



## Public Scoping Open House

# Welcome!

The public scoping comment period for the cave and karst management plan/environmental assessment (plan/EA) is open through April 13, 2018. There are several ways to provide input on the plan/EA:

- **Fill out a comment card today**
- **Submit comments online:**  
<http://parkplanning.nps.gov/MACA>  
(preferred method)
- **Submit written comments:**  
Mammoth Cave National Park  
c/o Cave and Karst Management Plan  
P.O. Box 7  
Mammoth Cave, KY 42259





## Purpose and Need

The purpose of this plan is to provide a consistent framework for managing the world-class cave and karst resources in the park and working cooperatively with partners within the broader Mammoth Cave Area International Biosphere Reserve. The plan will provide direction to protect and conserve the park's complex and sensitive resources through the use of science to promote stewardship and understanding. A plan is needed to address:

- 1) resource protection issues, particularly those related to visitation, research, and/or resulting from aboveground activities that can impact cave resources below ground; and
- 2) sustainable public enjoyment and education.

**Karst** – A landscape that is formed primarily by the dissolution of soluble rocks (typically limestone or dolomite) and is characterized by the presence of caves, sinkholes, sinking streams, springs, and subterranean rivers.

**Biosphere** – An area that has been designated by the United Nations Man and the Biosphere Program as a unique landscape, possessing a high diversity and/or unique population of plants, animals, and micro-organisms. Management of this area strives to balance these biological resources and their associated sustainable use.







## Key Issues the Plan Needs to Address

**Integrity of Cave Environment** – Mammoth Cave National Park faces numerous issues related to the condition of its natural systems and the overall cave environment. Air flow, temperature, relative humidity, and condensation can affect cave conditions, natural and cultural resources, and park infrastructure. Cave atmospheric conditions are also altered by visitor activities, surface activities, and changing climate. Visitors, cave management, and construction activities can introduce or promote growth of foreign biota (e.g., growth of algae near cave lighting). Some cave trails, particularly those with a dirt surface, are prone to dust production, which impacts natural and cultural resources in certain areas. Cave use by visitors, park staff, cooperators, and researchers, have cumulative effects on the cave's natural and cultural resources.

**Cave and Karst Restoration** – The park is pursuing approaches for deciding how to appropriately restore caves to protect their natural and cultural resources.

**Water Quality, Quantity, and Flow** – Activities adjacent to and within park boundaries (i.e., industry, agriculture, infrastructure development, transportation corridors, etc.) can threaten water quality, which affects sensitive karst formation and cave habitats, including threatened and endangered species. Changes to surface and groundwater quantity and flow regimes connected to dams, development, and oil and gas production can also disrupt habitats and affect cultural resources found within the park's caves.

**Administrative Guidance and Actions** – The park is striving for updated management guidelines, best practices, and standard operating procedures related to several management activities, including permitting (research and special park uses); maintenance; educating visitors; orienting new park staff and contractors to best management practices; gating cave passages; and exploration and discovery protocols.

**Appropriate Access and Use** – The park is challenged to provide adequate opportunities for visitors, researchers, and staff to experience cave resources in a sustainable, appropriate manner. With increasing visitation, it becomes more difficult to meet visitor demand. Current cave use and tour routes may be unable to meet future visitation levels in a manner that provides a meaningful visitor experience and adequate resource protection. Challenging topics related to this issue include:

- Tour size, seasonality, variety, and frequency.
- Providing adequate visitor facilities within the cave.
- Maintaining a safe environment for visitors and staff.
- Resource protection.
- Park-sponsored, large-scale special events.
- Cave zoning and acceptable uses in caves.
- Gating caves as appropriate to control non-authorized visitation.
- Evaluating requests of non-NPS special-use permits for activities in the caves.





## Proposed Action

The Cave and Karst Management Plan will evaluate the natural and cultural resource conditions and visitor experiences within the underground cave and karst systems of Mammoth Cave National Park to help define the desired future conditions and appropriate uses.

This plan will include the following actions:

- Clarify park policies to protect cave and karst resources while providing an appropriate level of access.
- Develop management strategies to address resource protection and restoration of degraded cave and karst resources.
- Ensure adequate safety for people accessing caves, while recognizing some people desire an experience that is more challenging and some research activities carry inherent risks.
- Develop monitoring methods using sound science to ensure quality visitor experiences and protection of the sensitive cave and karst resources.
- Develop visitor use management strategies that seek to balance increasing visitation and resource protection in a fiscally responsible manner.
- Include a compilation of management policies, practices and actions related to resource protection, physical security, safety, operations and maintenance.





# Resource Protection Actions Common to All Action Alternative Concepts

The following resource protection actions serve as examples of the types of strategies and activities that are considered common to all action alternative concepts:

- Restore/rehabilitate/modify natural or man-made cave entrances for resource protection and visitor access. The following are possible actions that would be considered:
  - Modify ventilation shafts and boreholes to manage water flow and airflow changes.
  - Install gates at entrances where inappropriate use and impacts are occurring.
  - Review and potentially modify current and former entrances to restore natural function while allowing appropriate use.
- Mitigate impacts due to water infiltration through structural upgrades. Examples of types of actions would include the following:
  - Upgrade the sewer system.
  - Improve the drinking water system.
  - Install check dam systems in vulnerable upland surface streams.
  - Install or improve catchment basins that may affect the cave systems.
  - Improve/expand parking lot filtering run-off systems.
- Promote accessibility/universal access.
  - Improve, expand, or develop accessible tour routes.
  - Develop programs and use available technology to bring the cave experience to those who cannot or do not want to go on tours.
- Develop and maintain partnerships to promote responsible research, resource protection, and sustainable use at the park. This would include the following types of groups:
  - Universities
  - Conservation and research organizations
  - Local show caves and tourism groups
  - Federal, State, and Local agencies
  - Neighboring landowners and communities
- Implement monitoring to inform park management decisions.







# Preliminary Alternative Concept A (No Action)

## Continuation of Current Management

The National Environmental Policy Act (NEPA) requires that a no-action alternative be analyzed. This alternative describes existing management and policies and establishes a baseline. Existing management activities at the park include:

- As possible, provide a number of tour options that seeks to meet visitation levels from recent years.
- Follow current management guidance on the number of people per tour.
- Provide a range of cave opportunities that accommodate large tours as well as more immersive experiences; however, focus on large tours as needed to meet demand.
- Maintain the current level of resource management protection.

Refer to cave zoning from the general management plan to guide what routes are available for public tours, scientific study, and exploration.

Cave Zone	Definition	Example Cave Areas
<b>Zone A</b>	Includes developed areas and facilities that can accommodate concentrated uses, events and interpretive opportunities for a large numbers of visitors. Areas are designed to provide important visitor services and amenities.	Snowball Room and Grand Central Station, comfort stations, and elevator portals
<b>Zone B</b>	Includes electrically lighted and fully developed passages. Developments include trails, bridges, steps, stairways, and handrails. Guides accompany all parties, which have a maximum of 120 visitors.	Cleveland Avenue and Broadway
<b>Zone C</b>	Includes partially developed passages and passages that were once developed and now abandoned. Trails range from "good condition" to somewhat primitive. Overall development is limited to essential infrastructure for visitor safety and there is no electric lighting. Such passages provide a "wild cave" experience for visitors without training in caving techniques. Lighting is by hand-carried lanterns and tour sizes are limited to 25 to 40 visitors per guide depending on the passage.	Nickerson Avenue, Fox Avenue, and old commercial routes in Colossal, Crystal, Great Onyx, and Proctor caves; back part of Salts Cave
<b>Zone D</b>	Passages in this zone are defined as "natural" and only those visitors with requisite caving experience and equipment are permitted to explore this zone. Caves are not improved with the exception of known hazardous areas. Small party sizes are required.	Columbian Avenue, Pohl Avenue, and the front part of Salts Cave
<b>Zone E</b>	Zone E includes portions of the cave systems reserved for scientific study and exclusively approved for exploration. The zone includes "pristine" passages that would be irreparably damaged by heavy use. Temporary "E" may be obtained in specific passages by scientists conducting approved projects.	Paradise passage in New Discovery; portions of Upper Turner Avenue, White Cave, and Long Cave (in winter)



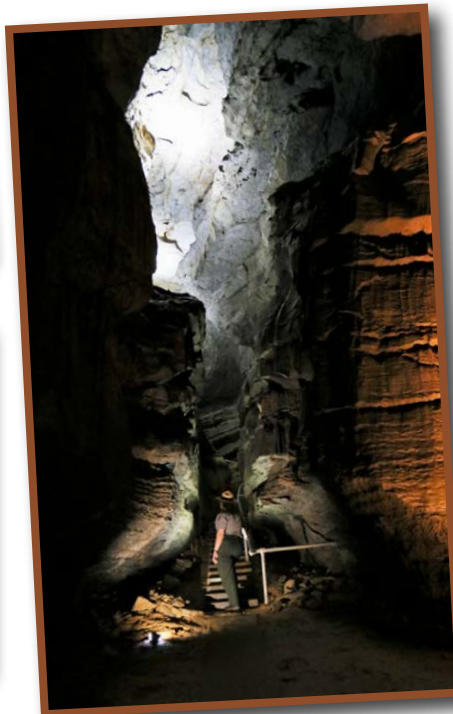


# Preliminary Alternative Concept B

## Small Tour Sizes with a High Level of Resource Protection

Under preliminary alternative B, park management would focus on providing cave experiences that include smaller tour sizes and a high level of natural and cultural resource protection. The following serve as examples of the types of strategies and actions that may be considered under this alternative:

- Simplify the available tour options so that visitors can more easily plan their trip and choose a tour that is right for them.
- Adjust the number of people per tour to provide a more engaging experience – adjustments would largely be made within zoning categories.
- Develop regional partnerships to improve how visitors gain information on additional caving opportunities in the area if their desired experience is not available at Mammoth Cave.
- As possible, focus on providing cave opportunities that do not require previous caving experience, and are appropriate for a variety of skill and comfort levels.
- Cave management Zones A and B would continue to provide routes for public access and tours.
- Categorize larger portions of the cave system as Zone C and Restricted so that resource improvements, study, and protection can occur.







# Preliminary Alternative Concept C

## Large Tour Sizes and Access to Additional Cave Routes

Under preliminary alternative C, park management would focus on providing larger tour sizes while minimizing natural and cultural resource impacts. The following serve as examples of the types of strategies and actions that may be considered under this alternative:

- Evaluate expanding the types of tour options available by making infrastructure improvements or developments to some routes.
- Potentially keep the number of people per tour similar to those currently used – any adjustments would be made within zoning categories.
- As possible, provide a variety of cave opportunities that range from no previous experience to advanced caving opportunities as well as scientific study and exploration.
- Consider expanding portions of the cave system as Zone A and B so that historically used routes can be opened to the public and offer a range of experiences.





# Mammoth Cave National Park

## Cave and Karst Management Plan / Environmental Assessment

Kentucky

March 2018






National Park Service  
U.S. Department of the Interior



# Proposed Updates to Cave Zones

Management zoning is a process of identifying and mapping the geographic areas of the cave and karst system where certain management programs will take place. Identifying management zones helps to assure that park activities occur in the areas where they are most suited. These zone will also be used to develop desired conditions and identify actions to address cave and karst management.

The current park general management plan includes a cave zoning system that is designated by the letters “A” through “F” in descending order of intensity of use and development. These zones, as outlined and defined in the general management plan, would be retained under a no action alternative. Below are proposed revisions to the cave management zone descriptions and areas:

Cave Zone	Cave Zone Description	Example Cave Areas
<b>Zone A</b> 	Cave Zone A includes public tour areas of the cave that have major development for walking (or accessible) tours, electric lights, and could include a telephone communication system. It supports concentrated use designed for visitor comfort and convenience. This zone contains infrastructure that can accommodate events and interpretive opportunities for large numbers of visitors. It would accommodate a variety of users with varying experience and physical abilities, including large groups and areas for large gatherings. Visitors in this zone would be immersed in the sights and sounds of the cave; however, at times the sounds of other people may dominate and visitor-caused impacts may be visible to cave resources. Opportunities for special events would be available in this zone, in appropriate areas, through a permit.	Cleaveland Avenue, Snowball Room, Kentucky Avenue, Grand Central Station, Frozen Niagara, Boone Avenue, Rafinesque Hall, Houchin's Narrows, Broadway, Main Cave, Blacksnake Avenue, Fat Man Misery, Great Relief, Sparks Avenue, Mammoth Dome, Little Bat Avenue, Audubon Avenue, etc.
<b>Zone B</b> 	Cave Zone B would provide for a more primitive cave experience and would require hand-held lights such as lanterns, flashlight, and/or headlamps. Moderate development including formalized trails may also occur in this zone in order to improve resource conditions; however, visitors may need to prepare for potentially challenging conditions. Approved educational groups and activities may occur in this zone. This zone could provide visitors with an opportunity to learn basic caving skills and necessitate the use of appropriate caving gear. Use would be managed to protect and enhance the natural function, diversity, complexity and resiliency of the cave. Sights and sounds of the cave along with personal interpretive opportunities should dominate this experience. This zone could provide for a more intensively primitive cave experience; however, at times some visitor-caused impacts or developments may be experienced. Opportunities for research would be available in this zone, in appropriate areas, through a permit.	Main Cave from Star Chamber to Violet City, Great Onyx Cave, Clark Avenue, Cathedral Domes, Becky's Alley, Nickerson Avenue, Big Break, Ganter and Jessup near Wooden Bowl, El Ghor-Silliman Avenue, Woodbury Pass, Colossal Entrance to Bedquilt Route, Historic Crystal Cave Trails, Historic Proctor, Long Cave, Upper Salts Cave, Olive's Bower, Briggs Avenue, Black Chambers, Blue Spring Branch, Echo River (end of Styx Catwalk to Minnehaha), Pensacola Avenue, Sylvan Avenue, Emily's Avenue, Wondering Woods Cave, Dixon Cave, Pohl Avenue, Turner Avenue, New Discovery (main passage to end of trail development with potential extension to Big Paradise), Owl Cave, Fort's Way, Roaring River, etc.
<b>Zone C</b> 	Cave Zone C would provide for a more intensively primitive cave experience, which is reflective of the conditions experienced by earlier cave explorers. These caves/passages are undeveloped and entered less frequently. It would encompass most of the Mammoth Cave System in the park as well as most of the other caves in the park. Minimal development would occur in this zone, mostly limited to narrow trails for traversing areas or minimal modifications for safe exploration, mapping, research, or management. The result would be a more physically demanding and challenging experience. Trail routes would not necessarily be marked. The primary users of this zone would be NPS resource managers and researchers with caving skills and experience. Most human modifications would not be authorized, except those needed for resource protection or safety. This zone would afford opportunities to study areas of the cave systems that have been minimally impacted by human activity. A permitting process would be used to determine appropriate uses and exploration activities within this zone and would not generally be available to the public. It would include newly discovered caves/passages that would be surveyed and assessed by highly skilled cavers and resource experts. Opportunities for research would be available in this zone, in appropriate areas, through a permit.	Examples from within the Mammoth Cave System include: East Bransford Avenue, Carlos Way, River Acheron, Miller Avenue, Proctor Cave (from Proctor Crawl), Logsdon River, Bridge Avenue, Colossal River, Candlelight River, Lower Salts, Ball Trail, The Overlook, Waterfall Trail, Gravel Avenue, etc.  Notable other caves: Lee Cave, Wilson Cave (other than Historic Section), Running Branch Cave, Little Beauty Cave, Dennison Cave, Smith Valley Cave, Sand Cave, Bat Cave (other than A-survey), Luna Cave, Fort's Funnel, Silent Grove Springhouse Cave, etc.
<b>Restriction Overlay for all Zones</b>  	This overlay is necessary to designate exceptional areas that require seasonal closures and/or special conditions for entry. This overlay would be managed to restrict resource impacts and is designed to protect pristine caves/passages with highly sensitive resources or specific resources that require additional safeguards. Restrictions will be tailored to specific areas, but examples would include seasonal restrictions, special permission to enter, special gear required, or similar restrictions. This overlay could also designate areas where protection is needed from dangerous conditions. As environmental conditions change within the cave/passages, the overlay areas or restrictions may be modified.	Seasonal bat closures: Bat Cave, Wilson Cave, Lee Cave, Colossal Cave (Grand Avenue and Colossal Entrance), Cyclops Gateway, JT Cave, Wildcat Hollow Cave, Misty Cave, Luna Cave, Coke Cave, Haunted Cave, Dynamite Rock Cave, Cathedral Cave, Wilson Hollow Pit, etc.  Bat restrictions all year (summer negotiable): Dixon Cave, Long Cave, Currie Cave, Hickory Flat Cave, etc.  Archaeological Restrictions: Watson Trace, Robbins Run, Upper Salts, Indian Avenue (Salts), Blue Arrow Passage (Salts), Blue Spring Branch, White Cave (pit at back of cave), AT-survey (Corkscrew), Marshall Avenue (Lee Cave), Upper Crouchway (Crystal), Smith Avenue, etc.  Historic Resources: New Discovery tour trails, etc.  Delicate formations or minerals: Little Paradise (New Discovery), Turner and Mather Avenues, Bennington's Grotto, etc.  Safety: Sand Cave, etc.

Note: the zones to which caves/passages are assigned can change as conditions and/or technology changes dictate. For example, if electrical lighting or trail upgrades are installed in a section, it would be reassigned from its original zone (Zone B or C) to Zone A.

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Cave and Karst Management Plan / Environmental Assessment

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## Current Cave Zones Map

### Cave Zones -- 1983 GMP

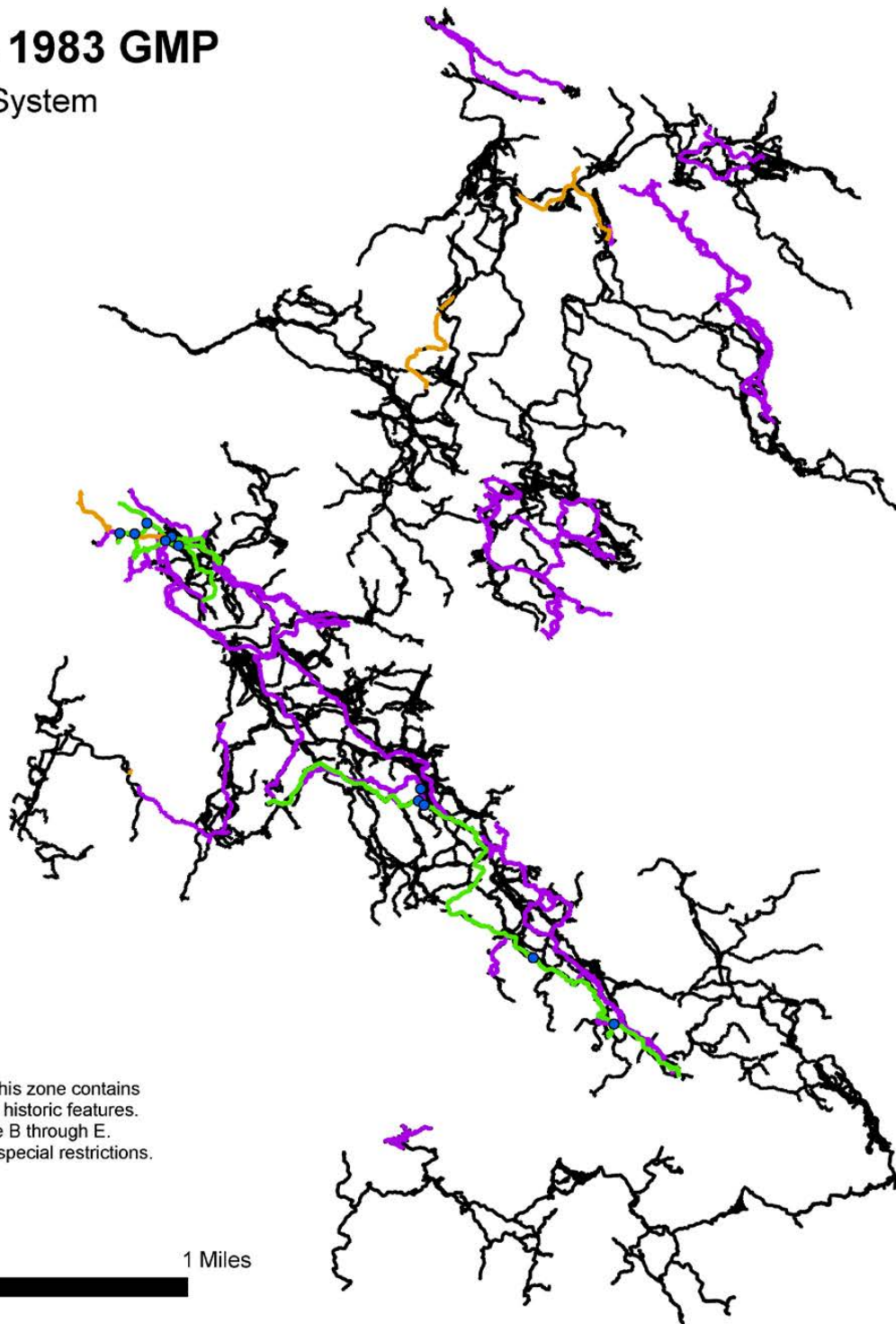
Mammoth Cave System

#### Legend

- Zone A
- Zone B
- Zone C
- Zone D
- Zone E

1983 GMP also has a Zone F. This zone contains passages with unique natural or historic features. They may be located within Zone B through E. Zone F passages are subject to special restrictions.

1 0.5 0 1 Miles





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## Proposed Cave Zone Map

### Proposed Cave Zones

Mammoth Cave System

#### Legend

- Zone A
- Zone B
- Zone C

The current proposed Cave Zonation also has an overlay of areas that have additional restrictions, such as seasonal closures. Areas with overlays can occur in any zone.

draft zone map  
specific passages in each zone  
subject to revision

1 0.5 0 1 Miles

