



Mammoth Cave National Park

Improvements to Concession Facilities

Environmental Assessment

November 2013



Mammoth Cave National Park

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Environmental Assessment

Produced by the Office of the Superintendent
Mammoth Cave National Park
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Mammoth Cave, KY 42259

National Park Service
U.S. Department of the Interior
Washington, DC

**U.S. Department of the Interior
National Park Service
Mammoth Cave National Park, Kentucky
Improvements to Concession Facilities
Environmental Assessment
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Summary

Mammoth Cave National Park (the park) comprises 52,830 acres in Edmonson, Hart, and Barren Counties in the Commonwealth of Kentucky, approximately 100 miles northeast of Nashville, Tennessee and approximately 100 miles south of Louisville, Kentucky. The park is best known for preserving Mammoth Cave, currently the longest known cave system in the world, with more than 400 miles of surveyed cave passages.

Mammoth Cave Hotel predates establishment of the national park by more than 100 years; the owner of the cave and surrounding property also owned and operated the hotel, providing cave tours, basic necessities, and visitor services. The hotel's facilities and services are intimately tied to the park's visitor operations and are therefore necessary and appropriate within the park boundary. Visitors waiting for a cave tour often want a quick snack or meal before their trip, or a souvenir following their tour. Overnight accommodations immerse visitors in an "in-park" experience of sights, sounds, and impressions that last a life time.

Improvements to Mammoth Cave Hotel would update the hotel facilities and infrastructures in a manner resulting in an efficient concession operation, while protecting and conserving park resources and values. The improvements would provide a quality facility that improves visitor services and meets current safety standards, building codes, and NPS directives, including energy efficiency and sustainability, while providing the concessioner a reasonable opportunity for profit.

The NPS has evaluated an action alternative and a no-action alternative, as described in this Environmental Assessment (EA). As described in this document, implementation of the NPS Preferred Alternative would result in a variety of impacts, both short-

term and long-term. Over the short-term, there would be negligible adverse impacts on energy conservation and conservation potential. Negligible to minor adverse impacts would also occur over the short-term to geological resources, and minor adverse impacts would occur over the short-term to soils and topography. There would be minor to moderate adverse impacts over the short-term on cultural landscapes and moderate, adverse impacts to visitor use and experience. Lastly, short-term, beneficial impacts would be expected for historic structures and socioeconomic resources. All of these short term impacts would be associated with the demolition and rehabilitation envisioned in the NPS Preferred Alternative.

Over the long-term there would be potential minor, adverse impacts on geologic resources and minor, adverse impacts on special status species. Long-term, adverse impacts on archeological resources would be anticipated at the negligible to minor level. Minor adverse impacts would occur over the long-term to soils and topography, vegetation, and historic structures. Implementation of the preferred alternative would result in beneficial, long-term impacts on vegetation, archeological resources, cultural landscapes, socioeconomic resources, visitor use and experience, visual resources, lightscapes, operations and infrastructure and energy conservation and conservation potential.

For Further Information Contact:

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Note to Reviewers and Respondents:

If you wish to comment on this Environmental Assessment, you may post your comments electronically at <http://parkplanning.nps.gov/mac> or you may mail comments within 30 days to the address below. It is the practice of the NPS to make all comments, including

names and addresses of respondents who provide that information, available for public review following the conclusion of the National Environmental Policy Act (NEPA) process. Individuals may request that the NPS withhold their name and/or address from public disclosure. If you wish to do this, you must state this prominently at the beginning of your comment. Commenters using the website can make such a request by checking the box "keep my contact information private." The NPS will honor such requests to the extent allowable by law, but you should be aware that the NPS may still be required to disclose your name and address pursuant to the Freedom of Information Act.

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ACRONYMS AND ABBREVIATIONS

ADA – Americans with Disabilities Act

ALR – anthropogenic light ratio

AoE – Assessment of Effect

CAA – Clean Air Act

CEQ – Council on Environmental Quality

CFR – Code of Federal Regulations

Concessions Act - Concessions Management Improvement Act of 1998

DEP – Department of Environmental Protection

EA – Environmental Assessment

EPA – Environmental Protection Agency

ESA – Endangered Species Act

GHG – Greenhouse gas

GMP – General Management Plan

HVAC – heating, ventilation, and air conditioning

I-65 – Interstate 65

IT – information technology

LEED – Leadership in Energy and Environmental Design

LSI – leaseholder surrender interest

NEPA – National Environmental Policy Act

National Register – National Register of Historic Places

NPS – National Park Service

PA – Programmatic Agreement

RBEB – Rafinesque’s big-eared bat

SHPO – State Historic Preservation Officer

the park - Mammoth Cave National Park

USFWS – U.S. Fish and Wildlife Service

USC – U.S. Code

USGS – United States Geological Survey

VA – Value Analysis

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1 INTRODUCTION: PURPOSE AND NEED

Within this document, the term “concession facilities” is defined as all the structures operated by the concessioner; the term “hotel lodge” is defined as the main building that houses the lobby, food/beverages services, retail outlets, meeting room, and accessible guest rooms; and the term “Heritage Trail wing” is defined as the building by that title that houses 38 guest rooms.

Mammoth Cave National Park (the park) comprises approximately 52,830 acres in Edmonson, Hart, and Barren Counties in the Commonwealth of Kentucky. The park is approximately 100 miles northeast of Nashville, Tennessee and approximately 100 miles south of Louisville, Kentucky (Figure 1) and is one of the most popular tourist attractions in the Commonwealth of Kentucky. The park is best known for preserving Mammoth Cave, currently the longest known cave system in the world, with more than 400 miles of surveyed cave passages.

The enabling legislation for the park noted three distinctive features of national significance: extensive limestone caverns and associated karst topography, scenic river valleys, and hilly country representative of south central Kentucky. In addition to being a unit of the national park system, the park also has been designated a World Heritage Site and is the core area of the Mammoth Cave Area International Biosphere Reserve.

Mammoth Cave National Park attracted 508,054 recreational visitors in 2012 to experience its scenic river valleys, bluffs, forests, abundant wildlife, as well as the caves (NPS 2013a). Most of the recreational visitors who come to the park enter Mammoth Cave (79%); there were 401,820 cave visitors in 2012. Related to park visitation, the Mammoth Cave Hotel is an important part of the park’s program for visitor services. It is estimated that approximately 200,000 park visitors (40%

of all park visitors) make use of the hotel, particularly cave visitors before or after their cave tour.

Section 10.2.2 of NPS *Management Policies 2006* defines the parameters under which a concession contract is appropriate as part of a park’s management strategies:

A park commercial services strategy must be in place to ensure that concession facilities and services are necessary and appropriate, financially viable, and addressed in an approved management plan. Commercial services plans may be developed to further implement a park’s commercial services strategy and to guide decisions on whether to authorize or expand concessions. A decision to authorize or expand a park concession will consider the effect on, or need for, additional infrastructure and management of operations and be based on a determination that the facility or service is consistent with enabling legislation, and is complementary to a park’s mission and visitor service objectives, and is necessary and appropriate for the public use and enjoyment of the park in which it is located, and is not, and cannot be, provided outside park boundaries, and incorporates sustainable principles and practices in planning, design, siting, construction, and maintenance, and adopts appropriate energy and water conservation, source reduction, and environmental purchasing standards and goals, and will not cause unacceptable impacts. Prior to initiating new services authorized under a concession contract, a market and financial viability study/analysis will be completed to ensure the overall contract is feasible. (NPS 2006)

Hotel services at Mammoth Cave were present during the infancy of tourism in the

United States and Kentucky. Cave tours were first conducted in 1816. All tours entered the cave at what is now called the Historic Entrance. From the establishment of the hotel until the establishment of the park in 1941—more than 100 years—Mammoth Cave Hotel and Mammoth Cave were synonymous; the owner of the cave and surrounding property also owned and operated the hotel, providing cave tours, basic necessities, and creature comforts to guests. In 1837, the original Mammoth Cave Hotel was constructed just up the hill from the cave. In 1916, the original hotel burned to the ground and was replaced in 1925 by the second generation hotel.

This hotel was closed by the park and demolished in 1979 because it was considered to be a fire hazard and its repair cost was prohibitive. The present building is the third generation and was constructed in the 1965, with two additions constructed in the early 1990s.

The present Mammoth Cave Hotel continues its predecessors' tradition of hospitality and dedication to serving cave/park visitors. The spatial design of the former visitor center and hotel gave each building two front doors: one serving arriving visitors, and another leading to a connecting foot-bridge between the buildings, allowing people to easily purchase cave tickets and grab a quick meal before their tour.

Because the visitor center, constructed a few years before the hotel, recently underwent extensive renovation and modernization, the hotel's appearance, facilities, and infrastructure are in need of modernization. The National Park Service (NPS) proposes to update the Mammoth Cave Hotel facilities and infrastructure in a manner that supports the hotel's necessary and appropriate services, resulting in a financially viable concession operation, while protecting and conserving park resources and values.

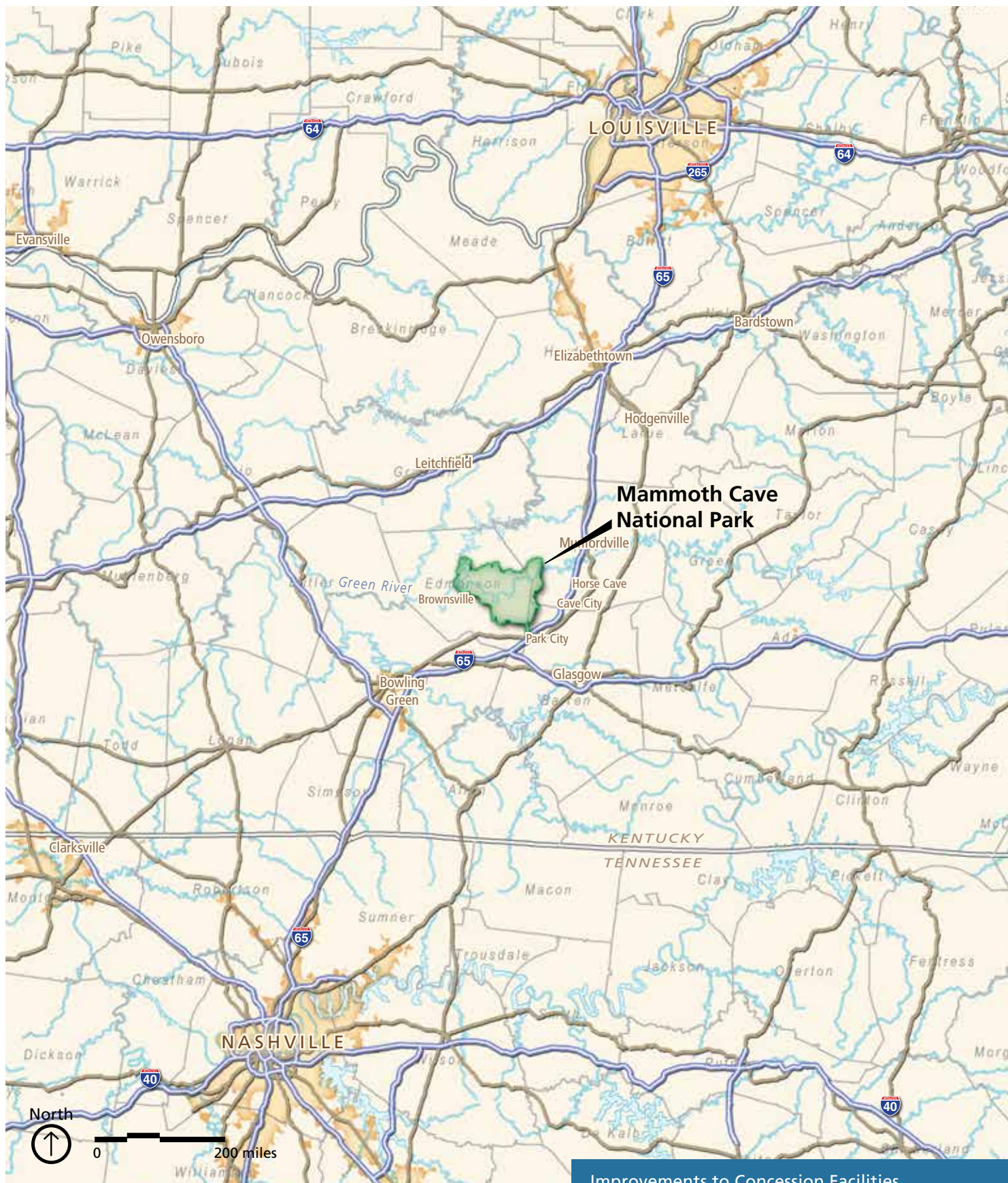
The hotel's facilities and services are intimately tied to the park's visitor operations, and therefore necessary and appropriate to be located within the park boundary (NPS 1983). Cave tours range from one hour to six hours and depart at scheduled times. The visitor center provides restrooms and a bookstore,

but all other basic visitor needs and wants are addressed at the hotel, a short walk from the visitor center.

The hotel buildings are owned by the National Park Service, which contracts with a concessioner to provide necessary and appropriate visitor services which are consistent to the highest feasible degree with the preservation and conservation of the park area's resources and values, according to the Concessions Management Improvement Act of 1998. Current services provided by the hotel concessioner include the following:

- Food and beverage service
- Gift shops
- Lodging (including accessible rooms)
- Cave tour bus transportation
- Camper store
- Miscellaneous services (pay showers, meeting rooms, special events, pet kennels, pay laundry, and tennis courts)

This Environmental Assessment (EA) evaluates two alternatives, a no-action alternative and one action alternative (the NPS preferred alternative). The EA further analyzes the potential impacts these alternatives would have on the natural, cultural, and human environment. This document has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA); regulations of the Council on Environmental Quality (CEQ) (40 CFR 1508.9); and the Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making (NPS 2001). Compliance with section 106 of the National Historic Preservation Act of 1966, as amended, will take place separately from this document as described later.



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National Park Service
U.S. Department of the Interior

Mammoth Cave National Park

Figure 1
Project Location

PURPOSE OF AND NEED FOR ACTION

The purpose of this project is to update the Mammoth Cave Hotel facilities and infrastructure in a manner resulting in an efficient concession operation, while protecting and conserving park resources. The updated facility would:

- provide a venue of value and quality that meets current safety standards, building codes, and NPS directives, including those for night sky protection, energy efficiency and sustainability
- protect and conserve park resources and values
- include NPS-funded improvements to existing facilities to enable execution of a 10-year concession contract
- meet the needs and expectations of the traveling public by providing a quality in-park experience

As detailed below, there is a need for a concession operation to meet existing NPS standards for utility systems, energy conservation, visitor services, and related amenities. All Mammoth Cave Hotel facilities are owned by the NPS. A Condition Assessment of park facilities was conducted to establish a baseline of current facility conditions, and develop a 20-year maintenance and repair plan. The facilities were found to be aging, yet kept clean; however, maintenance has been deferred in many instances. The updated facilities would improve the concession operation, making Mammoth Cave Hotel an attractive business prospect to the next concessioner.

Currently, the operation of the Mammoth Cave Hotel is not in full compliance with the 1998 Concessions Management Improvement Act (Public Law 105-391). The 1998 Act mandates that visitor accommodations, facilities, and services provided in a national park shall be limited to those accommodations, facilities, and services that are necessary and appropriate for public use and enjoyment of the park area, and are consistent to the highest feasible degree with the preservation and conservation of the park area's resources and values. The hotel has been operating under a series of one-year,

short-term concession contract extensions since 2004. This short-term management arrangement is not allowed under the Concessions Management Improvement Act. In light of contemporary park visitation levels and enhanced accessibility to park areas, Congress determined that a more competitive contract terms were necessary. The 1998 Act requires all previous concession contracts to be renewed with an updated contract structure as quickly as possible to foster appropriate competition. Therefore, it is imperative that Mammoth Cave National Park comes into compliance with the 1998 Act by awarding a new ten-year contract that is financially viable by offering the concessioner a reasonable opportunity for profit.

Though Mammoth Cave Hotel has the advantage of being located within the park, it must compete with other hotels and restaurants such as those offered in nearby Cave City (12 miles away), Horse Cave (17 miles away), and to some extent, Bowling Green, Kentucky (34 miles away). During a typical year, approximately 120,000 people eat in the food service areas at the hotel. In 2012, 28,098 people stayed overnight at the hotel. The 2012 Commercial Services Data Report (University of Idaho 2012a, 2012b) showed that, of the visitors who were surveyed, 94% of those who stayed in the hotel agreed that their overall lodging experience was satisfactory and 96% of those who ate in one of the food service areas agreed that their overall dining experience was satisfactory. Inspection of social media sites shows good and bad comments about overnight accommodations at the Mammoth Cave Hotel, many indicating the presence of mice and foul odors. The park regularly receives negative comments directly from visitors who state dissatisfaction with aging infrastructure of concession facilities.

Mechanical Systems, Life/Safety Improvements

The Mammoth Cave Hotel is open most of the year; services are reduced in the winter months. Its mechanical systems and utilities (heating, air conditioning, plumbing, and electric) have been repaired and maintained minimally since they were installed in 1965. As a whole, these systems have reached

the end of their life cycles, are not energy efficient, and may not meet all NPS directives and management policies such as those protecting night sky resources. Building code requirements have changed substantially in the past 48 years and now require critical life/safety improvements, including but not limited to fire protection sprinkler systems. Director's Order 35A: Sale or Lease of Park Services, Resources, or Water in Support of Activities Outside the Boundaries of National Park Areas and Director's Order 35B: Sale of National Park Service-produced Utilities require parks to make every effort to reduce their carbon footprints/energy consumption and construction projects meet at least the minimum Leadership in Energy and Environmental Design (LEED) certification.

To best serve food and retail patrons as well as overnight visitors, there is a need to update utility systems to meet current safety standards, building codes, and NPS directives.

Food and Beverage/Retail

The hotel lodge provides three food service areas, served by a large central kitchen:

- the 164-seat Travertine Restaurant, a full-service dining room
- the 54-seat Crystal Lake Coffee Shop
- the 64-seat TroglobITES quick-food outlet (constructed in 1992), operated seasonally.

The Mammoth Cave Hotel provides food service for both its overnight guests and day visitors to the park. In 2012, the hotel recorded 11,087 occupied room-nights, with 28,098 overnight guests.

It is estimated that at least 200,000 visitors (50% of those who toured the cave in 2012) frequented the food service areas or gift shops immediately before or after their cave tour. Cave tour ticket holders are often on a tight schedule, purchasing their tickets 30 minutes prior to departure time; they need quick food service to accommodate their needs.

The retail/gift shops are located just off the hotel lobby:

- the Kentucky Home Gift Shop (approximately 1,222 square feet) offers hand-crafted items and artwork
- the Cave Company (approximately 1,176 square feet) offers moderately-priced gifts and souvenirs.

The existing meeting room, the Rotunda Room, is used for private parties, public gatherings, park functions, meetings, and conferences.

It is critical that food service and retail operations be in proximity to the visitor center, easy to find, and efficient. Improvements are needed to the food service space to facilitate efficient operations and easy visitor access to serve both the traveling public and also the hotel's local constituency.

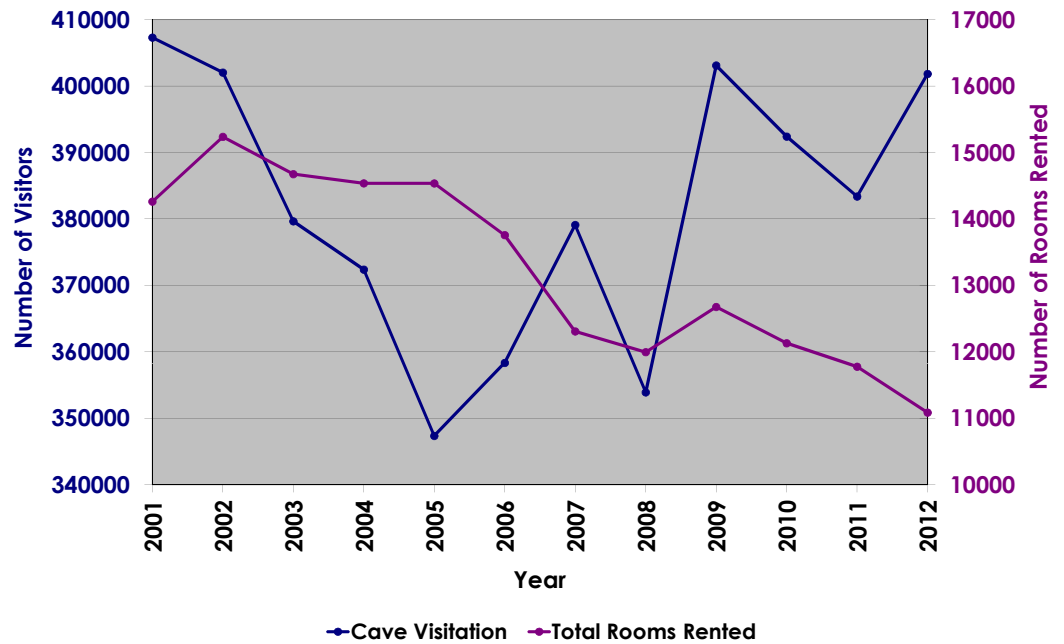
Lodging Facilities

Lodging options at Mammoth Cave Hotel include: the Heritage Trail wing (38 rooms); accessible rooms within the hotel lodge (4 rooms); Sunset Terrace Lodge (20 rooms); Hotel Cottages (10 units); and Woodland Cottages (20 units).

In 2012, the hotel had 11,087 occupied room-nights, with 28,098 overnight guests. In a typical year, Heritage Trail rooms are rented the most, followed by Sunset Terrace Lodge rooms, Woodland Cottage rooms, and Hotel Cottage rooms.

Over the past 10 years, visitor demand for lodging in the park has decreased by more than 25%. Less than 6% of park visitors use park lodging facilities (NPS 2013). The current occupancy rate for the concessioner's extended season (March through October) is 53%. The number of occupied room nights has decreased from over 15,000 to just above 11,000, a reduction of over 25% in occupied room nights. The continuous downward trending in lodging use has occurred with all of the lodging room types, and it has continued even though park cave tour visitation has increased in recent years. The following chart reflects cave visitation and the total number of occupied room nights since 2001.

Cave Visitation and Total Rooms Rented



The Heritage Trail wing, constructed at the same time as hotel lodge in 1965, reflect the room size, amenities, and utilities of that time. The Heritage Trail wing does not have life/safety systems that are now required. It is connected to the hotel lodge via an exterior stairway. The Heritage Trail rooms are approximately 235 square feet and have received some renovations and personal property updates since their construction. Comparable commercial hotels in the area provide standard-sized rooms of approximately 375 square feet. Visitor

comments have noted unpleasant, musty odors in the Heritage Trail rooms, caused in part by an inadequate heating, ventilation, and air conditioning (HVAC) system. The low ceilings and cell-like, concrete structure of the building inhibit renovation.

Four accessible rooms located within the hotel lodge were constructed in 1992. These rooms are in good condition and contain fixtures that meet Americans with Disabilities Act (ADA) standards.

Heritage Trail Wing





The Sunset Terrace Lodge, constructed in 1954 and 1958-1959, provides a drive-up motor lodge experience and is located at the forest's edge near Sunset Point and west of the hotel lodge. Sunset Terrace Lodge offers 20 rooms (each approximately 335 square feet), separated into four single-story, motor-lodge buildings, connected by a covered walkway. None of the rooms meet current ADA standards; however, two of the rooms can accommodate some mobility-impaired visitors. Thirty nearby parking spaces are designated for guests.

The Hotel Cottages and Woodland Cottages are historic structures, constructed between 1939 and 1949. The Hotel Cottages are air-conditioned, single rooms with baths, located near the park amphitheater overlooking a ravine, about 600 feet from the hotel lodge. The Woodland Cottages are one- to four-room structures, each with one bathroom and ceiling fans; they are located near the park picnic area, about 900 feet from the hotel lodge.

The Sunset Terrace Lodge units, Hotel Cottages, and Woodland Cottages are eligible for listing in the National Register of Historic Places. The Heritage Trail wing is not eligible for this status.

There is a need to focus on core visitor needs and expectations for an in-park lodging experience, and a facility with up-to-date mechanical and life/safety systems.

Visitor Circulation and Landscaping

As many as 2,000 cave tour visitors park adjacent to the hotel each day. These visitors have to navigate through or around the hotel lodge and the Heritage Trail wing to reach the visitor center. Going through the lodge requires a number of turns; going around the building requires walking through the lawn or passing the hotel dumpster and loading dock.

There is a need to improve visitor circulation and landscaping to ease wayfinding and improve the visitor experience.

Façade

Prior to renovation of the visitor center (completed in 2012), both the hotel and the visitor center bore a similar design and façade. The appearance of the existing hotel, with its brick/concrete façade and flat roof, now contrasts strongly with the visitor center's sandstone, timber, and "parkitecture" appearance.

There is a need to update the façade of the hotel to complement the renovated visitor center.

Bus Transportation for Cave Tours

The NPS contract with the hotel concessioner requires the concessioner to provide bus



transportation for cave tours that use outlying cave entrances. In 2012, approximately 40% of the visitors who toured Mammoth Cave went on a cave tour that required bus transportation (158,695 visitors).

Local Patrons

Mammoth Cave Hotel enjoys close ties with local patrons. Businesses and families hold annual special events, reunions, meetings, and banquets at the hotel. The lodging, food and beverage, and retail operations are similarly supported by the local community. Modernization may help the hotel retain its local constituency in the future.

SCOPE OF PROJECT

The primary focuses for concession facility improvements at Mammoth Cave National Park are food and beverage services, mechanical systems upgrades, lodging, visitor flow, and modification to the façade to complement the visitor center.

Specific proposed improvements to Mammoth Cave Hotel may include:

- Mechanical systems and life/safety improvements – increase efficiency and update all infrastructure, lighting, and utilities to current safety standards and building code requirements, and NPS

directives, including installation of fully sustainable lighting, a sprinkler system to be compliant with current fire code and updated information technology (IT)/ security/telephone systems/internet access

- Food service areas – improve food service space to facilitate efficient operations and easy visitor access and experience
- Lodging – provide an in-park overnight experience with particular emphasis on the continued use of historic lodging structures and improved occupancy rates
- Circulation – improve visitor flow in the vicinity of the hotel lodge, and circulation through and around the building
- Exterior – enhance the exterior façade and structural design to complement the visitor center design and present a cohesive “sense of place”; improve or add sidewalks, lighting, parking areas, green spaces, outdoor dining areas, and outdoor dining areas.

PROJECT AREA

The proposed action would be designed within the developed area surrounding the existing hotel and its support facilities, as displayed on Figure 2. The project area for this project consists of the Mammoth Cave Hotel lodge building including the Heritage Trail wing, the Sunset Terrace Lodge, parking

adjacent to the hotel, and all green spaces, sidewalks, landscaping, and roads in between these facilities and within the delineated area on Figure 2. Closely related facilities include the main park visitor center, the visitor plaza area around the bus loop and shelters A and B, the Woodland Cottages, the Hotel Cottages, the hotel dormitory, laundry, and the kennel.

The 38 Heritage Trail rooms are hotel rooms attached to the hotel lodge via a covered exterior stairway. Four accessible hotel rooms are located in the hotel lodge. The Sunset Terrace Lodge is located at the forest's edge and detached from the hotel lodge, providing a total of 20 rooms in four buildings connected by a covered walkway. These rooms have a separate parking area with approximately 30 spaces. Just outside the project area, there are 10 Hotel Cottages and 20 Woodland Cottages. There is a visitor parking lot located immediately adjacent to the south side of the hotel. It offers approximately 190 lined parking spaces and is used daily by visitors seeking the concession facilities and the visitor center. During the busier summer months when demand exceeds all existing paved parking, visitors are directed to park in lawn areas and along road shoulders. Currently, the hotel and the adjacent facilities have a variety of lighting fixtures, including some that are night-sky compliant and some that are not night-sky compliant.

HISTORY AND SIGNIFICANCE OF MAMMOTH CAVE NATIONAL PARK

The notoriety of Mammoth Cave predates the establishment of a national park. Prehistoric people, Woodland Cultures, explored and mined its passageways between 2,000 and 5,000 years ago. Later, American Indians frequented the park lands for subsistence living. A large cave was noted in a British survey of Green River, circa 1767. Legend says a hunter named Houchins rediscovered the cave in about 1797, when he chased a wounded bear into its entrance.

The first recorded owner (1799) of the land that includes Mammoth Cave was Valentine Simmons, who owned 200 acres along Green River. Over the next decade, the Mammoth Cave property changed hands several times. A saltpetre mining operation began around 1809, and was very profitable for its owners, Charles Wilkins and Hyman Gratz, during

the War of 1812 when the supply of saltpetre from Europe was cut off by the French and English embargoes.

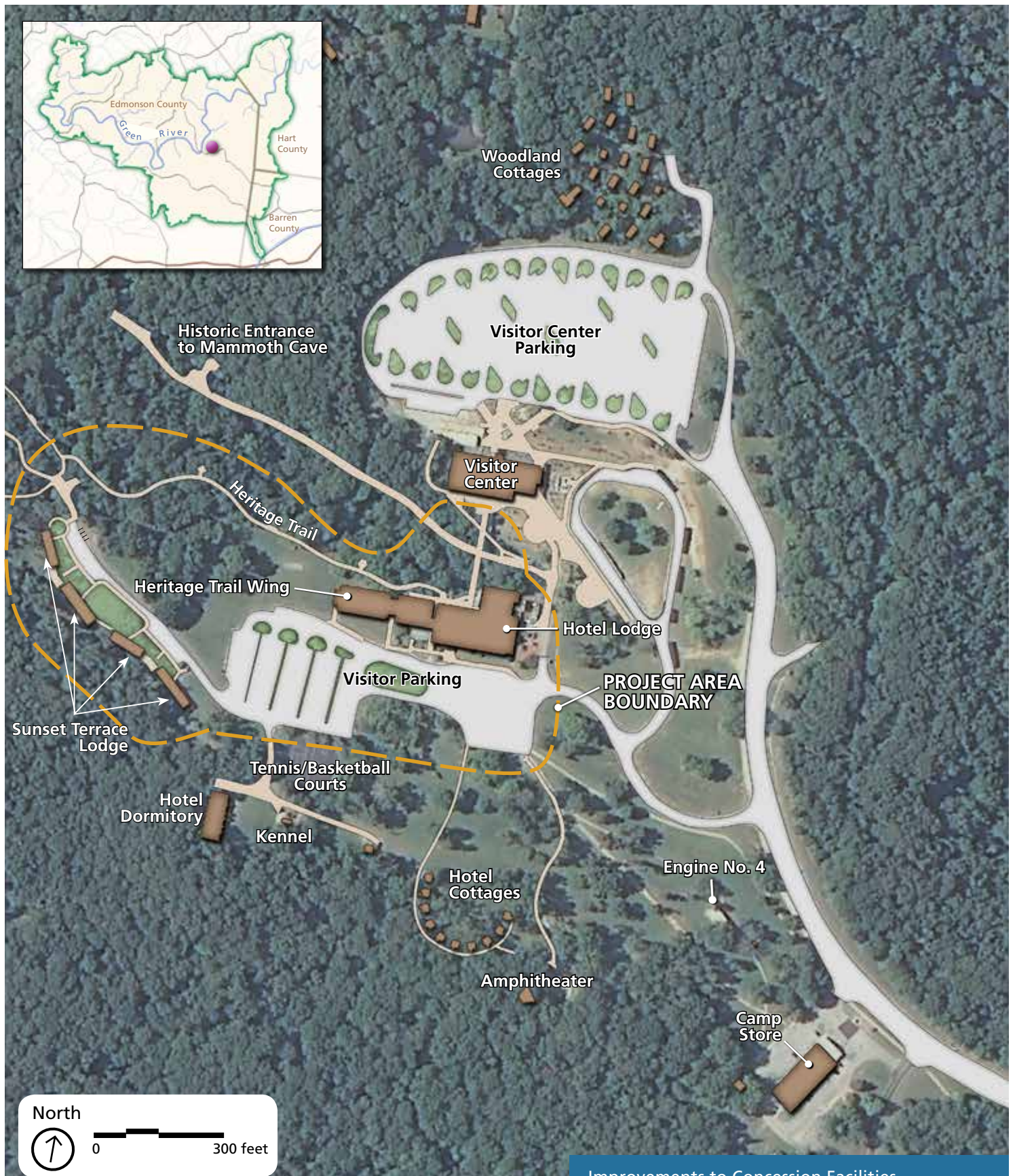
By 1816, people began to travel (by horse, buggy, or carriage) to Mammoth Cave for tours. In 1837, Franklin Gorin purchased the Mammoth Cave property, constructed a hotel, and brought three young slaves, Stephen Bishop, Mat Bransford, and Nick Bransford, to the cave to guide and explore. Gorin sold the property to Dr. John Croghan, a Louisville physician, in 1839. Croghan "helped to explore it further and put it in condition for full commercial exploitation" (Goode 1986). In 1842, he attempted an experiment for the cure of tuberculosis in the cave, which was not successful and was discontinued.

Croghan died in 1849 and left what became known as the Mammoth Cave Estate to his nieces and nephews. "Dr. John Croghan's foresight in preserving the cave and its surrounding territory as a natural estate for 77 years and his own responsible stewardship of it for ten years set a pattern which led naturally to its eventual dedication in perpetuity as a facility for all the people of this country as well as those beyond our shores who wished to visit it" (Goode 1986).

During the 1800s, scholars and scientists recorded observations of their studies of Mammoth Cave. In 1825, a famed French naturalist, Constantine Rafinesque, visited the area and wrote about its bats and salamanders. The world's first known eyeless cavefish was discovered in 1842. Other eyeless cave animals, including a crayfish, beetle, spider, and harvestman, were collected as early as 1842-1844. Mammoth Cave has one of the most diverse ecosystem of unique and fragile cave fauna in the world.

The movement toward creating a national park of Mammoth Cave and its vicinity started as a local effort in 1905. In that year, Mr. M.M. Logan, a Bowling Green lawyer (and former Attorney General of Kentucky, circuit judge and U.S. Senator) approached Kentucky Congressman James M. Richardson, who carried the idea forward to the Secretary of the Interior (Goode 1986).

Subsequently, bills were introduced in Congress, but no action was taken until after



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National Park Service
U.S. Department of the Interior

Mammoth Cave National Park

Figure 2
Project Area

the Secretary of the Interior received a report of the Southern Appalachian National Park Commission on April 18, 1926.

The report recommended national park status for the Mammoth Cave region because of:

The limestone caverns that contain “beautiful and wonderful formations,” the “great underground labyrinth” of passageways “of remarkable geological and recreational interest perhaps unparalleled elsewhere”

The rugged topography and “areas of apparently original forests which, though comparatively small in extent, are of prime value from an ecological and scientific standpoint, and should be preserved for all time in its virgin state for study and enjoyment”

The “beautiful and navigable Green River and its branch, the Nolin River”

All of this offers exceptional opportunity for developing a great national recreational park of outstanding service in the very heart of our Nation’s densest population and at a time when the need is increasingly urgent and most inadequately provided for.

Pursuant to the recommendation of the Southern Appalachian National Park Commission and the endorsement of the citizens of Kentucky, Congress authorized the park in 1926 to manage, develop, interpret, and preserve its resources “for the benefit and enjoyment of the people” (Act of May. 25, 1926, 44 Stat. 635). The act stipulated that only donated lands conveyed in fee simple could be accepted by the Secretary of the Interior. Later, Congress appropriated federal funds to speed acquisition.

For the purpose of receiving donations of land and money, the Mammoth Cave National Park Association was organized in Bowling Green in October 1924, incorporated on July 16, 1925. This group had no power of condemnation, so upon its recommendation, the Kentucky legislature created the Kentucky National Park Commission in 1928; the legislature also appropriated funds to be used for land acquisition.

The Association and Commission each operated the cave properties it had acquired. By agreement with these groups, the NPS began (after May 1934) the condemnation and purchase of property; and Mammoth Cave was operated by a joint committee with the profits earmarked for land acquisition. Mammoth Cave was declared a national park on July 1, 1941, when the minimum of 45,310 acres (more than 600 parcels) had been assembled (NPS 1983).

With development of the park’s 1983 General Management Plan, the following management objective was established for the Mammoth Cave National Park:

The aim of management at Mammoth Cave National Park is to perpetuate the integrity and diversity of geologic features and life systems of that area associated with the caves, and the aquatic and terrestrial environments, for these have aesthetic, recreational, education, and scientific values to man. (NPS 1983)

Today, Mammoth Cave National Park is known to include more than 400 caves, one of those being Mammoth Cave, currently the longest known cave system in the world; more than 400 miles have currently been surveyed (NPS 2013). The park is the core of the largest, most complex and most studied karst area in the world. Mammoth Cave is world renowned for its size and vast network of extremely large horizontal passages and vertical shafts.

Mammoth Cave National Park contains 52,830 forested acres of karst landscape and 31 miles of the Green and Nolin Rivers. Within the park boundary are more than 1,100 vascular plant species, 82 trees species, 203 bird species, 82 fish species, 50 mussel species, 43 mammal species, 38 reptile species, 29 amphibian species, and 19 federally listed threatened/endangered/candidate species. There are 138 animal species that use the cave on a regular basis.

Cultural resources in the park range from prehistoric and historic times. The Woodland people who ventured into Mammoth Cave left behind sandals, cane-torches, gourds, and baskets. The park protects more than 1,000 archeological sites above and below ground, as well as 30 listings in the National Register

of Historic Places (National Register), four historic districts, and 74 listings on the List of Classified Structures (NPS 2003a).

Cave tours are offered year round, excepting December 25. During peak visitation in the summer months the park provides 10 different cave tour offerings (34 tours/day). Nearly 402,000 people toured Mammoth Cave in 2012. The park is the tourism engine for the caveland region of Kentucky.

Mammoth Cave National Park offers regionally notable dark night skies that provide nocturnal habitat and night time recreation opportunities. While the existing photic environment and lightscape are partially degraded due to the proximity to population centers, Mammoth Cave National Park has an overall good quality lightscape. The park provides overnight camping, hosts night-time educational programs, and conducts night sky quality monitoring

In addition to its designation within the national park system, the park also has received two international designations. In 1981, Mammoth Cave was designated as a World Heritage Site. In 1990, the Mammoth Cave Area International Biosphere Reserve was designated, with all park acreage included in the core area. The biosphere area contains 909,328 acres (NPS 2003a).

HISTORY AND SIGNIFICANCE OF THE MAMMOTH CAVE HOTEL

Franklin Gorin, a prominent Glasgow, Kentucky lawyer, purchased Mammoth Cave and 1,300 surrounding acres in 1837, and he erected the first Mammoth Cave Hotel that year. Capable of accommodating 30 to 40 guests, the hotel may have included cabins built during the saltpetre mining days during the War of 1812. “The hotel became famous and was spoken and written about glowingly by visitors far and wide” (Goode 1986).

A description of the first hotel was contained in Gleason’s Pictorial Drawing Room Companion of May 22, 1852: “In this beautiful and retired spot, the stranger will meet with polished and refined society, from all parts of the world meeting there. The hotel is two stories high, and 200 feet long, with brick buildings at each extremity, showing their

gable ends in the front. The space between is occupied by a long wooden building, with a piazza, and gallery over it. At the end of the hotel runs a long row of log houses, one story high, with colonnades in front, the whole length, which must be near 200 feet. The dining room of the hotel is a spacious apartment, while the fare displayed upon its table is of the finest quality” (Goode 1986).

H.C. Hovey, author of Guide Book to the Mammoth Cave of Kentucky (1909), described the first Mammoth Cave Hotel and its guests. The hotel included parlors, a ball-room, and wide verandas with 600 feet of covered portico. “A bugle flourish would herald the arrival of . . . The hotel register showed from two to three thousand visitors a year. Many came from the north and a few from various parts of Europe. The majority however were from Louisville, Nashville, Memphis, New Orleans, and other cities of the South. Loitering along the long colonnade in the evening, guests would look between tall white pillars through the noble grove of aged oaks and across the bluegrass lawn. At 11 p.m. the band left the ball room for the veranda and according to their custom gave the signal for retiring by playing “Home, Sweet, Home.” The next morning at six o’clock the same musicians awoke the guests by playing “Dixie” (Goode 1986).

In 1916, the original hotel burned to the ground. It was replaced in 1925 by the second generation hotel, which became almost as famous and respected by guests and the community as the first (Goode 1986). This hotel was closed by the park and demolished in 1979 because it was considered to be a fire hazard and its repair would be cost prohibitive.

The Woodland Cottages and Hotel Cottages, constructed between 1939 and 1949, remain and are popular with guests.

The more recent buildings at Mammoth Cave, including the Sunset Terrace Lodge units, the existing Mammoth Cave Hotel, and the Heritage Trail wing, were all built during the NPS’s Mission 66 program. [The original section of the Sunset Terrace Lodge units were conceived and built in 1954, just prior to the start of the Mission 66 program (NPS 2013b).] In response to an increase in the number of American travelers in the mid-1950s, the National Park Service undertook

a large-scale planning and development effort. Dubbed Mission 66 by NPS director Conrad L. Wirth, the 10-year program was intended to modernize, enlarge, and reinvent the park system by 1966, the 50th anniversary of the NPS. Parks received little attention during World War II, and many facilities had deteriorated. Mission 66 was generously funded and was strongly supported by President Eisenhower; the program brought a vast physical legacy in the form of park roads, visitor centers, and housing, but also initiated environmental research and inventories of park resources.

At Mammoth Cave, building on the initial groundwork of the Civilian Conservation Corps in the 1930s, Mission 66 provided modern, planned development of the park. Landscape design of the core visitor services area, placed the visitor center and concession facilities near the Historic Entrance to Mammoth Cave and connected them by a bridge to facilitate mutual use by visitors. Facilities developed during the Mission 66 era include: visitor center (a new building type that provided visitors with park information and an educational experience), administrative offices, and concession buildings (hotel lodge, Heritage Trail wing, Sunset Terrace Lodge, camp store and post office); redesign and construction of park roads; water systems, septic systems, and a sewer plant; land acquisition of inholdings (Great Onyx Cave and Crystal Cave); cave trails, cave restrooms, the cave elevator, and Snowball Room food service facilities; picnic area and campgrounds.

At Mammoth Cave National Park, the earliest buildings from the Mission 66 period were the 1958-1959 Sunset Terrace Lodge units, which provide a drive-up motor lodge experience. The existing Mammoth Cave Hotel was constructed in 1965, and is the third generation of hotels that have existed at this site; the adjacent Heritage Trail wing date from the same year. The hotel, designed by Braun & Ryan Architects and Engineers of Louisville, Kentucky, featured the low profile, horizontal massing, and muted colors proscribed by the Mission 66 program to allow the buildings to blend in with the natural surroundings, unlike the predecessor rustic style NPS buildings that were prominent elements of the park landscape (NPS 2013b).

The current hotel offers a total of 92 total rooms in four distinct areas. Immediately to the west of the hotel lodge, 38 rooms are provided in the Heritage Trail wing. Four fully accessible rooms are located in the western wing of the hotel lodge. Sunset Terrace Lodge offers 20 rooms, separated into 4 single-story motor-lodge buildings, with parking devoted to its guests. The Hotel Cottages are located across the visitor parking lot from the hotel lodge and offer 10 cottages. Lastly, 20 Woodland Cottages are located well north of the hotel lodge and are separated from the rest of the hotel site by the visitor center and its parking lot.

The Mammoth Cave Hotel currently offers three choices of dining venues and two retail shops. The Travertine Restaurant offers a casual dining atmosphere for visitors. In addition, The Crystal Lake Coffee Shop and TrogloBITES offer a la carte items. The Kentucky Home Gift Shop offers hand-crafted gifts and artwork, whereas The Cave Company offers typical souvenirs. During a typical year, approximately 120,000 people purchase food from the food service area. Other amenities include a lobby; customer service/reservations desk; a patio off the quick-food outlet; a conference room; pet kennels; and tennis and shuffleboard courts.

As a result of declining lodging use and because of low off-season visitation patterns, the Mammoth Cave Hotel reduced its off-season operations and services in 2009 and subsequent years. Between the four-month period between November and February, hours of operation and levels of service are significantly reduced.

PROJECT BACKGROUND

Previous and related planning studies completed for the park, as well as specific plans for the Mammoth Cave Hotel, were reviewed to provide additional information and guidance for the proposed action. In addition, internal and public scoping (2010) was undertaken to allow agencies and interested parties to provide input regarding specific portions of the proposed action. The studies used and scoping efforts undertaken are summarized below.

Previous and Related Planning Studies

Several plans and studies have informed and contributed to the development of alternatives for improving the Mammoth Cave Hotel and facilities around it. The Mammoth Cave National Park General Management Plan (NPS 1983) was developed to direct future park planning and management. The GMP includes a long term planning framework that continues to guide park decision making for management of the caves, rivers, and other natural resources in the park, as well as concession operations. This planning framework provides direction for the park as it relates to the financial and environmental impact of proposed facilities and programs. Although it does not set forth specific goals for the hotel, it provides management objectives specifying the continued use of concessions to provide for the continuation of visitor accommodations, commercial facilities, and services necessary for the visitor's use and enjoyment of the park. In keeping with NPS policy, concession operations at Mammoth Cave are to provide only those services that are essential to the needs of the visitor and are not provided conveniently outside the park by the private sector.

The Mammoth Cave National Park Business Plan (NPS 2003a) calls for the establishment of a more concerted marketing effort in order to continue the recent pattern of increased visitation to the park. An important component of the marketing strategy is a broadening of relations with concessionaires and local communities. A cohesive marketing effort would build awareness and in turn create a common benefit for the area as a whole. Further awareness would result from the increased use of advertising media such as television and radio spots and on-site press conferences for special announcements and events. Efforts to increase coverage in publications geared toward senior citizens, campers, bikers, hikers, spelunkers and travelers would be a focus. Since the completion of the Business Plan, implementation of several of these marketing initiatives has resulted in increased visitation to the park, though greater opportunities exist for additional marketing efforts by both the park and by the concessioner.

The Mammoth Cave National Park Visitor Survey, Report 177 (University of Idaho 2006), completed in the summer of 2006, was a product of the University of Idaho Park Studies Unit, which carries out visitor studies as part of the large Visitor Studies Project to provide superintendents with usable knowledge about visitors to parks. This specific report describes results of a visitor study held at the park during July 23-29, 2006. A total of 660 questionnaires were distributed to visitor groups, and 435 total responses were returned. Questions asked included how visitors obtained information about the park, primary reasons for visiting the park, what services were used at the park and what level of satisfaction did visitors experience during their stay. According to this survey, most visitor groups (76%) cited visiting Mammoth Cave National Park as their reason for visiting the area (within 30 miles of the park); however, most visitor groups (84%) used services in the "gateway" communities outside the park. The Mammoth Cave National Park area hosts 75% of visitor groups for one- or two-night stays.

Visitor Survey Card Data Reports from 1998-2012 (University of Idaho 1998-2012c) carried out for Mammoth Cave National Park by the University of Idaho Park Studies Unit measure park performance related to the Government Performance and Results Act, specifically visitor satisfaction and visitor understanding and appreciation. Visitors were asked to report their opinions of the overall quality of facilities, recreation, and services at the park. Survey cards were distributed to a random sample of visitors. The 2012 Data Report concluded that visitor satisfaction with commercial services in the park was 98% (73% responded very good, 25% good, 1% average, 1% poor, 0% very poor). The 2012 Dining Experience Data Report concluded that visitor satisfaction with their dining experiences in the park was 96% (76% strongly agreed they were satisfied overall, 20% somewhat agreed, 2% neither agreed nor disagreed, 0% somewhat disagreed, and 2% strongly disagreed). The 2012 Lodging Experience Data Report concluded that visitor satisfaction with their lodging experiences in the park was 94% (73% strongly agreed they were satisfied overall, 21% somewhat agreed, 0% neither agreed nor

disagreed, 3% somewhat disagreed, and 3% strongly disagreed).

The Mammoth Cave National Park Long-Range Interpretive Plan (NPS 2003b) presents the park's vision for visitor experience by articulating park themes, describing visitor experience objectives, and proposing interpretation activities, media, facilities, and services. The plan notes that concessions are in a position to provide equally large interpretive benefits to visitors, and the need for orientation at the hotel is necessary for incoming visitors. The plan recommends that concession operation provide interpretive services and some interpretive media to visitors. The park would like to provide an orientation and tour information exhibit within the hotel, and park staff would encourage and assist the concession operator with development of items to improve visitor experience in rooms, lobbies, and eating facilities, as well as development of a short video in the lobby for visitors depicting development and evolving use of the park and historic accommodations.

The Franchise Fee Analysis (CHM 2009-2013) has involved a number of supporting financial and investment analyses that have identified strengths, weaknesses, and opportunities for the concession contract multiple times and has produced multiple reports. The analyses form the basis of information contained within a prospectus that has been developed to competitively advertise this concession opportunity. The purpose of this report is to summarize the results of a financial and investment analysis to assist the NPS in its determination of the minimum franchise fee for the hotel concessioner. Because the NPS plans to competitively bid this opportunity and because distribution of detailed information from this document outside the NPS Concession Program could affect the competitive bid process, most information within this document and its supporting analyses remain confidential.

Scoping

Under Director's Order 12 (NPS 2001), scoping includes two phases, internal and external. As stated in Director's Order 12, internal scoping is "simply the use of NPS staff to decide what

needs to be analyzed in a NEPA document." External scoping is early public involvement in the NEPA process consistent with objectives stated above. Information gathered from the public and agencies helps determine the scope of an EA and identify issues related to the proposed project or action. Both internal and external scoping were conducted for this proposed action.

An internal scoping meeting was held on February 17, 2010. The purpose of this meeting was to educate the group on the purpose and need of the project, to determine relevant planning issues to consider during the development and evaluation of alternatives and to discuss the details of the predesign and the EA for the Mammoth Cave Hotel improvements. Further internal scoping included two value analysis (VA) processes, one in August of 2010 and another in December 2012, following a reevaluation of the purpose of and need for the project by NPS staff.

On March 1, 2010, the park issued a press release to announce that a public scoping meeting would be held on March 16, 2010. In the handout and at the public scoping meeting, the park requested public input. In the March 2010 edition of the park's newsletter, The Flashlight, the NPS made mention of the Hotel Improvements Project and the March 16, 2010 public scoping meeting. The public scoping meeting was held at the Mammoth Cave Hotel and was attended by 37 members of the public. At the meeting, the public was provided with a handout that included information on the planning process. This meeting took the form of an open house where attendees were invited to tour the hotel. This initiated a 30-day public comment period which closed April 16, 2010. In addition, the NPS sent out a letter on March 22, 2010 to 68 randomly selected hotel guests who visited the park in 2009. The letter informed them of the current planning efforts and opportunity to comment on the attached form. Most of the 29 comments received were submitted on the park's comment form, which address the issues of concern identified by park staff. Comments received during this period and the method used to categorize, classify, and analyze the comments are described in detail in "Chapter 5: Consultation and Coordination."

The NPS sent out consultation letters to multiple agencies: the Kentucky Department of Environmental Protection (DEP), the Kentucky State Historic Preservation Officer (SHPO), the U.S. Fish and Wildlife Service (USFWS), and the Advisory Council on Historic Preservation. Multiple tribal groups also were consulted via letter during the scoping process: the Shawnee Tribe of Oklahoma, Cherokee Nation, Chickasaw Nation, the East Shawnee Tribe of Oklahoma, the Eastern Band of Cherokee, the Shawnee Tribe, and the United Keetoowah Band of Cherokee. A summary of the consultation process is provided in “Chapter 5: Consultation and Coordination,” and relevant agency consultation letters and responses are provided in Appendix A.

Planning Issues and Concerns

During the planning process, specific considerations and concerns were identified as critical to improving the concession facilities at Mammoth Cave National Park. Along with the purpose and need for the proposed action, these topics guided the development of alternatives and contributed to the selection of impact topics, as identified in the next section.

Modernizing the Hotel to Meet Current Visitor Needs. Modernization needs to include updates to meet safety standards, building codes, and NPS directives. This could also include improvements to IT connectivity, parking areas, landscaping, pathways, and the interior/exterior of the buildings. Any proposal made during the planning process should seek to modernize the hotel to meet current visitor needs.

Addressing Current Deficiencies and Deferred Maintenance with Current Hotel Facilities. The majority of mechanical systems and utilities in the concession facilities and surrounding area have been minimally repaired and maintained since the systems were installed in 1965. As a whole, the systems have reached the end of their life cycle and are not energy efficient. In addition, building code requirements have changed substantially in the past 48 years, and critical life/safety improvements are now required, such as fire protection sprinkler systems. Installation of new systems (including IT, telephone, and

security) may also need to be addressed at this same time. Any proposal made during the planning process should seek to modernize the hotel to meet current visitor needs. Work conducted on this project will be completed to the highest achievable sustainable principles and practices in accordance with the requirements of the Department of the Interior Sustainable Buildings Implementation Plan, Executive Order 13423, Executive Order 13514, the Energy Independence and Security Act of 2007, and other federal sustainability regulations.

Improving Efficiency of Concession Operations. The concession operations at the park serve a large number of visitors each day (estimated to be at least 200,000 visitors each year) and would remain an important partner to the park in assisting with personal services. The execution of a new long-term concession contract would include primarily NPS-funded improvements to existing facilities to meet visitor needs. Any proposal made during the planning process should seek to modernize the hotel to meet current visitor needs and offer a concessioner a reasonable opportunity for profit.

Consideration of Visitor Demographics. The park serves an array of park visitors (families, retirees, couples, large school groups, tour groups, etc.). Visitor demographics encompass a broad range of needs and values in what visitors perceive as being important to their park experience. Considerations include economy, convenience, accessibility, amenities, and the sense of place provided. The park proposes to provide lodging options that are more distinct to Mammoth Cave, particularly with the continued use of historic structures for lodging. Some comments made during public scoping suggest adding an improved visitor gathering area, such as an expanded patio, outdoor dining area, walkways or deck. In addition, a variety of dining experiences, including grab-and-go and formal options, could provide different choices for varying visitor budgets. Any proposal made during the planning process should consider the range of demographics typical to the park.

Improving Visual Experience. Recently, the visitor center underwent extensive renovation achieving a sustainable, “parkitecture” design. The concession facilities would benefit from

similar treatment. Landscaping could be used to screen areas such as the loading dock from visitors as they walk to the Historic Entrance or gather at the Shelter A and Shelter B plaza areas of the visitor center. Use of rooms with existing windows/views might be repurposed. Any proposal made during the planning process should seek to improve viewsheds into, out of, and around the hotel. Renovation also should improve night time scenic conditions by implementing fully sustainable lighting systems that reduce the amount of artificial light in the environment.

Improving Visitor Accessibility and Circulation.

The park would strive to better meet visitor needs by providing improved site access and circulation both inside and outside the concession facilities. Navigation is impeded by lack of direction and intuitive guidance. Additional orientation to the visitor service areas could improve flows. Additionally, any improvements would include, to the greatest extent possible, universal access to hotel amenities. Any proposal made during the planning process should seek to improve the accessibility of and circulation within and through the project area. Work conducted on this project would be completed in accordance with Director's Order #42: *Accessibility for Visitors with Disabilities in National Park Service Programs and Services*..

Preserving Geologic Features. The park was established, in part, to protect the unique and vast geologic resources within its boundary. All buildings within the project area are in proximity to the Historic Entrance to Mammoth Cave; surface water drains either overland toward the entrance or infiltrates naturally into subsurface geologic features. Installed oil and grit separation/filtration systems receive the stormwater runoff from the impervious surfaces. As such, any changes in the quality of stormwater runoff has the potential to impact geologic resources. Elements of the proposed project include physical development. Any proposal made during the planning process should seek to avoid direct and indirect impacts on areas of cave and karst resources; appropriate mitigation measures should be implemented where feasible.

Preserving Natural Resources. The park was also set aside to preserve its natural resources, in general, including unique habitats, soundscapes, and lightsapes. The park provides unique habitats in the form of old growth forests, the Green and Nolin Rivers, and the park's extensive cave system. The amount of human-caused sound and light within those habitats affect the soundscape and lightscape, respectively. Any proposal made during the planning process should seek to avoid direct and indirect impacts on the park's natural resources; appropriate mitigation measures should be implemented where feasible.

Preserving Cultural Resources. Evidence that humans occupied the park, frequenting the caves and the Green River valley, dates back at least as many as 10,000 years ago. As such, the ridgeline upon which the current and previous hotels have been developed is dotted with archeological resources. In the context of modern history, the existing hotel from 1965 is the third generation of hotel buildings to exist on this site since 1837; it dates to the Mission 66 period of the NPS, along with the Sunset Terrace Lodge buildings and the Heritage Trail wing. Other cultural landscape components, including the sidewalks and tennis and shuffleboard courts, date to the late 1930s to 1942 (period of early park development/establishment and the Civilian Conservation Corps), while the existing parking adjacent to the hotel dates to the late 1970s.

In 2002, the Kentucky SHPO stated that the Mammoth Cave Hotel, Gift Shop, and Restaurant were not eligible for the National Register because they were not designed by a prominent architect and had not achieved significance within the last 50 years (Morgan to Switzer, May 7, 2002). The Kentucky SHPO concurred on the National Register eligibility of the Woodland Cottages in 2009 (NPS 2013b) . A Cultural Landscape Report for the Mammoth Cave Core Visitor Services Area, which includes the project area, is currently close to completion and contains specific treatment recommendations ; however, this EA does not include specific treatment recommendations. Coordination and consultation with the Kentucky SHPO would be ongoing. Any proposal made during the planning process should seek to preserve the

character-defining elements of this site, and abide by the *Secretary of Interior's Standards for the Treatment of Historic Properties*.

Maintaining Services through Project Phasing. The concession operation generates revenue from food and beverage, retail, and lodging. As such, the park would ensure that food, beverage, retail and lodging would continue during construction of the hotel improvements. This would require that improvements be phased and scheduled in a manner to minimize impacts on park visitors and the concessioner. For instance, the park would need to decide how to handle the movement/replacement of utilities while providing a level of service to the current number of visitors. Most work would be performed in a manner to minimize impacts on the concession operation.

NPS Planning Process and Funding Availability

In 2009, the NPS initiated the process of developing a concession prospectus to rebid the park's concession contract. The existing concession operation was comprehensively assessed by a business consultant, a condition assessment was performed on all existing concession facilities, and current visitor needs for concession facilities and services were examined by NPS staff. As a result, it was determined that improvements to park concession facilities were needed to improve visitor service and experience.

In 2010, planning for improvements to the Mammoth Cave National Park concession facilities commenced with internal scoping, followed by a public scoping session, to determine the breadth of the project. A design charrette was held to establish the initial alternatives for improving the concession facilities, and three primary alternatives emerged: renovate the existing facilities; demolish existing facilities and build new facilities; and develop a combination of renovation and rebuilding. These three alternatives, along with additional scenarios, were reviewed using a VA workshop to help determine which would offer the best value to the government. Conceptual design work was completed along with additional financial analysis to ensure that any proposed improvements would be financially viable.

In 2011, the park proposed a phased, \$11 million rehabilitation alternative; however, this proposed alternative did not achieve internal NPS approval. Rather, the park was directed to reassess the number of rooms and importance of in-park lodging in light of decreasing levels of visitor usage for lodging versus other needed concession services (food and beverage, retail, etc.) that are used by a much larger number of park visitors. Also, the overall scope and cost of the project was deemed too high in light of limited NPS funds available for park improvement projects. Finally, the park was asked to reassess the extent to which a new concessioner could fund some of the needed improvements.

In 2012, aided by consultants, NPS staff determined in-park lodging to be an essential part of the concession operation, but that the new concession contract could be viable with fewer than 92 units. Also, it was again confirmed that a new concessioner would have a limited ability to fund needed improvements. If feasible and appropriate, the level of concessioner investment would be determined within the new concession contract.

At this point, revised alternatives were identified and considered, focusing on lower cost alternatives that would address the only most basic and essential facility improvement needs. As part of this reconsideration process, the second VA workshop was held to analyze a new set of alternatives, and an additional financial analysis was performed.

By 2013, the park had considered and dismissed numerous alternatives. Those concepts found to be infeasible were dismissed and are noted below under "Alternatives Considered but Dismissed."

During the four-year planning period, funding availability for hotel improvements greatly decreased in light of reduced funding and challenging financial circumstances across the NPS. Funding availability between 2013 and 2016 is presently estimated at \$3.4 million.

After several iterations of the planning, financial analysis, and evaluation processes, the NPS has developed one action alternative for full evaluation in this document. This EA evaluates two alternatives: Alternative

A: No-action and Alternative B: Renovate Concession Facilities (NPS Preferred).

At this time, the NPS would likely be able to secure \$3.4 million to implement the preferred alternative in phases within the planned funding cycles between 2014 and 2016. Additional components of this project are not funded at the present time, but could potentially be funded in the future.

Regulatory Issues and Management Concerns

Currently the concession is operating under a series of one year, short-term concession contract extensions. This method of contracting concession operations is not in full compliance with the provisions of the Concessions Management Improvement Act of 1998 (Concessions Act) or NPS regulations and policy implementing that act, which favors the use of ten year contracts. The 1998 Act requires all previous concession contracts to be renewed with an updated contract structure as quickly as possible to foster appropriate competition. Therefore, it is imperative that Mammoth Cave National Park comes into compliance with the 1998 Act by awarding a new ten-year contract that is financially viable by offering the concessioner a reasonable opportunity for profit. By undertaking the proposed improvements described in the action alternatives, it is anticipated that the park would be able to secure a viable concession operator and enter into a concession contract in compliance with the Concessions Act. If renovation of the facilities is not implemented, it is unlikely that a viable concessioner would be found and the NPS would need to continue to seek waivers from compliance with the Concessions Act. Eventually, such waivers could be denied or otherwise disallowed, ending the provision of dining and lodging services at Mammoth Cave National Park.

Several approvals and permits would be required prior to construction. In summary, permits and approvals required would include the following:

- Acquisition of a National Pollutant Discharge Elimination System permit, including a stormwater pollution prevention plan

- Consultation with USFWS to ensure compliance with Section 7 of the Endangered Species Act (ESA)
- Execution of a PA or similar agreement with the SHPO pursuant to Section 106 of the National Historic Preservation Act

These permits and approvals are described further in “Chapter 5: Consultation and Coordination.”

IMPACT TOPICS RETAINED FOR ANALYSIS

Impact topics are resources of concern within the project area that could be affected, either beneficially or adversely, by the range of alternatives presented in this EA. They were identified based on the issues raised during scoping, site conditions, federal laws, regulations, Executive Orders, NPS *Management Policies 2006*, Director’s Orders, and staff knowledge of the park’s resources.

Impact topics identified and analyzed in this EA are listed below along with a brief rationale for the selection of each impact topic. They include geologic resources, soils and topography, vegetation, special status species, cultural landscapes, historic structures, archeological resources, visual resources, lightscares, socioeconomic resources, visitor use and experience, operations and infrastructure, and energy conservation and conservation potential. Each impact topic is further discussed in detail in “Chapter 3: Affected Environment” of this document.

Geologic Resources

NPS *Management Policies 2006* state that the NPS will “protect geologic features from the unacceptable impacts of human activity while allowing natural processes to continue” (NPS 2006). There are a number of geologic resources in the vicinity of the Mammoth Cave Hotel associated with the regional karst topography, including the park’s extensive cave system. The hotel is located directly over the “Rotunda” room inside the cave. Construction activities such as the installation of underground utilities and parking lot stormwater filter systems may require excavation of bedrock and potentially impact

geologic resources. Water is an essential element in the formation of these caves, and NPS policies state that the NPS “will take all necessary actions to maintain or restore the quality of surface waters and ground waters within the parks consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations (NPS 2006).” The hotel is located approximately 350 feet from the Mammoth Cave Historic Entrance, and surface water drains either overland towards the entranceway or infiltrates naturally into subsurface geologic features. As such, any changes in stormwater quality has the potential to impact geologic resources. Therefore, the impact topic of geologic resources is addressed.

Soils and Topography

NPS *Management Policies 2006* state that the NPS would strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources. These policies further state that “[m]anagement action will be taken by superintendents to prevent or at least minimize adverse, potentially irreversible impacts on soils” (NPS 2006). Construction and demolition activities related to the proposed actions have the potential to disturb soils and change topography through grading. Therefore, the impact topic of soils and topography is addressed.

Vegetation

NPS policy is to protect the natural abundance and diversity of all naturally occurring communities. NPS *Management Policies 2006* and other NPS and park policies provide general direction for the protection of vegetation (NPS 2006). Vegetation in the project area consists primarily of maintained landscaping, and grass lawns with mature trees. Removal of some mature trees may be unavoidable during construction, while other areas would become available for revegetation following demolition. Therefore, the impact topic of vegetation is addressed.

Special Status Species

NPS policy is to protect the natural abundance and diversity of all naturally occurring communities. NPS *Management Policies 2006* and other NPS and park policies provide general direction for the protection of wildlife (NPS 2006). Additionally, Under Section 7 of the ESA, as amended, the NPS is required to consult with the USFWS on actions that have the potential to impact special status species.

The USFWS replied to the park request for information regarding listed or proposed threatened or endangered species or critical habitats that might occur in the project vicinity, and any special management considerations for such species as follows: “According to our records and based on our review of the subject proposal, the only federally listed threatened, endangered or candidate species known to occur within the proposed project area are the federally endangered Indiana bat, gray bat, and Rafinesque big-eared bat. As you are finalizing the proposed action, you should recognize that any building or other structure may be used as a roost for one or more of these bat species. An inspection of the structures should take place prior to any modifications to ensure that adverse effects do not occur.” Based upon this consultation, the proposed action could impact special status species. Therefore, the impact topic of special status species is addressed.

Cultural Landscapes

The NPS *Management Policies 2006* states that “the treatment of a cultural landscape will preserve significant physical attributes, biotic systems, and uses when those uses contribute to historical significance” (NPS 2006). According to Director’s Order 28, a cultural landscape is

...a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions. (NPS 2002)

The Cultural Landscape Report (CLR) , begun in 2011, is scheduled to be completed by the end of 2013. This work is for the entire Mammoth Cave Core Visitor Services Area, of which the hotel and adjacent surrounding area is a part. It will include documentation of site history, existing conditions, analysis of significance and integrity, and treatment recommendations. The Cultural Landscapes Inventory (CLI) will be completed at a later date.

The park would continue to consult with the Kentucky SHPO in relation to the identification and evaluation of the cultural landscape and its components within the project area. During this project the park would work to avoid impacts on all cultural resources. If avoidance is not feasible the park would continue consultation with the SHPO to develop mitigations or other appropriate measures to address the impacts. Therefore, the impact topic of cultural landscapes is addressed.

Historic Structures

Per the NPS *Management Policies 2006*, actions on historic and prehistoric structures are to be based on “sound preservation practice to enable the long-term preservation of a structure’s historic features, materials, and quality” (NPS 2006). A historic structure is defined by the NPS in Director’s Order 28: *Cultural Resource Management* (NPS 2002) as “a constructed work, usually immovable by nature or design, consciously created to serve some human act.” In order for a structure or building to be listed on or eligible for listing in the National Register, it must possess historic integrity of those features necessary to convey its significance, particularly with respect to location, setting, design, feeling, association, workmanship, and materials. The National Register Bulletin 15: *How to Apply the National Register Criteria for Evaluation* provides a comprehensive discussion of these characteristics.

The 1965 Mammoth Cave Hotel is the third generation of hotel buildings to exist on this site since 1837 and dates to the Mission 66 period of the NPS, along with the Sunset Terrace Lodge buildings, and the Heritage Trail wing. The sidewalks, tennis courts, and shuffleboard courts date to the Civilian Conservation Corps period of the late 1930s to 1942, while the existing parking adjacent to the hotel dates to the late 1970s. There

has only been a partial assessment to date of the National Register eligibility of the buildings and structures, as well as the cultural landscape. The Kentucky SHPO determined the Sunset Terrace Lodge buildings were eligible, but that the hotel and Heritage Trail wing were not eligible. The Cultural Landscape Report and Inventory, begun in 2011, is currently at 95% completion and is scheduled to be completed by the end of 2013. This work is for the entire Mammoth Cave Core Visitor Services Area, of which the hotel is a part. It will include documentation of site history, existing conditions, and analysis of significance and integrity. For purposes of the Cultural Landscape Report the project area was divided into several discrete character areas that share similar traits or are unified by land use, topography, vegetative character, or historic associations. Phase Two of the Cultural Landscape Report and Inventory, once funded, would include development of treatment recommendations and implementation projects for landscape rehabilitation. The park is striving to have this work funded and completed in 2014.

The park would continue to consult with the Kentucky SHPO in relation to the identification and evaluation of the historic structures within the project area. During this project the park would work to avoid impacts on all cultural resources. If avoidance is not feasible the park would continue consultation with the SHPO to develop mitigations or other appropriate measures to address the impacts. Therefore, the impact topic of historic structures is addressed.

Archeological Resources

NPS *Management Policies 2006* states that archeological resources “will be maintained and preserved in a stable condition to prevent degradation and loss” (NPS 2006). Archeological resources are the material remains of past human activity (National Register Bulletin 36, *Guidelines for Evaluating and Registering Archeological Properties*). Archeological resources exist within the project area, and development outside of the existing infrastructure footprint has the potential to impact these resources. Therefore, the impact topic of archeological resources is addressed.

Visual Resources

Within the *NPS Management Policies 2006*, the NPS declares that the park's scenery, scenic features, and natural visibility (in daytime and at night) are considered among the park resources and values that are not to be impaired (NPS 2006). In addition, the Organic Act states that NPS units are charged with conserving all the natural and cultural resources that contribute to important views. In the evaluation of visual resources, both the visual character of the project area and the quality of the viewshed within the project area were considered. A viewshed comprises the limits of the visual environment associated with the proposed action including the viewsheds within, into, and out of the project area. The proposed actions could result in changes to the viewshed due to the removal of existing structures. Therefore, the impact topic of visual resources is addressed.

Lightscares

In accordance with *NPS Management Policies 2006*, NPS strives to preserve natural ambient lightscares, which are natural resources and values that exist in the absence of human caused light. Changes to the Mammoth Cave National Park Hotel footprint and possible changes to parking adjacent to the hotel would alter the use of lighting in and around the hotel with the potential to reduce visitor appreciation of the night sky. The park would continue to strive to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements and to ensure that all outdoor lighting is shielded to the maximum extent possible, to keep light on the intended subject and out of the night sky. However, due to the value of night skies, the preservation of natural ambient lightscares would be a project objective. Therefore, the impact topic of lightscape management is addressed.

Socioeconomic Resources

NPS Management Policies 2006 requires the NPS to identify any impact on socioeconomic resources when determining the feasibility of a proposed action (NPS 2006). Construction activities would be minimized to the greatest extent possible in the hotel and the surrounding area. The concession operation employed 75 full-time and part-

time staff members in 2012, and these jobs would continue throughout construction and possibly decrease modestly in subsequent years. Updates to the hotel and surrounding infrastructure may increase the attractiveness of the area, thus increasing visitors and potentially boosting tourism. Therefore, the impact topic of socioeconomic resources is addressed.

Visitor Use and Experience

According to the *NPS Management Policies 2006*, enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks (NPS 2006). The NPS strives to provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the natural and cultural resources found in parks. The proposed action is meant to uphold the hotel's tradition of hospitality and enhancing the visitor experience, which encompasses understanding, enjoyment, and safety in and around the hotel. Visitor experience could be enhanced through renovations and updates to the facilities and infrastructure that make up the hotel and surrounding area. By providing a venue of value and quality that meets all current safety, building code, and NPS standards outlined in *Management Policies 2006*, the park would improve the sense of place, orientation, and cohesiveness of the Visitor Center-Hotel area. The current hotel design limits ADA accessibility, and the proposed action may improve upon the current conditions. Construction and demolition activities and facility improvements have the potential to impact visitor use and experience. Because the proposed action would result in changes to the visitor experience, the impact topic of visitor use and experience is addressed.

Operations and Infrastructure

According to the *NPS Management Policies 2006*, the NPS "will provide visitor and administrative facilities that are necessary, appropriate and consistent with the conservation of park resources and values" (NPS 2006). The proposed action would result in changes to operations and structures within the project area by updating the Mammoth Cave Hotel facilities and infrastructure in order to uphold the park's tradition of

hospitality, resulting in a financially viable concession operation. Improvements to the facilities would allow for improved efficiency, accessibility, and visitor experience. The park intends to provide a venue of value and quality that meets safety standards, building codes, and NPS directives. By improving orientation and parking for visitors, the park can create a cohesive sense of place for hotel visitors and guests. In addition, the hotel's mechanical systems and utilities have been repaired only minimally since installed in 1965, and as a whole, the systems have reached the end of their life cycle and are not energy efficient. Critical life/safety improvements such as fire protection sprinklers are necessary within the hotel facilities in order to meet building code requirements. Therefore, the impact topic of operations and infrastructure is addressed.

Energy Conservation and Conservation Potential

According to the NPS *Management Policies 2006*, "any facility development, whether it is a new building, a renovation, or an adaptive reuse of an existing facility, must include improvements in energy efficiency and reduction in greenhouse gas emissions for both the building envelope and the mechanical systems that support the facility" (NPS 2006). Mammoth Cave National Park strives to incorporate the principles of sustainable design and development into all facilities and park operations. Sustainability can be described as the result achieved by doing things in ways that do not compromise the environment or its capacity to provide for present and future generations. Sustainable practices minimize the short- and long-term environmental impacts of developments and other activities through resource conservation, recycling, waste minimization, and the use of energy efficient and ecologically responsible materials and techniques. The NPS used the VA processes to examine energy, environmental, and economic implications of proposed management decisions and development and also to analyze life cycle cost. The park also encourages suppliers, permittees, and contractors to follow sustainable practices.

The park would modernize existing systems throughout the facilities, including the heating and air conditioning systems, which would

reduce energy use. The existing late 1950s, early 1960s systems are inefficient compared to today's standards, and modernization would result in energy efficiency. In addition, LEED requirements alone for renovations or new construction should result in a 30% reduction in energy use. The park has projected a 50% decrease in energy and water usage as a result of system upgrades and the removal of the Heritage Trail wing. Therefore, the impact topic of energy conservation and conservation potential is addressed.

IMPACT TOPICS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

The following presents an overview of impact topics that were considered but ultimately dismissed from further analysis. Impact topics were dismissed from further analysis if it was determined that the project did not have the potential to cause substantial change to these resources and values. The regulatory context and baseline conditions relevant to each impact topic were analyzed in the process of determining if a topic should be retained or dismissed from further analysis. An outline of background information used in considering each topic is provided below along with the reasons for dismissing each topic from further analysis.

Wildlife and Wildlife Habitat

NPS policy, as laid out in the NPS *Management Policies 2006*, is to maintain as parts of the natural ecosystems of parks all plants and animals native to park ecosystems. The project area contains a variety of wildlife species that are adapted to using developed areas as habitat, such as white-tailed deer (*Odocoileus virginianus*), Eastern gray squirrels (*Sciurus carolinensis*), various migratory birds, and various songbirds. During construction and demolition, there would be a temporary disturbance and displacement of wildlife. The surrounding land, however, would continue to provide abundant nesting, escape, and protective cover. Some animals may temporarily relocate to areas outside the project area, but this would not be expected to have any long-term adverse effect upon local populations. Wildlife would be expected to reoccupy the

project area following construction. Impacts would be negligible and short-term. Impacts on special status species and their habitat are addressed separately under that impact topic. Therefore, the impact topic of wildlife and wildlife habitat has been dismissed from further analysis.

Wilderness

In keeping with the Wilderness Act (P.L. 88-577) and *NPS Management Policies 2006*, the Department of the Interior conducted a wilderness suitability study of Mammoth Cave National Park, and in 1974 concluded that due to visible signs of man's activity, the park area was not suitable for wilderness designation at that time (NPS 1983). Therefore, the impact topic of wilderness has been dismissed from further analysis.

Water Resources

The proposed action has the potential to cause temporary impacts on stormwater runoff; however, these changes are slight and addressed under the impact topics of geologic resources and soils and topography. Otherwise, there are no surface water features within the project area. Therefore, the impact topic of water resources has been dismissed from further analysis.

Prime and Unique Farmland

Prime farmland is one of several designations made by the U.S. Department of Agriculture to identify important farmlands in the United States. It is important because it contributes to the nation's short- and long-range needs for food and fiber. Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. The map of prime and unique agricultural lands and other high quality agricultural lands indicates that these high-value resources do not occur where the project area of concern is located. Therefore, the impact topic of prime and unique farmland has been dismissed from further analysis.

Floodplains

Executive Order 11988, "Floodplain Management" requires all federal agencies to avoid construction within the 100-year floodplain unless no other feasible alternative exists. As per *NPS Management Policies 2006* and Director's Order 77-2: *Floodplain Management*, NPS is mandated to strive to preserve floodplain values and minimize hazardous floodplain conditions. The Federal Emergency Management Agency has not mapped floodplains in the park, or in particular, the project area. However, mapping conducted by the United States Geological Survey (USGS) has indicated that the project area is above the 100-year floodplain elevation, estimated at 480 feet. The site is located at an elevation of between 650 and 750 feet. Therefore, the impact topic of floodplains has been dismissed from further analysis.

Wetland Resources

Executive Order 11990 "Protection of Wetlands" requires federal agencies to avoid, where possible, adversely impacting wetlands. *NPS Management Policies 2006* and Director's Order 77-1: *Wetland Protection* mandate that the NPS will strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. For regulatory purposes, the term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and other similar areas (NPS 2006). There are no wetlands located within or immediately adjacent to the project area. Therefore, the impact topic of wetlands has been dismissed from further analysis.

Air Quality

The Clean Air Act (CAA) and *NPS Management Policies 2006* require consideration of air quality impacts from NPS projects (NPS 2006). The proposed action would have minimal short-term impacts on air quality. Hauling of material, operating of equipment, and other construction activities could result in temporary increases in vehicle

exhaust and emissions. However, these activities would be consistent with other activities that have and would continue to occur in the immediate area. The increases in emissions that occur during these activities quickly dissipate in normal wind conditions. Therefore, there would be no perceptible impacts on air quality, although there may be a temporary increase in particulate matter and vehicle emissions associated with construction of the improvements. Therefore, the impact topic of air quality has been dismissed from further analysis.

Soundscapes

In accordance with NPS *Management Policies 2006* and Director's Order #47: *Sound Preservation and Noise Management*, an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

The project area is a developed setting, where the protection of a natural ambient soundscape and/or the opportunity for visitors to experience natural sound environments is not a primary objective. Visitors do not come to the Mammoth Cave Hotel developed area to experience natural soundscapes free of all human caused sound, but they do seek the quieter atmosphere and sounds of nature that are present after the visitor center has closed and the majority of the day-use visitors have left.

The park would limit hours during which noise producing construction and demolition activities would occur to protect soundscape values. Any construction/demolition

associated with implementation of the alternatives, e.g. the hauling of material or the operation of construction equipment, could result in dissonant sounds but such sounds would be temporary and end with the cessation of construction. Because protection of a natural ambient soundscape and/or opportunity for visitors to experience natural sound environments is not a primary consideration at the site of the hotel developed area, soundscapes were dismissed as an impact topic.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts on Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources in Mammoth Cave National Park. The lands comprising the park are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, Indian trust resources were dismissed as an impact topic.

Ethnographic Resources

The NPS *Management Policies 2006* state that the NPS, in terms of ethnographic resources, will work "to balance the perpetuation of use with the retention of the tangible evidence that represents its history" (NPS 2006). An ethnographic resource is defined as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (NPS 2002). Ethnographic resources are associated with cultural practices, beliefs, the sense of purpose, or existence of a living community that is rooted in that community's history or is important in maintaining its cultural identity and development as an ethnically distinctive people.

There are no known ethnographic resources in the area of potential effects. During scoping, American Indian tribes traditionally associated with the park lands (Shawnee Tribe, Cherokee Nation, Chickasaw Nation, the East Shawnee Tribe of Oklahoma, the Eastern Band of Cherokee, the United Keetoowah Band of Cherokee, and the Absentee-Shawnee Tribe of Oklahoma) were apprised by letter of the proposed action on May 19, 2010. No responses were received. Copies of the EA will be forwarded to each tribe for review and comment. The NPS will continue to recognize the past and present existence of peoples in the region and the traces of their use as an important part of the cultural environment, and if subsequent issues or concerns are identified, appropriate consultations would be undertaken. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001) would be followed. Therefore, ethnographic resources were dismissed from further analysis.

Museum Collections

Included in the NPS *Management Policies 2006*, the NPS “will collect, protect, preserve, provide access to, and use objects, specimens, and archival and manuscript collections in the disciplines of archeology, ethnography, history, biology, geology, and paleontology to aid understanding among park visitors, and to advance knowledge in the humanities and sciences” (NPS 2006). A museum collection is an assemblage of objects, works of art, historic documents, and/or natural history specimens collected according to a rational scheme and maintained so that they can be preserved, studied, and interpreted for public benefit (NPS 2002). The curation and storage of museum objects does not occur in the project area, and implementation of the proposed action would have no impact upon how museum objects are acquired, accessioned and cataloged, preserved, protected, and made available for access and use. Therefore, the impact topic of museum collections has been dismissed from further analysis.

Climate Change

Climate change refers to any significant changes in average climatic conditions (such as mean temperature, precipitation, or wind) or variability (such as seasonality and storm frequency) lasting for an extended period (decades or longer). Recent reports by the U.S. Climate Change Science Program, the National Academy of Sciences, and the United Nations Intergovernmental Panel on Climate Change provide evidence that climate change is occurring as a result of rising greenhouse gas (GHG) emissions and could accelerate in the coming decades. While climate change is a global phenomenon, it manifests differently depending on regional and local factors. General changes that are expected to occur in the future as a result of climate change include hotter, drier summers; warmer winters; warmer water; higher ocean levels; more severe wildfires; degraded air quality, more heavy downpours and flooding, and increased drought. Climate change is a far-reaching, long-term issue that could affect Mammoth Cave National Park, its resources, visitors, and management. Although some effects of climate change are considered known or likely to occur, many potential impacts are unknown. Much depends on the rate at which the temperature would continue to rise and whether global emissions of GHGs can be reduced or mitigated. Climate change science is a rapidly advancing field and new information is being collected and released continually.

Construction activities associated with implementation of the proposed action would contribute to increased GHG emissions, but such emissions would be short-term, ending with the cessation of construction, and it is not possible to meaningfully link the GHG emissions of such individual project actions to quantitative effects on regional or global climatic patterns. Any effects on climate change would not be discernible at a regional scale. Therefore, climate change was dismissed from further evaluation.

Environmental Justice

Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all federal agencies to incorporate

environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental impacts of their programs and policies on minorities and low-income populations and communities. The goal of environmental justice is not to shift risks among populations but to identify potentially disproportionately high and adverse impacts and identify alternatives that may mitigate these impacts.

Communities near Mammoth Cave National Park contain both minority and low-income populations; however, environmental justice is dismissed as an impact topic for the following reasons:

- The park staff and planning team actively solicited public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors
- Implementation of the proposed alternative would not result in any identifiable adverse human health impacts, therefore, there would be no direct or indirect adverse impacts on any minority or low-income population
- The impacts associated with implementation of the preferred alternative would not disproportionately affect any minority or low-income population or community
- Implementation of the preferred alternative would not result in any identified impacts that would be specific to any minority or low-income community

For the reasons outlined above, the proposed action would not impact nearby communities. Therefore, the impact topic of environmental justice has been dismissed from further analysis.

the proposed action. The design of the built environment would remain relatively consistent throughout the site. Therefore, the impact topic of land use planning and design was considered but dismissed from further analysis.

Land Use Planning and Design

There are no identified conflicts between the proposed action and land use plans, policies, or controls for the area concerned. Rural quality would not be affected by

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2 ALTERNATIVES

This chapter of the EA describes two alternatives for the Mammoth Cave Hotel improvements: Alternative A, a no-action alternative, and Alternative B, an action alternative. The description and evaluation of the no-action alternative provides a baseline to which the action alternative can be compared.

Several other alternatives that were considered but dismissed from further analysis are listed and described on page 46 of this document.

The hotel's facilities and services are intimately tied to the park's visitor operations and therefore are necessary and appropriate within the park boundary. Improvements to Mammoth Cave Hotel would update the hotel facilities and infrastructures in a manner resulting in an efficient concession operation, while protecting and conserving park resources and values. The improvements would provide a quality facility that improves visitor services and meets current safety standards, building codes, and NPS directives, including energy efficiency and sustainability, and provides the concessioner a reasonable opportunity for profit.

In addition, the NPS seeks to bring the concession contracting into full compliance with the 1998 Concessions Management Improvement Act.

DEVELOPMENT OF ALTERNATIVES

The planning team used existing planning documents and existing and new studies to develop a reasonable range of feasible alternatives to meet the project objectives. These documents include:

- The park's 1983 GMP
- The NPS Management Policies 2006
- The 2003 *Mammoth Cave National Park Business Plan*
- The 2003 *Mammoth Cave National Park Long-Range Interpretive Plan*

- The 2006 *Mammoth Cave National Park Visitor Survey*
- The 2012 *Visitor Survey Card Data Report*
- The draft *Franchise Fee Analysis* and supporting analyses

Further development of alternatives was based on information gained from scoping within the NPS, consultation with representatives of relevant government agencies, and outreach to the general public during the planning process. Initial scenarios for hotel improvement projects were developed in March-May, 2009 as the park began to draft a concession prospectus for the hotel. Options for improvements covered a wide range, such as no-action, to full renovation of the existing Heritage Trail wing, creating mini-suites, demolition of the existing Heritage Trail lodging rooms, Sunset Terrace Lodge room renovation, new construction of the hotel lodge and rooms, and other combinations of the above items. In October 2009, it was recognized that the park needed to prepare an environmental assessment and that architectural and engineering work was needed.

The internal planning process has spanned several years and involved the following efforts of the NPS:

- 2010: In April, a design charrette was held where NPS staff (park, regional, Washington level) met to establish the initial alternatives for improving the concession facilities: renovate the existing facilities; demolish existing facilities and build new facilities; and develop a combination of renovation and rebuild. A VA workshop was held in August to help determine which alternative would offer the NPS the best value.
- 2011: The overall scope and cost of the project (\$11 million) was deemed too high in light of limited NPS funds available for improvement projects across the NPS. The NPS reassessed the importance of in-

park lodging at Mammoth Cave in light of declining levels of overnight stays versus the public use of food/beverage, retail, and transportation services provided by the concessioner.

- 2012 to early-2013: The park was directed to prioritize basic concession improvements with an overall gross construction cost of less than \$6 million. A VA was conducted to consider and analyze various alternatives.
- 2013: With reduced funding and challenging financial circumstances across the NPS, the available funding for concession facility improvements is estimated at \$3.4 million.

Those concepts found to be infeasible during internal scoping and the two VA workshops were dismissed and are noted below under “Alternatives Considered but Dismissed.”

After several iterations of the planning, consultation, and evaluation processes, the NPS has developed one action alternative for full evaluation in this document. This EA evaluates two alternatives: “Alternative A: No-action” and “Alternative B: Renovate Concession Facilities (NPS Preferred).”

The elements of these alternatives are described in the following sections. Impacts associated with the actions are outlined in “Chapter 4: Environmental Consequences.”

ALTERNATIVE A: NO-ACTION

Under this alternative, existing hotel operations would continue under the current conditions, using the existing infrastructure and the existing concessioner contracting methods. The park and concessioner would make changes to facilities and operations as necessary and in accordance with normal park management. However, under this no-action alternative, most facilities and operations would remain unchanged for the foreseeable future (Figures 3 and 4).

Concession Contract

Since 2004, the park has renewed one-year contract extensions with the concessioner to provide food/beverage, retail, transportation, and overnight accommodations; however

this action is out of compliance with the Concessions Management Improvement Act of 1998. The 1998 Act requires all previous concession contracts to be renewed with an updated contract structure as quickly as possible to foster appropriate competition. Therefore, it is imperative that Mammoth Cave National Park comes into compliance with the 1998 Act by awarding a new ten-year contract that is financially viable by offering the concessioner a reasonable opportunity for profit.

Under Alternative A, the park would continue to operate under one-year extensions of the concession contract and continue to be out of compliance. Because of the absence of a long-term contract, the concessioner could choose to withdraw from the park. Continuity of visitor service provided by the concessioner could not be assured.

Concession Facilities

The NPS would continue to oversee operation of the concession facilities in their current state. Efforts to modernize the concession facilities and services would continue to take place on an as-needed basis. The Hotel Cottages and Woodland Cottages, which are not addressed in this EA, would continue to be operated by the concessioner.

Lodging Facilities

The hotel would continue to operate its current facilities and services, which includes 92 total lodging units in the hotel lodge, Heritage Trail wing, Sunset Terrace Lodge, Hotel Cottages, and Woodland Cottages. Mechanical systems and utilities (heating, air conditioning, plumbing, and electric) would not be upgraded. A sprinkler system would not be installed. As a result of declining lodging use and because of low off-season visitation patterns, the Mammoth Cave Hotel reduced its off-season operations and services in 2009 and subsequent years. In the four-month period between November and February, hours of operation and levels of service are substantially reduced.

Hotel Lodge

The main portion of the hotel is primarily public space and includes the hotel lobby, three food service areas, gift shops, four accessible rooms, a meeting room, and is



Improvements to Concession Facilities
Environmental Assessment



National Park Service
U.S. Department of the Interior

Mammoth Cave National Park

Figure 3
Alternative A: No-action

referred to as the hotel lodge. The total size of the existing hotel lodge is approximately 40,000 square feet. The building would retain its brick exterior and the green awning that signals the main entrance to the concession facilities. The loading dock at the eastern end of the hotel where visitors enter the parking lot would continue to be partially screened by a wooden fence.

Heritage Trail Wing

The Heritage Trail wing would remain connected to the hotel lodge by a covered stairway. This wing would remain in its current configuration, offering 38 rooms, each of which measures 236 square feet. Mechanical systems would not be upgraded and ventilation problems would persist. The Heritage Trail wing would not meet current health and safety codes.

Sunset Terrace Lodge

The Sunset Terrace Lodge would continue to provide a drive-up motor lodge experience. Sunset Terrace Lodge offers 20 rooms (each approximately 335 square feet), separated into four single-story, motor-lodge buildings, connected by a covered walkway. None of the rooms meet current ADA standards; however, two of the rooms can accommodate some mobility-impaired visitors. Thirty nearby parking spaces are designated for guests.

Visitor Access and Circulation

Cave tours visitors who park in the lot adjacent to the hotel lodge would continue to navigate through or around the hotel lodge and the Heritage Trail wing to reach the visitor center. Going through the building would continue to require a number of turns; going

**View of Hotel Lodge from
Pedestrian Bridge**



**View of Visitor Center from
Pedestrian Bridge**



around the building requires walking through the lawn or passing the hotel dumpster and loading dock.

Food and Beverage Facilities

The Mammoth Cave Hotel would continue to provide food service for both its overnight guests and day visitors to the park. The hotel lodge would continue to provide three food service areas, served by a large central kitchen:

- the 164-seat Travertine Restaurant, a full-service dining room (64 seats)
- the 54-seat Crystal Lake Coffee Shop (54 seats)
- the 64-seat TroglOBITES quick-food outlet (constructed in 1992), operated seasonally (64 seats).

Existing Crystal Lake Coffee Shop



Existing TroglOBITES



Retail Facilities

The two retail gift shops would continue business, with the Cave Company providing a souvenir emphasis and the Kentucky Home Gift Shop featuring hand-crafted items and artwork. The Cave Company measures approximately 1,176 square feet and the Kentucky Home Gift Shop measures approximately 1,222 square feet. Interior access to the Kentucky Home Gift Shop requires the use of stairs.

Parking Adjacent to the Hotel

The parking lot on the south side of the hotel would continue to offer approximately 190 lined parking spaces and serve both visitors seeking the visitor center and the concession facilities. During the busy summer months, the park would continue to direct visitors to park in lawn areas and along road shoulders when demand exceeds the existing paved parking areas provided. Visitors would continue to be guided by signs through and around the existing hotel lodge to access the visitor center.

Meets Purpose and Need?

Alternative A, the no-action alternative does not meet the purpose and need of this project. Mechanical and other utility systems in the hotel primarily date from its original construction and are at the end of their useful life. While the facilities are minimally serviceable, they are in need of critical life/safety updates. Food and beverage service space is crowded. Current lodging is outdated and does not meet visitor expectations. The retail shops are separated and, as currently configured, are not universally accessible. Visitor circulation is confusing due to the lack of a direct route from the visitor parking lot adjacent to the hotel to the visitor center. In addition, the loading dock is exposed to visitor view from the entry road, walkways, and the tour bus shelters. The current hotel façade is in need of renovation to make it similar to the newly renovated visitor center.

ALTERNATIVE B: RENOVATE CONCESSION FACILITIES (NPS PREFERRED)

Under this alternative, concession facility improvements would include upgrades of utilities and mechanical systems, the removal of the Heritage Trail wing, rehabilitation of the Sunset Terrace Lodge buildings, improved circulation and accessibility, increased parking, and renovation of the hotel lodge. (Figures 5 and 6).

Concession Contract

A new 10-year concession contract would be issued for operation of the hotel. The new concession contract would be in compliance with Concessions Management Improvement Act of 1998. A new contract would better ensure the continuity of concession operations and services to park visitors, and provide the concessioner a reasonable opportunity for profit. If visitation is down during the winter months or at other points during the year, the concessioner would be able to close or alter lodging facilities, and/or food and beverage service areas.

Concession Facilities

The NPS would undertake efforts to modernize the concession facilities and services. The hotel lodge and Sunset Terrace Lodge would be renovated. The existing main utilities and mechanical systems and distribution and hot water system would be replaced to improve energy efficiency and to address required critical life/safety repairs and upgrades. Sprinklers would be added, and the existing lighting and electrical systems would be replaced. IT, security, internet access, and telephone systems may be addressed, as well. The Hotel Cottages and Woodland Cottages, which are not addressed in this EA, would continue to be operated by the concessioner.

Lodging Facilities

Under Alternative B, lodging facilities offered at Mammoth Cave NP would include 54 total lodging units in the hotel lodge, Sunset Terrace Lodge, Hotel Cottages, and Woodland Cottages. The Heritage Trail wing (38 units) would be removed.

Hotel Lodge

The main portion of the hotel is primarily public space and includes the hotel lobby, three food service areas, gift shops, four accessible rooms, a meeting room, and is referred to as the hotel lodge. The total size of the existing hotel lodge is approximately 40,000 square feet. The building exterior façade would be altered to complement the “park-itecture” look of the visitor center. The loading dock, HVAC unit and dumpster at the eastern end of the building would be screened. Sidewalks, the outdoor dining area, and green space would be altered or added, as discussed further under the following sections.

Heritage Trail Wing

The 5,500-square foot Heritage Trail wing would be demolished. The area affected by demolition (i.e. the Heritage Trail wing plus an area surrounding this footprint where heavy equipment might be used) is estimated to be up to approximately 8,000 square feet.

The 38 Heritage Trail wing rooms would be demolished for the following reasons:

- Declining occupancy – In-park overnight accommodations would be reduced from 92 rooms to 54 rooms. At the park, fewer people use the concessioner overnight accommodations now than in past years, down more than 25 percent in the last ten years. The continuous downward trending in lodging use has occurred with all of the lodging room types, and it has continued even though park cave tour visitation has increased in recent years. Less than 5% of park visitors use park lodging facilities annually.
- Cost of renovation – Several iterations of rehabilitation were considered; however, with its cell-like, concrete construction, renovating of the Heritage Trail wing would be cost prohibitive. As in the hotel lodge, upgrades are needed for the mechanical (particularly plumbing) and life/safety systems to meet current code requirements. In 2011, interior and exterior rehabilitation to the Heritage Trail wing was estimated to be more than \$2 million. The park would use its limited funds to benefit the greatest number of visitors.
- Economy and energy conservation – Removing the Heritage Trail wing would reduce the scope and cost of other renovation projects (HVAC replacement, electrical system upgrade, fire protection system). By removing the two story building (11,000 square feet), it is estimated that utility costs and energy conservation would improve by approximately 50%.
- Operational efficiency – The current occupancy rate for the concessioner’s extended season (March-October) is 53%, which is lower than the occupancy rate in hotels/motels in surrounding area. The NPS business consultant projects that by lowering the number of rooms from 92 to 54 the concessioner could lower operational costs and improve operational efficiency.
- Small rooms – The rooms in the Heritage Trail wing do not meet current industry standards. Heritage Trail rooms are 235 square feet, versus 275-375 square feet as current average room size.
- Unique in-park experience – Since renovation of the Heritage Trail wing proved to be cost prohibitive, building a new hotel wing was considered but dismissed. Replacement of the Heritage Trail wing would duplicate those offered by the private sector outside the park. Almost all of the remaining 54 lodging units are unique to the park (historic cottages and the historic Sunset Terrace Lodge).
- Footprint of development reduced – Removing the Heritage Trail Wing would reduce the footprint of development in the park by approximately 5,500 square feet, and reduce operation/maintenance costs. The hotel would therefore have a reduced carbon footprint.

Sunset Terrace Lodge

The 20 Sunset Terrace Lodge rooms would undergo interior and exterior repairs and rehabilitation. The rooms would remain the same size as the existing rooms, measuring 335 square feet. The rooms would undergo remodeling to refinish surfaces, upgrade 38 bathroom fixtures, and upgrade other amenities. Mechanical, electrical, plumbing,



Improvements to Concession Facilities Environmental Assessment

Figure 5
Alternative B: Renovated Concession Facilities
(NPS Preferred)



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Mammoth Cave National Park

Overall improvements:

- Utilities (e.g., HVAC, electrical, and sprinkler systems upgraded)
- Exterior façade updated to match the new visitor center

VISITOR CIRCULATION BETWEEN
VISITOR PARKING ADJACENT TO THE
HOTEL LODGE AND VISITOR CENTER

FOOT BRIDGE TO VISITOR CENTER

The coffee shop and TrogloBITES may be
reprogrammed and consolidated at the discretion of
the concessioner. Below is one potential concept.

OUTDOOR SEATING/
TABLES

PRIMARY FOOD AND
BEVERAGE AREA

HVAC
Unit

STEPS

TREES

CRAFTS

VENDING

TOILETS

CHECKOUT

TOILETS

KITCHEN

LOADING
DOCK

Road to Historic Entrance

RECEPTION

LOBBY

SOUVENIR SHOP

SIDEWALK

TRAVERTINE RESTAURANT
This area could be repurposed as
meeting space, if desired.

WAIT STATION

FORMAL FOOD & BEVERAGE

PARKING

NORTH



0 16 32 Feet



National Park Service
U.S. Department of the Interior

Mammoth Cave National Park

Improvements to Concession Facilities
Environmental Assessment

Figure 6
Alternative B: Renovate Hotel Lodge
(Remove Heritage Trail Wing)

and utility systems would be upgraded to provide critical life/safety required repairs. Roofs would be replaced, and windows would be replaced. The parking area associated with these rooms would be reconfigured to improve drainage. Two rooms would be rehabilitated to address accessibility issues, including ADA compliant doorways, bathrooms equipped with hand rails and other necessities. Sidewalks would be replaced to eliminate entryway steps and made wider to accommodate wheelchairs. The Sunset Terrace Lodge is eligible for listing on the National Register of Historic Places. All repairs and modifications are subject to *Secretary of Interior's Standards for the Treatment of Historic Places*.

Food and Beverage Facilities

The existing food and beverage facilities would be renovated. Two food and beverage areas (currently known as the Crystal Lake Coffee Shop and the TrogloBITES quick-food outlet) may be consolidated into one primary food and beverage area to provide approximately 136 seats. The Travertine Restaurant could become a flexible space, which could be used for a more formal dining area with set hours, an overflow area for dining during peak visitation periods, and as a meeting room space that could be partitioned. The plaza could be modestly expanded and reconfigured to provide additional outdoor dining areas.

Retail Facilities

Modifications would be made to the two retail gift shops in the hotel lodge to improve visitor access.

Visitor Access and Circulation

Walkways would be added or altered in the vicinity of the concession facilities to improve visitor access. Pathways, sidewalks, green spaces, outdoor dining area, and/or alterations to building interiors would be constructed or modified to improve visitor circulation. Visitors who park adjacent to the hotel and wish to get to the visitor center would either walk along a new pathways outside the hotel facilities or navigate through several turns (Figure 6) within the hotel lodge. The new and improved sidewalks are anticipated to require approximately 4,000 square feet in construction area.

Parking Adjacent to the Hotel Lodge

Approximately 50 spaces would be added, estimated at 10,000 square feet, to increase parking from 190 to 240 spaces, improving visitor access and circulation. All lighting fixtures would comply with NPS night sky recommendations.

Funding Availability

All NPS units are facing reduced funding and challenging financial circumstances. At this time, Mammoth Cave National Park has identified the available funding for improvements to its concession facility to be estimated at \$3.4 million.

Some of the actions listed in Alternative B would be undertaken in the coming years, while some do not have a funding source at this time.

The purpose of an environmental assessment is to consider the impacts of planned management actions. All potential alterations to the concession facilities were evaluated in this document to clear the way for future actions.

Funded actions include upgrades to utilities and mechanical systems, demolition of the Heritage Trail wing, and renovation of Sunset Terrace Lodge.

As funding becomes available, the park would add approximately 50 spaces to the parking area adjacent to concession facilities, renovate the food and beverage facilities, update the exterior façade of the hotel lodge, and construct or modify walkways, outdoor dining areas, green spaces, and/or building interiors to improve visitor access and circulation. These items would further public use and enjoyment of the park.

Meets Purpose and Need?

Alternative B meets the proposed project purpose and need, working within the funding available to the park at this time. The NPS has determined that the best value to the American people is to renovate the existing hotel lodge, update mechanical systems and critical life/safety systems to meet standards, remove the Heritage Trail wing, and renovate the Sunset Terrace Lodge. This project would:

- provide a venue of value and quality that meets current safety standards, building codes, and NPS directives, including those for energy efficiency and sustainability
- protect and conserve park resources and values
- include NPS-funded improvements to existing facilities to enable execution of a 10-year concession contract
- meet the needs and expectations of the traveling public by providing a quality in-park experience

MITIGATION MEASURES

To minimize environmental impacts related to the action alternatives, the NPS would implement mitigation measures whenever feasible. Although the exact mitigation measures to be implemented would depend upon the final design and approval of plans by relevant agencies, the following is a list of actions that could take place:

- Appropriate erosion and siltation controls would be maintained during construction and demolition, and all exposed soil or fill material would be permanently stabilized at the earliest feasible date. To this end, erosion control devices such silt fences would minimize associated impacts.
- Stockpile materials would only be placed in designated locations to avoid sensitive areas, visitor pathways, and natural features.
- Where plantings or seeding are required, native plant material would be obtained and used in accordance with NPS policies and guidance. Management techniques would be implemented to foster rapid development of target native plant communities and to eliminate invasion by exotic or other undesirable species.
- Tree removal would be avoided to the greatest extent feasible. If tree removal is unavoidable, each tree would be assessed for potential impacts on special status species, and removal would conform to the park's *Hazard Tree Management Plan* (NPS 2000). Trees would only be

removed between November 16 and March 31 while bats are hibernating in caves or through other approved procedures/processes.

- All buildings, trees, and other structures would be inspected for use as roosting habitats prior to any alterations.
- Equipment would be restricted to the road corridor, parking lots, and other identified previously disturbed areas to avoid impacts on natural and cultural resources.
- Mammoth Cave National Park has not been systematically surveyed for archeological resources. In areas where surveys for archeological resources have not been conducted, archeological surveys would precede design and construction. Known archeological resources would be avoided to the greatest extent possible during all construction activities. If National Register eligible or listed archeological resources could not be avoided, an appropriate mitigation strategy (e.g. the excavation, recordation, and mapping of cultural remains prior to disturbance, to ensure that important archeological data that otherwise would be lost is recovered and documented) would be developed in consultation with the SHPO and, as necessary, associated American Indian tribes. If during construction previously undiscovered archeological resources were uncovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the SHPO and, as necessary, associated American Indian tribes.
- A Cultural Landscape Report is underway for the entire Mammoth Cave Core Visitor Services Area, of which the hotel and surrounding area is a part. The surveys and research necessary to determine the eligibility of a landscape, and its associated patterns and features, for listing in the National Register of Historic Places are a prerequisite for understanding the landscape's significance and the basis of informed

decision-making regarding how the resource should be managed. The Cultural Landscape Report is scheduled to be completed by the end of 2013.

- The park would continue to consult with the Kentucky SHPO in relation to the identification and evaluation of the cultural resources within the project area. During this project the park would work to avoid impacts on cultural resources. If avoidance is not feasible the park would develop mitigations in consultation with the SHPO to reduce the impacts. As necessary and appropriate, through this consultative process, the park may develop either a Programmatic Agreement or a Memorandum of Understanding with the Kentucky SHPO
- Project phasing may be implemented to mitigate the inconvenience and economic impacts of hotel renovation/construction activities on the concessioner and visitors.

ALTERNATIVES CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

In the four-year planning process for improvements to the Mammoth Cave National Park concession facilities, NPS personnel and consultants have considered more than 50 design elements, focusing on the objectives of the project and the planning issues as listed in this document.

Planning commenced in 2009-2010, with internal scoping followed by a public scoping session to determine the breadth of the project. A design charrette was used to establish the initial alternatives for improving the concession facilities, and three primary alternatives emerged: renovate the existing facilities; demolish existing facilities and build new facilities; and develop a combination of renovation and rebuilding. These three alternatives, along with additional scenarios, were scrutinized through two value analysis (VA) workshops to determine which would offer the best value to the government.

Elements and alternatives that were considered but dismissed from further analysis are described below.

Major Renovation of the Hotel Building and Heritage Trail Wing

Under this alternative, the following options were considered:

- full renovation of the hotel lodge, including resizing of the Heritage Trail rooms;
- a lower-grade renovation of the building with resizing of the Heritage Trail rooms; and
- full renovation of the hotel lodge with minimal upgrades to the Heritage Trail wing.

These alternative/elements were determined to be cost-prohibitive, and there is presently less need for lodging. These alternative/elements were dismissed from further analysis.

Construct New Hotel

Under this alternative, the hotel lodge and Heritage Trail wing would be demolished. A new, 20-room hotel with food service and retail would be constructed on the same location. This alternative was determined to be cost prohibitive, it duplicated lodging available in the local community which would compete with local businesses, and there is presently less need for lodging in the park. This alternative was dismissed from further analysis.

Mix of New Construction and Renovation

Under this alternative, the hotel lodge would be renovated, and the Heritage Trail wing demolished and replaced with a new, 20-room wing. Construction of the new rooms was considered on the same site in line with the lodge, or as a perpendicular structure jutting into the present parking lot. This alternative was determined to be cost prohibitive, it duplicated lodging available in the local community which would compete with local businesses, and there is presently less need for lodging in the park. This alternative was dismissed from further analysis.

Require a Substantial Concessioner Investment in Renovation/Improvement of the Hotel

Under this alternative, the concessioner would fund and complete a substantial portion of the renovations and improvements of the facilities. Financial analysis of the concession operation indicates a very limited potential for concessioner financing. This alternative was dismissed from further analysis because it was determined to not be financially viable. During the concession contract development, the possibility of some concessioner financed improvements would be assessed.

Moderate Renovation of the The Hotel and Demolition of the Heritage Trail Wing

Under this alternative, the hotel lodge would experience modest renovations which include gift shop, entrance, and lobby renovations in addition to all other work identified under Alternative B. The Heritage Trail wing would be removed. This alternative was determined to be cost prohibitive, and was dismissed from further analysis.

New Food and Retail Outlets with Retention of the 1990s Building and Removal of the Heritage Wing

Under this alternative, the Heritage Trail wing would be demolished, the 1965-portion of the hotel lodge would be demolished, and a smaller new building would be constructed to house food service and retail areas. Several variations were considered which included different sizing of the building and outdoor spaces. Retention of the 1990s additions (TrogloBITE and accessible room/meeting room) could be renovated for new guest room/suites, offices or retail space. This alternative was determined to be cost prohibitive, and was dismissed from further analysis.

Construct New Food and Retail Outlets & Demolish Main Building and Heritage Trail Wing

Under this alternative, the hotel lodge and the Heritage Trail wing would be demolished, and a new building would be constructed to house the food service and retail areas. This alternative considered several construction options: one-phase construction, two-phase construction, and one-phase construction along with keeping the TrogloBite 1990-addition. This alternative was determined to be cost prohibitive, and was dismissed from further analysis.

Major Renovation or New Construction of the Main Hotel Building, Demolition of the Heritage Trail Wing, and Construct Additional Sunset Terrace Lodge Units

Under this alternative, the hotel lodge would be fully renovated or replaced, the Heritage Trail wing would have been removed, and the Sunset Terrace Lodge would receive additional rooms. This alternative was determined to be cost prohibitive, and there is presently less need for lodging in the park. This alternative was dismissed from further analysis.

Discontinue Hotel Concession and Remove Hotel Facilities

Under this alternative, visitors would have no lodging, food/beverage, or retail options within the park. This option would not meet the needs of park visitors; concession operations are deemed necessary and appropriate to the park. Because this alternative does not meet the identified purpose and need of this project, it was dismissed from further analysis.

SUMMARY COMPARISON OF THE ALTERNATIVES

Table 1 provides a summary of the alternatives presented above.

TABLE 1. SUMMARY OF ALTERNATIVES

Alternative Element	Alternative A: No-action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Concession Contract	The park would continue to operate under one-year extensions of the concession contract and continue to be out of compliance. Because of the absence of a long-term contract, the concessioner could choose to withdraw from the park. Continuity of visitor service provided by the concessioner could not be assured.	A new 10-year concession contract for management of the hotel would be awarded. The new concession contract would be in compliance with Concessions Management Improvement Act of 1998.
Hotel Lodge	Structures remain as they are. The hotel would continue to operate its current facilities and services. Maintenance and repairs would be made as necessary. The hotel design and exterior façade would continue to contrast with the newly renovated visitor center.	Modernization of the hotel lodge. Utility systems would be upgraded. The existing main mechanical, electrical and lighting systems would be replaced. Critical life/safety issues such as sprinkler systems would be addressed. Façade updates would complement the newly renovated visitor center for a more cohesive sense of place. Renovations of the hotel exterior are funding-dependent.
Heritage Trail Wing	The 38 Heritage Trail rooms would remain in their current condition, including size (235 square feet), location, and room amenities. Current rooms are below industry standards and size and outdated. The 2-story wing would maintain its footprint of approximately 5,500 square feet.	The 38-room Heritage Trail wing would be demolished reducing lodging units from 92 to 54 units, decreasing the overall concession facility footprint by approximately 5,500 square feet.
Sunset Terrace Lodge	Structures remain as they are. The Sunset Terrace Lodge parking would provide 30 spaces.	The roofs and HVAC systems of these buildings would be replaced. The 20 Sunset Terrace Lodge rooms would undergo interior and exterior rehabilitation. To make the area more accessible, sidewalks would be replaced to eliminate entryway steps and made wider to accommodate wheelchairs. All the rooms would undergo interior rehabilitation including critical life/safety improvements such as sprinkler systems, and two rooms would include specific rehabilitation to meet ADA requirements including compliant doorways, bathrooms equipped with handrails, and other necessities.

TABLE 1. SUMMARY OF ALTERNATIVES (CON'T)

Alternative Element	Alternative A: No-action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Food and Beverage Facilities	The hotel would continue to provide dining through the three dining areas: Travertine Restaurant (seats 164), the Crystal Lake Coffee Shop (seats 54), and the TroglOBITES eatery (seats 64).	<p>At the discretion of the concessioner, two food and beverage areas (currently known as the Crystal Lake Coffee Shop and the TroglOBITES quick-food outlet), could be renovated and combined into one primary food and beverage area, with seating for approximately 136.</p> <p>The current Travertine Restaurant area could become a flexible space, to be used for a formal dining area with set hours, an overflow area for dining during peak visitation periods, or a meeting space that could be partitioned.</p> <p>The outside dining area could be modestly reconfigured and expanded to provide more dining area and seating space.</p>
Retail Facilities	Two retail shops would continue business, with one providing a souvenir emphasis and one craft shop.	Changes to the uses of the approximately 1,176- and approximately 1,222-square foot retail areas would be at the discretion of the concessioner.
Parking adjacent to the Hotel	Approximately 190 paved parking spaces are available in this large parking area. Visitors park on adjacent lawn areas during peak visitation when demand exceeds these spaces.	Funding-dependent renovations would include reconfiguring and expanding parking adjacent to the hotel by approximately 50 spaces to improve visitor access and circulation, for a total of 240 spaces.
Meets Purpose and Need?	No. The existing hotel configuration would continue to have issues related to efficient, financially viable concessioner operations and to inadequate visitor experience and accessibility.	Yes. Hotel improvements would address issues related to efficient, financially viable concessioner operations and to inadequate visitor experience and accessibility.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 2 provides a summary of the environmental consequences related to each alternative. A more detailed explanation of the impacts is presented in “Chapter 4: Environmental Consequences.”

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Geologic Resources	<p>Direct Impacts: none</p> <p>Indirect Impacts: Most of the stormwater runoff from the impervious surface in the area would continue to flow into oil and grit separator/filter systems and is unlikely to impact karst or other geologic resources.</p> <p>Overall Impact: long-term, negligible, adverse</p> <p>Cumulative Impact: contributes an imperceptible adverse increment to long-term, minor to moderate, adverse and long-term, beneficial cumulative impact</p>	<p>Direct Impacts: none</p> <p>Indirect Impacts: Any increases in stormwater would continue to flow into oil and grit separator/filter systems. Best management practices would minimize runoff during construction and demolition. The slight risk of indirect impacts on karst or other geologic resources from this runoff would continue.</p> <p>Overall Impact: short-term, minor, adverse and long-term, minor to moderate, adverse</p> <p>Cumulative Impact: contributes a noticeable adverse increment to long-term, minor to moderate, adverse and long-term, beneficial cumulative impacts</p>

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CON'T)

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Soils and Topography	<p>Direct Impacts: Existing impervious surfaces remain in place. Soils remain compacts under existing infrastructure and in some lawn areas.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, negligible, adverse</p> <p>Cumulative Impact: contributes an imperceptible adverse increment to long-term, minor to moderate, adverse and long-term, beneficial cumulative impact</p>	<p>Direct Impacts: The removal of the Heritage Trail wing would remove 5,500 square feet of existing impervious surface and a source of soil compaction. Possible redesign and expansion of parking adjacent to the hotel would increase the amount of impervious surface at the site by approximately 10,000 square feet. Soil disturbance would occur in construction areas.</p> <p>If the parking lot is not expanded, an approximate net balance of 2,500 square feet of soils would benefit in the long-term under this alternative from the decrease in impervious surface. If the parking lot is expanded, an approximate net balance of 7,500 square feet of soils would be covered by park infrastructure and adversely impacted under this alternative.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: short-term, minor, adverse and long-term, minor, adverse</p> <p>Cumulative Impact: contributes noticeable adverse increment to long-term, minor to moderate, adverse and long-term beneficial cumulative impacts</p>

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CON'T)

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Vegetation	<p>Direct Impacts: Continued use and maintenance of the site in its current layout would continue to impose relatively low levels of disturbances to vegetation.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, negligible, adverse</p> <p>Cumulative Impact: contributes an imperceptible adverse increment to long-term, minor, adverse cumulative impacts</p>	<p>Direct Impacts: The removal of the Heritage Trail wing would result in the removal of lawn during the construction period and the addition of more lawn in the long-term. The possible reconfiguration and expansion of parking adjacent to the hotel would result in the removal of maintained lawn on approximately 10,000 square feet of land and would avoid the removal of trees to the greatest extent possible. However, the visitor parking expansion could reduce the need for visitors to park on lawn areas adjacent to the visitor parking lot during peak visitation.</p> <p>If the parking lot is not expanded, an approximate net balance of 2,500 square feet of vegetation would be planted and benefit in the long-term under this alternative. If the parking lot is expanded, an approximate net balance of 7,500 square feet of vegetation would be covered by park infrastructure and adversely impacted under this alternative.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, minor, adverse and long-term beneficial</p> <p>Cumulative Impact: contributes noticeable adverse and beneficial increments to long-term, minor, adverse cumulative impacts</p>

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CON'T)

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Special Status Species	<p>Direct Impacts: none</p> <p>Indirect Impacts: Impacts on potential bat habitat resulting from continuing operation and maintenance of the hotel facilities and grounds would continue at current levels.</p> <p>Overall Impact: long-term, minor, adverse and ongoing, long-term, beneficial</p> <p>Cumulative Impact: contributes an imperceptible adverse increment to long-term, minor, adverse and long-term, beneficial cumulative impacts</p>	<p>Direct Impacts: Highly unlikely that any of the animals considered in this section would be directly impacted. Impacts related to alterations to potential habitat are addressed below.</p> <p>Indirect Impacts: Possible tree removal could affect foraging habitat for the species. Depending on which trees are cleared, if any, possible tree removal could decrease habitat for the species and could decrease potential roosting for the Indiana bats. If tree removal is required, trees would be evaluated individually for potential bat habitat. Trees would only be removed between November 16 and March 31 while bats are hibernating in caves or through other approved procedures/processes.</p> <p>Overall Impact: long-term, minor, adverse</p> <p>Cumulative Impact: contributes an imperceptible adverse increment to long-term, minor, adverse and long-term, beneficial cumulative impacts</p>

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CON'T)

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Cultural Landscapes	<p>No impact to the existing cultural landscapes, as the landscaping, patterns of circulation, and use would remain unchanged.</p> <p>A Cultural Landscape Report began in 2011 and will be completed in 2013.</p> <p>Direct Impacts: none</p> <p>Indirect Impacts: none</p> <p>Overall Impact: no impact</p> <p>Cumulative Impact: no cumulative impact</p>	<p>The park would continue to consult with the Kentucky SHPO in relation to the identification and evaluation of the cultural landscape within the project area. During this project the park would work to avoid impacts on cultural landscapes. If avoidance is not feasible the park would develop mitigations in consultation with the SHPO to reduce the impacts. As necessary and appropriate, through this consultative process, the park may develop either a Programmatic Agreement or a Memorandum of Understanding with the Kentucky SHPO.</p> <p>Direct Impacts: The Heritage Trail wing would be removed, which may partially restore the original cultural landscape in the hotel area. The historic Sunset Terrace Lodge rooms would undergo exterior rehabilitation per the <i>Secretary of the Interior Standards for the Treatment of Historic Properties</i>. Although there could be some modest alterations in circulation within the site, such as new sidewalks, a modified parking lot, and expansion of the outdoor dining area, these changes are not expected to noticeably detract from the cultural landscape</p> <p>Indirect Impacts: none</p> <p>Overall Impact: Short term, minor, adverse impacts during construction and long-term beneficial impacts</p> <p>Cumulative Impact: contributes a noticeable beneficial increment to long-term, minor to moderate, adverse cumulative impact</p>

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CON'T)

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Historic Structures	<p>No changes to existing structures. The hotel's current facilities would operate as they currently do.</p> <p>Direct Impacts: none</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, negligible</p> <p>Cumulative Impact: no cumulative impacts</p>	<p>Direct Impacts: Removal of the Heritage Trail wing would decrease the building footprint and remove a non-historic structure. Sunset Terrace Lodge rooms would undergo interior and exterior rehabilitation per the <i>Secretary of the Interior Standards for the Treatment of Historic Properties</i>. Historical use of the Sunset Terrace Lodge would continue.</p> <p>The park would continue to consult with the Kentucky SHPO in relation to the identification and evaluation of the historic structures within the project area. During this project the park would work to avoid impacts on historic structures. If necessary the park would develop mitigations in consultation with the SHPO to reduce the impacts. As necessary and appropriate, through this consultative process, the park may develop either a Programmatic Agreement or a Memorandum of Understanding with the Kentucky SHPO.</p> <p>Indirect Impacts: The integrity of the setting of the pedestrian bridge, which is adjacent to the project area, could be adversely impacted by actions under this alternative.</p> <p>Overall Impact: long-term, minor, adverse and long-term, beneficial</p> <p>Cumulative Impact: contributes a noticeable beneficial increment to long-term, moderate, adverse cumulative impact</p>

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CON'T)

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Archeological Resources	<p>Direct Impacts: Alternative A could result in direct impact to known parts of three sites. Full extent is unknown as site boundaries are unknown. Ongoing use of lawn areas for overflow parking has some limited potential to impact known archeological sites within project area.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, negligible to minor, adverse</p> <p>Cumulative Impact: contributes an imperceptible adverse increment to long-term, minor to moderate, adverse cumulative impacts</p>	<p>Direct Impacts: Hotel lodge renovation and reduction of concession facility footprint by approximately 5,500 square feet from the removal of the Heritage Trail wing. Sunset Terrace Lodge room sidewalk replacement and regrading may have potential for impacts on archeological resources within the project area. Stockpile material would only be placed in designated areas to avoid sensitive areas and features. Possible reconfiguration and expansion of parking adjacent to the hotel by approximately 50 spaces, affecting approximately 10,000 square feet of land.</p> <p>Alternative B could result in impacts on known sites and their components. The park would continue to consult with the Kentucky SHPO in relation to the identification and evaluation of the archeological resources within the project area. During this project the park would work to avoid impacts on archeological resources. If avoidance is not feasible the park would develop mitigations in consultation with the SHPO to reduce the impacts. As necessary and appropriate, through this consultative process, the park may develop either a Programmatic Agreement or a Memorandum of Understanding with the Kentucky SHPO.</p> <p>Indirect Impacts: Expanded paved parking would reduce the need to use grassy areas for overflow parking.</p> <p>Overall Impact: long-term, negligible to minor, adverse and long-term beneficial</p> <p>Cumulative Impact: contributes an imperceptible adverse increment to long-term, minor to moderate, adverse cumulative impacts</p>

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CON'T)

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Visual Resources	<p>Direct Impacts: Inconsistent styles between the 1965 hotel and the 2012 visitor center, the lack of visual connections between the visitor center and the parking lot next to the hotel, and the prominent view of the loading dock when approaching from the Mammoth Cave Parkway and from the cave tour shelters would continue would continue to cause readily detectable impacts on visual quality within the project area.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, moderate, adverse</p> <p>Cumulative Impact: contributes an appreciable adverse increment to long-term, beneficial cumulative impacts</p>	<p>Direct Impacts: The possible rehabilitation of hotel lodge façade would result in complementary architectural style between the hotel and visitor center facilities. Plantings and/or structural elements such as walls or fencing would screen the loading area to improve the viewshed for visitors entering the project area from Mammoth Cave Parkway. New sidewalks, changes to the outdoor dining area, and possible changes to the parking lot adjacent to the hotel would be visible but would not have noticeable impacts on visual resources.</p> <p>Removal of the Heritage Trail wing would remove a portion of the hotel structure directly upslope from the Historic Entrance, returning a portion of the view from the entrance to a more natural setting and may provide a visual connection between some portions of the parking lot adjacent to the hotel and the visitor center. The cleared area may be planted in grass adding to the maintained lawn around the hotel facilities.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, beneficial</p> <p>Cumulative Impact: contributes an appreciable beneficial increment to long-term, beneficial cumulative impacts</p>
Lightscapes	<p>Direct Impacts: Current outdoor lighting on the hotel and adjacent facilities includes a mix of fixtures, some of which are not night-sky compliant. These lights diminish the lightscapes at night.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, moderate, adverse</p> <p>Cumulative Impact: contributes an appreciable adverse increment to long-term, beneficial cumulative impacts</p>	<p>Direct Impacts: All non-compliant lighting fixtures would be replaced with night-sky compliant options. The replacement lights would decrease the effects of park infrastructure on the nighttime lightscapes.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term beneficial</p> <p>Cumulative Impact: contributes an appreciable beneficial increment to long-term, beneficial cumulative impacts</p>

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CON'T)

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Socioeconomic Resources	<p>Direct Impacts: Concessioners would continue to receive strong competition from hotels and restaurants outside park limits.</p> <p>Occupancy rates at the hotel would continue to be lower than the Cave Region hotel market as a whole due in part to outdated facilities.</p> <p>Because of the absence of a long-term contract, the concessioner could choose to withdraw from the park. Continuity of visitor service provided by the concessioner could not be assured.</p> <p>Permanent and seasonal employment rates would remain the same. The park would continue to support local economies through employment and as a tourist attraction.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, minor, adverse</p> <p>Cumulative Impact: contributes a noticeable adverse increment to long-term, beneficial cumulative impact</p>	<p>Direct Impacts: Concessioners would continue to receive strong competition from hotels and restaurants outside park limits.</p> <p>Consolidation of food service areas could reduce direct costs. The former restaurant area could become a flexible space, which could be used for a variety of uses, possibly facilitating increased visitation and financial viability for hotel.</p> <p>A new 10-year concession contract for operation and management of the hotel would provide opportunities for the concessioner and the park to invest in the hotel. A possible new exterior would increase curb appeal, likely drawing additional visitors to the hotel. It is anticipated that the hotel occupancy rate would be higher than the Cave Region due to hotel lodge improvements and the removal of the Heritage Trail wing. Some short-term jobs would be created during construction activities associated with the renovations.</p> <p>Permanent employment is expected to remain the same, while seasonal employment could increase. The park would continue to support local economies through employment, as a tourist attraction, during construction, and with the new 10-year concession contract.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: Short-term, beneficial and long-term, beneficial</p> <p>Cumulative Impact: contributes a noticeable beneficial increment to long-term, beneficial cumulative impact</p>

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CON'T)

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Visitor Use and Experience	<p>Direct Impacts: Because of the absence of a long-term contract, the concessioner could choose to withdraw from the park. Continuity of visitor service provided by the concessioner could not be assured.</p> <p>The hotel complex would continue to be architecturally different from the visitor center. Pedestrian flow between parking adjacent to the hotel and visitor center would continue to be rely heavily upon wayfinding signs.</p> <p>The existing Heritage Trail rooms would remain small, in comparison to other hotel rooms in the vicinity of the park. The Sunset Terrace Lodge rooms would continue to offer limited accessibility accommodations.</p> <p>Visitors would be able to choose between three dining areas and two retail shops.</p> <p>On peak visitation days, limited parking would result in visitors parking in lawn areas.</p> <p>Visitors would continue to be satisfied overall with the concession facilities, with the exception of a few common issues (e.g. odors in the Heritage Trail wing, aging utilities, etc.). Circulation in the vicinity of the hotel lodge and visitor center would continue to unclear and indirect. Visitors would continue to have a visual experience that is impacted by aging facilities that lack visual continuity.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, moderate, adverse</p> <p>Cumulative Impact: contributes an appreciable adverse increment to long-term, beneficial impacts</p>	<p>Direct Impacts: Issuance of a long-term (10-year contract) would assure continuity of visitor service by the concessioner. Concession services could be consolidated and improved in a many ways to provide a better visitor experience. Two food and beverage areas could be consolidated into one primary food and beverage area, which would be more convenient for visitors. The Travertine Restaurant could be redesigned as flexible space, in order to better visitor needs by providing a variety of services in the hotel lodge. Park lodging would be more desirable after demolition and renovations.</p> <p>The hotel façade may be updated to be complementary to the visitor center. The existing Heritage trail wing would be demolished, making circulation around the hotel lodge more intuitive and convenient. Parking lot expansion would reduce the need for visitors to park in lawn overflow areas.</p> <p>Sunset Terrace Lodge rooms would undergo interior and exterior rehabilitation. New HVAC systems and updated critical life/safety issues, such as sprinkler systems and new heating and cooling systems, would make the hotel lodge more comfortable for visitors. Rehabilitation of to two rooms would address accessibility at the Sunset Terrace Lodge. Sidewalks replaced to eliminate entryway steps and made wider to accommodate wheelchairs.</p> <p>Phasing would be implemented to limit interruption of service during construction.</p> <p>Visitor experience of the concession facilities would be improved by utility and aesthetical updates. Circulation would substantially improve to be clearer and more direct. The visual experience would be improved by the removal of the Heritage Trail wing and exterior modifications.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: short-term, moderate, adverse and long-term, beneficial</p> <p>Cumulative Impact: contributes an appreciable beneficial increment to long-term, beneficial cumulative impacts</p>

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CON'T)

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Operations and Infrastructure	<p>Direct Impacts: Current inefficiencies associated with existing operations and infrastructure within the project area would continue. The park would continue to maintain the existing parking lots and the hotel grounds. The concessioner would continue to operate the existing hotel facilities.</p> <p>The current hotel arrangement would continue to be somewhat inefficient. The hotel lodge would continue to include three dining areas and two retail shops. The 38 existing Heritage Trail rooms would remain small and outdated. The 20 Sunset Terrace Lodge rooms would continue to offer limited accessibility.</p> <p>The outdated utilities would continue to be energy inefficient, and deferred updates to critical life/safety systems and other maintenance items would continue to contribute to the less than ideal condition of the hotel and associated facilities. Emergency repairs would be necessary when systems fail, causing inconveniences to visitors.</p> <p>Infrastructure would continue to be dated and minimally maintained. The lack of modern critical/life safety systems would continue to impact visitor and employee safety.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, moderate, adverse</p> <p>Cumulative Impact: contributes a noticeable adverse increment to long-term, beneficial</p>	<p>Direct Impacts: Actions under Alternative B would help streamline operations. Hotel lodge could offer one primary dining area for an increase in efficiency. Former restaurant area could be repurposed to provide a variety of services.</p> <p>Alternative B would also greatly improve park infrastructure. Park could reconfigure and expand parking adjacent to the hotel. Utilities would be updated for increased efficiency. Heritage Trail wing would be demolished. Sunset Terrace Lodge buildings would have new roofing, HVAC system/s and interior rehabilitation to the rooms, including critical life/safety upgrades such as sprinkler systems, and expanded parking area. Interior rehabilitation of two rooms would include ADA improvements. Exterior improvements to the landscaping and sidewalks.</p> <p>Infrastructure would be updated to current standards with continued maintenance. New critical/life safety systems would improve visitor and employee safety.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, beneficial</p> <p>Cumulative Impact: contributes an appreciable beneficial increment to long-term, beneficial cumulative impacts</p>

TABLE 2: SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CON'T)

Resource	Alternative A: No Action	Alternative B: Renovate Concession Facilities (NPS Preferred)
Energy Conservation and Conservation Potential	<p>Direct Impacts: No changes in amount of energy used. Energy use would remain inefficient, due to outdated utilities and facilities. Maintenance would take place as needed to old and failing utility systems.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: long-term, moderate, adverse</p> <p>Cumulative Impact: contributes a noticeable adverse increment to long-term, beneficial impacts</p>	<p>Direct Impacts: Energy use would decrease by an estimated 50% due to the removal of the Heritage Trail wing, new high efficiency utility systems, and use of energy-efficient building materials in building renovations.</p> <p>Short-term increase in energy use would occur during construction due to equipment and vehicle use. Impacts would be short-term and negligible.</p> <p>Indirect Impacts: none</p> <p>Overall Impact: Short-term, negligible, adverse and long-term, beneficial</p> <p>Cumulative Impact: contributes an appreciable increment to long-term, beneficial impacts</p>

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The environmentally preferable alternative is defined by the CEQ as “the alternative that will promote the national environmental policy as expressed in the National Environmental Policy Act [Section 101 (b)].”

Generally, the environmentally preferable alternative is defined as the alternative that causes the least damage to the biological and physical environment and that best protects, preserves, and enhances historic, cultural, and natural resources. Alternative B surpasses the no-action alternative in fulfilling the criteria outlined in NEPA Section 101(b).

Alternative B may result in an adverse impact on archeological resources and would require some clearing and grading of the site to implement the project but would otherwise benefit park resources. Alternative B best meets the criteria for the environmentally preferable alternative.

NPS PREFERRED ALTERNATIVE

Alternative B was identified as the NPS preferred alternative. The NPS generally uses evaluations done during the VA process to provide input for the identification of the preferred alternative. This process identifies the alternative which provides the NPS with the greatest advantages when compared to the estimated cost. In this case during the VA, the alternative identified as most advantageous given the expected available funding was Alternative B: Renovate Concession Facilities. The NPS has identified Alternative B: Renovate Concession Facilities as the NPS preferred alternative based on their agreement with the results of the VA.

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3 AFFECTED ENVIRONMENT

Mammoth Cave National Park is located in the Edmonson, Barren, and Hart Counties of Kentucky. Within the park, extensive cave systems and unique examples of karst topography attract visitors from near and far. The proposed actions are confined to the project area defined in chapter 1 and outlined in Figure 2. Organized by resource topic, this chapter describes the resources that could be impacted by the proposed action. Resources examined in detail include geologic resources, soils and topography, vegetation, special status species, cultural landscapes, historic structures, archeological resources, visual resources, lightscares, socioeconomic resources, visitor use and experience, operations and infrastructure, and energy requirements and conservation potential. Resources dismissed from further analysis are discussed in “Chapter 1: Purpose and Need.”

GEOLOGIC RESOURCES

The Mammoth Cave Plateau, south of Green River and east of Turnhole Bend, possesses over 400 miles of cave passages. This plateau is an ancient configuration resulting from erosional remnants of three northwest trending ridges: Joppa, Mammoth Cave, and Flint. These ridges are separated by 200 to 300 feet deep valleys which formed when cave ceilings collapsed along ancient stream beds.

Mammoth Cave’s karst landscape is internationally renowned, showcasing the geologic and hydrologic processes linking the surface and subsurface environments. The park contains an incredible density of extensive caves, including the world’s longest known system at 400 miles. These geologic features include bluffs, rock outcrops, sinkholes, and springs, in addition to the cave system. The caves contain minerals, such as dripstone, gypsum, and mirabilite, as well as prehistoric Indian artifacts and fossils. Ridges are capped by sandstone and shale beds about 50 feet thick, which protect the caves

in the limestone beneath. As flowing water contributed to solution of the limestone, cave passages were destroyed or formed, with some measuring up to 100 feet in width and height (NPS 1983). Most of the park’s cave passages are dry, due to the insoluble sandstone and shale caprock, however the deepest passages have flowing streams. Domepits, measuring up to 200 feet in height, have been carved out by the water that pours in during wet weather events from the surface.

The groundwaters in the cave area exist primarily in karst. The Mammoth Cave groundwatershed receives waters from 11 surrounding watersheds. The groundwaters flow through the Mammoth Cave karst aquifer quickly into cave streams; therefore, contaminants are quickly transported through the cave streams unaltered. Contaminants do not have the chance to disperse slowly and remain relatively concentrated. Groundwater quality would vary seasonally, would be impacted by non-point pollution in nearby areas, and could vary annually (e.g. a severe drought would impact the amount of time for the aquifer to recharge) (NPS 1983).

The hotel is located approximately 350 feet from the Historic Entrance to Mammoth Cave and above the “Rotunda” room in the cave, and surface water drains along the ravine between the hotel and visitor center. Dye tracing studies have demonstrated the complex hydrology of the caves. For instance, dye injected into the Big Clifty/Girkin contact swallet behind the service station was detected at Hades, River Styx, the Dead Sea, and Styx and Echo River Springs. Such studies have prompted the NPS to install oil and grit separators and stormwater filters within the park (Meiman, Grovers, and Hernstein 2009). In 2003 and 2004, stormwater management systems were installed to filter pollutants out of water run-off from various park parking lots, including the hotel parking area and the Sunset Terrace Lodge parking area. These

systems are in good condition, and the filters are periodically replaced. These systems capture approximately 80% of the water from the hotel and Sunset Terrace Lodge parking areas. These systems were designed to handle additional capacity of water run-off if needed.

SOILS AND TOPOGRAPHY

The project area is located on a ridgeline on the south side of Green River. The elevation of the project area ranges from 650 to 750 feet. The soils in the project area are primarily categorized as Clarkrange silt loam, with smaller areas of Lily loam, Rosine silt loam, and Wallen-Bledsoe-Donahue complex. The Clarkrange silt loam is found at 2% to 12% sloped ridges. These soils have low water capacity and are moderately well drained. Lily loam, found at 6% to 12% slope ridges, has low water capacity and is well drained. The Rosine silt loam is found at slopes of 2% to 6%, is has a high water capacity and is well drained. Wallen-Bledsoe-Donahue soils are typically found in hills, with a slope of 35% to 50%. These soils are somewhat excessively drained with very low water capacity. The water table in the Wallen-Bledsoe-Donahue complex is very deep with relatively shallow restrictive features (NRCS 2011). The soils in this area have been disturbed in the past with the construction of the parking lots, hotel, visitor center, and other park infrastructure. These soils currently support the existing hotel and visitor center buildings, as well as the large parking lots.

VEGETATION

The vegetation in the Mammoth Cave Region is transitional between the Oak-Hickory forest region to the west and the Mixed Mesophytic forest region to the east and north. The park's vegetation list includes 84 species of trees, 28 kinds of shrubs and vines, 29 types of ferns, and 209 wildflowers (NPS 1983). Within the project area, the vegetation is primarily developed and mowed lawn, established landscaping shrubs, and scattered trees. Commonly found herbaceous species include Kentucky bluegrass (*Poa pratensis* L.), Kentucky 31 Tall Fescue (*Festuca arundinacea*), purple dead nettle (*Lamium purpureum*), clover (*Trifolium spp.*), and dandelion (*Taraxacum officinale*). These dominant

grasses and weedy herbs are typically found in disturbed or maintained conditions. In addition, some eastern red cedar (*Juniperus virginiana*), white ash (*Fraxinus Americana*), American sycamore (*Platanus occidentalis*), sugar maple (*Acer saccharum*), Virginia pine (*Pinus virginiana*), eastern redbud (*Cercis canadensis*), white oak (*Quercus alba*), and other hardwood species can be found throughout the project area. The woody vegetation surrounding the maintained lawns and landscaping are typical of the species composition found in the natural forests of the park. According to the CLR, no specimen trees exist within the project area; however, large stands of older trees, including Eastern Red Cedars are located just south of the project area (NPS 2013b).

SPECIAL STATUS SPECIES

Based on coordination with the USFWS (Appendix A) and a review of Kentucky Department of Fish and Wildlife Resources special status list, the project area has the potential for use by two federally- listed and 14 state special status species (table 3). Although no documented evidence of special status species occupying the project area are known, an analysis of the preferred habitats of these species was compared to the habitat available at the project area to determine the likelihood that special status species may occur within the project area.

Brief descriptions of those special status species that could potentially inhabit the project area are provided in this section, which include identifying characteristics and details of reproduction, habitat (including critical habitat), range, and principal threats to survival. Additional information concerning these species within the park setting is also provided in the narrative below.

Federally-Listed Species

Federally listed species include those species regulated by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act of 1973. The species list provided by the USFWS for this project (included in Appendix A) includes the potential for impacts on the gray bat and Indiana bat. Descriptions of the habitat requirements for these species are included below.

TABLE 3. SPECIAL STATUS SPECIES POTENTIALLY AFFECTED BY THE PROPOSED ACTION

Scientific Name	Common Name	Forma	Federal Status	State Status	Presence in Project Area
<i>Myotis grisescens</i>	gray bat	mammal	Endangered	Endangered	habitat present
<i>Myotis sodalist</i>	Indiana bat	mammal	Endangered	Endangered	habitat present
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	mammal	N/A	Special Concern	unlikely but possible
<i>Myotis leibii</i>	Eastern small-footed bat	mammal	N/A	Threatened	unlikely but possible
<i>Nycticeius humeralis</i>	Evening bat	mammal	N/A	Special Concern	possible during migration
<i>Myotis austroriparius</i>	Southeastern bat	mammal	N/A	Endangered	habitat present
<i>Cistothorus platensis</i>	Sedge wren	bird	N/A	Special Concern	possible during migration
<i>Haliaeetus leucocephalus</i>	Bald Eagle	bird	N/A	Threatened	habitat present
<i>Junco hyemalis</i>	Dark-eyed Junco	bird	N/A	Special Concern	present
<i>Thryomanes bewickii</i>	Bewick's wren	bird	N/A	Special Concern	habitat present
<i>Pituophis m. melanoleucus</i>	Northern Pine snake	reptile	N/A	Endangered	unlikely but possible
<i>Elaphe guttata</i>	Eastern corn snake	reptile	N/A	Special Concern	unlikely but possible
<i>Lampropeltis triangulum</i>	Scarlet King snake	reptile	N/A	Special Concern	unlikely but possible
<i>Plestiodon inexpectatus</i>	Southeastern five-lined Skink	reptile	N/A	Special Concern	unlikely but possible
<i>Ophisaurus ventralis</i>	Eastern Slender Glass Lizard	reptile	N/A	Threatened	unlikely but possible

Source: refined from USFWS letter dated May 24, 2010 and Kentucky Department of Fish and Wildlife Resources (<http://fw.ky.gov/kfwis/speciesInfo/speciesList.asp?strGroup=4&strSort1=Class&strSort2=CommonName>)

Gray Bat

Identifying characteristics for the gray bat include uniform colored dorsal fur from base to tip and the wing membrane attachment at ankle. Reproduction begins during a yearly September to October mating period, with the young bats born in the following May or June. Roost sites are mostly restricted to caves throughout the year, with specific cave environment/climate characteristics depending on the season. There have been no studies in the project area investigating the presence of potential roost sites, but they are considered unlikely. No critical habitat has been established. The range of the gray bat includes the cave regions of Missouri, Arkansas, Kentucky, Tennessee, and Alabama. Threats to the species include human-induced disturbance at cave sites, such as changes in airflow characteristics from entrance construction or gates; activities that affect foraging grounds, such as deforestation adjacent to cave entrances; and White-nose

Syndrome (a disease with the potential to dramatically impact cave-dwelling bats).

Gray bats are known to hibernate with Indiana bats and other species at the park. A major gray bat hibernaculum (i.e., the location chosen by an animal for hibernation) is also located near the park (NPS 2007). Unlike Indiana bats, gray bats do not typically roost in trees – they hibernate in caves and use caves for their summer roosts as well (Tuttle 1979, Stevenson and Tuttle 1981). Gray bats have been documented using the Dixon Cave and Historic Entrance. Dixon Cave is approximately 0.5 kilometers from the project area, and the Historic Entrance is 0.2 kilometers from the project area.

Foraging of gray bats in summers is strongly correlated with open water of rivers, streams, lakes or reservoirs. Although the species may travel up to 35 kilometers between prime feeding areas over lakes or rivers and

occupied caves (LaVal et al. 1977; Tuttle and Kennedy 2005), most maternity colonies are usually located between 1-4 kilometers from foraging locations (Tuttle 1976b). At foraging sites, Tuttle (1976b) estimated that gray bats forage within roughly three meters of the water's surface. Gray bats are highly dependent on aquatic insects, especially mayflies, caddisflies, and stoneflies. The species is an opportunistic forager, however, and also consumes beetles and moths (Harvey 1994; Tuttle and Kennedy 2005).

Indiana Bat

The Indiana bat ranges from eastern Oklahoma and the Iowa Ozark region; north and east to Michigan, New York, New England, and northern NJ; south to northern Alabama and Arkansas; and has non-regular occurrences outside this range. This species is identified by the presence of a very prominently keeled calcar (or cartilaginous supporting structure on the rear edge of its tail membrane), a character not found in similar species. Reproduction begins during the August to October mating period prior to hibernation. Young are typically born between June and July. Hibernation occurs in caves, while roosting sites may include behind loose bark of dead or dying trees, or in tree cavities. Foraging habitat includes riparian areas, upland forests, ponds, or fields. In Kentucky, critical habitat locations are Bat Cave (Carter Co.) and Coach Cave (Edmonson Co.) (USFWS 1976). Primary threats to the species include human disturbance at cave sites (including deforestation of areas adjacent to cave entrances) and White-nose Syndrome.

The park provides important year-round habitat for the Indiana bat. Several caves within the park are hibernacula for this species. Indiana bats are known to occur in Dixon Cave and occasionally the Historic Entrance nearby the project area. The number of bats that use the priority hibernacula within the park is monitored biannually by the USFWS (NPS 2007). The cave hibernacula are gated to prevent human disturbance during hibernation (NPS 2007). When not hibernating, female Indiana bats roost in trees under loose bark. There is a preference for standing dead trees and species that have loose bark, but Indiana bats may roost in any tree greater than six inches in diameter

(they have occasionally been seen in smaller trees) (Britzke et al. 2003). There have been no studies in the project area investigating the presence of potential roost sites, but they are considered unlikely.

State-Listed Species

The state of Kentucky maintains a list of special status species with categories that include endangered, threatened, and species of special concern. Of this list, the park considers four mammals, five birds, and five reptiles as possible inhabitants within or near the project area. A brief discussion of these species is provided below.

Mammals

Rafinesque's Big-eared Bat

The Rafinesque's big-eared bat (RBEB) is a medium sized bat listed as federal Species of Management Concern by the USFWS and the State of Kentucky. This bat is approximately 4 inches in length with grayish brown fur on the back and white fur along the belly. A distinct feature of this bat is long toe hairs that extend beyond the tips of the toes (Eastern Kentucky University 2011). Its range covers much of the Southeastern and Midwest portion of the United States and is a year-round resident of Kentucky. The RBEB uses a wide variety of roost and hibernation sites to include caverns, mines, snags, bridges, and abandoned buildings and attics (Rice 2009, Trousdale 2008, Eastern Kentucky University 2011, USFWS 2011). A study on RBEB usage of roosting trees in South Carolina found that live, damaged trees were preferred over dead snags (Lucas 2009). Other studies suggest hardwood swamps are preferred habitats for roosting (Stevenson 2008, Rice 2009), while Menzel et al. (2001) in South Carolina found most foraging activity occurred in young pine stands. Bats have been observed roosting alone or in colonies up to 100 individuals (Trousdale 2008, Eastern Kentucky University 2011). Typically, these bats emerge to forage on insects and moths well after dark (Menzel 2001, Texas Tech University 2011).

RBEB has been known to roost in buildings within one mile of the project area. Roosting habitat within the project area includes large deciduous trees within the forests surrounding

the project area and the larger trees around the parking area that may have available cavities or dead stems. It is unlikely that these bats utilize the existing buildings as roosting sites because of the level of human disturbance, some buildings have flat roofs with no attic space, and the attic space in other structures is sealed eliminating access. The opening in the forest canopy at the parking area and walkways provides an attractive habitat for foraging bats to find insect prey.

Eastern Small-footed Bat

The smallest myotis in North America with a characteristic slow flight (Erdle and Hobson 2001), the eastern small-footed bat is approximately 3 inches long with a wingspan around 8 to 10 inches, and is recognized by its black face and ears. This species returns each year to hibernate in caves and old mines, typically in small colonies. During summer months, caverns, rock crevices, old buildings, bridges, and hollow trees are used for daytime roosting (Erdle and Hobson 2001, Center for Biological Diversity 2013). Foraging areas tend to be along forest edges below canopy height, over streams and ponds, and along the face of rocky ledges (Erdle and Hobson 2001) with possibly a preference of hemlock forests (Virginia Department of Game and Inland Fisheries 2013).

Similar to the RBEB, roosting habitat in the project area includes large deciduous trees around the parking area that may have available cavities or dead stems. It is unlikely that this species of bat inhabits existing buildings as roosting sites due to the level of human disturbance, buildings with no attic space and since the attic space in other structures is sealed eliminating access. The open, park-like area associated with the park facilities may be used for nocturnal foraging.

Evening Bat

The evening bat looks similar to the big brown bat (*Eptesicus fuscus*), but with a wingspan of approximately 11 inches, is smaller than the big brown bat. Evening bats are not commonly found in caves. Rather, this species of bat winter is thought to winter in the southern region of Kentucky and return during the summer months. Roosting sites include

trees, buildings, and barns. Foraging areas include semi-open forests, stream corridors and woodland edges (Eastern Kentucky University 2013a). There have been no studies in the project area investigating the presence of potential roost sites, but they are considered unlikely.

The project area may be used by evening bats during summer months when bats migrate to this area of Kentucky. Preferred roosting areas may be available surrounding the project area parking lot where large trees are present. Similarly, the openness of the forest canopy and park infrastructure may provide foraging habitat for this species.

Southeastern Bat

The southeastern bat is a medium size mammal with an approximate 9- to 11-inch wingspan, having a woolly textured fur that is brown on the back and buff colored on the belly. In Kentucky, this species is primarily found in the western part where it roosts in caves, old buildings, and hollow trees often found in swamps with standing water and bottomlands (Tennessee Wildlife Resources Agency 2013). Foraging habitat includes areas over ponds, lakes and streams where bats can be observed flying close to the water surface (Eastern Kentucky University 2013b).

While southeastern bats may forage in the open areas associated with the park facilities, the Green River appears to be the preferred habitat closest to the project area approximately one-half mile away towards the west. There have been no studies in the project area investigating the presence of potential roost sites, but they are considered unlikely.

Birds

Sedge Wren

The sedge wren is a secretive bird that primarily utilizes dense grassy marshes and wetland sedges for foraging and nesting habitat, but will occasionally be observed in hayfields and overgrown pastures in Kentucky. This species is known for its unpredictable seasonal movements and has the potential to be present in the project area during migration (Palmer-Ball 1996).

Bald Eagle

The bald eagle has been delisted as a threaten/endangered species by the USFWS as populations have grown across various regions of the country, particularly in the Great Lakes region, Chesapeake Bay, and Florida (USFWS 2013). In Kentucky, nesting pairs have expanded in numbers from 6 in 1990 to 123 pairs in 2013 (KDFWR 2013a), with most nest sites occurring in the western part of the state associated with forested riparian areas along large reservoirs and rivers. Eagles prefer fish as the primary food source, but are known to prey on waterfowl, shorebirds, and small mammals. Preferred nesting sites include exceptionally tall, live evergreens near shorelines of open-water lakes, rivers, and estuaries generally distant from human disturbances (USFWS 1983).

The Green River occurs approximately one-half mile west of the project area, and one nest site is known to occur within the park in the Green River vicinity. The immediate area of the project area does not contain preferred habitat for bald eagles.

Dark-eyed Junco

The dark-eyed junco is a ground-feeding sparrow with plumage variants. The slate colored form is the most common form found throughout the eastern United States. The specie is known to exist across most of North America. Breeding territories extend from Alaska across Canada to Newfoundland and south to as far as Arizona and western Texas (Nature Serve 2013). Wintering areas include most of the mid-western and eastern states. The species tends to avoid areas of dense understory, and instead prefers open park-like habitats, suburban settings, and are easily drawn to feeders (National Geographic 2006).

With the absence of heavy underbrush and the open park-like setting, the project area provides habitat for wintering dark-eyed juncos. The dark-eyed junco is a common winter resident within the park and the general area. Birds would likely be found utilizing grassy, open areas as they forage.

Bewick's Wren

Bewick's wrens are cavity nesters that prefer semi-open areas including farmland, yards in suburban areas, forest margins (Palmer-

Ball 1996). Birds feed on insects and spiders within the bark of trees, along branches, and leaves typically less than 10 feet in height. Scientists believe the decline of the species may be attributable to the expansion of the house wren (*Troglodytes aedon*) promoted in part by the placement of nest boxes in yards. The house wren is a competing species that removes eggs from the nests of Bewick's wrens (Cornell Lab of Ornithology 2013).

The park has no records of Bewick's wrens using the project area. However, the species is typically found in less natural settings and has the potential to exist in the project area (Palmer-Ball 1996).

Reptiles

Northern Pine Snake, Eastern Corn Snake, Scarlet King Snake, Southeastern Five-lined Skink, and Eastern Slender Glass Lizard

These species of reptiles are most often found in the southeastern Coastal Plain within upland, dry forests (often dominated by pines), sandhills, fields, and barren areas generally associated with sandy or loosesoil where they can burrow into the soil or utilize burrows from other animals (SREL 2013abcd, NJDFW 2009, KDFWR 2007 and 2013b). Elusive species such as the northern pine snake and eastern slender glass lizard also inhabit areas underneath rocks, logs, and other debris. Soils within the project area comprise mostly loams and silt loams that are not conducive to preferred soil types typically associated with these species.

For the most part, Kentucky is the northern extent of the range of these species in the central US. However, park data shows that the northern pine snake and the southeastern five-lined skink have historically been found in the park and that the eastern corn snake, scarlet king snake, and eastern slender glass lizard all occur within the park. The northern pine snake, eastern corn snake, eastern slender glass lizard, and southeastern five-lined skink are known to occur in Barren, Edmonson, and Hart counties (KDFWR 2013cdef), and the scarlet king snake is known to occur within Edmonson County (KDFWR 2013g). While these are not likely to be found within the project area, it is possible that they could be present in or moving through the project area.

CULTURAL LANDSCAPES

The park initiated a Cultural Landscape Report for the core visitor services area in 2011, of which the Mammoth Cave Hotel and surrounding area are part; the report is now close to completion. Over the years, evolving park management, routine maintenance, and visitor use needs have led to changes within this area, and the Cultural Landscape Report will guide the design and implementation of proposed changes, as well as the repair and rehabilitation of features now and in the future.

The project area is defined as part of a greater core visitor services landscape atop the broad ridgeline surrounding the Mammoth Cave Historic Entrance, which has been a popular tourist attraction since the early 19th century. The first generation Mammoth Cave Hotel was built in 1837, and visitation increased greatly with the completion of the spur off the Louisville and Nashville Railroad in 1886. In 1916, the original hotel burned to the ground. It was replaced in 1925 by the second generation hotel, which became almost as famous and respected by guests and the community as the first (Goode 1986). This hotel was closed by the park and demolished in 1979 because it was considered to be a fire hazard and its repair would be cost prohibitive. The existing parking adjacent to the hotel was subsequently enlarged in this area.

The cultural landscape within the project area encompasses the buildings, circulation systems, vegetation, land uses and activities, and small scale features which date mainly to the 1930s through the 1970s, although some features predate this period. The immediate setting of the project area lies on top of a ridge with gradually descending areas to the east and west. The majority of the buildings, structures, much of the circulation system, and some of the existing vegetation date to two well-known federal building programs: the Civilian Conservation Corps (1933-1942) and the Mission 66 program of the NPS (1956-1966).

The cultural landscape, including the buildings, structures, circulation system vegetation, views and viewsheds, was evaluated in the 2013 Cultural Landscape Report ; the report stated that the core visitor services area landscape as a whole did not constitute a distinct historic district, due to

integrity issues (NPS 2013b). However, certain individual resources were considered to be contributing resources to a smaller historic district that consists of selected resources that represent the evolution of visitor accommodations within Mammoth Cave National Park (NPS 2013b). The buildings within the project area front upon the large visitor parking lot adjacent to the hotel, with the 1965 Mammoth Cave Hotel and Heritage Trail wing to the north [neither of these buildings is considered eligible for the National Register (NPS 2013b)]. The 1954 and 1958 Sunset Terrace Lodge buildings to the south-west (also considered contributing resources, but meriting further study regarding their specific significance); and the group of small single-story gable roofed Hotel Cottages (considered a contributing resource) due south of the hotel and the parking adjacent to the hotel (NPS 2013b). Other components of the cultural landscape include the tennis and shuffleboard courts, built by the Civilian Conservation Corps in the late 1930s to early 1940s, and just north of the Hotel Cottages, sidewalks which connect the various buildings and parking adjacent to the hotel and grass-covered lawn areas. The current Cultural Landscape Report found that the 1938 courts were contributing resources (NPS 2013b). Vegetation in the area consists of lawn areas south of parking adjacent to the hotel and to the east and west of the current hotel. The lawn area to the south of the visitor parking lot adjacent to the hotel also contains small groups of trees, including several large mature trees. Major revisions were made to this area in the 1960s and 1970s as a result of the removal of the second generation hotel, the construction of the existing Mammoth Cave Hotel and Heritage Trail wing, and the reconfiguration of the current visitor parking lot adjacent to the hotel. The parking lots in this area are not considered to be contributing resources (NPS 2013b). However, the original use of the area for a hotel and other visitor amenities remains unchanged.

Discussion of the buildings and structures within the cultural landscapes is included under the Historic Structures section below.

HISTORIC STRUCTURES

The original Mammoth Cave Hotel was constructed in 1837 by Franklin Gorin. This

hotel was capable of accommodating 30 to 40 guests and may have included cabins dating to the saltpeter mining days during the War of 1812. It was upgraded during its early years with the addition of a large two-story building that included a first-floor dining room and a second-floor ballroom. A veranda and bandstand were added in the early 1900s.

In 1916, the original hotel burnt to the ground, but it was replaced in 1925 by the second generation hotel at this site, which became almost as famous and respected by guests and the community as the first. The second generation hotel was razed in 1979 following completion of the third generation hotel and Heritage Trail wing in 1965. The Hotel Cottages, Woodland Cottages, and tennis, and shuffleboard courts still remain from the CCC era.

The more recent buildings at Mammoth Cave, including the existing Mammoth Cave Hotel, the Heritage Trail wing, and the Sunset Terrace Lodge units, were all built during the NPS's Mission 66 program. The Mission 66 program was a 10-year program instituted by the NPS in 1956 (although planning and design efforts preceded this date) to improve visitors' experiences in national parks throughout the country. These improvements included updated road systems, employee housing, and visitor centers. The earliest buildings from the Mission 66 period were the 1954/1958 Sunset Terrace Lodge units, which provide a drive-up motor lodge experience.

The first visitor center (a 1963 Modern Movement building typical of Mission 66 architecture) was recently transformed into an interpretation of a rustic style lodge, with large log columns and gabled roofs.

The existing Mammoth Cave Hotel, which dates to 1963, consists of two buildings, the hotel lodge Heritage Trail wing. The hotel lodge, on the east side, contains dining areas, gift shops, and guest rooms, is a one-story, flat-roofed brick building on a concrete foundation. The walls contain tall, narrow windows that were popular in the 1960s. This section also has two brick-clad additions with a stuccoed band on both at the rooflines. The hotel lodge may be considered an example of the continuing improvement of park facilities after World War II and the beginning of Mission 66 era

development. The hotel lodge could also be considered an example (albeit minor) of pre-Mission 66 modern architecture in National Parks. The design displays a modernist design (horizontal emphasis, low slope roofs), characteristics of modernist architecture in the national parks. However, it was not designed by a prominent architect; the site plan for the hotel lodge indicates that the architectural firm of Braun and Ryan designed the building, and based on research conducted as part of the Cultural Landscape Report, this firm does not appear to be well known or to have designed a significant body of work. Also, within the historic context of Mission 66 architecture, it is not likely that the hotel lodge would be considered a significant architectural example. Thus, the hotel lodge as an individual structure would not be an appropriate candidate for listing in the National Register.

The second building is the Heritage Trail wing, a two-story brick building connection to the hotel lodge by a covered staircase. The Heritage Trail wing is part of the Mission 66 hotel, and remains more intact than the rest of the hotel. However, the 1992 additions and alterations have diminished the integrity of the building as a whole in terms of design.

The Sunset Terrace Lodge rooms, which date to 1954 and 1958, comprise four buildings which are connected by terraces and breezeways. The buildings, oriented southwest of the Mammoth Cave Hotel, are rectangular plan buildings with a low-pitched saddleback hip roof with wide eaves. Each building contains five rooms. Each room contains a door and paired windows. The buildings' shorter east and west end walls are composed of large ashlar stone blocks, while the longer north and south elevations are covered with vertical wood siding.

In 1999, the Kentucky SHPO indicated that the visitor center was not eligible for the National Register because the building was less than 50 years old as of the date of the review (1999); was not designed by a prominent architect; and was not significant under any of the National Register criteria (NPS 2013b). Due to its many modifications, the visitor center has lost integrity and is not considered a contributing structure to the Core Visitor Services Area (NPS 2013b). The current Cultural Landscape Report states

that the 1965 Mammoth Cave Hotel is not an appropriate candidate for listing in the National Register due to the fact that it is still less than 50 years old; does not appear to have been designed by a significant architectural firm, and, in the context of the architecture of other Mission 66 buildings, does not appear to be individually eligible nor is it considered a contributing resource to the Core Visitor Services Area (NPS 2013b). The 1954 and 1958 Sunset Terrace Lodge buildings are considered to be contributing resources to the Core Visitor Services Area as they display a high level of integrity (NPS 2013b). Any expansion in the Core Visitor Services Area would be consistent with the treatment plan included in the CLR.

ARCHEOLOGICAL RESOURCES

Archeological resources including historic scatters and building remnants and prehistoric scatters have been reported nearby and within the project area. These resources are discussed below. The discussion is based on data presented in Prentice (1993; *Archeological Overview and Assessment of Mammoth Cave National Park*) and individual inventory forms. It should be noted that systematic archeological survey of areas which might be affected by actions proposed under the two alternatives has not been conducted.

One previously reported archeological site lies in the vicinity of the Heritage Trail wing and is a component of a larger parent site. According to Prentice (1993), this site might represent the remains of one of the earlier historic period residential cottages. While this is important, it is shadowed by the persistent subsurface scatter of both historic and prehistoric artifacts found nearby. The latter included Middle Archaic, Late Archaic, Early Woodland and Late Woodland artifacts. The presence of these materials led to an extension of the boundaries of the larger parent site.

A second group of archeological sites is comprised of those sites associated with the old 1925 hotel, the remains of which underlie existing infrastructure. The old hotel site is listed, and it has several component parts which are reported. According to Tracy Stakely, Acting Chief of the Division of Science and Resource Management for Mammoth Cave National Park (March 18, 2011 email Stakely to Tracy

Hamm, VHB), all surface traces of the old 1925 hotel have been obliterated. However, subsurface remains have been identified. The site is currently classified as stable and in good condition as it is protected by the overlying existing infrastructure. The current status of the residential sites is unknown but the plotted locations of these sites are within landscaped areas.

The final group of previously reported archeological sites is those in the vicinity of existing roadways. Today, the park uses lawn areas and road shoulders to accommodate visitor parking during overflow periods. Previously reported sites in the vicinity of existing roads include a site near an entrance/exit way; one located in the vicinity of the main entrance road; and the Old Mammoth Hotel Site (1925 hotel). The site adjacent to an entrance/exit way has not been assessed for condition or significance. The site near the main entrance road is a component of a larger parent site. This component is not described in Prentice (1993) but it was a residential structure plotted on the basis of an historic USGS map. It, too, has not been evaluated for significance. Finally, the old Mammoth Hotel Site is stable and protected, at least in part, by existing infrastructure. Existing infrastructure may not protect all of the area containing the remains of the old hotel sites (Prentice 1993).

VISUAL RESOURCES

The visual resources within the project area are primarily made up of infrastructure and development, along with some historic and natural viewsheds. The main viewsheds into and out of the project area include the views as visitors first enter the project area along Mammoth Cave Parkway, the views towards the hotel from the visitor center, the views towards the hotel from the parking adjacent to the hotel, and the views out of the hotel. Complementary design of modern, lodge-like facilities, providing visual connections between area of concentrated visitor activity, and providing a park-like atmosphere (providing vegetated areas and clean facilities) are all aspects of the visual quality of the area.

As visitors enter the project area on Mammoth Cave Parkway, the visual disconnect between the Mammoth Cave Hotel and the new visitor center is readily apparent, because the

two buildings contrast greatly in design and materials. The new visitor center has a crisp, lodge-like appearance with stone veneers, pointed roofs, and established entrances. By comparison, the Mammoth Cave Hotel appears outdated with a flat roofline, narrow windows, and a brick exterior. Additionally, as visitors turn into the visitor parking lot adjacent to the hotel, the loading dock, HVAC unit, and dumpster at the eastern end of the hotel lodge are first elements of the hotel in sight.

The contrast in appearances is evident both to those driving into the area and to visitors within the new visitor center, looking south at the hotel. Views looking north for visitors using the parking adjacent to the hotel are dominated by the existing hotel and attached Heritage Trail wing. It is difficult to see the visitor center. For many parking spaces, there is no visual connection to the visitor center with the exception of a sign next to the main hotel entrance indicating that the visitor center can be accessed through the hotel.

The viewsheds from within the hotel include the existing parking lot immediately to the south (with other hotel facilities and vegetated areas beyond) and the new visitor center and the connecting walkway to north. The Heritage Trail wing is somewhat visible to the west for visitors in the outdoor dining area.

LIGHTSCAPES

The lightscape of concern within the project area is the night sky. Although the park night sky quality is partially degraded due to the proximity to population centers, Mammoth Cave NP provides important forest, riparian and karst habitat for nocturnal wildlife. Mammoth Cave NP offers opportunities for many people to enjoy night sky resources. By providing overnight camping, offering ranger-led night-time programs, and conducting night sky quality monitoring, the park has demonstrated that it is dedicated to protecting night sky resources. Currently, the lodging areas and surrounding infrastructure contribute unnatural light to the lightscape. Interior lights in the Mammoth Cave Hotel rooms and Sunset Terrace Lodge units, exterior lighting along pedestrian walkways, parking lot lighting, and other visitor safety lights all constitute man-made sources of light within the project area.

The quality of the park's lightscapes is measured by the anthropogenic light ratio (ALR), which is the measurement of total sky brightness averaged across the entire sky compared to natural nighttime light levels. Lower ALR levels reflect higher quality night sky conditions. Ground based measurements from Houchin's Field in 2008 indicated an ALR of 3.01. The modeled ALR value for the entire park was 2.01. At these light levels, the Milky Way has typically lost most of its detail and may only be visible when overhead. Zodiacal light (or "false dawn" which is faint glow at the horizon just before dawn or just after dusk) is rarely seen. Man-made light likely dominates natural celestial features and shadows from distant lights will be seen (NPS 2008a).

SOCIOECONOMIC RESOURCES

Over the past five years, the popularity of Mammoth Cave as a visitor destination has grown. Mammoth Cave National Park is part of the 10-county Caves, Lakes, and Corvettes Region. Tourism of Kentucky, where tourism continues to be a large contributor to the overall economy in South Central Kentucky. In 2012, direct travel expenditures in the Caves, Lakes, and Corvettes Region exceeded \$358 million, an increase of 5.5% over 2011. This tourism is centered on the Interstate 65 (I-65) interchanges near the park, as well as in the towns of Horse Cave, Cave City, Park City, and Bowling Green. Although the hotel has the advantage of being located within the park, it must compete with other hotels and restaurants such as those offered in nearby Cave City, Horse Cave, and to some extent, Bowling Green, Kentucky. The Cave Region provides many motels, camping facilities, and other attractions for visitors. The nearest community that provides competition for concessions within the park is Cave City, an approximately 20 minute drive from the park entrance (CHM 2009c). There are approximately 30 hotels/motels and 20 restaurants within Cave City and Horse Cave. The hotels/motels nearest to the park (within Cave City) include the Oakes Motel and Campground, Days Inn, Park View Motel, B&B Hotel, Inc., Comfort Inn and Suites, Days Inn Cave City, and the Super 8 Cave City.

The population density surrounding the park is low, and no increase in urbanization is expected in the near future. Examples of some of the area attractions include the Abraham Lincoln Birthplace National Historic Site, Beech Bend Amusement Park and Drag Strip, the National Corvette Museum, Kentucky Down Under, Dinosaur World, Diamond Caverns, Nolin River Lake, Barren River Lake, and Western Kentucky University (NPS 1983). The park generally draws between approximately 500,000 and 550,000 visitors per year, with a pronounced increase in visitation from March to October.

Mammoth Cave National Park provided an economic impact of \$33 million in 2011. The park supports a total of 557 jobs (in the park and in the surrounding area). According to the 2003 *Mammoth Cave National Park Business Plan*, Mammoth Cave National Park employs 75 permanent employees (64 employees in 2013), and is heavily supported by seasonal staff. Currently, the hotel itself employs 75 full-time and part-time employees. In addition, the proximity of the hotel to the park visitor center and the Historic Entrance give the hotel an advantage over the other local accommodations outside of park boundaries.

According to U.S. Census Bureau data, between 2007 and 2011 the top industries within Horse Cave, Cave City, Park City, and Bowling Green, Kentucky were educational services and healthcare and social assistance; manufacturing; arts, entertainment, recreation, accommodation and food services; and retail trade. The large concentration of employment within retail trade and the arts, entertainment, recreation, accommodation and food service indicates the importance of tourism within these communities (US Census Bureau 2011). For instance, 22 percent and 25 percent of the employed population of Cave City and Horse City, respectively, works in service occupations (US Census Bureau 2011).

The Mammoth Cave Hotel consists of 92 guest rooms, including 42 hotel rooms (38 Heritage Trail rooms and 4 accessible hotel rooms in the hotel lodge), 20 motor lodge rooms (Sunset Terrace Lodge), 10 Hotel Cottages, and 20 Woodland Cottages. Room rates vary throughout the year and are dependent on demand and other factors. Maximum room rates are \$99 per night for

Heritage Trail rooms, \$104 per night for the Sunset Trail Lodges rooms, \$79 per night for the Historic Hotel Cottage, and \$104 per night for the larger Woodland Cottages (accommodates up to 16 people). Additional concessions at the hotel include three restaurants and two gift shops.

Retail, food, beverage, and lodging facilities consistently provide the largest source of revenue for the hotel concessioner. It is estimated that greater than 200,000 park visitors use the hotel's services each year, representing approximately 40% of all visitors to the park. In 2012, the hotel rented 11,087 rooms to 28,098 visitors. However, occupancy rates for the hotel have averaged approximately 53% during the busiest eight months (March-October) in recent years, which is lower than the occupancy rates in both Cave City and the Cave Region as a whole. Mammoth Cave Hotel guest occupancy has decreased by more than 25 percent in the last ten years, from over 15,000 to just above 11,000. In addition to lodging, typically 120,000 park visitors dine at one of the hotel's restaurants. Another approximately 160,000 visitors rode a concessioner-operated bus for cave tour transportation. The hotel's gross revenue for 2012 was just under \$4 million.

The hotel lacks some amenities found at commercial lodging facilities adjacent to the park, such as game rooms, playground equipment, a lounge, and water play areas, which may contribute to the lower occupancy rates. The hotel does organize special events and programs for guests; however, there is significant potential for expansion in this area. Because many visitors to the park are families with children, hotels with such amenities tend to attract more guests.

The 2012 Commercial Services Data Report (University of Idaho 2012a, 2012b) showed, of those visitors who were surveyed:

- 94% of those who stayed in the hotel “strongly agreed” or “somewhat agreed” that their overall lodging experience was satisfactory
- 96% of those who ate in one of the food service areas at the hotel “strongly agreed” or “somewhat agreed” that their overall dining experience was satisfactory

Inspection of social media sites shows good and bad comments about overnight accommodations at the Mammoth Cave Hotel, many indicating the presence of mice and foul odors. The park regularly receives negative comments directly from visitors who state dissatisfaction with aging infrastructure of concession facilities. Despite the generally positive ratings provided in the survey, there is potential to improve hotel conditions.

VISITOR USE AND EXPERIENCE

In 2012, 508,054 recreational visitors travelled to the park. Park visitation is heaviest during spring break, summer, and fall foliage seasons. The uses at the site include hotel lodging, hiking trails, educational programs and experiences, dining, shopping, and cave tours.

The primary use of the project area is the hotel accommodations and associated services. Currently, the hotel is fully operational from March through October and offers more limited services from November through February. The hotel is proximal to and provides convenient access to the Historic Entrance of Mammoth Cave and the visitor center (each approximately 300 feet away). Within the hotel lodge, visitors are presented with three choices of dining venues and two retail shops. The Travertine Restaurant offers a casual atmosphere for visitors. In addition, The Crystal Lake Coffee Shop and TroglOBITES offer a la carte items. The Kentucky Home Gift Shop offers gifts and artwork, whereas The Cave Company offers typical souvenirs. Visitors also have the option to reserve a meeting room for special events. These amenities are available to both overnight and day use visitors. The hotel registration desk and a lobby are located in the central part of the hotel lodge.

Overnight visitors to the hotel have several options for room accommodations. The Heritage Trail rooms, approximately 235 square feet, connect to the hotel lodge via a covered stairway. Half of the 38 rooms overlook the Heritage Trail and the wooded valley to the Historic Entrance; the other 19 rooms face the parking lot. Four rooms are located within the hotel lodge and provide fully accessible accommodations.

The 20 Sunset Terrace Lodge rooms are located at the far western edge of the project area. Set back from the hotel lodge, they provide larger motel units (335 square feet) in a quieter, forested area. Two of these rooms can accommodate some mobility impaired visitors; however, they do not meet ADA requirements. Sunset Terrace Lodge has covered walkways and plazas, with outdoor tables and chairs, and a parking lot with space for 30 vehicles. The hotel lodge is approximately 600 feet away.

The visitor parking lot adjacent to the hotel offers 190 spaces. During peak season, demand for parking exceeds the paved spaces available, and visitors may be required to park on lawn areas.

Visitors using the parking area adjacent to the hotel are not presented with a clear path to the visitor center. A green awning emblazoned with the hotel name indicates the main entrance to the hotel, and a plain white sign indicates that the visitor center can be accessed through this entrance. Visitors must make several turns (Figure 4) to access the visitor center by walking through the hotel lodge. This can be disorienting and confusing. The visitor center is mostly hidden from view by the hotel lodge and Heritage Trail wing. The visual differences between the hotel and the new visitor center contribute to this disorientation, as discussed under the impact topic of Visual Resources.

OPERATIONS AND INFRASTRUCTURE

Within the project area, the park retains responsibility for maintenance of the parking areas and grounds, and shares responsibility for maintenance of the buildings associated with Mammoth Cave Hotel operations with the hotel concessioner. It should be noted that the park retains ownership of the buildings and works with the concessioner on necessary updates on a case-by-case basis (NPS 2009a). Forever/NPC Resorts LLC is the current concessioner and assumed the 1982 contract under a sale and transfer agreement from National Parks Concessions Inc. in 2001 (NPS 2009a). The contract was time-limited to 2005, and the concessioner has subsequently

operated on one-year contract extensions pending award of a new contract. The park would continue to operate under one-year extensions of the concession contract and continue to be out of compliance. Because of the absence of a long-term contract, the concessioner could choose to withdraw from the park. Continuity of visitor service provided by the concessioner could not be assured. When a concessioner is given such a short-term contract, there is less incentive to make investments into property improvements.

The prominent buildings within the project area include the hotel lodge, the adjacent Heritage Trail wing, and the Sunset Terrace Lodge to the west. The hotel lodge houses the three existing food service areas and two existing retail facilities. The Travertine Restaurant offers a 164-seat full service restaurant. In addition, The Crystal Lake Coffee Shop offers 54-seats, and TrogloBITES is a 64-seat quick-food outlet. All three dining areas are located on eastern side of the hotel where they share a large central kitchen. The retail shops are located just off the hotel lobby. The Kentucky Home Gift Shop (approximately 1,222-square feet) offers gifts and artwork, whereas The Cave Company (approximately 1,176-square feet) offers typical souvenirs.

The hotel offers several options for room accommodations within the project area, including the 38 Heritage Trail rooms, four accessible hotel rooms in the hotel lodge building, the 20 Sunset Terrace Lodge rooms, the 10 Hotel Cottages, and the 20 Woodland Cottages. Four ADA-accessible rooms are available in the hotel lodge. Two of the Sunset Terrace Lodge rooms are relatively accessible, but not fully accessible by ADA standards. The other rooms have steps up into the facility, and none of the rooms have bathrooms with hand rails, wheelchair accessible sidewalks, or wheelchair accessible doorways.

The parking adjacent to the hotel provides 190 paved parking spaces and is fed by Mammoth Cave Parkway on its way to the visitor center. On the western side of the parking adjacent to the hotel, the Sunset Terrace Lodge have their own parking lot, offering 30 spaces.

There are a number of known issues with the hotel facilities that affect the financial viability of the hotel. Small room size in the Heritage Trail wing, limited accessibility and outdated facilities (in part) may decrease the attractiveness of the Mammoth Cave Hotel when compared to other choices in the region. The three food service areas are somewhat redundant and impose a level of inefficiency on the concession. Finally, the utilities have received regular maintenance since their installation in 1965 but have not been upgraded to modern code requirements.

ENERGY CONSERVATION AND CONSERVATION POTENTIAL

Mammoth Cave National Park strives to incorporate the principles of sustainable design and development into all facilities and park operations. Work conducted on this project will be completed to the highest achievable sustainable principles and practices in accordance with the requirements of the Department of the Interior Sustainable Buildings Implementation Plan, Executive Order 13423, Executive Order 13514, the Energy Independence and Security Act of 2007, and other federal sustainability regulations.

Hotel facilities, including outside lighting, utilities, and other elements are not energy-efficient. Current hotel and facility utility systems, primarily the heating and cooling systems, were installed in the late 1950s, early 1960s. In 2012, the Mammoth Cave Hotel (composed of the hotel lodge and the Heritage Trail wing) used 969,000 kwh of electricity, 7,020 gallons of fuel oil, 12,020 gallons of propane, and 1,854,594 gallons of water. In 2012, the 20 Sunset Terrace Lodge used 102,147 kwh of electricity and 560,570 gallons of water. These existing systems are inefficient compared to today's standards. Heating, cooling, and other utility systems are maintained or repaired as needed.

Windows, insulation, and other building materials are outdated compared to energy efficient materials used today, so energy use would remain high and inefficient compared to buildings that incorporate these energy conservation measures.

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4 ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental consequences associated with the alternatives presented in “Chapter 2: Alternatives.” It is organized by impact topic, which distills the issues and concerns into distinct subjects for analysis. NEPA requires consideration of context, intensity, and duration of adverse and beneficial impacts (direct, indirect, and cumulative) and measures to mitigate for impacts.

GENERAL METHODOLOGY FOR ASSESSING IMPACTS

Potential impacts are described in terms of type (beneficial or adverse), context (site specific, local, or regional), duration, and level of intensity (negligible, minor, moderate, or major). Both indirect and direct impacts also are described; however, they may not be identified specifically as direct or indirect. These terms are defined below. Overall, these impact analyses and conclusions were based on the review of existing literature and studies, information provided by on-site experts and other government agencies, professional judgments, and park service staff insight.

Type

Impacts can be beneficial or adverse. Beneficial impacts would improve resource conditions, while adverse impacts would deplete or negatively alter resources.

Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

Direct: An impact that is caused by an action and occurs at the same time and place.

Indirect: An impact that is caused by an action but is later in time or farther removed in distance, but still reasonably foreseeable.

Context

Context is the setting within which an impact occurs and can be site specific, local, parkwide, or regionwide. Each of these categories is defined below.

Site Specific: The impact would occur within the project area.

Local: The impact would occur within the general vicinity of the project area.

Parkwide: The impact would affect a would affect a noticeable portion or all of the park.

Regional: The impact would affect localities, cities, or towns surrounding the national park.

Duration

Impacts can be either short-term or long-term. A short-term impact would be temporary in duration and would be associated with the construction process. Depending on the resource, impacts would last as long as construction was taking place, or up to one year after construction is completed. Long-term impacts last beyond the construction period, and the resources may need more than one year after construction to resume their previous condition. Impact duration for each resource may differ and is presented for each resource topic, where applicable.

Short-term: Impacts that occur only during construction or last less than one year.

Long-term: Impacts that last longer than one year.

Level of Intensity

Level of intensity means the severity or magnitude of an impact. Because the levels of intensity definitions (negligible, minor, moderate, major) vary by resource, separate definitions are provided for each impact topic analyzed. Beneficial impacts are described but are not assigned a level of intensity.

Cumulative Actions

The CEQ regulations that implement NEPA require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as impacts which result when the impact of the proposed action is added to the impacts of other present and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7).

Cumulative Impact Contribution Methodology

In defining the contribution of each alternative to cumulative impacts, the following terminology is used:

Imperceptible: The incremental effect contributed by the alternative to the overall cumulative impact is such a small increment that it is impossible or extremely difficult to discern.

Noticeable: The incremental effect contributed by the alternative, while evident and observable, is still relatively small in proportion to the overall cumulative impact.

Appreciable: The incremental effect contributed by the alternative constitutes a large portion of the overall cumulative impact.

To determine the potential cumulative impacts, existing and anticipated future projects within the project area and in the surrounding area were identified. The projects and plans identified include the visitor center improvements, rehabilitation of the amphitheater, Mammoth Cave National Park Business Plan, the Rehabilitate Cave Tour Trails Plan/EA, cave elevator repair, improvements to the cave infrastructure, the Comprehensive Trail Management Plan/EA, the Mammoth Cave Railroad Hike and Bike Trail, the Rehabilitate Green River Crossing EA/Assessment of Effect (AoE), and the White-Nose Syndrome Response Plan.

Visitor Center Improvements

The park visitor center has been renovated to provide an improved visitor experience. Improvements included new interpretive displays and an updated lodge-like façade, new restrooms, expanded tickets sales area, spacious lobby, and a new information desk. A new bus loop was constructed to improve visitor circulation, and new shelters provide tour gathering spaces. A modestly expanded plaza area provides video monitors outlining cave tours and other park information. This project was completed in 2012 and had the potential to impact geologic resources, archeological resources, cultural landscapes (identified as a noncontributing resource), visitor use and experience, visual resources, operations and infrastructure, and energy conservation and conservation potential.

Rehabilitation of the Amphitheater

The amphitheater located just southeast of the hotel lodge recently underwent updates (2010) to improve accessibility. The seating was replaced and the audio/visual equipment was updated. This project has the potential to impact visitor use and experience and cultural landscapes.

The Mammoth Cave National Park Business Plan

The park business plan (NPS 2003a) called for the establishment of a more concerted marketing effort. Park marketing efforts have subsequently increased along with marketing efforts by area tourism groups. Visitation has increased over the past five years. This project

had the potential to impact socioeconomic resources, visitor use and experience, and operations and infrastructure.

Rehabilitate Cave Tour Trails Plan/EA

The park recently completed an EA on how to best reconstruct existing cave trails to improve safety, durability, and protection of natural and cultural resources (NPS 2009a). The *Rehabilitate Cave Tour Trails Plan/EA* calls for improvements to the cave trails that would lead to improved visitor experience and could draw additional visitors to the area, some of which may desire to use the services provided by the hotel. However, funding for this project is tentatively scheduled for 2015. This project has the potential to impact geologic resources, special status species, socioeconomic resources, cultural landscapes, archeological resources, operations and infrastructure, and visitor use and experience.

Cave Elevator Repair

The elevator that provides access to the Snowball Room in the cave has been replaced. This improvement provides accessibility to this section of the cave and improved emergency medical service access and response capabilities. Although this improvement provides easy access to the caves, it should be noted that the cave tours are not considered universally accessible. The cave elevator repair had the potential to impact geologic resources, operations and infrastructure, and visitor use and experience.

Improvements to the Cave Facilities

In the past, the park has improved the electric, water, and sewer systems serving the park and cave infrastructure. The Mammoth Dome Tower was recently replaced (2008) to improve visitor safety, visitor experience and enjoyment, and to improve emergency medical service access and response capabilities. These projects have improved visitor safety and experience within the cave. This project has the potential to impact special status species, operations and infrastructure, and visitor use and experience.

Comprehensive Trail Management Plan

This plan identifies management objectives and strategies to guide the protection, management and use of the trails within

Mammoth Cave National Park over the next 10 years (NPS 2007a). Trail use, development, and maintenance could influence resources in the vicinity of the proposal. This project has the potential to impact soils and topography, vegetation, archeological resources, visitor use and experience, and operations and infrastructure.

Mammoth Cave Railroad Hike and \ Bike Trail

This trail was constructed in part on the historic Mammoth Cave Railroad berm. Its proximity to the hotel offers visitors an additional recreational opportunity to hike and/or bike through the park and enjoy its natural setting. This trail provides for the separation of bike traffic from motor vehicle traffic on narrow and busy park roads. Development of the Mammoth Cave Railroad Hike and Bike Trail was completed in 2012, connecting to the Park City trail system. Its proximity to the hotel offers visitors a chance to hike and/or bike through the park and enjoy its natural setting. This project has the potential to impact soils and topography, vegetation, archeological resources, cultural landscapes, socioeconomic resources, visitor use and experience, and operations and infrastructure.

Rehabilitate Green River Crossing EA/AoE

The Rehabilitate Green River Crossing EA/AoE was completed in 2011 to determine the best way in which to create a safe and reliable connection for travelers across the Green River in an environmentally sensitive and fiscally responsible manner. Such improvements would increase the access between the developed zone (hotel and visitor center on the south side of the Green River) and the recreational backcountry trails and facilities on the north side of the park. This project has the potential to impact geologic resources, soils and topography, special status species, historic structures, archeological resources, cultural landscapes, visitor use and experience, and operations and infrastructure.

White-Nose Syndrome Response Plan

In January 2011, the park released an official White-Nose Syndrome Response Plan to provide for appropriate science-based management of the disease at the park (NPS

2011). The plan provides for monitoring and surveillance of bat populations to detect, provide data on the spread of, and determine impacts of the disease on area bats. In addition, the plan includes the establishment of appropriate decontamination procedures to protect bat and cave resources and aid in the development of outreach and educational tools to inform park visitors of the threat of the disease and help prevent them from inadvertently spreading it. This project has the potential to impact special status species and operations and infrastructure.

GEOLOGIC RESOURCES

Methodology

In order to assess impacts on geologic resources within the project area, general descriptions of the geology of the area were reviewed. Predictions about short- and long-term site impacts were based on recent studies and on projects of a similar nature and on state and local requirements for the stabilization and revegetation of disturbed surfaces. The thresholds for the intensity of an impact are defined below.

- Negligible:** Impacts on karst features and geology would be at or below the lower levels of detection.
- Minor:** The impacts on karst features and geology would be detectable and small. Mitigation may be needed to offset adverse impacts and would be relatively simple to implement and likely be successful.
- Moderate:** The impacts on karst features and geology would be readily apparent and result in a change to the character of these resources over a relatively wide area. Mitigation measures would be necessary to offset adverse impacts and likely be successful.

Major: The impacts on karst features and geology would be readily apparent and would substantially change the character of these resources over a large area in and/or out of the park. Mitigation measures to offset adverse impacts would be needed, extensive, and their success could not be guaranteed.

Impacts of Alternative A: No-Action

Impacts

Under the no-action alternative, no changes would be made to the existing hotel facilities. The hotel would remain located above the “Rotunda” room in the cave. Most of the stormwater runoff from the impervious surface of the Mammoth Cave Hotel, parking adjacent to the hotel, visitor center, and other impervious infrastructure would continue to flow into the oil and grit separator/filter systems located near the parking lots. Any indirect impacts on geologic processes from this runoff would be gradual and would remain at the existing level. Because impacts on geologic resources would be at or below levels of detection, Alternative A would result in a long-term, negligible, adverse impact on geologic resources. Direct impacts are not anticipated.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on geologic resources in and around the project area. These actions include the Rehabilitate Cave Tour Trails Plan/EA, cave elevator repair, and visitor center improvements. The Rehabilitate Cave Tour Trails Plan/EA could result in impacts on geologic resources during construction and trail renovations but could also reduce impacts on geologic resources related to continued visitor use. As such, this action would have short-term, minor to moderate, adverse and long-term beneficial impacts on geologic resources. Cave elevator repair would result in disturbance of geologic resources since the improvements extend into the bedrock. The impact would involve two 18-inch wide, 267-foot deep holes that would

be used to relocate utilities out of the existing shaft. As such, this action would have a short-term, minor to moderate, adverse impact. Visitor center improvements excavated bedrock, resulting in a long-term, moderate, adverse impact. Overall, these actions have a long-term, minor to moderate, adverse and long-term, beneficial impact on geologic resources. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, negligible, adverse impact described above for Alternative A, would result in long-term, minor to moderate, adverse and long-term, beneficial cumulative impacts on geologic resources. Alternative A would contribute an imperceptible adverse increment to this cumulative impact.

Conclusion

Overall, impacts on geologic resources would be at or below levels of detection. Because impacts on geologic resources would be at or below levels of detection, Alternative A would result in a direct long-term, negligible, adverse impact on geologic resources. Other past, present, and reasonably foreseeable future actions would result in a long-term, minor to moderate, adverse and long-term, beneficial impact on geologic resources. Alternative A would contribute an imperceptible adverse increment to the long-term, minor to moderate, adverse and long-term, beneficial cumulative impacts on geologic resources.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, there would be indirect impacts associated with increased impervious surface in or around the project area. Renovations would include reconfiguring and expanding parking adjacent to the hotel by 50 spaces to improve visitor access and circulation, for a total of 240 spaces. The removal of the Heritage Trail wing would decrease impervious surface by approximately 5,500 square feet, with construction activities resulting in ground disturbance impacts to approximately 8,000 square feet. New sidewalks would be constructed adjacent to the visitor center, sidewalks near the Sunset

Trail Lodge would be expanded, and the plaza could be modestly expanded and reconfigured to accommodate an outdoor dining area. These activities are anticipated to result in the addition of approximately 3,000 square feet of impervious surface, with construction activities resulting in ground disturbance impacts to approximately 4,000 square feet. Additionally, construction related to visitor parking expansion and/or reconfiguration has the potential to increase impervious surface by 10,000 square feet. Ground disturbing activities may increase the amount of sediment and contaminants in stormwater runoff. Any construction/demolition activities would be carried out using best management practices and in accordance with an approved erosion and sediment control plan. Although visitor parking improvements may result in a modest increase in impervious surface, the stormwater from the parking adjacent to the hotel would continue to flow into the existing oil and grit separator/filter systems near the parking lots. However, it is possible that some stormwater runoff would not be filtered; the contaminants and sedimentation from this runoff has the potential to gradually impact geologic resources. Because direct impacts on karst features would be detectable and small during and after construction and could be successfully mitigated, Alternative B would result in short-term, minor, adverse impacts. For these reasons, Alternative B would also result in long-term, minor, adverse indirect impacts on geologic resources.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on geologic resources in or around the project area. These actions include the Rehabilitate Cave Tour Trails Plan/EA, cave elevator repair, and visitor center improvements. These actions and their impacts are described under Alternative A. Overall, these actions have long-term, minor to moderate, adverse and long-term, indirect beneficial impacts on geologic resources. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the short-term, minor, adverse and long-term, negligible to minor, adverse impact described above for Alternative B, would result in long-term, minor to moderate,

adverse and long-term, beneficial cumulative impacts on geologic resources. Alternative B would contribute a noticeable adverse increment to this cumulative impact.

Conclusion

Overall, impacts on geologic resources due to changes in the amount of or contaminants in stormwater runoff from the project area would be detectable and small during construction and after construction. Alternative B would result in direct, short-term, minor, adverse impacts during construction and indirect, long-term, minor to moderate, adverse impacts on geologic resources. Other past, present, and reasonably foreseeable future actions have a long-term, minor to moderate, adverse and long-term, beneficial impact on geologic resources. Alternative B would contribute a noticeable adverse increment to the long-term, minor to moderate, adverse and long-term, beneficial cumulative impacts on geologic resources.

SOILS AND TOPOGRAPHY

Methodology

In order to assess impacts on soils and topography within the project area, information on local soil classification was gathered from the Natural Resources Conservation Service and existing conditions within the project area were examined. Following establishment of the existing conditions, impacts are described related to the proposed action under each potential alternative. Impacts are based on several soil properties, particularly organic matter and mineral content, air content, and moisture. The thresholds for the intensity of an impact are defined below.

Negligible: Impacts on soils would be at or below the lower levels of detection.

Minor: The impacts on soils would be detectable and small. Mitigation may be needed to offset adverse impacts and would be relatively simple to implement and likely be successful.

Moderate: The impacts on soils would be readily apparent and result in a change to soils over a relatively wide area. Mitigation measures would be necessary to offset adverse impacts and likely be successful.

Major: The impacts on soils would be readily apparent and would substantially change the character of the soils over a large area in and or outside of the park. Mitigation measures to offset adverse impacts would be needed, extensive, and their success could not be guaranteed.

Impacts of Alternative A: No-Action

Impacts

Under Alternative A, current conditions impacting soils and topography would continue. Within the project area, there would be no change in the amount of impervious surface covering the soils, and compaction of soils would continue under existing infrastructure and in some lawn areas. Stormwater runoff would continue to run into the oil and grit separation/filtration systems located near the parking lots. The soils in this area have been disturbed in the past with the construction of the parking lots, hotel, visitor center, and other park infrastructure. These soils currently support the existing hotel and visitor center buildings, as well as the large parking lots. The entire footprint of the hotel lodge and facilities measures approximately 40,000 square feet. The parking adjacent to the hotel is less than 4 acres (180,000 square feet). Compaction of soils under these structures and in the overflow parking lawn areas would continue. Compaction would impact the air and moisture content of the soils which would make them less able to support vegetation and more susceptible to erosion. Because impacts on soils and topography from continued compaction would be at or below levels of detection, Alternative A would result in a direct long-term, negligible, adverse impact on soils and topography. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on soils and topography in or around the project area. These actions include the Comprehensive Trail Management Plan and the Mammoth Cave Railroad Hike and Bike Trail. The Comprehensive Trail Management Plan includes actions that may result in impacts on soils and topography due to trail use and maintenance. In addition, the use of sustainable design methods as part of the Comprehensive Trail Management Plan could improve soil compaction and erosion conditions. As such, this action would have a long-term, minor, adverse impact and a long-term, beneficial impact. The Mammoth Cave Railroad Hike and Bike Trail would result in impacts on soils and topography which were already impacted by the creation of the trail; however, improved trails may increase visitor usage. As such, this action would have a long-term, minor, adverse impact. Overall, these actions have a long-term, minor to moderate, adverse and long-term, beneficial impact on soils and topography. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, negligible, adverse impact described above for Alternative A, would result in long-term, minor to moderate, adverse and long-term, beneficial cumulative impacts on soils and topography. Alternative A would contribute an imperceptible adverse increment to this cumulative impact.

Conclusion

Overall, impacts on soils and topography due to continued wide-scale compaction of soil would be at or below levels of detection. Alternative A would result in a direct, long-term, negligible, adverse impact on soils and topography. Other past, present, and reasonably foreseeable future actions would result in a long-term, minor to moderate, adverse and long-term, beneficial impact on soils and topography. Alternative A would contribute an imperceptible adverse increment to the long-term, minor to moderate, adverse and long-term, beneficial cumulative impacts on soils and topography.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, renovation of hotel facilities, including Heritage Trail wing removal and possible reconfiguration and expansion of parking adjacent to the hotel, would result in direct impacts on soils and topography. No indirect impacts would occur. The existing Heritage Trail wing would be demolished decreasing the hotel footprint by approximately 5,500 square feet. Soil exposed as a result of the demolition of the Heritage Trail wing would be planted with grass to avoid erosion. Addition and expansion of sidewalks as well as the modest expansion and reconfiguration of the outdoor dining area would also impact soils. Overall ground disturbance would be minimized as much as feasible. It is expected that this alternative would have a net balance of cut and fill, and major changes to land form are not expected.

The parking adjacent to the hotel could be redesigned and expanded. The renovations would include reconfiguring and expanding the parking adjacent to the hotel by approximately 50 spaces to improve visitor access and circulation, for a total of 240 spaces. Most of this development would fall in areas of previous soil and topography disturbance from the hotel and other nearby facility construction. The expansion in paved parking area would result in an increase in compacted soil and changes to topography as a result of grading. Expansion of the parking adjacent to the hotel would increase the amount of impervious surface at the site but would reduce impacts to lawn areas currently used as overflow parking. This increase in impervious surface would increase stormwater runoff from the site; however, the runoff would continue to flow into the oil and grit separator/filter systems located near the lot.

During construction, a maximum of 12,000 to 22,000 square feet would be disturbed. This disturbance comprises 8,000 square feet of impacted soils associated with the removal of the Heritage Trail wing, 4,000 square feet associated with the construction of sidewalks and the outdoor dining area, and possibly an additional 10,000 square feet for the visitor

parking lot reconfiguration. Soil disturbing activities would be carried out using best management practices and in accordance with an approved erosion and sediment control plan. Although visitor parking lot expansion/reconfiguration may result in an increase in impervious surface within the project area, this impact could be balanced to some extent by the removal of the Heritage Trail wing. The reduction in compaction of soils beneath the current Heritage Trail wing and in some lawn areas would result in better air and moisture content of the soils, which would make them more able to support vegetation and less susceptible to erosion. The net balance would depend upon future planning for visitor parking lot alterations. If the parking lot is not expanded, an approximate net balance of 2,500 square feet of soils would be planted with vegetation and benefit in the long-term under this alternative. If the parking lot is expanded, an approximate net balance of 7,500 square feet of soils would be covered by park infrastructure and adversely impacted under this alternative.

Because direct impacts from disturbance of soil during construction would be detectable, but small, and mitigation would be simple and likely successful, Alternative B would result in direct, short-term, minor, adverse impacts on soils and topography during construction. Because impacts from an increase in soil compaction and changes in grading would be detectable, but small, Alternative B would result in a direct, long-term, minor, adverse impact on soils and topography. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on soils and topography in or around the project area. These actions include the Comprehensive Trail Management Plan and the Mammoth Cave Railroad Hike and Bike Trail. These actions and their impacts are described under Alternative A. Overall, these actions have a long-term, minor to moderate, adverse and long-term, beneficial impact on soils and topography. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the short-term, minor, adverse impacts during

construction and long-term, minor, adverse impacts described above for Alternative B, would result in long-term, minor to moderate, adverse and long-term, beneficial cumulative impacts on soils and topography. Alternative B would contribute a noticeable adverse increment to this cumulative impact.

Conclusion

Overall, impacts on soils and topography would be detectable, but small, and mitigation would be simple and likely successfully. Alternative B would result in a direct, short-term, minor, adverse impact on soil and topography during construction and a long-term, minor, adverse impact on soils and topography due to soil compaction and grading. The cumulative actions described above have a long-term, minor to moderate, adverse and long-term, beneficial impact on soils and topography. Alternative B would contribute a noticeable adverse increment to a long-term, minor to moderate, adverse and long-term, beneficial cumulative impact.

VEGETATION

Methodology

All available information on plants and vegetative communities potentially impacted by the Mammoth Cave Hotel improvements was compiled for this document. Predictions about short- and long-term site impacts were based on recent studies and previous projects with similar vegetation. The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** No vegetation would be affected, or a very limited number of individual plants could be affected as a result of the alternative, but there would be no impact to native species populations. The impacts would be on a small scale.
- Minor:** The alternative would affect several individual plants and would also affect a very small portion of that species' population. Mitigation to offset adverse impacts could be required and would likely be successful.

Moderate: The alternative would affect numerous individual plants and would also affect a sizeable segment of the species' population over a relatively large area. Mitigation to offset adverse impacts could be extensive but would likely be successful.

Major: The alternative would affect a very large number of plants over a relatively large area of the park and would affect a relatively large portion of that species population. Mitigation to offset the adverse impacts would be required and extensive, and success of the mitigation measures would not be guaranteed.

Impacts of Alternative A: No-Action

Impacts

Under the no-action alternative, the vegetation that exists in and around the Mammoth Cave Hotel area would remain. The vegetation immediately surrounding structures in the project area is primarily made up of developed lawn and established landscaping. The woody vegetation surrounding the maintained lawns and landscaping are typical of the rest of the park, especially in areas adjacent to development, and include Oak-Hickory forest and Mixed Mesophytic forest characteristics. Continued use and maintenance of the site in its current layout would continue to impose relatively low levels of disturbances to vegetation. The most noticeable impact is caused by vehicles using areas of the lawn surrounding the existing parking area for overflow parking during peak visitation in the summer months. The compaction of vegetation during use of the lawn for parking is generally limited to about 20 days per year. Because impacts on vegetation would be at or below levels of detection, Alternative A would result in a direct long-term, negligible, adverse impact on vegetation. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute

to the cumulative impact on vegetation in or around the project area. These actions include the Comprehensive Trail Management Plan, the Mammoth Cave Railroad Hike and Bike Trail, construction of the Big Hollow Trail, extension of the Raymer Hollow Trail, and the expansion of the Maple Springs Trailhead parking. The Comprehensive Trail Management Plan could result in impacts on vegetation if trails are extended outside their current footprint. Similarly, the Mammoth Cave Railroad Hike and Bike Trail removed a small amount of vegetation during improvements along the entire corridor. The construction of the Big Hollow Trail, extension of the Raymer Hollow Trail, and the expansion of the Maple Springs Trailhead parking all resulted in removal of vegetation. The cumulative actions described above have resulted in a long-term, minor, adverse impact to vegetation. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, negligible, adverse impact described above for Alternative A, would result in a long-term, minor, adverse cumulative impact on vegetation. Alternative A would contribute an imperceptible adverse increment to this cumulative impact.

Conclusion

Overall, continued use and maintenance of the site would continue to result in levels of disturbance at or below the level of detection for vegetation. Alternative A would result in a direct long-term, negligible, adverse impact on vegetation. Other past, present, and reasonably foreseeable future actions would result in a long-term, minor, adverse impact on vegetation. Alternative A would contribute an imperceptible adverse increment to a long-term, minor, adverse cumulative impact.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, renovation of the hotel lodge, possibly including the food and beverage and retail spaces, would take place. The removal of the existing Heritage Trail wing would decrease the concession facility footprint by approximately 5,500 square feet. After demolition, the space where the

Heritage Trail wing would be planted with grass and maintained similarly to other regularly mowed grass areas. The possible expansion of parking adjacent to the hotel would result in the removal of maintained lawn and would avoid the removal of trees to the greatest extent possible. However, the visitor parking lot expansion would reduce the need for visitors to park on lawn areas adjacent to the visitor parking lot during peak visitation, allowing for the vegetation in these areas to remain intact. Additional plantings may be added to screen the loading area at the eastern end of the hotel, which is one of the first areas of the hotel that visitors see when approaching from Mammoth Cave Parkway. The additional sidewalks adjacent to the hotel lodge, the expansion of the Sunset Terrace Lodge sidewalks, and the modest expansion and reconfiguration of the outdoor dining area would impact relatively small amounts of vegetation.

The proposed development within Alternative B would result in the maximum disturbance of 12,000-22,000 square feet of land and the loss of maintained lawn in the project area, potentially including several trees, but the loss would not represent a critical impact to vegetation (10,000 square feet accounted for the possible parking lot reconfiguration). If the parking lot is not expanded, an approximate net balance of 2,500 square feet of vegetation would be planted, resulting in a long-term beneficial impact under this alternative. If the parking lot is expanded, an approximate net balance of 7,500 square feet of vegetation would be covered by park infrastructure, resulting in a long-term adverse impact under this alternative. Because a very small portion of the overall vegetation type would be affected or lost, because tree removal would be avoided to the greatest extent feasible, and because approximately 5,500 square feet would become available for revegetation, Alternative B would result in direct, long-term, minor, adverse and direct, long-term, beneficial impacts on vegetation. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on vegetation in or around the project area. These actions include

the Comprehensive Trail Management Plan and the Mammoth Cave Railroad Hike and Bike Trail. These actions and their impacts are described under Alternative A. Overall, these actions have a long-term, minor, adverse impact on vegetation. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, minor, adverse impact described above for Alternative B, would result in a long-term, minor, adverse cumulative impact on vegetation. Alternative B would contribute noticeable adverse and beneficial increments to this cumulative impact.

Conclusion

Overall, impacts on vegetation would include the loss of a very small portion of the overall vegetation type and an opportunity for revegetation of approximately 5,500 square feet. Alternative B would result in direct, long-term, minor, adverse and direct, long-term, beneficial impacts on vegetation. The cumulative actions described above have a long-term, minor, adverse impact on vegetation. Alternative B would contribute noticeable adverse and beneficial increment to a long-term, minor, adverse cumulative impact.

SPECIAL STATUS SPECIES

Methodology

Endangered Species Act (16 USC 1531 et. seq.) mandates that all federal agencies consider the potential impacts of their actions on species listed as threatened or endangered. If the NPS determines that an action may adversely impact a federally listed species, consultation with the USFWS is required to ensure that the action would not jeopardize the species' continued existence or result in the destruction or adverse modification of critical habitat. Similarly, if a listed species were encountered, construction activities would be stopped and immediate consultation with the USFWS would be initiated. In addition, NPS *Management Policies 2006* states that potential impacts of agency actions would also be considered on state or locally listed species. The NPS is required to control access to critical habitat of such species, and to perpetuate the natural distribution and abundance of these species and the ecosystem upon which they depend.

The USFWS was consulted regarding listed species prior to this analysis. They identified the gray bat (endangered) and Indiana bat (endangered), and Rafinesque's big-eared bat (candidate species) as potential inhabitants of the project area (Appendix A). Indirect impacts described under Alternative B assume that bats are using cave areas subject to impacts related to runoff from the project area; this may not be the case. In addition, the park has identified the potential for an additional 12 species listed by the State of Kentucky as either endangered, threatened, or species of special concern. The habitats associated with these species were compared with that of the proposed developments and existing facilities utilizing the thresholds of change for the intensity of an impact as follows:

Negligible: No observable or measurable impacts on special status species, their habitats, or the natural processes sustaining them would occur. An assessment of effect according to Section 7 of the ESA would result in a finding of *no effect*.

Minor: Impacts on special status species would be detectable, but would not be outside the natural range of variability. Occasional responses by some individuals to disturbance could be expected, and may result in minimal interference to feeding, reproduction, resting, or other factors affecting population levels, but would not be expected to result in changes to local population numbers, population structure, and other demographic factors. An assessment of effect according to Section 7 of the ESA would result in a finding of *may affect, but not likely to adversely affect*.

Moderate: Impacts on special status species, their habitats, or the natural processes sustaining them would be detectable and could be outside the natural range of variability. Frequent responses by some individuals to

disturbance could be expected, with some negative impacts on feeding, reproduction, resting, or other factors affecting local population levels. Small changes to local population numbers, population structure, and other demographic factors may occur. Some impacts might occur during critical periods of reproduction or in key habitats and result in harassment, injury, or mortality to one or more individuals. However, sufficient population numbers and habitat would remain functional to maintain a sustainable population. An assessment of effect according to Section 7 of the ESA would result in a finding of *may affect/likely to adversely affect*.

Major: Impacts on special status species, their habitats, or the natural processes sustaining them would be detectable and would be expected to be outside the natural range of variability. Frequent responses by some individuals to disturbance would be expected, with negative impacts on feeding, reproduction, or other factors resulting in a decrease in population levels or a failure to restore levels that are needed to maintain a sustainable population. Impacts would occur during critical periods of reproduction or in key habitats and result in direct harassment, injury, or mortality of individuals or loss of habitat. Local population numbers, population structure, and other demographic factors might experience large declines. An assessment of effect according to Section 7 of the ESA would result in a finding of *likely to jeopardize species /adversely modify critical habitat*.

Impacts of Alternative A: No-Action

Impacts Analysis

Under Alternative A, hotel operations would continue to use the existing infrastructure and facilities with no foreseeable change. Deciduous and evergreen trees are scattered across the project area, most of which are of medium size. The American sycamore tree species is the most common, mature, and large tree in the project area that could potentially be targeted by bats for roosting. This specific tree species generally has flakey bark on the lower portions of the trunk. Additionally, it is not likely that trees within the current hotel grounds would be used by roosting bats due to regular activity and disturbances of humans (visitors and maintenance crews), which would continue under normal operations. Gray bats generally do not use trees for roosting, and Alternative A would not affect this species.

This alternative would keep the hotel lodge, Heritage Trail wing, and Sunset Terrace Lodge in their existing condition. It is not likely that roosting bats would use the hotel or Heritage Trail buildings due to the flat roofs and lack of attic space. The Sunset Terrace Lodge buildings have pitched roofs with attics that could be used by bats, but this is again unlikely because of disturbances from visitors and maintenance crews.

The Indiana and gray bats have been known to use the Historic Entrance of the Mammoth Cave within 1,000 feet of the project area, although current level of use is unknown. No new impacts on water quality in the cave system would occur or subsequently impact bats. The existing oil and grit separation/filtration system and existing stormwater management would continue to mitigate any noticeable change in water quality due to runoff from the project area.

Alternative A would keep the existing forest canopy opening in its current condition. This habitat is a preferred habitat type by foraging bats. Furthermore, nighttime lighting of the parking area and buildings would continue to attract moths and insects, thereby enhancing the localized food supply for bats.

The only special status bird species that is known to use the project area is the dark-eyed junco (state species of special concern), which prefers open forests, fields, and yards free of heavy underbrush. Habitat characteristics of the sedge wren and bald eagle are available in the project area, and the presence of these species is possible. Preferred habitat is not available for the Bewick's wren, but its presence is possible during migration. The dark-eyed junco likely uses the park during the winter migration period, and would be found within the maintained lawns surrounding the parking areas and hotel facilities. These areas would continue to exist under Alternative A, providing habitat for the dark-eyed junco.

Habitat needs for the listed reptiles include dry uplands dominated by hardwoods and pines with loose, sandy soils preferred for burrowing. While this habitat type is absent from the project area, these species are known to exist nearby and could occasionally be found in the project area. In addition, use of the grassy areas for overflow parking would prevent these species from being able to use the area. Park data shows that the northern pine snake and the southeastern five-lined skink have historically been found in the park and that the eastern corn snake, scarlet king snake, and eastern slender glass lizard all occur within the park. The northern pine snake, eastern corn snake, eastern slender glass lizard, and southeastern five-lined skink are known to occur in Barren, Edmonson, and Hart counties (KDFWR 2013cdef), and the scarlet king snake is known to occur within Edmonson County (KDFWR 2013g). These are not likely to be found within the project area, and alternative A is not expected to impact listed reptiles.

No trees would be removed under this alternative, and the open canopy available for foraging bats caused by the existing infrastructure would continue to exist. Habitat for the gray, Indiana, and southeastern bats all exist within the project area. The presence of the Rafinesque's big-eared bat, Eastern small-footed bat, and evening bat is considered unlikely but possible, particularly during evening bat migration. Although no bats have been documented roosting within the project area, the disturbances caused by humans may

impact the use of the area by special status bat species. For these reasons, impacts from Alternative A would be detectable but would not be outside the natural range of variability for the special status bat species. Because adverse impacts would be detectable but not outside the natural range of variability and because beneficial impacts would continue to provide habitat for potential dark-eyed juncos and several other species, Alternative A would result in an indirect, long-term, minor, adverse impact on listed bat species and provide ongoing indirect, long-term, beneficial impacts for the dark-eyed junco. Direct impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on special status species in and around the project area. These actions include the Rehabilitate Cave Tour Trails Plan/EA, cave elevator repair, improvements to the cave infrastructure, and the White-Nose Syndrome Response Plan. These projects either have had or would have the potential to impact areas of Mammoth Cave that are potentially used by listed bats. Overall, increases in disturbance related to these actions would result in long-term, minor, adverse impacts and long-term, beneficial impacts on special status species. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, minor, adverse impact and the ongoing long-term, beneficial impacts described for Alternative A above, would result in long-term, minor, adverse impacts and long-term, beneficial impacts on special status species. Alternative A would contribute imperceptible adverse and imperceptible beneficial increments to this cumulative impact.

Conclusion

Overall, Alternative A would result in indirect, long-term, minor, adverse and ongoing indirect, long-term, beneficial impacts on special status species because impacts would be detectable, but would not be outside the natural range of variability on the listed bats. This alternative does not require the removal of trees within the project area that could potentially be used as roosting sites. Continued maintenance of lawn openings

in the forest canopy, as well as parking areas, provide suitable aerial foraging habitat for bats and ground foraging for the dark-eyed junco. Other past, present, and reasonably foreseeable future actions would result in long-term, minor, adverse impacts and long-term, beneficial impacts on special status species. Alternative A would contribute imperceptible adverse and imperceptible beneficial increments to this cumulative impact.

Section 7 Summary. For the reasons described above, the NPS concludes that implementation of Alternative A may affect, but is not likely to adversely affect special status species, or candidate species, or critical habitat for special status species, in or around the project area.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, improvements to the hotel facilities would include a decrease in the hotel footprint from the removal of the Heritage Trail wing, rehabilitation of the Sunset Terrace Lodge rooms, and a possible expansion of the parking adjacent to the hotel. While the maximum area of disturbance is estimated to be between 12,000 and 22,000 square feet (10,000 square feet accounted for the possible parking lot reconfiguration), most of the disturbance would occur within the footprint of existing infrastructure. Dixon Cave is a known hibernacula and is located a short distance from the Historic Entrance, but there are no anticipated impacts on any underground roost sites or hibernacula associated with the project area. Thus, Alternative B would not be expected to have any direct impact on gray and Indiana bat hibernation sites.

No known active Indiana bat roosting sites occur within the project area. With the absence of dead trees in the project area, potential roost sites for listed bats are limited to hollow trees, flaking/peeling bark and bark crevasses, and underneath branches of live trees. The possible expansion of parking adjacent to the hotel would result in the removal of maintained lawn and would avoid the removal of trees to the greatest extent

possible. Gray bats, on the other hand, prefer to roost inside caves and do not typically roost in trees. All tree removal activities would be restricted to the limits of construction during periods of time when bats are likely to be hibernating in caves, or the trees to be removed would be evaluated for potential as a roost tree and for the presence of bats prior to removal (i.e., mid-November to late April) (NPS 2007). Alternative B would not impact trees or snags along the forest edge or any trees within the large tracts of forested woodlands surrounding the hotel facilities where there is greater potential for listed bats to roost. Due to the number of available roost sites within the immediate vicinity of the project area and throughout the park in general, the reduction of potential roost site that could occur as a part of this activity would be minimal.

The hotel lodge and Heritage Trail wing maintain flat roofs and no attics. Alternative B requires the modernization/removal of these buildings. It is highly unlikely that bats would utilize these buildings for roosting because of the lack of attic space and the degree of human disturbance during the peak summer visitation period (i.e. non-hibernation period). Thus, the modifications of the buildings are not expected to impact roosting habitat for listed bats.

Indirect impacts for Alternative B may include disturbances to trees used for roosting by listed bats during daylight hours while construction activities and normal operations are ongoing. It is unlikely that the mature deciduous trees in the project area are used by roosting bats due to the level of human activity and disturbance by visitors and maintenance crews. Nevertheless, the indirect impacts on bat roosting habitat resulting from the continued operation and maintenance of the hotel facilities and grounds would continue at current levels. Disturbances to gray bats would not occur due to a lack of roosting habitat on site for this species. Indirect impacts on listed bats would also include potential changes in water quality from the project area. Any contaminants within runoff from the project area would be likely removed by stormwater management measures and/or the oil and grit separation/filtration systems before reaching the caves. In total, the level of indirect impact to roosting bats is adverse and negligible.

Alternative B would remove the Heritage Trail Wing, reconfigure and expand the parking areas providing more open space, adding to foraging habitat that could potentially be used by listed bats. Modifications to the parking areas would include night sky compliant lighting that would attract moths and other insects thereby concentrating prey opportunities for bats; however, under Alternative B, all nighttime lighting would be night sky-compliant and may attract slightly fewer insects than under Alternative A. This work is expected to provide long term, beneficial impacts on listed bats.

Impacts on special status birds and reptiles would generally be the same as for Alternative A with the exception of slight impacts on lawn habitat for the expansion of the hotel parking lot that could be used by wintering dark-eyed juncos. However, the removal of the Heritage Trail wing may restore lawn habitat for junco use. These actions would have a long-term, minor, adverse impact to juncos.

Because adverse impacts would be detectable but not outside the natural range of variability and because beneficial impacts would provide habitat for potential dark-eyed juncos, Alternative B could result in indirect, long-term, minor, adverse and indirect, long-term beneficial impacts on special status species, particularly if roosting bats and dark-eyed juncos occur within the project area, because impacts would be detectable, but would not be outside the natural range of variability. If a listed species were encountered, construction activities would be stopped and immediate consultation with the USFWS would be initiated. Direct impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on special status species in and around the project area. These actions include the Rehabilitate Cave Tour Trails Plan/EA, cave elevator repair, improvements to the cave infrastructure, and the White-Nose Syndrome Response Plan. These actions and their impacts are described under Alternative A. Overall increases in disturbance related to these actions would result in long-term, minor, adverse and long-

term beneficial impacts on special status species. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, minor, adverse and indirect, long-term beneficial impacts described for Alternative B above, would result in long-term, minor, adverse impacts and long-term, beneficial impacts on special status species. Alternative B would contribute imperceptible adverse and imperceptible beneficial increments to this cumulative impact.

Conclusion

Because adverse impacts would be detectable but not outside the natural range of variability, impacts on special status species from the modification of the hotel, Heritage Trail wing, Sunset Terrace Lodge buildings, and parking as well as any unavoidable removal of trees would have an overall indirect, long-term, minor, adverse impact on special status species. Indirect, beneficial impacts may occur to bat species with the improvements to the parking area creating more open space and lighting as an attractant to insects/ moths for foraging bats. Mitigative steps include conducting field surveys for roosting bats within trees and buildings prior to construction and/or limiting tree removal to hibernation periods. If any listed bats are observed, consultation with the U.S. Fish and Wildlife Service would be initiated. Indirect impacts on dark-eyed junco habitat would occur with the loss of lawns from the expansion of the hotel parking lot and the Sunset Terrace parking lot. However, new lawn habitat would be restored at the site of the Heritage Trail wing after demolition. Other past, present, and reasonably foreseeable future actions would result in long-term, minor, adverse and long-term, beneficial impacts on special status species. Alternative B would contribute imperceptible adverse and imperceptible beneficial increments to this cumulative impact.

Section 7 Summary. For the reasons described above, the NPS concludes that implementation of Alternative B may affect, but is not likely to adversely affect special status species, or candidate species, or critical habitat for special status species, in or around the project area.

CULTURAL LANDSCAPES

Methodology

Cultural landscapes are the result of the long interaction between people and the land, and the influence of human beliefs and actions over time upon the natural landscape. Shaped through time by historical land-use and management practices, as well as politics and property laws, levels of technology, and economic conditions, cultural landscapes provide a living record of an area's past, as well as a visual chronicle of its history. In order for a cultural landscape to be listed on or eligible for listing in the National Register, it must possess historic integrity of those features necessary to convey its significance. The character-defining features of a cultural landscape include spatial organization and land patterns, topography, vegetation, circulation patterns, water features, structures/ buildings, site furnishings, and objects. The National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation (NPS 1990) provides a comprehensive discussion of these characteristics. There has only been a partial assessment to date of the National Register eligibility of the buildings and structures within the project area, as well as the cultural landscape. The Kentucky SHPO determined that the Sunset Terrace Lodge buildings were eligible, but that the hotel lodge and Heritage Trail wing were not eligible. A Cultural Landscape Report began in 2011, is currently at 95% completion, and will be completed in 2013. This work is for the entire Mammoth Cave Core Visitor Services Area, of which the hotel is a part. The park would continue to consult with the Kentucky SHPO in relation to the identification and evaluation of the cultural landscapes within the project area. During this project the park would work to avoid impacts on cultural resources. If avoidance is not feasible the park would develop mitigations in consultation with the SHPO to reduce the impacts. As necessary and appropriate, through this consultative process, the park may develop either a Programmatic Agreement or a Memorandum of Understanding with the Kentucky SHPO.

For purposes of analyzing potential impacts on these resources, the thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** Impact(s) is at or below the lowest level of detection, with no potential for loss of integrity.
- Minor:** Alteration of a pattern(s) or feature(s) of the landscape would result in little, if any, loss of integrity of the cultural landscape.
- Moderate:** Alteration of a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the cultural landscape.
- Major:** The loss of character-defining patterns or features would result in loss of integrity of the cultural landscape, and if relevant, warrants its removal from listing in the National Register, or result in the resource becoming ineligible for listing in the National Register.

Impacts of Alternative A: No-Action

Impacts

Under this alternative, there would be no impact to the existing cultural landscape, as the existing structures, landscaping, patterns of circulation, and use would remain unchanged. The hotel's current facilities would operate as they do now. There would be no exterior modification to the Hotel Lodge building or to the Heritage Trail wing. Access to the Heritage Trail would be unchanged and there would be no modification to the trail. The parking adjacent to the hotel would remain in its current location with no change in footprint. The Sunset Terrace Lodge rooms and the associated parking would not be changed. The lawn area north of the Hotel Cottages would remain and not receive any changes.

Overall, the no-action alternative would have no impacts, direct or indirect, to the cultural landscape.

Cumulative Impacts

Although past, present, and reasonably foreseeable future actions may and have affected cultural landscapes in the area, Alternative A would have no impacts and therefore would not contribute to the effects of other actions. Consequently, there would be no cumulative impacts on cultural landscapes under Alternative A.

Conclusion

There would be no new direct impacts, indirect impacts, or cumulative impacts on cultural landscapes under Alternative A.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, a series of changes would be made to the project area. The façade of the hotel lodge could be rehabilitated, which would be more complementary to the visitor center, which was recently rehabilitated. The demolition of the Heritage Trail wing would remove a non-historic building from the cultural landscape. It is unclear how the removal of the Heritage Trail wing would impact the cultural landscape; the park is working to have this phase of the Cultural Landscape Report completed in 2014. This alternative would likely be neutral or slightly beneficial to cultural landscapes.

Circulation through and experience of the cultural landscape could be improved as visitors could more easily walk around the smaller hotel or continue to walk through it. Changes to visitor circulation could lead to alterations in visitor experience of some elements of the cultural landscape, including some sidewalk and parking lot areas, which would be removed, modified, or added in this alternative. These changes would be sensitively designed to result in a minimal change in the scale of and visual relationships among the landscape features. The sidewalk of the Sunset Terrace Lodge rooms would be altered or replaced to eliminate entryway steps and made wider to accommodate wheelchairs but would minimally impact the visual relationship with the rest of the landscape.

In addition, the parking adjacent to the hotel could be expanded and reconfigured, which could result in the removal of some lawn areas and possible removal of mature trees. Tree removal would be avoided to the greatest extent possible. According to the 95% draft of the CLR, no specimen trees exist within the project area; however, large stands of older trees, including Eastern Red Cedars are located just south of the project area (NPS 2013b). Actions under this alternative would be consistent with the treatment plan in the CLR. Overall, the topography, vegetation, and land use patterns of the cultural landscape would remain largely unaltered.

Construction activities associated with the hotel improvements would temporarily introduce non-historic visual, audible, and atmospheric elements into the setting of the hotel. Such intrusions would be short-term, lasting only as long as construction. Adverse impacts would be short-term and would not exceed the minor threshold.

Impacts would include modifications to the parking adjacent to the hotel, sidewalks, lawn areas, and buildings as part of this alternative. While the landscape uses remain largely the same, there are changes to the circulation patterns, especially with regard to the parking lots and the paths around the buildings. However the continuity of the landscape's distinctive characteristics would be retained. The landscape would still exhibit overall continuity of form, order, use, features, and materials.

Alternative B would result in direct, short-term, minor, adverse impacts on cultural landscapes during construction because the temporary presence of a construction site and its associated equipment would not result in a loss of integrity of the cultural landscape. Alternative B could also result in direct, long-term beneficial impacts if the areas of significance and contributing elements are avoided. No indirect impacts are expected.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on cultural landscapes within and around the project area. Rehabilitation of the nearby Green River ferry crossing is planned to improve the safety and reliability of the river crossing. The existing

approaches and landings would be altered and an enlarged parking area and upstream canoe landing would be constructed. In addition, implementation of the parkwide Comprehensive Trail Management Plan could result in changes to existing trails and the construction of new trails, trailheads and parking areas. Potential impacts on the park's cultural landscapes would be adverse, of minor to moderate intensity, and long-term.

As described above, implementation of Alternative B would result in long-term, minor, adverse and possible long-term, beneficial impacts on the park's core visitor services area cultural landscape. The impacts of this alternative, in combination with the long-term, minor to moderate, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, moderate, adverse cumulative impact. Alternative B would contribute a noticeable adverse increment to the cumulative impact.

Conclusion

Overall, the renovation of the hotel lodge, removal of the Heritage Trail wing, renovation of Sunset Terrace Lodge buildings, and possible expansion of the parking adjacent to the hotel lodge (which requires the use of open space and could result in the removal of trees) could keep the essential cultural landscape components intact, including major circulation, use, structures, and lawn areas. Alternative B would result in a direct, short-term, minor, adverse impact and a possible long-term, beneficial impact. Other past, present, and reasonably foreseeable future actions would result in a long-term, minor to moderate impact on cultural landscapes. Alternative B would contribute a noticeable adverse increment to the long-term, minor to moderate, adverse cumulative impact.

HISTORIC STRUCTURES

Methodology

A historic structure is defined by the NPS in Director's Order 28 as "a constructed work, usually immovable by nature or design, consciously created to serve some human act." In order for a structure or building to be listed on or to be considered eligible for listing on

the National Register, it must possess historic integrity of those features necessary to convey its significance, particularly with respect to location, setting, design, feeling, association, workmanship, and materials. For purposes of analyzing potential impacts on historic structures, the thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** Impact(s) is at or below the lowest level of detection and would not diminish the integrity of the resource.
- Minor:** Alteration of a character defining feature(s) would not diminish the overall integrity of the resources.
- Moderate:** Alteration of a character defining feature(s) would diminish the overall integrity of the resource.
- Major:** Alteration of a character defining feature(s) would result in loss of integrity of the resource, and if relevant, warrants its removal from listing on the National Register, or result in the resource becoming ineligible for listing on the National Register.

Impacts of Alternative A: No-Action

Impacts

Under this alternative, there would be no planned changes to the existing structures. The hotel's current facilities would operate as they do now. There would be no exterior modifications to the hotel lodge or to the Heritage Trail wing. Access to the Heritage Trail wing would be unchanged and there would be no modification to the trail. The Sunset Terrace Lodge rooms and the associated parking would not be changed. The park and concessioner would continue to maintain historic structures according to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

There would be no impacts, direct or indirect, on historic structures under this alternative.

Cumulative Impacts

Although past, present, and reasonably foreseeable future actions may affect historic structures in the area, Alternative A would have no new impacts on historic structures and therefore would not contribute to the effects of other actions. Consequently, there would be no cumulative impacts on historic structures under Alternative A.

Conclusion

There would be no new direct impacts, indirect impacts, or cumulative impacts under Alternative A.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, the exteriors of the 20 Sunset Terrace Lodge rooms would be rehabilitated to improve accessibility, roofs would be replaced, and improvements to heating and cooling systems would take place. These buildings are considered eligible for listing in the National Register by the SHPO, and the rehabilitation would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995). The rehabilitation of two rooms would address accessibility issues, including ADA compliant doorways, bathrooms equipped with hand rails and other necessities. The other rooms could also receive interior renovations. Sprinkler systems and new heating and cooling systems would be installed. Roofs would be replaced, and windows could be replaced or rehabilitated. Sidewalks would be replaced to comply with ADA standards. Care would be taken to ensure that the rehabilitation would minimally affect character defining spaces, materials, features, and finishes. Any materials removed during rehabilitation efforts would be evaluated to determine their value to the park's museum collections and/or for their comparative use in future preservation work at the sites. Because the rehabilitation would be undertaken in accordance with the Secretary of Interior's standards, any impacts would be beneficial.

The Heritage Trail wing would be removed, the hotel would undergo utility and critical life/safety system upgrades, sidewalks would be added or modified, the outdoor dining area could be modestly expanded, the hotel façade could be updated, and parking adjacent to the hotel lodge could be expanded and reconfigured. A previous letter from the Kentucky SHPO regarding the eligibility of the Mammoth Cave Hotel for the National Register (dated May 7, 2002) stated that the SHPO indicated that the Mammoth Cave Hotel, Gift Shop, and Restaurant are not individually eligible for the National Register. In addition, the Heritage Trail wing was also considered not eligible. The removal of the non-historic Heritage Trail wing would decrease the building footprint and would not adversely impact nearby historic structures. The buildings have been preliminarily evaluated in a Cultural Landscape Report of the Mammoth Cave Core Visitor Services Area, which is currently at 95% completion.

The parking adjacent to the hotel could be improved, and additional areas of lawn with some mature trees, which would be avoided to the greatest extent feasible, would be disturbed to reconfigure the lot. The reconfiguration and expansion by approximately 50 spaces, for a total of 240 spaces, of the parking adjacent to the hotel would improve visitor access and circulation.

The hotel lodge as an individual structure is not considered an appropriate candidate for listing in the National Register; however, renovation of the hotel's façade to match the lodge-like appearance of the renovated visitor center may eliminate and/or obscure the character of the Mission 66 structure. In doing so, the integrity of setting for the nearby pedestrian bridge connecting to the visitor center would be diminished.

The park would continue to consult with the Kentucky SHPO in relation to the identification and evaluation of the historic structures within the project area. During this project the park would work to avoid impacts on historic structures. If avoidance is not feasible the park would develop mitigations in consultation with the SHPO to reduce the impacts. As necessary and appropriate, through this consultative process, the park may develop either a

Programmatic Agreement or a Memorandum of Understanding with the Kentucky SHPO.

The overall integrity of the resources within the project area would not be diminished because the Sunset Terrace Lodge rooms would be rehabilitated consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*; the Heritage Trail wing, which would be removed, is not historic; and the hotel lodge as an individual structure is not considered an appropriate candidate for listing in the National Register. Because impacts would not result in loss of integrity of the historic structures and historical use of the structures would continue, Alternative B would have a direct, long-term, beneficial impact on historic structures. However, actions within the project area have the potential to diminish the integrity of the setting for a structure just outside the project area (the pedestrian bridge). Therefore, because impacts would also result in diminished integrity of the historic setting, Alternative B would have an indirect, long-term, moderate, adverse impact on historic structures.

Cumulative Impacts

Rehabilitation of the nearby Green River ferry crossing is planned, to improve the safety and reliability of the river crossing. The existing approaches and landings would be altered, including four Civilian Conservation Corps-era dry-laid limestone retaining walls erected during the 1930s. Impacts on historic structures would be long-term, moderate, adverse. Recent rehabilitation and development of structures within the vicinity of the project area (including reconstruction of the visitor center and hotel additions in 1992) have diminished the overall integrity of the Mission 66 era setting for remaining structures such as the pedestrian bridge between the hotel and visitor center. Overall, these actions have a long-term, moderate, adverse impact on historic structures. These reasonably foreseeable actions, when combined with the long-term, beneficial, adverse impact described above for Alternative B, would result in long-term, moderate, adverse cumulative impacts on historic structures. Alternative B would contribute a noticeable beneficial increment to this cumulative impact.

Conclusion

Overall, because the Sunset Terrace Lodge rooms would be rehabilitated consistent with the *Secretary of the Interior Standards for the Treatment of Historic Properties* and their historical use would continue, the overall integrity of the resource would not be diminished. Alternative B would have a direct, long-term, beneficial impact to historic structures. Other past, present, and reasonably foreseeable future actions would result in long-term, moderate, adverse impacts on historic structures. Alternative B would contribute a noticeable beneficial increment to the long-term, moderate, adverse cumulative impacts on historic structures.

ARCHEOLOGICAL RESOURCES

Methodology

Archeological resources are the remains of past human activity and records documenting the scientific analysis of the remains, according to Director's Order 28: Cultural Resource Management Guideline. Section 106 compliance for this project is being completed separately from this EA. For purposes of analyzing potential impacts on archeological resources, the thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** Impact is at the lowest levels of detection with no perceptible consequences.
- Minor:** Disturbance of a site(s) results in little, if any, loss of significance or integrity and the National Register eligibility of the site(s) is unaffected.
- Moderate:** Disturbance of a site(s) does not diminish the significance or integrity of the site(s) to the extent that its National Register eligibility is jeopardized.
- Major:** Disturbance of a site(s) diminishes the significance and integrity of the site(s) to the extent that it is no longer eligible to be listed in the National Register.

Impacts of Alternative A: No-Action

Impacts

Under Alternative A, there would be limited potential to impact known archeological sites through continued use of the lawns for overflow parking. Potential to similarly impact sites/resources that have not yet been identified would also exist. This alternative could potentially result in direct impacts on unknown archeological resources; possible indirect impacts would result from continued use of lawn areas in known archeological sites. Direct impacts are expected to be long-term, negligible to minor, and adverse. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past development in the park resulted in the disturbance of some archeological resources during excavation and construction activities – a minor to moderate, long-term adverse impact. Long-term impacts are considered permanent for archeological resources. Rehabilitation of the nearby Green River ferry crossing is planned to improve the safety and reliability of the river crossing. The existing approaches and landings would be altered and an enlarged parking area and upstream canoe landing would be constructed. In addition, implementation of the parkwide Comprehensive Trail Management Plan and construction of the Mammoth Cave Railroad Hike and Bike Trail could result in changes to existing or the construction of new trails, trailheads and parking areas. If archeological resources could not be avoided during construction, potential impacts on the archeological resources could be adverse, of minor to moderate intensity, and long-term.

Because impacts would be at or below the level of detection or would not result in loss of significance or integrity of the archeological resources, Alternative A could result in long-term, negligible to minor, adverse impacts on the park's archeological resources. The long-term, negligible to minor, adverse impacts of this alternative, in combination with the minor to long-term, moderate, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, moderate, adverse cumulative

impact. Alternative A would contribute an imperceptible adverse increment to the effects of the other actions.

Conclusion

Overall, this alternative could potentially result in direct, long-term, negligible to minor, adverse impacts on known archeological resources, though the full extent of potential impacts is unknown. Other past, present, and reasonably foreseeable future actions have had long-term, minor to moderate, adverse impacts on archeological resources in the area. Alternative A would contribute an imperceptible adverse increment to the effects of the other actions.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, a number of actions have the potential for direct impacts on archeological resources within the project area. Limited direct impacts could result from continued use of lawn areas for parking in and around known archeological sites. This includes the regrading and expansion of the sidewalk to the Sunset Terrace Lodge rooms, the modest expansion and reconfiguration of the outdoor dining area, new sidewalks adjacent to the hotel lodge, the possible reconfiguration and expansion of the parking adjacent to the hotel by approximately 50 spaces, and the Heritage Trail wing demolition.

Sunset Terrace Lodge room sidewalk replacement and regrading may have potential for impacts on archeological resources within 4,000 square feet of land in the project area. Hotel façade improvements, modest expansion of the outdoor dining area, and addition of sidewalks adjacent to the hotel lodge could impact any archeological resources in approximately 2,500 square feet of land surrounding the hotel lodge due to land disturbance associated with these improvements. The possible reconfiguration and expansion by approximately 50 spaces of parking adjacent to the hotel, could affect any archeological resources in approximately 10,000 square feet of land. Parking in unpaved areas would be reduced, which could indirectly benefit archaeological

resources through avoidance. The demolition of the Heritage Trail wing would reduce the concession facility footprint by approximately 5,500 square feet. Stockpile material would only be placed in designated areas to avoid sensitive areas and features.

These actions have the potential to impact several known archeological sites. Full boundary definition has not been completed on these sites because parts of both sites are under existing parking lots or roads. Systematic survey has not been completed of the area between the existing parking area adjacent to the hotel and the Hotel Cottages. Additional survey or Phase Two testing would be conducted as necessary prior to construction/soil disturbance in order to determine the presence and significance of archeological resources in proposed impact areas. While, at present, none of the sites have been fully evaluated for significance, it is likely that both parent sites would be eligible to the National Register based on their roles in the early development of the area and of the park.

The park would continue to consult with the Kentucky SHPO in relation to the identification and evaluation of the archeological resources within the project area. During this project the park would work to avoid impacts on archeological resources. If avoidance is not feasible the park would develop mitigations in consultation with the SHPO to reduce the impacts. As necessary and appropriate, through this consultative process, the park may develop either a Programmatic Agreement or a Memorandum of Agreement with the Kentucky SHPO.

Because of the uncertainty related to site boundaries and the possibility of avoidance, adverse impacts on archeological resources could range from impacts at the lowest levels of detection and barely perceptible or impacts that are measurable and perceptible but localized within a relatively small area. Indirect, long-term, beneficial impacts could result from reduced need to use grassy areas for overflow parking. Overall, Alternative B could have direct, long-term, negligible to minor, adverse impacts and an indirect, long-term, beneficial impact on archeological resources under NEPA assuming these resources could not be avoided.

Cumulative Impacts

Past development in the park resulted in the disturbance of some archeological resources during excavation and construction activities – a minor to moderate, long-term adverse impact which is described under Alternative A.

As described above, implementation of Alternative B could result in long-term, negligible to minor adverse effects to the park's archeological resources. The negligible to minor, long-term adverse impacts of this alternative, in combination with the minor to moderate long-term adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, moderate, adverse cumulative impact. Alternative B would contribute an imperceptible adverse increment to the effects of the other actions.

Conclusion

Because of the uncertainty related to site boundaries and the possibility of avoidance, impacts on archeological resources could range from impacts at the lowest levels of detection and barely perceptible or impacts that are measurable and perceptible but localized within a relatively small area. Overall, Alternative B could have direct, long-term, negligible to minor, adverse impacts and an indirect, long-term, beneficial impact on archeological resources. Other past, present, and reasonably foreseeable future actions described above have the potential for long-term, negligible to minor, adverse impacts on archeological resources. Alternative B would contribute an imperceptible adverse increment to a long-term, moderate, adverse cumulative impact.

VISUAL RESOURCES

Methodology

The existing visual environment is defined as what is seen by the visitor during the approach to the project area, as well as what is seen by the visitor within the area itself. The visual environment impacts both the anticipation and experience at these sites. The quality of the visual environment is a vital resource in relating the park-like experience of these sites and delineating them from the rest of the environment. Consistent presentation of

modern, lodge-like facilities, providing visual connections between areas of concentrated visitor activity, and providing a park-like atmosphere (providing vegetated areas and clean facilities) are all aspects of the visual quality of the area. For this section, the intensity of visual resource impacts is defined as follows:

- Negligible:** The visual quality of the project area would not be affected or the impacts would be at or below the level of detection, and the changes would be so slight that they would not be of any measurable or perceptible consequence to the visual experience.
- Minor:** Impacts on the visual quality of the project area would be detectable, although the impacts would be localized and would be small and of little consequence to the visual experience. Mitigation measures, if needed to offset adverse impacts, would be simple and likely successful.
- Moderate:** Impacts on the visual quality of the project area would be readily detectable and localized, with consequences to the visual experience. Mitigation measures, if needed to offset adverse impacts, would be extensive and likely successful.
- Major:** Impacts on the visual quality of the project area would be obvious and would have substantial consequences to the visual experience in the park and region. Extensive mitigation measures would be needed to offset any adverse impacts, and their success would not be guaranteed.

Impacts of Alternative A: No-Action

Impacts

Under the no-action alternative, no changes would be made within the project area. For visitors entering the project area, a visual disconnect between the Mammoth Cave

Hotel and the new visitor center presents itself to visitors because the two buildings contrast greatly in architectural style and era. As described in chapter 3, the new visitor center has a lodge-like appearance with stone veneers, pointed roofs, and established entrances. By comparison, the Mammoth Cave Hotel has a dated design, with a flat roofline, narrow windows, and dark brick exterior. The inconsistency in style detracts from the visual quality of the area.

Additionally, as visitors turn into the hotel area, the loading dock, HVAC unit, and dumpster at the eastern end of the hotel lodge is one of the first elements of the hotel in sight. The loading dock would continue to be partially screened by a slat fence but would continue to detract from the attractiveness of the viewshed for visitors entering the project area by not maintaining a clean, park-like presentation.

The inconsistencies in style would continue to detract from the visual quality of the area for visitors viewing the hotel from the visitor center. And there would be a limited opportunity to establish a visual connection to the visitor center from the visitor parking next to the hotel; the visual connection is blocked by the hotel lodge and the Heritage Trail wing.

The immediate viewshed from the hotel would continue to include the existing parking lot to the south (with the other hotel facilities and vegetated areas beyond) and the new visitor center and the connecting bridge to north. The Heritage Trail wing is somewhat visible to the west for visitors in the outdoor dining area and to visitors as they walk to and from the Historic Entrance of Mammoth Cave.

Inconsistent architectural styles between the hotel (outdated) and visitor center (modern), the lack of visual connections between the visitor center and the parking lot next to the hotel, and the apparent presentation of the hotel loading dock would continue to cause readily detectable impacts on visual quality within the project area, with consequences to the visual experience. Therefore, Alternative A would result in a direct, long-term, moderate, adverse impact on visual resources. No indirect impacts are anticipated.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have a cumulative impact on visual resources within the project area. These actions include the visitor center improvements. The visitor center improvements have resulted in impacts on visual resources by creating a new structure with an updated lodge-like appearance. This action is a long-term, beneficial impact on visual resources. Overall, these actions have a long-term, beneficial impact on visual resources. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, moderate, adverse impact described above for Alternative A, would result in a long-term, moderate, adverse and long-term, beneficial cumulative impact on visual resources. Alternative A would contribute an appreciable adverse increment to this cumulative impact.

Conclusion

Overall, inconsistent architectural styles between the hotel and visitor center, the lack of visual connections between the visitor center and the parking lot next to the hotel, and the hotel loading dock would continue to cause readily detectable impacts on visual quality within the project area, with consequences to the visual experience. Therefore, Alternative A would result in a direct, long-term, moderate, adverse impact on visual resources. Other past, present, and reasonably foreseeable future actions described above have resulted in a long-term, beneficial impact on visual resources. Alternative A contributes an appreciable adverse increment to a long-term, moderate, adverse and long-term, beneficial cumulative impact on visual resources.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, several actions would take place that would improve the visual quality of views into and out of the project area.

The façade of the hotel lodge could be replaced to complement the appearance of

the new visitor center, portraying a lodge-like appearance with pitched roofs and stone veneer. This would give the hotel a more modern appearance and would complement the new visitor center's architecture, thus improving visual quality for those entering the project area along Mammoth Cave Parkway or those viewing the hotel from the visitor center.

Plantings and/or structural elements such as walls or fencing would screen the loading area at the eastern end of the hotel, which is one of the first areas of the hotel that visitors see when approaching from Mammoth Cave Parkway. This would provide a cleaner, more park-like entrance to the project area.

Removal of the Heritage Trail wing would provide a direct line of site to the visitor center for some areas of the parking adjacent to the hotel, providing a visual connection between two major areas of concentrated visitor activity. The vegetation that would be visible after the removal of the Heritage Trail wing would also improve visual quality by increasing visible natural features, part of maintaining a park-like presentation. These changes would improve the visual experience to and from the Historic Entrance by presenting the hotel lodge, visitor center, and the connecting pedestrian bridge as a unified area.

The immediate viewshed from the hotel would continue to include the existing parking lot to the south (with the other hotel facilities and vegetated areas beyond) and the new visitor center and the connecting walkway to north (with a new walkway providing more intuitive access to the visitor center). The Heritage Trail wing would no longer be visible to the west for visitors in the outdoor dining area. New sidewalks, a new outdoor dining area, and possible changes to the parking lot adjacent to the hotel would alter the viewshed without noticeable impacts. As mentioned above, this may result in a slight improvement in visual quality due to the park-like presentation of this vegetated area.

Because actions would improve the visual quality of the project area and improve the visual experience both looking into and out of the project area, Alternative B would result in a direct, long-term, beneficial impact on visual resources. No indirect impacts are anticipated.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have a cumulative impact on visual resources within the project area. These actions include the visitor center improvements. The impacts associated with these actions are described above in Alternative A. Overall, these actions have a long-term, beneficial impact on visual resources. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, beneficial impact described above for Alternative B, would result in a long-term, beneficial cumulative impact on visual resources. Alternative B would contribute an appreciable beneficial increment to this cumulative impact.

Conclusion

Overall, because actions would improve the visual quality of the project area and improve the visual experience both looking into and out of the project area, Alternative B would result in a direct, long-term, beneficial impact on visual resources. Other past, present, and reasonably foreseeable future actions described above have resulted in a long-term, beneficial impact on visual resources. Alternative B contributes an appreciable beneficial increment to a long-term, beneficial cumulative impact on visual resources.

LIGHTSCAPES

Methodology

The existing lightscapes are defined as the view of the night sky from within the project area. The lightscapes impact the experience at these sites. The quality of the lightscapes is a vital resource in relating the park-like experience of these sites. For this section, the intensity of lightscapes impacts is defined as follows:

- Negligible:** No new light sources would be introduced in the night sky landscape.
- Minor:** Light sources may be introduced but would not be expected to dominate or change the night sky darkness.

Moderate: More light sources would be introduced into the landscape but would not dominate the night sky, but may diminish the quality of night sky darkness.

Major: Introduction of night light sources in locations that would represent an observable change and would potentially diminish the quality of night sky darkness.

Impacts of Alternative A: No-Action

Impacts

Under the no-action alternative, no changes would be made within the project area that would impact lightscapes. Visitors would continue to experience the relatively dark night skies that are characteristic of the park's undeveloped areas; however, lighting fixtures in and around the Mammoth Cave Hotel, Sunset Terrace Lodge, pedestrian walkways, and parking lots would all contribute to the light that distracts and/or diminishes the visitor's view of the lightscapes, especially those that are not night-sky compliant. Currently, the hotel and adjacent facilities have a variety of lighting fixtures, some that are night-sky compliant and some that are not. Because impacts due to light from the infrastructure in the project area would be readily detectable, with consequences to the lightscape, Alternative A would result in a direct long-term, moderate, adverse impact on lightscapes. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have a cumulative impact on lightscapes within the project area. These actions include the visitor center improvements. The visitor center improvements have resulted in night-sky compliant lighting being added to the visitor center. This action is a long-term, beneficial impact on lightscapes. Overall, these actions have a long-term, beneficial impact on lightscapes. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term,

moderate, adverse impact described above for Alternative A, would result in a long-term, moderate, adverse impact on lightscapes. Alternative A would contribute an appreciable adverse increment to this cumulative impact.

Conclusion

Overall, impacts on lightscapes would include the lighting from all infrastructure in the project area, which would be readily detectable. Alternative A would result in direct, long-term, moderate, adverse impacts on lightscapes. Other past, present, and reasonably foreseeable future actions described above have resulted in a long-term, minor adverse impact on lightscapes. Alternative A contributes an appreciable adverse increment to a long-term, moderate, adverse impact on lightscapes.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, the removal of the Heritage Trail wing and expansion of the parking adjacent to the hotel would impact lightscapes. Visitors would continue to experience the dark night skies that are characteristic of the park's undeveloped areas; however, lighting fixtures in and around the Mammoth Cave Hotel, Sunset Terrace Lodge, pedestrian walkways, and parking lots would all contribute to the light that distracts and/or diminishes the visitor's view of the lightscapes. The removal of the Heritage Trail wing would decrease the amount of light that distracts and/or diminishes the visitor's view of the night sky, but the expansions of the parking adjacent to the hotel would increase the amount of impacting light. Currently, the hotel and adjacent facilities have a variety of lighting fixtures, some that are night-sky compliant and some that are not. Under this alternative, all non-compliant light fixtures would be replaced. Because all outdoor lighting would be night-sky compliant and because the Heritage Trail wing would be removed, Alternative B would result in a direct, long-term, beneficial impact on lightscape. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have a cumulative impact on lightscapes within the project area. These actions include the visitor center improvements. The visitor center improvements have resulted in night-sky compliant lighting being added to the visitor center. This action is a long-term, beneficial impact on lightscapes. Overall, these actions have a long-term, beneficial impact on lightscapes. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, beneficial impact described above for Alternative B, would result in a long-term, beneficial impact on lightscapes. Alternative B would contribute an appreciable beneficial increment to this cumulative impact.

Conclusion

Overall, impacts on lightscapes would include the lighting from all infrastructures in the project area, which would be readily detectable. Alternative B would result in direct, long-term, beneficial impact on lightscapes. Other past, present, and reasonably foreseeable future actions described above have resulted in a long-term, beneficial impact on lightscapes. Alternative B contributes an appreciable beneficial increment to a long-term, beneficial impact on lightscapes.

SOCIOECONOMIC RESOURCES

Methodology

NEPA requires that economic and social impacts be analyzed in an EA when they are interrelated with natural or physical impacts. Additionally, NPS *Management Policies 2006* requires the NPS to identify any impact to socioeconomic resources when determining the feasibility of a proposed action. The proposed alternatives could result in socioeconomic impacts on the park and the surrounding communities that provide lodging and dining options to park visitors. Therefore, for the purposes of this particular analysis, the project area includes the park as well as the nearby communities of Cave City, Brownsville, Park City, and Horse Cave and considers approximately 20 years into the future.

Potential impacts on socioeconomic resources were analyzed qualitatively using information from previous park studies, alternative plans provided by the park, and public scoping. Based on this information, this section includes an evaluation of the intensity of each socioeconomic impact, or the degree to which the resource would be affected. Changes in socioeconomic conditions are measured qualitatively using employment rates and seasonality trends in and around the park, lodging occupancy rates in and around the park, and generalized contributions to the local economy. The following intensity levels have been developed for impacts on socioeconomic resources:

Negligible: The impacts on economic conditions would be at or below the level of detection and short-term. There would be no long-term impacts on the park or surrounding communities.

Minor: The impacts on economic conditions would be noticeable, short-term, and comparatively small. The impacts would be limited to the park and surrounding communities.

Moderate: The impacts on economic conditions would be readily apparent, short-term and long-term. The impacts would involve the park, surrounding communities and local area.

Major: The impacts on economic conditions would be readily apparent, short-term and long-term. The impacts would extend beyond the park, surrounding communities, and into the larger regional economy or beyond.

Impacts of Alternative A: No-Action

Impacts

Under the no-action alternative, there would be no changes to existing conditions, including concession operations and structures. Concessioners would continue to receive strong competition from hotels and

restaurants outside of the park, within Cave City and Horse Cave, Kentucky and other communities within the Cave Region. The hotel would continue to support 92 guest rooms, including the 38 Heritage Trail rooms, 4 accessible hotel rooms in the hotel lodge building, 20 Sunset Terrace Lodge rooms, 10 Hotel Cottages, and 20 Woodland Cottages.

Occupancy rates at Mammoth Cave Hotel would continue to be lower than the hotel market in the surrounding communities due, in part, to outdated facilities, and could decline over time. As described in chapter 3, the hotel lacks some of the basic amenities that may make other hotels more attractive to visitors, especially those with families. If facilities are not modernized, visitor use of concession services could decline, and hotel staff could consequently be reduced; however, visitors could choose local hotels and restaurants instead, thereby supporting local economies. Noticeable impacts on the local economies are not expected. Visitation to the area would continue to vary seasonally, with a peak in the March to October months. Additional seasonal staff may be needed to support operations during this time period.

Under Alternative A, the park would continue to operate under one-year extensions of the concession contract and continue to be out of compliance with the CMIA. Annually awarded concession contracts could impact job stability for hotel employees. Because of the absence of a long-term contract, the concessioner could choose to withdraw from the park. Continuity of visitor service provided by the concessioner would not be assured. Should a lapse in concession operations take place, there could be a temporary loss of jobs until a new concession contract could be arranged.

The hotel lodge would continue to have three food service areas and two retail areas. The convenience of the concession facilities to the visitor center would continue to draw visitors.

Because the potential for job loss if visitor use of concession services was to decline or if a lapse in concession operations were to take place and because occupancy rates may continue to lag behind other area hotels, impacts on socioeconomic resources would be noticable, short-term, and comparatively small,

as well as limited to the park and surrounding communities, Alternative A would result in direct, long-term, minor, adverse impacts on socioeconomic resources. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on socioeconomic resources in and around the Mammoth Cave Hotel. These actions include the Mammoth Cave National Park Business Plan, the Rehabilitate Cave Tour Trails Plan, Mammoth Cave Railroad Hike and Bike Trail, the opening of the Big Hollow Trail, the Comprehensive Trails Management Plan, and the Rehabilitate Green River Crossing EA/AoE. The Mammoth Cave National Park Business Plan has resulted in improved marketing efforts by the park to increase visitation. The plan specifically calls for an increase in marketing efforts associated with the Mammoth Cave Hotel. This effort has contributed to increased visitor use of concession services in three out of the last five years and, in turn, the pool of potential hotel guests. As such the Mammoth Cave National Park Business Plan would result in a long-term, beneficial impact for the park, depending on the degree of hotel marketing. The Rehabilitate Cave Tour Trails Plan would improve existing park resources, and the Mammoth Cave Railroad Hike and Bike Trail, the Big Hollow Trail, and the Comprehensive Trails Management Plan have provided additional recreational opportunities for the park in the vicinity of the Mammoth Cave Hotel. These efforts would increase park visitation, which could result in increased visitor use of concession services at the hotel. The result would be a long-term, beneficial impact to socioeconomic resources. Overall, these actions have a long-term, beneficial impact to socioeconomic resources. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, minor, adverse impacts described above for Alternative A, would result in long-term, minor, adverse and long-term, beneficial cumulative impacts on socioeconomic resources. Alternative A would contribute a noticeable adverse increment to this cumulative impact.

Conclusion

Overall, impacts on socioeconomic resources would have the potential for job loss if visitor use of concession services were to decline or if the concessioner withdrew from the park and because occupancy rates may continue to lag behind other area hotels, impacts would be noticeable, short-term, and comparatively small, as well as limited to the park and surrounding communities. Alternative A would result in a direct, long-term, minor, adverse impact on socioeconomic resources. Other past, present, and reasonably foreseeable future actions would result in long-term beneficial impacts on socioeconomic resources. Alternative A would contribute a noticeable adverse increment to the long-term, minor, adverse and long-term, beneficial cumulative impacts on socioeconomic resources.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, modernization of the hotel lodge, including possible renovations within the food service areas, would take place. In total, this alternative would remove approximately 5,500 square feet to the building footprint. The 38 Heritage Trail rooms would be removed, reducing the capacity of the hotel. The increased curb appeal of the facility could draw additional visitors to the hotel. The food service area, which currently has an inefficient layout, would be consolidated to accommodate approximately 136 seats.

The former restaurant area would become a flexible space, which could be used for a more formal dining area with set hours, an overflow area for dining during peak visitation periods, or a meeting space that could be partitioned. These partitions also could serve to close off portions of the hotel and/or dining facilities during the off-season when visitation is lower. The dining area currently known as the Crystal Lake Coffee Shop and TrogloBITES could be consolidated into one primary food and beverage area. In addition, the hotel lodge would include a complimentary breakfast area for hotel guests. This facility could increase

visitation and improve financial viability for the hotel. In particular, the meeting space would allow for an increased level of group functions at the hotel, and would target nontraditional visitors who may not otherwise consider coming into the park (i.e., business or organization functions, weddings, family reunions, etc.). Improved amenities and services also could entice visitors to stay additional nights at the hotel. Additionally, visitors to the hotel would continue to contribute to socioeconomic conditions within the project area; therefore, there would be no overall impact on socioeconomic conditions related to increased visitor use of concession services.

Alternative B would include a new 10-year concession contract for management of the hotel, allowing the park to build a long-term relationship with the concessioner and providing opportunities for them to invest in the hotel and park. Investments could include increased marketing for the hotel to attract visitors and make them aware of recent renovations. Employment rates would remain approximately the same, but there may be a shift to more seasonal employment.

Additionally, construction activities associated with Alternative B, particularly the removal of the Heritage Trail wing, would provide short-term employment opportunities for local workers. If workers are brought in from further away than the surrounding communities, they would contribute to the local economy by using local lodging, restaurant, and retail facilities. Additionally, any buildings materials and/or equipment obtained locally would benefit the economy of the surrounding communities.

In addition to the hotel, all 20 of the Sunset Terrace Lodge rooms would be remodeled under Alternative B. The remodeled rooms would be more attractive to potential visitors.

Occupancy rates would improve under Alternative B. Improvements to the concession facilities could draw more overnight visitors, thereby increasing occupancy rates at the hotel, and the removal of the Heritage Trail wing would have an immediate impact on occupancy rates because of the reduction in maximum occupancy.

Because the potential to provide more jobs during the construction period Alternative B would result in direct, short-term, beneficial impacts during construction. Because of more stable employment opportunities (albeit possibly more seasonal) and because of improved occupancy rates, Alternative B would result in direct, long-term, beneficial impacts on socioeconomic resources. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have a cumulative impact on socioeconomic resources in and around the Mammoth Cave Hotel. These actions include the Mammoth Cave National Park Business Plan, the Rehabilitate Cave Tour Trails Plan, Mammoth Cave Railroad Hike and Bike Trail, the opening of the Big Hollow Trail, the Comprehensive Trails Management Plan, and the Rehabilitate Green River Crossing EA/AoE, and the cumulative impacts associated with each are described under Alternative A. Overall, these actions have a long-term, beneficial impact on socioeconomic resources. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the short-term, beneficial and long-term, beneficial impacts described above for Alternative B, would result in short and long-term beneficial cumulative impacts on socioeconomic resources. Alternative B would contribute a noticeable beneficial increment to this cumulative impact.

Conclusion

Overall, impacts on socioeconomic resources would have the potential to create jobs during construction and provide for more stable employment opportunities (albeit possibly more seasonal) and improved occupancy rates. Alternative B would result in a direct, short-term, beneficial impact and a direct, long-term beneficial impact on socioeconomic resources. Other past, present, and reasonably foreseeable future actions would result in long-term beneficial impacts on socioeconomic resources. Alternative B would contribute a noticeable beneficial increment to the short and long-term beneficial cumulative impacts on socioeconomic resources.

VISITOR USE AND EXPERIENCE

Methodology

NPS *Management Policies 2006* states that enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks, and that the NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy parks. Past interpretive and administrative planning documents provided background on changes to visitor use and experience over time. Anticipated impacts on visitor use and experience were analyzed using information from previous studies. For this analysis, visitor use and experience includes visitor understanding and satisfaction, site access and circulation, and visual quality. Based on these findings, the following intensity levels were developed:

- Negligible:** Changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the impacts associated with the alternative.
- Minor:** Changes in visitor use and/or experience would be detectable, although the changes would be slight. The visitor would be aware of the impacts associated with the alternative, but would be unlikely to have an opinion about the changes.
- Moderate:** Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the impacts associated with the alternative and would likely be able to express an opinion about the changes.
- Major:** Changes in visitor use and/or experience would be readily apparent and would be severely adverse or exceptionally beneficial. The visitor would be aware of the impacts associated with the alternative and would likely express a strong opinion about the changes.

Impacts of Alternative A: No-Action

Impacts

Under the no-action alternative, no changes would be made to the existing facilities or services within the project area. Because of the absence of a long-term contract, the concessioner could choose to withdraw from the park. Continuity of visitor service provided by the concessioner could not be assured.

On approximately 20 days/year, limited parking would continue to result in visitors having to park in the lawn areas and roadsides near the parking adjacent to the hotel when the lots reach capacity. This inconvenience is likely to decrease visitor satisfaction and may cause safety hazards during days when the parking lot is very busy.

The pedestrian pathway between the parking adjacent to the hotel and the visitor center would remain somewhat confusing. A sidewalk that runs from the parking adjacent to the hotel to the visitor center does not exist, and visitors need to walk through the hotel along an indirect route to access the visitor center. Visitors also would continue to be presented with two very different atmospheres when walking through the relatively outdated hotel facilities when compared to the newly renovated lodge-type visitor center. These items would continue to hinder visitor understanding of how to circulate between primary areas of concentrated visitor activity (namely the parking lot, the hotel lodge, and the visitor center). A lack of understanding may decrease visitor satisfaction during their use of the project area. Impacts on the visual resources are discussed in more detail under the impact topic of Visual Resources.

The hotel would continue to provide three choices of dining venues and two retail shops. The food service areas include the Travertine Restaurant (a 164-seat full service restaurant), the Crystal Lake Coffee Shop (a 54-seat coffee shop), and the TrogloBITES (a 65-seat quick food outlet). Kentucky Home Gift Shop would continue to offer gifts and artwork, whereas The Cave Company would continue to offer typical souvenirs. These facilities would continue to provide convenient dining and retail options for park visitors. Visitor would

continue to enter the Kentucky Home Gift Shop by stairs from the lobby or through an accessible exterior door. One meeting room would be available for special events. Although visitors may enjoy having a number of options for dining and retail, the lack of accessibility of the Kentucky Home Gift Shop may decrease satisfaction for those visitors wishing to shop there but who have limited mobility.

Overnight visitors to the hotel would continue to have several options for room accommodations, including the 38 Heritage Trail rooms, the four accessible rooms located in the hotel lodge building, the 20 Sunset Terrace Lodge rooms, the 10 Hotel Cottages, and the 20 Woodland Cottages. Heritage Trail wing rooms would continue to be smaller with fewer amenities when compared to modern hotel rooms found elsewhere. Two of the Sunset Terrace Lodge rooms are relatively accessible, but not fully accessible by ADA standards. The other rooms have steps up into the facility, and none of the rooms have bathrooms with hand rails, wheelchair accessible sidewalks, or wheelchair accessible doorways. A lack of accessibility at the Sunset Terrace Lodge would continue to decrease visitor satisfaction for those visitors with limited mobility who use this area.

Because impacts on visitor use and experience would be readily apparent, including aging facilities and accessibility issues, and the visitor would be aware of the impacts associated with the alternative and would likely be able to express an opinion about the changes, Alternative A would result in a direct, long-term, moderate, adverse impact on visitor use and experience. No indirect impacts are anticipated.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on visitor use and experience in or around the project area. These actions include the Mammoth Cave National Park Business Plan, the Rehabilitate Cave Tour Trails Plan, cave elevator repair, improvements to the cave infrastructure, visitor center improvements, the rehabilitation of the amphitheater, the Comprehensive Trail Management Plan, the Mammoth

Cave Railroad Hike and Bike Trail, and the Rehabilitate Green River Ferry Crossing EA/AoE. Implementation of the Business Plan is meant to increase visitation and planning expenditures to benefit and enhance the visitor experience. As such, this action would have a long-term, beneficial impact to visitor use and experience. The Rehabilitate Cave Tour Trails Plan, cave elevator repair, the Comprehensive Trail Management Plan, the Mammoth Cave Railroad Hike and Bike Trail, and the Rehabilitate Green River Ferry Crossing EA/AoE provide enhanced trail amenities for visitors, in addition to increasing accessibility throughout the park and its trails. Improvements to the amphitheater improved accessibility for hotel guests and other park visitors. As such, these actions would have a long-term, beneficial impact to visitor use and experience. Lastly, the improvements to the cave trails and visitor center are actions that would impact the visitor experience in an improved way, providing an attractive, modern visitor center with new amenities and exhibits and improving access to the cave resources of which all visitors are eager to explore. As such, these actions would have a long-term, beneficial impact on visitor use and experience. Overall, these actions would have a long-term, beneficial impact on visitor use and experience. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, moderate, adverse impacts described above for Alternative A, would result in long-term, moderate, adverse and long-term, beneficial cumulative impacts on visitor use and experience. Alternative A would contribute an appreciable adverse increment to this cumulative impact.

Conclusion

Overall, impacts on visitor use and experience would be readily apparent, including aging facilities and accessibility issues, and the visitor would be aware of the impacts associated with the alternative and would likely be able to express an opinion about the need for changes. Alternative A would result in direct, long-term, moderate, adverse impacts on visitor use and experience. Other past, present, and reasonably foreseeable future actions described above would have a long-term, beneficial impact on visitor use and

experience. Alternative A would contribute an appreciable adverse increment to long-term, moderate, adverse and long-term, beneficial cumulative impacts on visitor use and experience.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, the concession facilities would undergo a number of changes with the potential to impact visitor use and experience within the project area. Because of the issuance of a long-term (10-year) contract, continuity of visitor service by the concessioner would be assured.

The façade of the hotel lodge could be updated to complement the new visitor center lodge-like appearance, using large timber construction. The removal of the Heritage Trail wing may provide a more direct visual connection to the visitor center from a portion of the parking area, and a sidewalk would be added along the western side of the hotel lodge providing more direct access to the Heritage Trail. These changes would improve visitor wayfinding between the visitor center and the western portion of the parking area adjacent to the hotel. Increased visitor understanding of how to move through and between areas of concentrated visitor activity would increase visitor satisfaction while using the project area. Impacts on the visual resources are discussed in more detail under the impact topic of Visual Resources.

Renovations would include reconfiguring and expanding the parking adjacent to the hotel by approximately 50 spaces, for a total of 240 spaces, to improve visitor access and circulation. This would reduce the need for visitors to park on lawn areas adjacent to the parking adjacent to the hotel during peak visitation.

The additional parking spaces would reduce the need to park in grassy areas. The removal of the Heritage Trail wing would improve visitor circulation and visual experience. All these things would improve visitor satisfaction while using the project area.

The hotel lodge would continue to offer dining and retail services; however, some modifications to these services and their associated facilities could take place at the discretion of the concessioner. Under one possible scenario, the food service area would become consolidated and located in the northeast corner of the renovated lodge. It would provide for approximately 136 seats, as well as a grab-and-go option for visitors looking for a variety of different food options to suit their needs. The Travertine Restaurant area would become a flexible space, which could be used for a more formal dining area with set hours, an overflow area for dining during peak visitation periods, or a meeting space that could be partitioned. The outdoor dining area could be modestly expanded and reconfigured to provide additional seating. These dining and retail services would be conveniently located to other park features for park visitors. Visitors would continue to have diverse options for dining and retail, and consolidation of these services could make access to them more efficient and easier to understand for first-time visitors. This would increase visitor satisfaction. System and utility upgrades and critical life/safety improvements in the hotel lodge would increase visitor comfort and safety.

The 38 Heritage Trail rooms would be demolished. Although the maximum hotel occupancy would decrease, the hotel's other, historic lodging options would be sufficient to meet projected future occupancy demands. The number of occupied room nights has decreased from over 15,000 to just above 11,000, a reduction of over 25% in occupied room nights. The higher future occupancy rate would allow concessioner staff to focus on a more concentrated area, giving them more time to focus on other visitor needs. This is expected to improve overall visitor satisfaction.

The 20 Sunset Terrace Lodge rooms would undergo interior and exterior rehabilitation. The rehabilitation of two rooms would address accessibility issues, including ADA compliant doorways, bathrooms equipped with hand rails and other necessities. Roofs would be replaced. Sprinkler systems and new heating and cooling systems would be installed. Sidewalks would be replaced or

modified to eliminate entryway steps and made wider to accommodate wheelchairs. The rehabilitation of Sunset Terrace Lodge would improve the accessibility, comfort, and safety of these rooms, which would improve visitor satisfaction for those using these rooms.

During the construction period, there may be some change in the level of service offered for retail and/or food service, which would inconvenience visitors and lead to a temporary decrease in satisfaction; however, phasing of construction would be implemented to limit impacts on visitor use and experience and concession operations and viability. Construction and demolition would be timed to limit disturbance of visitors. Alternative B would result in a short-term, moderate, adverse impact during construction and demolition because visitors would be aware of the limited services offered and noise of construction/demolition during their visit, and they would be able to voice their concerns.

Because impacts on visitor use and experience would be readily apparent, including change of service during construction and the improvement of service areas and renovation of facilities, and the visitor would be aware of the impacts associated with the alternative and would likely be able to express an opinion about the changes, Alternative B would result in a direct, short-term, moderate, adverse impact during construction and a direct, long-term, beneficial impact on visitor use and experience. No indirect impacts are anticipated.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on visitor use and experience in or around the project area. These actions include the Mammoth Cave National Park Business Plan, the Rehabilitate Cave Tour Trails Plan, cave elevator repair, improvements to the cave infrastructure, visitor center improvements, the rehabilitation of the amphitheater, the Comprehensive Trail Management Plan, the Mammoth Cave Railroad Hike and Bike Trail, and the Rehabilitate Green River Ferry Crossing EA/AoE. Impacts from each action are described above in Alternative A. Overall, these actions would have a long-term, beneficial impact

on visitor use and experience. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the short-term, moderate, adverse impact during construction and long-term, beneficial impacts described above for Alternative B, would result in short-term, moderate, adverse and long-term, beneficial cumulative impacts on visitor use and experience. Alternative B would contribute an appreciable beneficial increment to this cumulative impact.

Conclusion

Overall, impacts on visitor use and experience would be readily apparent, including change in service during construction, demolition, and improvement of facilities and services, and the visitor would be aware of the impacts associated with the alternative and would likely be able to express an opinion about the changes. Alternative B would result in direct, short-term, moderate, adverse and direct, long-term, beneficial impacts on visitor use and experience. Other past, present, and reasonably foreseeable future actions described above would have a long-term, beneficial impact on visitor use and experience. Alternative B would contribute an appreciable beneficial increment to the short-term, moderate, adverse and long-term, beneficial cumulative impacts on visitor use and experience.

OPERATIONS AND INFRASTRUCTURE

Methodology

Impact analyses are based on the current description of operations and infrastructure presented in this document. As noted above, operations and infrastructure includes quality of effectiveness of the infrastructure and the ability to maintain the infrastructure used in the operation of the park in order to adequately protect and preserve vital resources and provide for an effective and safe visitor experience. Operations and infrastructure also include a discussion of appropriate staff to maintain the site and employee safety at the site. The thresholds of change for the intensity of this impact are defined as follows:

Negligible: Operations and infrastructure would not be affected, or the impacts would be at or below

levels of detection and would not have a noticeable impact on operations and infrastructure.

Minor: The impact would be detectable and would have a noticeable impact on operations and infrastructure. If mitigation was needed to offset adverse impacts, it would be simple and likely successful.

Moderate: The impacts would be readily apparent and would result in a substantial change in operations and infrastructure in a manner noticeable to staff and the public. If mitigation measures are necessary to offset adverse impacts, they would likely be successful.

Major: The impacts would be readily apparent, would result in a substantial change in park infrastructure in a manner noticeable to staff and the public, and be markedly different from existing operations and infrastructure. If mitigation measures are necessary to offset adverse impacts, they would be extensive, and their success could not be guaranteed.

Impacts of Alternative A: No-Action

Impacts

Under Alternative A, existing operations and infrastructure would remain unchanged. The concessioner would continue to be responsible for maintenance of the hotel buildings. Temporary, short-term (one-year) concession contracts would continue to be issued annually until a new contract is prepared, providing little no motivation for the concessioner to make property improvements. The park would continue to maintain the existing parking lots.

The hotel lodge would continue to house three food service areas and two retail facilities at their existing level of service. Overnight visitors to the hotel would

continue to have several options for room accommodations, including the 38 Heritage Trail rooms, the four accessible hotel rooms located in the hotel lodge building, the 20 Sunset Terrace Lodge rooms, the 10 Hotel Cottages, and the 20 Woodland Cottages.

Room size would continue to be smaller than industry standard and dated in the Heritage Trail wing. Accessibility levels would remain at existing levels. Providing redundant services may maintain some level of inefficiency in current hotel operations. Existing utilities and systems would be maintained as needed and would therefore continue to be outdated and energy inefficient as a whole.

Because impacts on operations and infrastructure, such as those resulting from continual use of outdated utility and critical life/safety systems and from insufficient infrastructure that does not meet park needs, are detectable, yet of a magnitude that would not have a noticeable impact on operations and infrastructure, Alternative A would result in direct, long-term, moderate, adverse impacts on operations and infrastructure. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and a cumulative impact on operations and infrastructure in or around the project area. These actions include the visitor center improvements, the Mammoth Cave National Park Business Plan, the Rehabilitate Cave Tour Trails Plan/EA, elevator repair, improvements to the cave infrastructure, the Comprehensive Trail Management Plan, the Mammoth Cave Railroad Hike and Bike Trail, and the White-Nose Syndrome Response Plan. All three actions would develop or improve existing infrastructure for greater operational efficiency. Overall, these actions would have a long-term, beneficial impact on operations and infrastructure. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term, minor, adverse impacts described above for Alternative A, would result in long-term, moderate, adverse impacts and long-term, beneficial impacts on operations and

infrastructure. Alternative A would contribute a noticeable adverse increment to this cumulative impact.

Conclusion

Overall, continued issues with operations and infrastructure would cause inefficiency and reduce desirability of the hotel, and these impacts would be detectable, yet of a magnitude that would not have a noticeable impact on operations and infrastructure. Alternative A would result in a direct, long-term, moderate, adverse impact on operations and infrastructure. Other past, present, and reasonably foreseeable future actions would result in a long-term, beneficial impact on operations and infrastructure. Alternative A would contribute a noticeable adverse increment to long-term, beneficial and long-term, moderate, adverse cumulative impacts on operations and infrastructure.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, a number of improvements to the hotel infrastructure would take place in order to improve existing facilities and infrastructure and to increase efficiency of operations and thereby increase financial viability of the concession contract. The concessioner would be responsible for maintenance of the hotel buildings, and a long-term (10-year) concession contract would be issued to encourage the concessioner to make property improvements. The parking adjacent to the hotel could be expanded by approximately 50 spaces if funding becomes available.

The hotel lodge utilities and critical life/safety systems would be upgraded to current standards. The modernization would increase the building's energy efficiency. Critical life/safety systems would be modernized, as well, including sprinklers. Two new walkways, one along the west side of building and one from the hotel bridge to the top of the Historic Entrance Road, would be added.

The hotel lodge would continue to house dining and retail facilities. The new 10-year concession contract would provide more reliable park operations. Dining facilities could be reconfigured to reduce redundancy and improve efficiency. Under one possible scenario, one primary dining area would be located in the northeast corner of the lodge. The former restaurant area would become a flexible space, which could be used for a more formal dining area with set hours, an overflow area for dining during peak visitation periods, or a meeting space that could be partitioned.

The removal of the Heritage Trail wing is projected to increase future occupancy rates substantially to higher occupancy rates than the Cave Region, making the concession contract more financially viable. Additionally, the concessioner energy use is projected to decrease by 50% as a result of a more efficient HVAC system and the reduction of over 11,000 square feet of interior space. Decreased impervious surface from the hotel footprint reduction by approximately 5,500 square feet would decrease stormwater runoff. Runoff would continue to flow into the oil and grit separation/filtration systems, which were designed to handle additional capacity of water run-off, so the additional impervious surface from the potential expansion of parking adjacent to the hotel would still be well within the capacity of these systems.

The Sunset Terrace Lodge rooms would undergo exterior rehabilitation including sidewalks to improve accessibility and new roofs. New HVAC would be installed, interior renovation would be completed, and utility and critical life/safety systems would be installed or upgraded. The existing Heritage Trail wing would be demolished, which would allow park and concessioner staff to focus their efforts on other facilities.

Because impacts from hotel renovations that would improve infrastructure and management efficiency of the hotel and its operations would be readily apparent and would result in a substantial change in operations and infrastructure in a manner noticeable to staff and the public, Alternative B would have a direct, long-term, beneficial impact on operations and infrastructure. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have a cumulative impact on operations and infrastructure in or around the project area. These actions include the visitor center improvements, the Mammoth Cave National Park Business Plan, the Rehabilitate Cave Tour Trails Plan/EA, elevator repair, improvements to the cave infrastructure, the Comprehensive Trail Management Plan, the Mammoth Cave Railroad Hike and Bike Trail, and the White-Nose Syndrome Response Plan and are described under Alternative A. Overall, these actions would have a long-term, beneficial impact on operations and infrastructure. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the long-term beneficial impacts described above for Alternative B, would result in long-term, beneficial impacts on operations and infrastructure. Alternative B would contribute an appreciable beneficial cumulative increment to this cumulative impact.

Conclusion

Overall, hotel renovations that would improve efficiency of the hotel and its operations would be readily apparent and would result in a substantial change in operations and infrastructure in a manner noticeable to staff and the public. Alternative B would result in a direct, long-term, beneficial impact on operations and infrastructure. Other past, present, and reasonably foreseeable future actions described above would have a long-term, beneficial impact on operations and infrastructure. Alternative B would contribute an appreciable beneficial increment to a long-term, beneficial cumulative impact on operations and infrastructure.

ENERGY CONSERVATION AND CONSERVATION POTENTIAL

Methodology

In order to assess impacts on energy conservation and conservation potential within the project area, general descriptions of the energy use and conservation of the area were reviewed. Predictions about short- and long-term site impacts were based on recent

studies and on projects of a similar nature and on state and local requirements for energy conservation. The thresholds for the intensity of an impact are defined below.

Negligible: Impacts on energy conservation and conservation potential would be below or at the lower levels of detection.

Minor: The impacts on energy conservation and conservation potential would be detectable and small. Mitigation may be needed to offset adverse impacts and would be relatively simple to implement and likely be successful.

Moderate: The impacts on energy conservation and conservation potential would be readily apparent and result in a change in energy use or conservation. Mitigation measures would be necessary to offset adverse impacts and likely be successful.

Major: The impacts on energy conservation and conservation potential would be readily apparent and would substantially change the character of energy use in and out of the park. Mitigation measures to offset adverse impacts would be needed, extensive, and their success could not be guaranteed.

Impacts of Alternative A: No-Action

Impacts

Under the no-action alternative, no changes would be made to the existing concession facilities. The park would continue to strive to incorporate the principles of sustainable design and development into all facilities and park operations. The park also would continue to encourage suppliers, permittees, and contractors to follow sustainable practices.

Hotel facilities, including outside lighting, utilities, and other elements would continue to consume relatively the same amount of energy in the park. Current hotel and facility utility systems, primarily the heating and cooling systems, were installed in the mid-1960s and were only be repaired or upgraded as needed. In 2010, the Mammoth Cave Hotel (comprised of the hotel lodge and Heritage Trail wing) used 1,037,100 kwh of electricity and 18,952 gallons of fuel oil. In 2010, the 20 Sunset Terrace Lodge used 126,673 kwh of electricity. This usage would remain relatively stable under this alternative. These existing systems would remain inefficient compared to today's standards.

In addition, the overall facilities of the hotel area would remain outdated and inefficient. Windows, insulation, and other building materials are outdated compared to energy efficient materials used today, so energy use would remain high and inefficient.

Because impacts on energy conservation and conservation potential would be readily apparent and because there would be no change in energy use and the utility systems would remain substandard, Alternative A would result in direct, long-term, moderate, adverse impacts on energy conservation and conservation potential. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have a cumulative impact on energy conservation and conservation potential in and around the project area. These actions include the Visitor Center Improvements. The Visitor Center Improvements updated the current utility systems that provide for the building, and used new buildings materials in the center renovations. Improvements included a large bank of solar panels and a large tank to store rain/water for reuse in restrooms. In the implementation of the improvements, energy use became more efficient in the building. These improvements have long-term, beneficial impacts on energy conservation and conservation potential. Overall, these actions would have a long-term, beneficial impact

on energy conservation and conservation potential. The impacts of other past, present, and reasonably foreseeable future actions, when combined with the long-term, moderate, adverse impact described above for Alternative A, would result in long-term, moderate, adverse impacts and long-term, beneficial impacts on energy conservation and conservation potential. Alternative A would contribute a noticeable adverse increment to this cumulative impact.

Conclusion

Overall, impacts on energy conservation and conservation potential would be readily apparent, since there would be no change in energy use and the utility systems would remain substandard. Alternative A would result in a direct, long-term, moderate, adverse impact on energy conservation and conservation potential. Other past, present, and reasonably foreseeable future actions would result in long-term, beneficial impacts on energy conservation and conservation potential. Alternative A would contribute a noticeable adverse increment to long-term, moderate, adverse and long-term, beneficial cumulative impacts on energy conservation and conservation potential.

Impacts of Alternative B: Renovate Concession Facilities (NPS Preferred)

Impacts

Under Alternative B, a number of improvements to the hotel infrastructure would take place in order to increase efficiency of energy use at the park. The park would continue to strive to incorporate the principles of sustainable design and development into all facilities and park operations. The park also would continue to encourage suppliers, permittees, and contractors to follow sustainable practices.

The hotel lodge would undergo mechanical systems and utilities. Building materials used would be up-to-date and energy efficient. The utility systems in the hotel lodge and Sunset Terrace Lodge buildings would be modernized and meet today's efficiency standards and would thereby increase the buildings' energy efficiency. The existing

systems are inefficient compared to today's standards, and modernization would result in energy efficiency. The removal of the Heritage Trail wing and upgrades to the utilities in the hotel lodge and Sunset Terrace Lodge are projected to reduce the concession operations heating fuel, propane, electricity, and water usage by 50% (NPS 2013b).

Equipment and worker vehicles operated during construction would use fossil fuels. This increased fuel consumption would be temporary and would cease at the end of the construction activity. The marginal increases in fossil fuel use resulting from construction are not expected to have any major impacts on energy resources.

Because there would be increased energy use and fuel consumption during construction, but a change in energy use or conservation since utility systems would become more efficient, Alternative B would result in direct, short-term, negligible, adverse impacts on energy conservation and conservation potential during construction and direct, long-term, beneficial impacts on energy conservation and conservation potential. Indirect impacts are considered highly unlikely.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have a cumulative impact on energy conservation and conservation potential in and around the project area. These actions include the Visitor Center Improvements. The impacts are described above under Alternative A. These improvements have long-term, beneficial impacts on energy conservation and conservation potential. Overall, these actions would have a long-term, beneficial impact on energy conservation and conservation potential. The impacts of these other past, present, and reasonably foreseeable future actions, when combined with the short-term, negligible, adverse construction impact and long-term, beneficial impact described above for Alternative B, would result in long-term, beneficial impacts on energy conservation and conservation potential. Alternative B would contribute an appreciable beneficial increment to this cumulative impact.

Conclusion

Overall, an increase in energy conservation would take place under this alternative, with a temporary increase in energy use during construction, resulting in a change in energy use and conservation. Alternative B would result in a direct, short-term, negligible, adverse impact during construction and a direct, long-term, beneficial impact on energy conservation and conservation potential. Other past, present, and reasonably foreseeable future actions would result in long-term, beneficial impacts on energy conservation and conservation potential. Alternative B would contribute an appreciable beneficial increment to long-term, beneficial cumulative impacts on energy conservation and conservation potential.

5 CONSULTATION AND COORDINATION

NPS Director's Order 12 requires the NPS to make "diligent" efforts to involve the interested and affected public in the NEPA process. This process, known as scoping, helps to determine the important issues and eliminate those that are not; allocate assignments among the interdisciplinary team members and/or other participating agencies; identify related projects and associated documents; identify other permits, surveys, consultations, etc. required by other agencies; and create a schedule that allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made. This chapter documents the scoping process for the proposed action, identifies future compliance needs and permits, and includes the list of preparers for the document.

THE SCOPING PROCESS

The scoping process is initiated at the beginning of a NEPA project to identify the range of issues, resources, and alternatives to address in the EA. Typically both internal and public scoping is conducted to address these elements. State and federal agencies were also contacted in order to uncover any additional planning issues and to fulfill statutory requirements. The planning process for the proposed action was initiated during the internal, agency, and public scoping in the spring of 2010. This process introduced the purpose and need of the project and potential actions that could be included with the hotel improvements. Discussions with interested agencies and individuals were initiated at this time.

Internal Scoping

An internal scoping meeting to discuss the project was held on February 17, 2010, with the purpose of discussing the details of the predesign, discussing the EA for the improvements, and determining relevant

planning issues to consider during the development and evaluation of alternatives for the project.

In April 2010, a design charrette was held where NPS staff (park, regional, Washington, D.C. level) established the initial alternatives for improving the concession facilities: renovate the existing facilities; demolish existing facilities and build new facilities; and develop a combination of renovation and rebuild. Later, on August 24-26, 2010, a VA meeting was held to further define and evaluate the alternatives for hotel improvements. The VA process is defined by NPS DO-90 as "an organized team effort directed at analyzing the functions of facilities, processes, systems, equipment, services, and supplies for the purpose of achieving essential functions at the lowest life-cycle cost consistent with required performance, reliability, quality, safety, and achievement of NPS mission priorities." The three action alternatives were considered to be the most advantageous options for improving hotel facilities, and initial analysis of these alternatives were carried forth in a draft EA, developed internally over the next year.

Considering the high project cost (\$11 million) of the NPS preferred alternative in 2011 and following additional discussion with the NPS Development Advisory Board, the planning team spent 2012 and early 2013 reconsidering the purpose of and need for the project and revising the alternatives that would be most advantageous options for improving hotel facilities under this revised project purpose and restricted funding. The park was directed to prioritize basic concession improvements with an overall gross construction cost of less than \$6 million. The planning team undertook an additional VA processes on December 11-13, 2012. From this process, the action alternative considered in this document was identified as the most advantageous option for improving hotel facilities.

All National Park Service units are facing reduced funding and challenging financial circumstances. At this time, Mammoth Cave National Park has identified the available funding for improvements to its concession facility to be estimated at \$3.4 million.

Some of the actions listed in Alternative B would be undertaken in the coming years, while some do not have a funding source at this time.

The purpose of an environmental assessment is to consider the impacts of planned management actions. All potential alterations to the concession facilities were evaluated in this document to clear the way for future actions.

Funded actions include: upgrade to utilities and mechanical systems; demolition of the Heritage Trail wing; and renovation of Sunset Terrace Lodge.

As funding becomes available, the park would add approximately 50 spaces to the parking area adjacent to concession facilities, renovate the food and beverage facilities, update the exterior façade of the hotel lodge, and construct or modify walkways, plazas, green spaces, and/or building interiors to improve visitor access and circulation.

Public Scoping

The March 2010 edition of the park's newsletter, *The Flashlight*, the NPS issued a press release announcing a public scoping meeting on March 16th to discuss potential improvements to the Mammoth Cave Hotel. On March 16, 2010, the NPS hosted a public scoping meeting in the Rotunda Room in the Mammoth Cave Hotel. Thirty-seven members of the public attended. The meeting, formatted as an open house, included a tour of the hotel. Throughout the meeting, NPS staff introduced potential concepts for improving the hotel and solicited written input from the public. This meeting began the 30-day period during which the park received written comments, both online and by mail, ending on April 16, 2010. In addition, the NPS sent out a letter on March 22, 2010 to 68 randomly selected hotel guests who visited the park in 2009. The letter informed them of the current planning efforts and opportunity to comment.

A total of 29 comments were received, mostly on the park's comment form, which separated the issues of concern identified by park staff. The public was asked to rank services, amenities, and facilities from most important to least important in terms of their visits to Mammoth Cave Hotel. Lodging and room amenities were ranked as the most important entity. Food and beverage services and upgraded utilities, heating/cooling systems were ranked 2 and 3, respectively. The last ranked service was conference and event facilities.

Agency Consultation

The NPS initiated scoping with multiple relevant agencies early in the planning process. The park sent agency consultation letters to the Kentucky DEP, the Kentucky SHPO, the Advisory Council on Historic Preservation, and the USFWS. These letters were sent on May 19, 2010. A formal response was received from the USFWS (Appendix A) citing the potential impacts on the gray bat, Indiana bat, and Rafinesque's big-eared bat. The letters sent by the park are included in Appendix A for reference.

Additionally, a previous letter from the Kentucky SHPO regarding the eligibility of the Mammoth Cave Hotel for the National Register (dated May 7, 2002) was used in development of this EA. There has only been a partial assessment to date of the National Register eligibility of the buildings and structures, as well as the cultural landscape. The Kentucky SHPO determined the Sunset Terrace Lodge buildings were eligible, but that the hotel and Heritage Trail wing were not eligible. The park is completing a Cultural Landscape Report of the Mammoth Cave Core Visitor Services Area, which includes the entire project area. The park will continue to consult with the Kentucky SHPO in relation to the identification and evaluation of the cultural resources within the project area. During this project the park would work to avoid impacts on cultural resources. If avoidance is not feasible the park would develop mitigations in consultation with the SHPO to reduce the impacts. As necessary and appropriate, through this consultative process, the park may develop either a Programmatic Agreement or a Memorandum

of Agreement with the Kentucky SHPO. Agency consultation and coordination will resume when relevant agencies are provided with this EA when it is released to the public.

Tribal Consultation

The park sent letters to representatives of the seven tribes who may be interested in the project. These tribes include the Shawnee Tribe, Cherokee Nation, Chickasaw Nation, the East Shawnee Tribe of Oklahoma, the Eastern Band of Cherokee, and the United Keetoowah Band of Cherokee, and the Absentee-Shawnee Tribe of Oklahoma. The letters were sent on May 19, 2010. No formal responses were received; therefore, the letters sent by the park are included in Appendix A. The park will provide the tribes with a copy of this document and will continue to coordinate with them as the project moves forward. Tribal consultation and coordination will resume when tribes are provided with this EA when it is released to the public.

FUTURE COMPLIANCE NEEDS/ PERMITS

Implementation of the NPS preferred alternative would require that the NPS coordinate with relevant agencies to ensure compliance with all relevant federal, state, and local regulations. Actions include coordination with the USFWS and SHPO.

The park will continue to consult with the Kentucky SHPO in relation to the identification and evaluation of the cultural resources within the project area. During this project the park would work to avoid impacts on cultural resources. If avoidance is not feasible the park would develop mitigations in consultation with the SHPO to reduce the impacts. As necessary and appropriate, through this consultative process, the park may develop either a Programmatic Agreement or a Memorandum of Understanding with the Kentucky SHPO.

The NPS preferred alternative also would require a National Pollutant Discharge Elimination System permit. The Kentucky Department for Environmental Protection, Division of Water is delegated by EPA as the Kentucky water pollution control agency and is responsible for the implementation of federal and state water pollution control laws and regulations.

LIST OF PREPARERS AND CONTRIBUTORS

This document was prepared by Vanasse Hangen Brustlin, Inc. (VHB) with input from staff at Mammoth Cave National Park, the NPS Denver Service Center, and the NPS Southeast Regional Office.

TABLE 4. LIST OF PREPARERS AT VANASSE HANGEN BRUSTLIN, INC.

Name	Position	Role
Tricia Wingard	Project Manager	Guidance of NEPA process; document review; and project management
Tracy Hamm	Environmental Planner	Document preparation; natural resources review and analysis
Diane Ditzel	Environmental Planner	Document preparation; natural resources review and analysis
Mariah Murphy	Environmental Planner	Document preparation; natural resources review and analysis
Kimberly Threlfall	Environmental Planner	Natural resources review and analysis
Carol Weed	Senior Archeologist	Cultural resource review and analysis
Chris Senfield	Environmental Scientist	Natural resource review and analysis
Vikrant Desai	Project Engineer	Project layout and design confirmation
Margaret Beavers	Environmental Scientist	Graphics and GIS analysis

Contributors and Reviewers

TABLE 5. LIST OF CONTRIBUTORS AND REVIEWERS

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Sarah Craighead	Superintendent
Steve Kovar	Chief of Maintenance (Facility Management)
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NPS Denver Service Center	
Jon Mitchell	Project Manager (current)
Lydia Creager	Project Manager (2009-2011)
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Tommy Jones	Former Regional 106 Coordinator
Tracy Stakely	Former Branch Chief, Cultural Landscapes
Christine Arato	Former Senior Historian

PUBLIC REVIEW

The EA will be on formal public and agency review for 30 days and has been distributed to a variety of interested individuals, agencies, and organizations. It also is available on the internet at <<http://parkplanning.nps.gov/macac>>, and hard copies are available at the park's visitor center, Mammoth Cave Hotel, Office of the Superintendent, the Cave City Convention Center, and the Edmonson County Public Library.

REFERENCES

Allaback, Sarah, Ph.D.

- 2000 Mission 66 Visitor Centers: The History of a Building Type U.S. Department of the Interior, National Park Service, Cultural Resources Stewardship and Partnerships, Park Historic Structures and Cultural Landscapes Program, Washington, D.C.

Britzke, E. R., M. J. Harvey, and S. C. Loeb

- 2003 Indiana bat, *Myotis sodalis*, maternity roosts in the southern United States. Southeastern Naturalist 2:235-242.

Capital Hotel Management (CHM)

- 2009a Mammoth Cave Hotel – Baseline Report. National Park Service. Mammoth Cave National Park. June 15, 2009.
- 2009b Summary Findings from CHM Project Team: Mammoth Cave Hotel, Mammoth Cave National Park, Kentucky. March 12, 2009.
- 2009c Preliminary Partial Draft Mammoth Cave - Franchise Fee Analysis. National Park Service. Mammoth Cave National Park. October 23, 2009.

Center for Biological Diversity

- 2013 Eastern small-footed bat. Available online at: <http://www.biologicaldiversity.org/species/mammals/eastern_small-footed_bat/natural_history.html>. Accessed October 1, 2013.

Cornell Laboratory of Ornithology

- 2013 Bewick's Wren. Available online at: http://www.allaboutbirds.org/guide/Bewicks_Wren/lifehistory. Accessed on September 30, 2013.

Eastern Kentucky University

- 2011 Rafinesque's big-eared bat (*Corynorhinus rafinesquii*). Website <http://www.biology.eku.edu/bats/rafbat.html> accessed on June 7, 2011.
- 2013a Evening Bat (*Nycticeius humeralis*). Available online at: <http://biology.eku.edu/bats/eveningbat.html>. Accessed September 30, 2013.
- 2013b Southeastern myotis (*Myotis austroriparius*). Available online at: <http://biology.eku.edu/bats/semyotis.html>. Accessed September 20, 2013

Environmental Protection Agency (EPA)

- 2011 Region 4 National Maps of Air Quality Non-Attainment Areas . Available online at: <http://www.epa.gov/region4/air/naaqs/naaqs.htm>

Erdle, S. Y., and C. S. Hobson

- 2001 Current status and conservation strategy for the eastern small-footed myotis (*Myotis leibii*). Natural Heritage Technical Report # 00-19. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA. 17 pp + appendices.

- Fernald, M. L.
1950 *Gray's Manual of Botany*, 8th Edition. Dioscorides Press, Portland, Oregon.
- Jacobs Engineering Group Inc.
2009 Executive Summary – Real Property Analysis: Mammoth Cave National Park (Condition Assessment)
- Kentucky Department of Fish and Wildlife Resources (KDFWR)
2013a Kentucky's Bald Eagles. Available online at: <http://fw.ky.gov/baldeaglenesting.asp> Accessed on September 30, 2013.
- 2013b Eastern Slender Glass Lizard. Available online at: http://www.kentuckyawake.org/Eastern_Slender_Glass_Lizard. Accessed on September 30, 2013>.
- 2013c "Species Information: County observation(s) for *Pituophis melanoleucus melanoleucus*." Available online at: <http://fw.ky.gov/kfwis/speciesInfo/speciesListCounty.asp?strScientificName=Pituophis+melanoleucus+melanoleucus&strGroup=-1>. Accessed November 17, 2013.
- 2013d "Species Information: County observation(s) for *Eumeces inexpectatus*." Available online at: <http://fw.ky.gov/kfwis/speciesInfo/speciesListCounty.asp?strScientificName=Eumeces+inexpectatus&strGroup=-1>. Accessed November 17, 2013.
- 2013e "Species Information: County observation(s) for *Elaphe guttata*." Available online at: <http://fw.ky.gov/kfwis/speciesInfo/speciesListCounty.asp?strScientificName=Elaphe+guttata&strGroup=-1>. Accessed November 17, 2013.
- 2013f "Species Information: County observation(s) for *Ophisaurus attenuatus longicaudus*." Available online at: <http://fw.ky.gov/kfwis/speciesInfo/speciesListCounty.asp?strScientificName=Ophisaurus+attenuatus+longicaudus&strGroup=-1>. Accessed November 17, 2013.
- 2013g "Species Information: County observation(s) for *Lampropeltis triangulum elapsoides*." Available online at: <http://fw.ky.gov/kfwis/speciesInfo/speciesListCounty.asp?strScientificName=Lampropeltis+triangulum+elapsoides&strGroup=-1>. Accessed November 17, 2013.
- Lucas, J. S.
2009 Roost selection by Rafinesque's big-eared bats (*Corynorhinus rafinesquii*) in Congaree National Park – a multiscaled approach. M.S. Thesis. Clemson University. 47pp.
- Mammoth Cave Hotel
2011 Mammoth Cave Hotel Website. Available online at: www.mammothcavehotel.com. Accessed March 14, 2011.
- Medley, M. E.
1993 An annotated catalog of the known or reported vascular flora of Kentucky. Ph.D. dissertation. University of Louisville. Louisville, Kentucky (as cited in USDA-NRCS Plants Database <http://plants.usda.gov/>. Accessed June 2010).
- Meiman, J., C. Grovers, and S. Hernstein
2009 In-Cave Dye Tracing and Drainage Basin Divides in the Mammoth Cave Karst Aquifer, Kentucky. U.S. Geological Survey Karst Interst Group Proceedings, Water-Resources Investigations Report 01-4011, p 179-185.

Menzel, M. A., J. M. Menzel, W. M. Ford, J. W. Edwards, T. C. Carter, J. B. and Churchill, J. C. Kilgo
2001 Home range and habitat use of male Rafinesque's big-eared bats
(*Corynorhinus rafinesquii*). American Midland Naturalist,
Vol. 45, No. 2. p. 402-408.

National Geographic Society

2006 Complete Birds of North America. Jonathan Alderfer, ed. National
Geographic, Washington, DC. 696pp.

National Park Service (NPS)

- 1983 *Mammoth Cave National Park General Management Plan.*
- 1990 National Register Bulletin 15: How to Apply the National Register Criteria
for Evaluation.
- 2000 National Register Bulletin 36: Guidelines for Evaluating and
Registering Archeological Properties
- 2001 Director's Order 12: *Conservation Planning, Environmental Impact Analysis,
and Decision-making.*
- 2002 Director's Order 28: *Cultural Resource Management.*
- 2003a *Mammoth Cave National Park Business Plan.*
- 2003b *Mammoth Cave National Park Long-Range Interpretive Plan.*
- 2006 *Management Policies 2006.*
- 2007a Comprehensive Trail Management Plan/EA.
- 2007b *Biological Assessment: Fiscal Year 2007 Prescribed Fire Plan,*
Mammoth Cave National Park, Kentucky.
- 2008a *Night Skies and Phtotic Environment Resource Summary:* Mammoth
Cave National Park. Natural Sounds & Night Skies Division
- 2008b *Rehabilitate Green River Ferry Site Analysis Study.* Mammoth Cave
National Park.
- 2009a *Rehabilitate Cave Tour Trails Plan/Environmental Assessment.*
- 2011 *White-Nose Syndrome Response Plan*
- 2013a NPS Stats Website. Annual Park Visitation Report. Available online at: < [http://
www.nature.nps.gov/stats/](http://www.nature.nps.gov/stats/)>
- 2013b *Mammoth Cave National Park Core Visitor Services Area Cultural Landscape
Report, 95% draft, Southeast Regional Office.*

National Resource Conservation Service (NRCS)

2011 Web Soil Survey. Available online at: <<http://websoilsurvey.nrcs.usda.gov/>>

NatureServe

2013 *Junco hyemalis.* Available online at: [http://www.natureserve.org/explorer/
servlet/NatureServe?searchName=Junco+hyemalis+](http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Junco+hyemalis+) Accessed on
September 30, 2013.

New Jersey Division of Fish and Wildlife (NJDFW)

- 2009 Status Assessment of the Northern Pine Snake (*Pituophis m. melanoleucus*) in New Jersey: An Evaluation of Trends and Threats. New Jersey Department of Environmental Protection, Trenton, NJ. 53pp.

Ohio Department of Natural Resources

- 2013 Sedge Wren. Available online at: http://www.dnr.state.oh.us/Home/species_a_to_z/SpeciesGuideIndex/sedgewren/tabid/6925/Default.aspx. Accessed on September 30, 2013.

Palmer-Ball, B. L.

- 1996 *The Kentucky Breeding Bird Atlas*. University Press of Kentucky.

Prentice, Guy.

- 1993 *Archeological Overview and Assessment of Mammoth Cave National Park*.| Volumes I and II. Tallahassee, Florida: Southeast Archeological Center, National Park Service.

Rice, C. L.

- 2009 Roosting ecology of *Corynorhinus Rafinesquii* (Rafinesque's big-eared bat) and *Myotis austroriparius* (Southeastern myotis) in tree cavities found in a northeastern Louisiana bottomland hardwood forest streambed. M. S. Thesis. Department of Biology, University of Louisiana at Monroe. 117pp.

Savannah River Ecology Laboratory (SREL)

- 2013a Corn snake (*Elaphe [Pantherophis] guttata*). Available online at: <http://srelherp.uga.edu/snakes/elagut.htm>. Accessed on September 30, 2013.
- 2013b Eastern glass lizard (*Ophisaurus ventralis*). Available online at: <http://srelherp.uga.edu/lizards/ophven.htm>. Accessed on September 30, 2013.
- 2013c Scarlet kingsnake/Eastern milksnake (*Lampropeltis triangulum*). Available online at: <http://srelherp.uga.edu/snakes/lamtri.htm>. Accessed on September 30, 2013.
- 2013d Southeastern five-lined skink (*Eumeces [Plestiodon] inexpectus*). Available online at: <http://srelherp.uga.edu/lizards/eumine.htm>. Accessed on September 30, 2013.

Stevenson, C. L.

- 2008 Availability and seasonal use of diurnal roosts by Rafinesque's big-eared bat and southeastern myotis in bottomland hardwoods of Mississippi. M.S Thesis. Department of Wildlife and Fisheries, Mississippi State University. 109pp.

Stevenson, D. E. and M. D. Tuttle

- 1981 Survivorship in the endangered gray bat (*Myotis grisescens*). Journal of Mammalogy 62:244-257.

Texas Tech University

- 2011 Rafinesque's big-eared bat. Website <http://www.nsrl.ttu.edu/tmoti/plecrafi.htm>. Access on June 7, 2011.

Trousdale, A. W. III

- 2008 Roosting ecology of Rafinesque's big-eared bat, *Corynorhinus rafinesquii*, in southeastern Mississippi. Ph. D. Thesis. University of Southern Mississippi. 120pp.

Tuttle, M. D.

- 1979 Status, causes of decline, and management of endangered gray bats. *Journal of Wildlife Management* 43:1-17.

University of Idaho Park Studies Unit

1998-2012c

Mammoth Cave National Park Visitor Survey Card Data Reports.
University of Idaho Park Studies Unit Visitor Survey Card Project.

- 2006 Mammoth Cave National Park Visitor Study. University of Idaho Park Studies Unit Visitor Services Project Report 177.

- 2012a Mammoth Cave National Park Dining Experience. 2012 Commercial Services Data Report.

- 2012b Mammoth Cave National Park Lodging Experience. 2012 Commercial Services Data Report.

U.S. Census Bureau

2007-2011

American Community Survey 5-Year Estimates, U.S. Census Bureau website (<http://factfinder.census.gov/>). Accessed March 2011.

U. S. Fish and Wildlife Service (USFWS)

- 1976 Federal Register. 41 FR 41914.

- 1993 Price's potato bean (*Apios priceana*) Recovery Plan. U.S. Fish and Wildlife Service, Southeast Region. Atlanta, GA. 45pp.

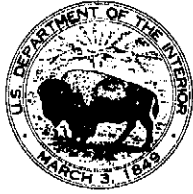
- 2007 Indiana bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 258 pp.

- 2011 Rafinesque's big-eared bat. Website
<http://www.fws.gov/southwest/refuges/texas/trinityriver/Docs/Rafinesquebats.pdf>. Accessed June 7, 2011

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APPENDIX A: RELEVANT CORRESPONDENCE

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United States Department of the Interior

NATIONAL PARK SERVICE

Mammoth Cave National Park

P.O. Box 7

Mammoth Cave, Kentucky 42259-0007

IN REPLY REFER TO:

L7619

May 19, 2010

Mr. Larry Taylor
Kentucky Department for Environmental Protection
300 Fair Oaks Lane
Frankfort, KY 40601

Re: Improvements at Mammoth Cave Hotel
Mammoth Cave National Park

Dear Mr. Taylor:

The National Park Service is initiating the preparation of a combined Environmental Assessment/Assessment of Effect (EA/AoE) for proposed improvements to the Mammoth Cave Hotel, Mammoth Cave National Park, Kentucky. The document is being prepared under the provisions of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act. The combined document will be prepared in accord with the regulations of the Advisory Council on Historic Preservation and its guidance for combined documents contained at 36 CFR §800.8(c).

The Mammoth Cave Hotel was constructed in the 1960s in a style that corresponded to that of the visitor center. The visitor center is now under renovation, and the Mammoth Cave Hotel is in need of a similar upgrade to the facility and its appearance to better meet visitor needs. In the EA/AoE, the park is considering several basic facilities needs to be addressed via rehabilitation, new construction, or a combination of both: utilities; food service areas; lobby, registration, and visitor flow; gift shops; Heritage Trail guest rooms; and an exterior to match the visitor center design.

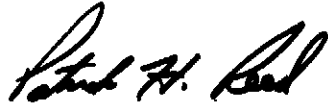
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To provide information to you on this project, we have enclosed a Mammoth Cave Hotel Handout. The project area is depicted on the enclosed section of the Mammoth

Cave, Kentucky USGS Quadrangle. Materials describing the project are also located on the park's public comment website at <http://parkplanning.nps.gov/maca>.

We appreciated your assistance with this project. If you have any initial input or questions regarding the project, please contact Ken Kern, Management Assistant, at 270-758-2187 or Ken_Kern@nps.gov.

Sincerely,

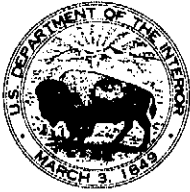
A handwritten signature in black ink, appearing to read "Patrick H. Reed". The signature is fluid and cursive, with the first name "Patrick" being more prominent.

Patrick H. Reed
Superintendent

Enclosures

cc:

Connie Chitwood, NPS-DSC
Tricia Wingard, VHB



United States Department of the Interior

NATIONAL PARK SERVICE

Mammoth Cave National Park

P.O. Box 7

Mammoth Cave, Kentucky 42259-0007

IN REPLY REFER TO:

L7619

May 19, 2010

Mr. Mark Dennen

Executive Director and State Historic Preservation Officer

300 Washington Street

Frankfort, Kentucky 40601

Re: Improvements at Mammoth Cave Hotel
Mammoth Cave National Park

Dear Mr. Dennen:

The National Park Service is initiating the preparation of a combined Environmental Assessment/Assessment of Effect (EA/AoE) for improved visitor services at the Mammoth Cave Hotel, Mammoth Cave National Park, Kentucky. The document is being prepared under the provisions of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act. The combined document will be prepared in accord with the regulations of the Advisory Council on Historic Preservation and its guidance for combined documents contained at 36 CFR §800.8(c).

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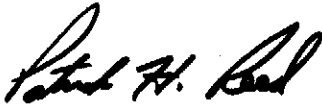
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contain an assessment of effect for all cultural resources potentially affected by the proposed project.

To provide information to your agency on this project, we have enclosed a Mammoth Cave Hotel Handout. The project area is depicted on the enclosed section of the Mammoth Cave, Kentucky USGS Quadrangle. Materials describing the project are also located on the park's public comment website at <http://parkplanning.nps.gov/macac>.

We appreciate the long and positive working relationship the park has enjoyed with your office and look forward to your continued participation in the current project. If you have any initial input or questions regarding the project, please contact Ken Kern, Management Assistant, at 270-758-2187 or Ken_Kern@nps.gov.

Sincerely,

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Patrick H. Reed
Superintendent

Enclosures

cc:

Connie Chitwood, NPS-DSC
Tricia Wingard, VHB



IN REPLY REFER TO:

L7619

May 19, 2010

United States Department of the Interior

NATIONAL PARK SERVICE

Mammoth Cave National Park

P.O. Box 7

Mammoth Cave, Kentucky 42259-0007

Mr. John M. Fowler, Executive Director
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue NW, Suite 803
Old Post Office Building
Washington, DC 20004

Re: Improvements at Mammoth Cave Hotel
Mammoth Cave National Park

Dear Mr. Fowler:

The National Park Service is initiating the preparation of a combined Environmental Assessment/Assessment of Effect (EA/AoE) for improved visitor services at the Mammoth Cave Hotel, Mammoth Cave National Park, Kentucky. The document is being prepared under the provisions of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act. The combined document will be prepared in accord with the regulations of the Advisory Council on Historic Preservation and its guidance for combined documents contained at 36 CFR §800.8(c).

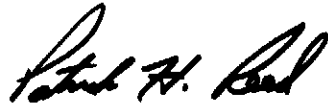
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This letter serves as notification that we have begun the compliance process and are proposing to have an EA/AoE available for public and regulatory review in late 2010. The planning process and documentation will be used for compliance with both NEPA and Section 106 of the National Historical Preservation Act of 1966, as amended, and will contain an assessment of effect for all cultural resources potentially affected by the proposed project.

To provide information to you on this project, we have enclosed a Mammoth Cave Hotel Handout. The project area is depicted on the enclosed section of the Mammoth Cave, Kentucky USGS Quadrangle. Materials describing the project are also located on the park's public comment website at <http://parkplanning.nps.gov/maca>.

We appreciated your assistance with this project. If you have any initial input, require additional information or have questions regarding, please contact Ken Kern, Management Assistant, at 270-758-2187 or Ken-Kern@nps.gov. We look forward to hearing from you.

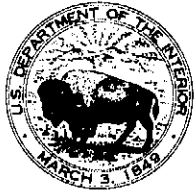
Sincerely,

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Patrick H. Reed
Superintendent

cc:

Connie Chitwood, NPS-DSC
Tricia Wingard, VHB



United States Department of the Interior

NATIONAL PARK SERVICE

Mammoth Cave National Park
P.O. Box 7
Mammoth Cave, Kentucky 42259-0007

IN REPLY REFER TO:

L7619

May 18, 2010

Mr. Lee Andrews
Field Supervisor
U.S. Fish and Wildlife Service
Kentucky Ecological Services Field Office
J.C. Watts Federal Building, Room 265
330 West Broadway
Frankfort, Kentucky 40601

Dear Mr. Andrews:

The National Park Service is preparing an Environmental Assessment (EA) for proposed improvements to the Mammoth Cave Hotel, Mammoth Cave National Park, Kentucky. The document will be prepared under the provisions of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act, and in accord with the regulations of the Advisory Council on Historic Preservation.

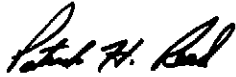
The Mammoth Cave Hotel was constructed in the 1960s in a style that corresponded to that of the Visitor Center. The Visitor Center is now under renovation, and the Mammoth Cave Hotel is in need of a similar upgrade to the facility and its appearance. In the EA, the park is considering several basic facilities needs to be addressed via rehabilitation, new construction, or a combination of both: utilities; food service areas; lobby, registration, and visitor flow; gift shops; Heritage Trail guest rooms; and an exterior to match the Visitor Center design.

This letter serves as notification that we have begun the compliance process and are proposing to have an EA available for public and regulatory review in late 2010. This letter also serves as a record that the NPS is initiating informal consultation with your agency pursuant to the requirements of the 1973 Endangered Species Act, as amended, and NPS *Management Policies 2006*. As part of the scoping for this project, we request any information regarding listed or proposed threatened or endangered species or critical habitats that might occur in the project vicinity, and any special management considerations for such species. We would also like to solicit comments related to the development of an Environmental Assessment (EA) for the project.

To provide information to your agency on this project, we have enclosed a Mammoth Cave Hotel handout. The project area is depicted on the enclosed section of the Mammoth Cave, Kentucky USGS Quadrangle. Materials describing the project are also located on the park's public comment website at <http://parkplanning.nps.gov/macac>.

We appreciate the long and positive working relationship the park has enjoyed with your office and look forward to your continued participation in the current project. If you have any initial input or questions regarding the project, please contact Ken Kern, Management Assistant, at 270-758-2187 or Ken_Kern@nps.gov.

Sincerely,

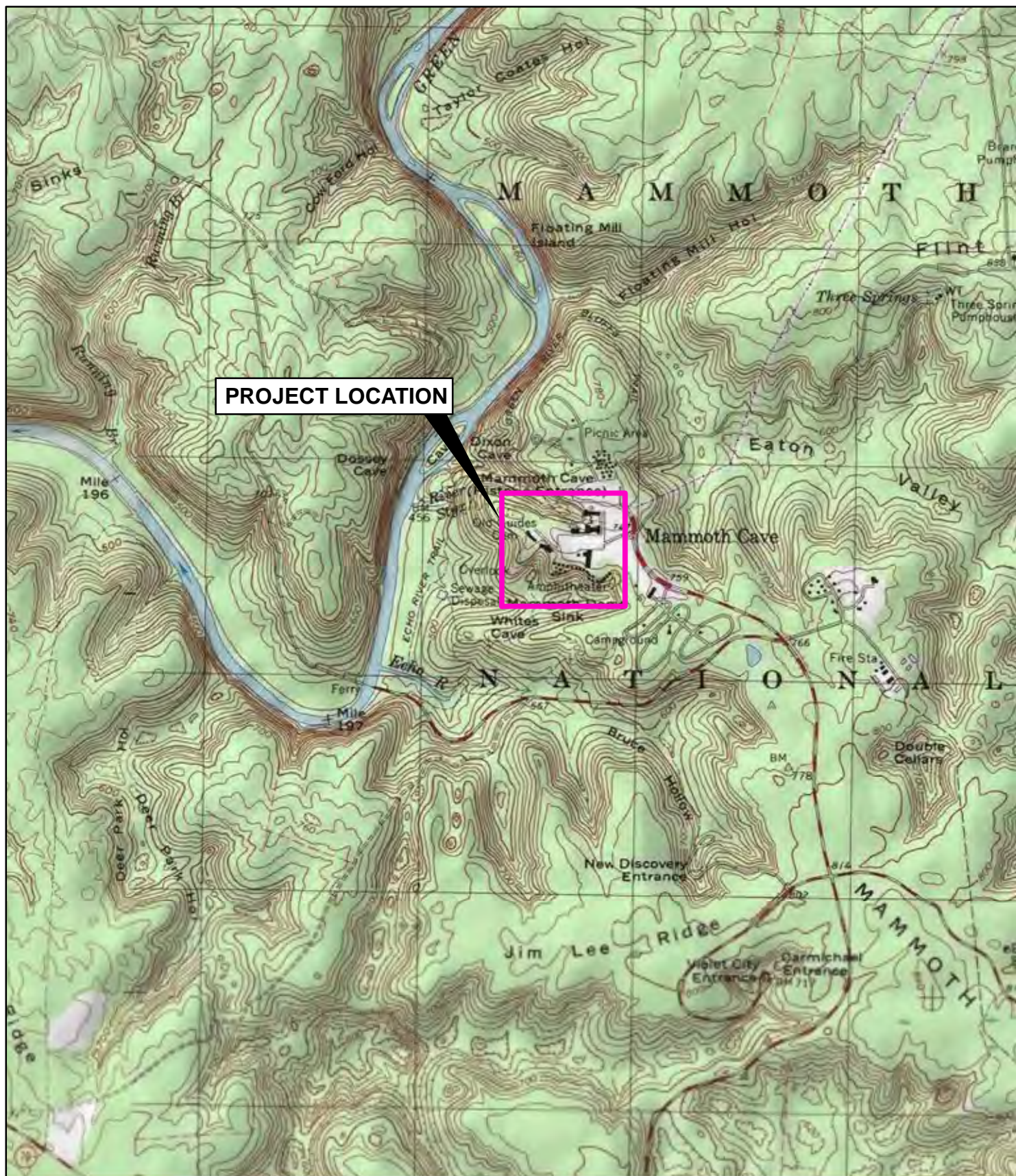


Patrick H. Reed
Superintendent

Enclosures

cc:

Connie Chitwood, NPS-DSC



Source: USGS 7.5 minute Mammoth Cave, Kentucky Quadrangle

Mammoth Cave National Park

Mammoth Cave, Kentucky



0 1,000 2,000
Feet

Project Location Map



Mike_Armstrong@fws.gov
07/20/2010 08:19 AM

To Ken_Kern@nps.gov
cc Lee_Andrews@fws.gov
bcc
Subject FWS#10-B-0648; Comments on MCNP Proposed
Improvements to Mammoth Cave Hotel

Dear Mr. Kern:

The Frankfort, KY Field Office of the U.S. Fish and Wildlife Service has reviewed the subject project in accordance with the Endangered Species Act (ESA) and Fish and Wildlife Coordination Act (FWCA). Your staff has requested any information regarding listed or proposed threatened or endangered species or critical habitats that might occur in the project vicinity, and any special management considerations for such species. According to our records and based on our review of the subject proposal, the only federally listed threatened, endangered, or candidate species known to occur within the proposed project area and may be affected by the proposed project are the federally endangered Indiana bat and gray bat, and Rafinesque big-eared bat. As you are finalizing the proposed action, you should recognize that any building or other structure may be used as a roost for one or more of these bat species. An inspection of the structures should take place prior to any modifications to ensure that adverse affects do not occur.

The comments provided above have been submitted electronically (e-mail) to expedite processing of the subject application(s). These comments have been discussed and approved by Mr. Virgil Lee Andrews, Jr., Field Supervisor and therefore should be considered the comments of the Service and Kentucky Field Office. We appreciate the opportunity to provide input on the proposed project(s). If you have any questions on this comment letter or its contents, please contact me at (502) 695-0468, Ext. 101.

Mike Armstrong
Acting Field Supervisor
U.S. Fish and Wildlife Service
J.C. Watts Federal Building, Room 265
330 W. Broadway
Frankfort, Kentucky 40601
502-695-0468
502-229-4632 (cell)
502-695-1024 (fax)



Education, Arts and Humanities Cabinet

KENTUCKY HERITAGE COUNCIL

The State Historic Preservation Office

Paul E. Patton

Governor

Marlene M. Helm

Cabinet Secretary

David L. Morgan

Executive Director and

SHPO

May 7, 2002

Mr. Ronald R. Switzer
Superintendent
Mammoth Cave National Park
P.O. Box 7
Mammoth Cave, Kentucky 42259

Dear Mr. Switzer:

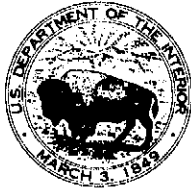
As identified in Appendix B of the Mammoth Cave National Park Programmatic Agreement, the Mammoth Cave Hotel, Gift Shop, and Restaurant are not eligible for the National Register of Historic Places. Even considering construction dates within the Mission 66 Period, these structures do not meet eligibility requirements under "The National Register Criteria For Evaluation." These structures were not designed by a prominent architect and have not obtained historic significance within the last 50 years, and therefore, do not meet the "exception criteria" for eligibility consideration.

Additionally, we concur with your assessment that the Maple Springs Road is not eligible for the National Register of Historic Places, either as a cultural landscape or as a structure. This road is identified as a "spur" in two Appendix B listings, i.e. Cade and Good Spring Church roads. Due to modifications since the 1970's, we believe the loss of integrity would prevent this route from being considered eligible.

If you have questions, please feel free to call Thomas Sanders of my staff at (502) 564-7005, ext. 118.

Sincerely,

David L. Morgan
Kentucky State Historic
Preservation Officer



IN REPLY REFER TO:

L7619

May 19, 2010

United States Department of the Interior

NATIONAL PARK SERVICE

Mammoth Cave National Park

P.O. Box 7

Mammoth Cave, Kentucky 42259-0007

Chairman Ron Sparkman
Shawnee Tribe
Post Office Box 189
Miami, Oklahoma 74355

Re: Improvements at Mammoth Cave Hotel
Mammoth Cave National Park

Dear Chairman Sparkman:

The National Park Service is initiating the preparation of a combined Environmental Assessment/Assessment of Effect (EA/AoE) for improved visitor services at the Mammoth Cave Hotel, Mammoth Cave National Park, Kentucky. The document is being prepared under the provisions of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act. The combined document will be prepared in accord with the regulations of the Advisory Council on Historic Preservation and its guidance for combined documents contained at 36 CFR §800.8(c).

The Mammoth Cave Hotel was constructed in the 1960s in a style that corresponded to that of the visitor center. The visitor center is now under renovation, and the Mammoth Cave Hotel is in need of a similar upgrade to the facility and its appearance to better meet visitor needs. In the EA/AoE, the park is considering several basic facilities needs to be addressed via rehabilitation, new construction, or a combination of both: utilities; food service areas; lobby, registration, and visitor flow; gift shops; Heritage Trail guest rooms; and an exterior to match the visitor center design.

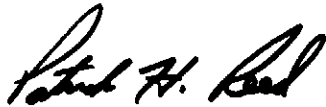
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To provide information to you on this project, we have enclosed a Mammoth Cave Hotel Handout. The project area is depicted on the enclosed section of the Mammoth

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We appreciated the long and positive working relationship the park has enjoyed with your office and look forward to your continued participation and assistance with this project. If you have any initial input, require additional information or have questions regarding, please contact Ken Kern, Management Assistant, at 270-758-2187 or Ken-Kern@nps.gov. We look forward to hearing from you.

Sincerely,

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Patrick H. Reed
Superintendent

Enclosures

cc:

Connie Chitwood, NPS-DSC
Tricia Wingard, VHB



United States Department of the Interior

NATIONAL PARK SERVICE

Mammoth Cave National Park

P.O. Box 7

Mammoth Cave, Kentucky 42259-0007

IN REPLY REFER TO:

L7619

May 19, 2010

Principal Chief Chadwick Smith
Cherokee Nation
Post Office Box 948
Tahlequah, Oklahoma 74465

Re: Improvements at Mammoth Cave Hotel
Mammoth Cave National Park

Dear Principal Chief Smith:

The National Park Service is initiating the preparation of a combined Environmental Assessment/Assessment of Effect (EA/AoE) for improved visitor services at the Mammoth Cave Hotel, Mammoth Cave National Park, Kentucky. The document is being prepared under the provisions of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act. The combined document will be prepared in accord with the regulations of the Advisory Council on Historic Preservation and its guidance for combined documents contained at 36 CFR §800.8(c).

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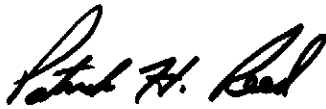
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Patrick H. Reed
Superintendent

Enclosures

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Connie Chitwood, NPS-DSC
Tricia Wingard, VHB



United States Department of the Interior

NATIONAL PARK SERVICE

Mammoth Cave National Park

P.O. Box 7

Mammoth Cave, Kentucky 42259-0007

IN REPLY REFER TO:

L7619

May 19, 2010

Governor Bill Anoatubby
Chickasaw Nation
Post Office Box 1548
Ada, Oklahoma 74821

Re: Improvements at Mammoth Cave Hotel
Mammoth Cave National Park

Dear Governor Anoatubby:

The National Park Service is initiating the preparation of a combined Environmental Assessment/Assessment of Effect (EA/AoE) for improved visitor services at the Mammoth Cave Hotel, Mammoth Cave National Park, Kentucky. The document is being prepared under the provisions of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act. The combined document will be prepared in accord with the regulations of the Advisory Council on Historic Preservation and its guidance for combined documents contained at 36 CFR §800.8(c).

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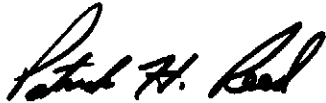
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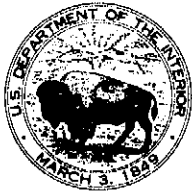
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Patrick H. Reed
Superintendent

Enclosures

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Connie Chitwood, NPS-DSC
Tricia Wingard, VHB



United States Department of the Interior

NATIONAL PARK SERVICE

Mammoth Cave National Park

P.O. Box 7

Mammoth Cave, Kentucky 42259-0007

IN REPLY REFER TO:

L7619

May 19, 2010

Chief Glenna J. Wallace
Eastern Shawnee Tribe of Oklahoma
Post Office Box 350
Seneca, Missouri 64865

Re: Improvements at Mammoth Cave Hotel
Mammoth Cave National Park

Dear Chief Wallace:

The National Park Service is initiating the preparation of a combined Environmental Assessment/Assessment of Effect (EA/AoE) for improved visitor services at the Mammoth Cave Hotel, Mammoth Cave National Park, Kentucky. The document is being prepared under the provisions of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act. The combined document will be prepared in accord with the regulations of the Advisory Council on Historic Preservation and its guidance for combined documents contained at 36 CFR §800.8(c).

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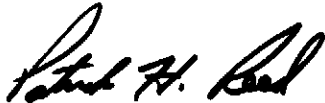
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Patrick H. Reed
Superintendent

Enclosures

cc:

Connie Chitwood, NPS-DSC
Tricia Wingard, VHB



United States Department of the Interior

NATIONAL PARK SERVICE

Mammoth Cave National Park

P.O. Box 7

Mammoth Cave, Kentucky 42259-0007

IN REPLY REFER TO:

L7619

May 19, 2010

Principal Chief Michell Hicks
Eastern Band of Cherokee Indians
Post Office Box 455
Cherokee, North Carolina 28719

Re: Improvements at Mammoth Cave Hotel
Mammoth Cave National Park

Dear Principal Chief Hicks:

The National Park Service is initiating the preparation of a combined Environmental Assessment/Assessment of Effect (EA/AoE) for improved visitor services at the Mammoth Cave Hotel, Mammoth Cave National Park, Kentucky. The document is being prepared under the provisions of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act. The combined document will be prepared in accord with the regulations of the Advisory Council on Historic Preservation and its guidance for combined documents contained at 36 CFR §800.8(c).

The Mammoth Cave Hotel was constructed in the 1960s in a style that corresponded to that of the visitor center. The visitor center is now under renovation, and the Mammoth Cave Hotel is in need of a similar upgrade to the facility and its appearance to better meet visitor needs. In the EA/AoE, the park is considering several basic facilities needs to be addressed via rehabilitation, new construction, or a combination of both: utilities; food service areas; lobby, registration, and visitor flow; gift shops; Heritage Trail guest rooms; and an exterior to match the visitor center design.

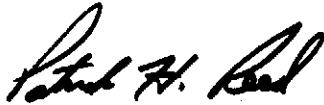
This letter serves as notification that we have begun the compliance process and are proposing to have an EA/AoE available for public and regulatory review in late 2010. The planning process and documentation will be used for compliance with both NEPA and Section 106 of the National Historical Preservation Act of 1966, as amended, and will contain an assessment of effect for all cultural resources potentially affected by the proposed project.

To provide information to you on this project, we have enclosed a Mammoth Cave Hotel Handout. The project area is depicted on the enclosed section of the Mammoth

Cave, Kentucky USGS Quadrangle. Materials describing the project are also located on the park's public comment website at <http://parkplanning.nps.gov/maca>.

We appreciated the long and positive working relationship the park has enjoyed with your office and look forward to your continued participation and assistance with this project. If you have any initial input, require additional information or have questions regarding, please contact Ken Kern, Management Assistant, at 270-758-2187 or Ken-Kern@nps.gov. We look forward to hearing from you.

Sincerely,

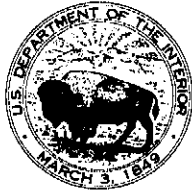
A handwritten signature in black ink, appearing to read "Patrick H. Reed". The signature is fluid and cursive, with the first name "Patrick" being more prominent.

Patrick H. Reed
Superintendent

Enclosures

cc:

Connie Chitwood, NPS-DSC
Tricia Wingard, VHB



United States Department of the Interior

NATIONAL PARK SERVICE

Mammoth Cave National Park
P.O. Box 7
Mammoth Cave, Kentucky 42259-0007

IN REPLY REFER TO:

L7619

May 19, 2010

Chief George Wickliffe
United Keetoowah Band of Cherokee Indians
Post office Box 746
Tahlequah, Oklahoma 74465

Re: Improvements at Mammoth Cave Hotel
Mammoth Cave National Park

Dear Chief Wickliffe:

The National Park Service is initiating the preparation of a combined Environmental Assessment/Assessment of Effect (EA/AoE) for improved visitor services at the Mammoth Cave Hotel, Mammoth Cave National Park, Kentucky. The document is being prepared under the provisions of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act. The combined document will be prepared in accord with the regulations of the Advisory Council on Historic Preservation and its guidance for combined documents contained at 36 CFR §800.8(c).

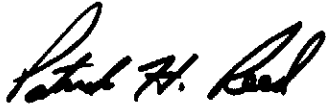
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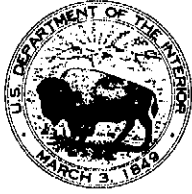
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Superintendent

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Tricia Wingard, VHB



United States Department of the Interior

NATIONAL PARK SERVICE

Mammoth Cave National Park

P.O. Box 7

Mammoth Cave, Kentucky 42259-0007

IN REPLY REFER TO:

L7619

May 19, 2010

Governor Scott Miller
Absentee-Shawnee Tribe of Indians of Oklahoma
2025 South Gordon Cooper Drive
Shawnee, Oklahoma 74801

Re: Improvements at Mammoth Cave Hotel
Mammoth Cave National Park

Dear Governor Miller:

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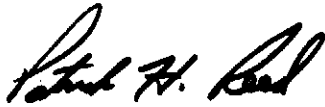
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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical 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