine	2006

Document Name	Date
Determination of Significance for Walnut Canyon Road Culverts & Retaining Walls	2006
Determination of Significance for Lowe Ranch Tank	2006
Cultural Landscapes Inventory – Caverns Historic District	2006
Lessons in History: Colony Size and Population Decline of Brazilian Free-Tailed Bats at Carlsbad Caverns. N.I. Hristov, M. Betke, & T.H. Kunz.	2006
Chihuahuan Desert Network, Water Resource Information and Assessment Report, Phase II. G.F. Huff, M.H. Reiser, & J.T. Richie.	2006
Preliminary List of Known Insects of Carlsbad Caverns National Park Through 2006	2006
Evidence for Pacific-modulated precipitation variability during the late Holocene from the southwestern USA	2006
Syndepositional Deformation of the Capitan Carbonate Reef Complex, Slaughter Canyon, New Mexico: Application of Photogrammetry and GPS Survey Techniques	2006
Winter survey for eastern fox squirrel dreys	2006
Checklist of Amphibians and Reptiles of Carlsbad Caverns National Park	2007
Checklist of Birds of Carlsbad Caverns National Park	2007
Checklist of the Vascular Plants of Carlsbad Caverns National Park	2007
Checklist of the Mammals of Carlsbad Caverns National Park	2007
Geologic Resource Evaluation Report	2007
Weather and Climate Inventory; Chihuahuan Desert Network	2007
Fish Renovation Project Final Report – Summary	2007
Determination of Eligibility (DOE) on the Caverns Historic District	2007
Wastewater System Rehabilitation / Environmental Assessment	2007
Reconstruction of Visitor Center Parking Areas and Rehabilitation of Walnut Canyon Entrance Road / Environmental Assessment / Assessment of Effect	2007
Winter activity of bats over water and along flyways in New Mexico	2007
Weird Green Disks & Alien Invaders? (termite prevention in CCNP buildings)	2008
Thermal imaging reveals significantly smaller Brazilian free-tailed bat colonies than previously estimated	2008
Intermountain Region New Deal Resources; Research Findings for Carlsbad Caverns National Park	2008
Applications of thermal infrared imaging for research in aeroecology	2008
Assessing Mexican Free-tailed Bat Population at Carlsbad Cavern Using Advanced Thermal Infrared Imaging	2008
Evaluation of two GIS habitat models and initial characterization of nesting and breeding-season roosting microhabitat for Mexican spotted owls in the Guadalupe Mountains	2008

Document Name	Date
First documented Willow Flycatcher (*Empidonax traillii*) nesting in Eddy County, New Mexico	2008
Distribution and abundance of Barbary sheep and other ungulates in Carlsbad Caverns National Park, Implications for native bighorn sheep restoration	2009
Carlsbad Caverns and Guadalupe Mountains National Parks: The development of habitat and corridor suitability models as a test of landscape connectivity within the Chihuahuan Desert Network	2009
Historical Perspective of Surface Water and Groundwater Resources in the Chihuahuan Desert Network. S.D. Porter, R.A. Barker, R.M. Slade, Jr. & G. Longley.	2009
Development of Invasive Plant Species Monitoring Protocol for Park Units in the Chihuahuan Desert Network	2009
Chihuahuan Desert Network Vital Signs Monitoring Plan	2010
First records, representing major range extensions, of three species of Lepidoptera (*Erebidae, Noctuidae,* and *Lasiocampidae*) from New Mexico	2010
Seasonal variation in colony size of Brazilian free-tailed bats at Carlsbad Cavern based on thermal imaging	2010
A new species of *Elasmia* (Möschler) from New Mexico and Texas, and a new subspecies of *Elasmia mandela* (Druce) from Texas and Oklahoma (*Lepidoptera, Notodontidae, Nystaleinae*)	2011
Willow Flycatchers at Rattlesnake Springs	2011
Evaluation of the Sensitivity on Inventory and Monitoring National Parks to Acidification Effects from Atmospheric Sulfur and Nitrogen Deposition	2011
Evaluation of the Sensitivity on Inventory and Monitoring National Parks to Nutrient Enrichment Effects from Atmospheric Nitrogen Deposition	2011
Summary of Hydrogeologic Investigations in the Vicinity of Rattlesnake Springs	2011
Varied Bunting surveys in Carlsbad Caverns National Park, Eddy County, New Mexico	2012
Studying bat habitat associations at Carlsbad Caverns National Park: Recommendations for long-term monitoring	2012
Exotic Plant Monitoring in the Chihuahuan Desert Network; 2011 Annual Report	2012
Superintendent's Compendium of Designations, Closures, Permit Requirements and Other Restrictions Imposed Under Discretionary Authority	2012
Caverns' Chronology	2013
Reconstruction of Mesa Top Waterline / Environmental Assessment	2013
Landbird Monitoring in the Chihuahuan Desert Network; 2012 Annual Report	2013
A review of the genus *Ogdoconta* Butler (Lepidoptera, Noctuidae, Condicinae, Condicini) from North America north of Mexico with descriptions of three new species	2013
The Transport of Nonindigenous Microorganisms Into Caves by Human Visitation: A Case Study at Carlsbad Caverns National Park	2014
External Microbiota of Western United States Bats: Does It Matter Where You Are From?	2015
First record of the orchid bee genus *Eufriesea* Cockerell (Hymenoptera: Apidae: Euglossini) in the United States	2015

Appendix D: Traditionally Associated American Indian Tribes

At present 14 groups are listed as traditionally associated American Indian tribes; that is, these tribes have expressed cultural ties to the Carlsbad Caverns-Guadalupe Mountains region:

Apache Tribe of Oklahoma

Comanche Nation, Oklahoma

Fort Sill Apache Tribe of Oklahoma

Hopi Tribe of Arizona

Jicarilla Apache Nation, New Mexico

Kiowa Indian Tribe of Oklahoma

Mescalero Apache Tribe of the Mescalero Reservation, New Mexico

Pawnee Nation of Oklahoma

Pueblo of Isleta, New Mexico

Pueblo of Zia, New Mexico

San Carlos Apache Tribe of the San Carlos Reservation, Arizona

White Mountain Apache Tribe of the Fort Apache Reservation, Arizona

Ysleta del Sur Pueblo of Texas

Zuni Tribe of the Zuni Reservation, New Mexico

Intermountain Region Foundation Document Recommendation
Carlsbad Caverns National Park
January 2017

This Foundation Document has been prepared as a collaborative effort between park and regional staff and is recommended for approval by the Intermountain Regional Director.

Douglas S Neighbor 1/20/2017

RECOMMENDED
Doug Neighbor, Superintendent, Carlsbad Caverns National Park **Date**

Sue E. Masica 2/13/17

APPROVED
Sue E. Masica, Regional Director, Intermountain Region **Date**

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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