

Kartchner Caverns State Park: Approaches to Protecting a Delicate Environment during Development and Tours

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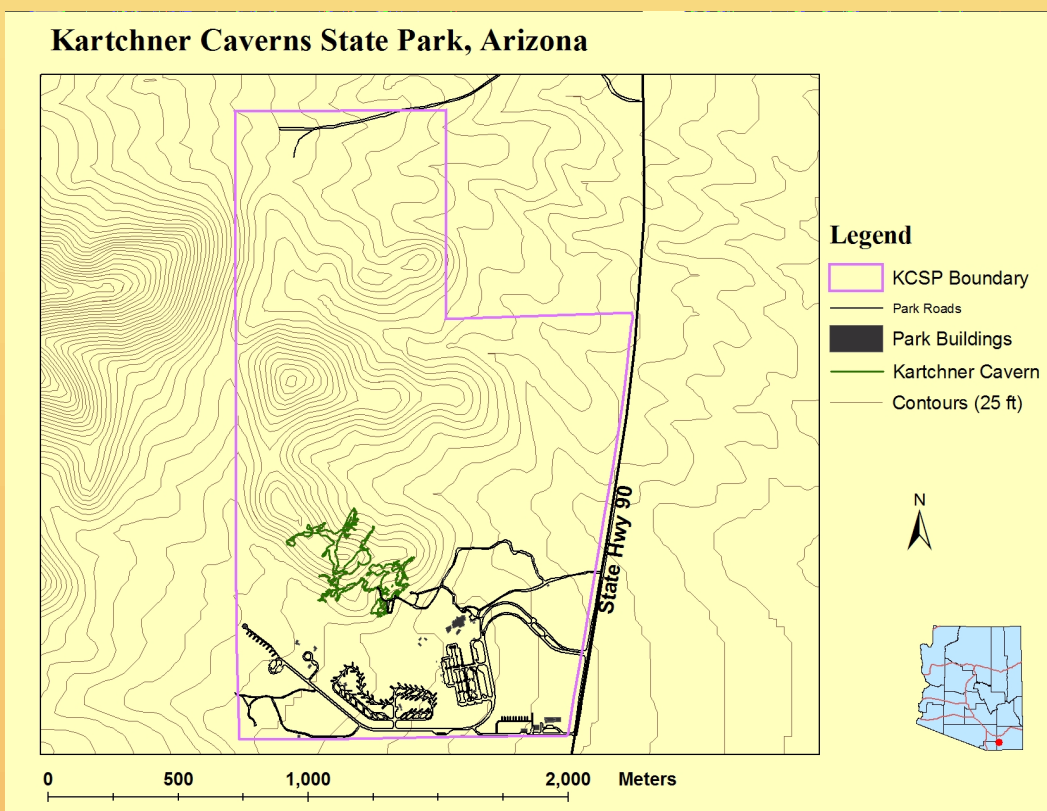
Abstract

Kartchner Caverns is a humid, highly decorated cave in southeastern Arizona. When it was discovered in 1974, it was identified as being vulnerable to destruction through carelessness. It was kept secret by a small group of people until it was purchased by Arizona State Parks in 1988. Between 1988 when Parks acquired the cave and 1999 when the park opened to the public, State Parks studied the cave, designed plans to develop the cave and park, and constructed both surface and underground facilities at the Park. The over-riding goal in developing the park was to “Develop Kartchner Caverns for public viewing and education while preserving the cave in as pristine a condition as possible.”

Many of the steps that State Parks undertook in trying to achieve this goal are applicable to other environmental development while some are unique to the cave environment. The importance of comprehensive study of the area and environmental system before developing plans for the area cannot be emphasized. Another crucial component of protection is continued monitoring during development and tourism and a willingness to alter operations in response to new information, and monitoring results.

It starts with a commitment:

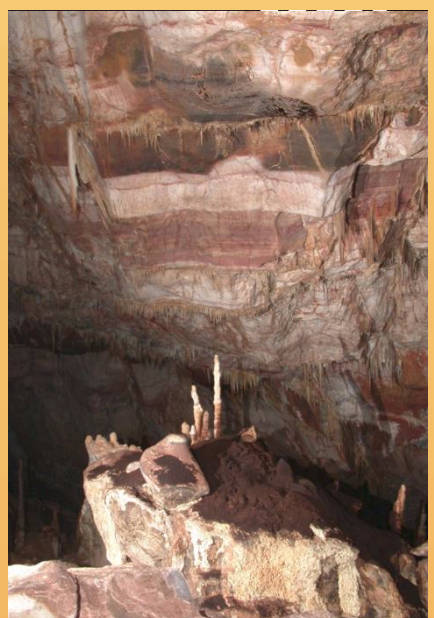
Develop Kartchner Caverns for public viewing and education while preserving the cave in as pristine a condition as possible.



Identify Sensitive Resources



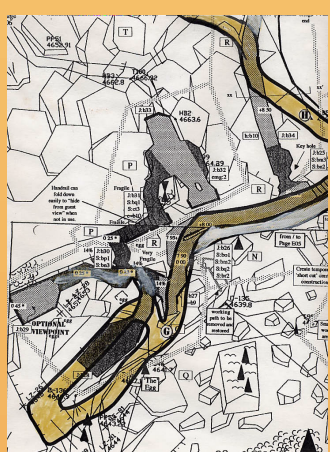
The cave has a rich invertebrate fauna.



Beautiful cave formations require both protection and interpretation.



Lighting short sections of the cave as needed and separating trail and feature lighting reduces the impact of lights in the cave.



Careful trail planning limited impact while providing the best experience for visitors.

Innovative Trail Design



Visitors pass through several pairs of freezer doors. These airlock-like chambers limit mixing of outside and cave air.



Trails with integrated curbing and tread allow washing to remove dirt and lint. Sumps collect the wash water for removal from the cave.

Adaptive Management



The computer controlled lighting system allows staff to adjust lighting to address potential impacts.



Misting adds water to the air to compensate for losses. Although not an ideal approach, misting provides protection while issues are addressed.



An air curtain was added to assist with climate and lint control.

Visitor Management for Cave Protection and Visitor Experience

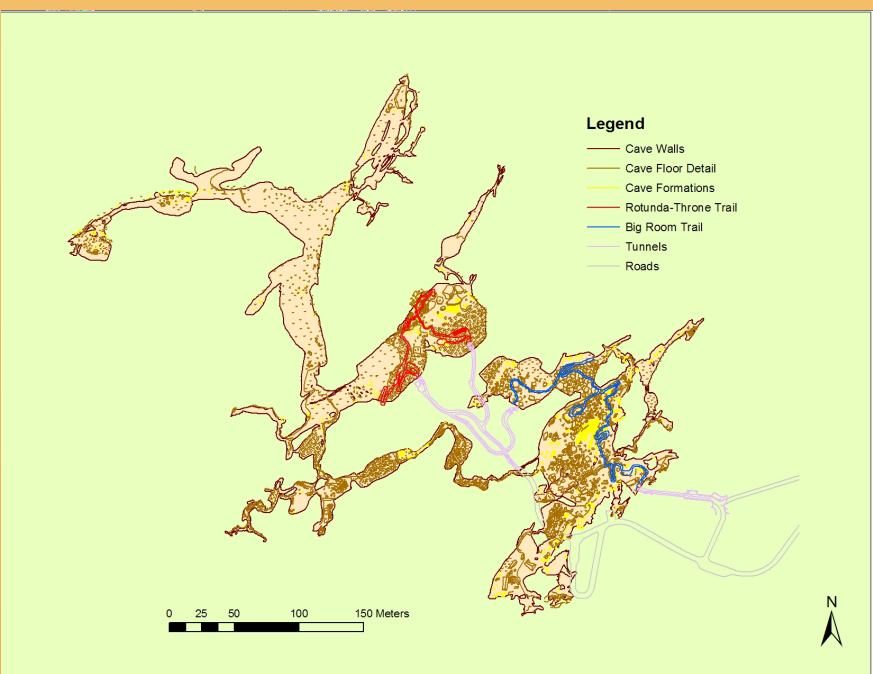


Small tours limit total number of visitors, allow the lead and trailing guide to manage tours, and provide for effective communication between guides and guests.



Electric trams ferry visitors from the visitor center to the cave limiting the development that took place over the cave.

Pre-Development Studies



Detailed mapping and inventories provides information vital to planning and decision making.



Studying bats with an IR camera allowed planners to limit impact on the maternity colony.



Pre-development environmental and photographic monitoring provide a baseline for assessing change.

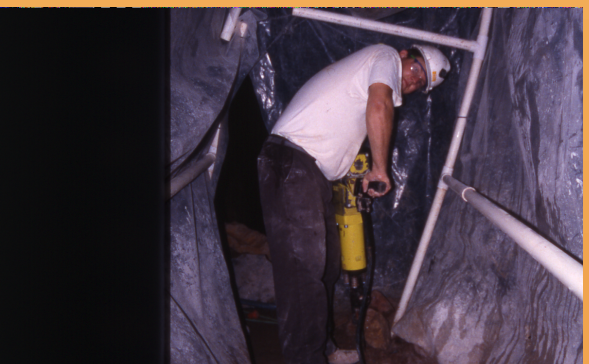
Kartchner Caverns Timeline

- 1974Cave found by Randy Tufts and Gary Tenen
- 1988Cave purchased by Arizona State Parks
- 1989-1991Pre-Development Studies by Arizona Conservation Projects Inc.
- 1995-1997Tunnel Construction
- Nov 1999Rotunda-Throne Tours Begin
- Nov 2003Big Room Tours Begin (seasonal)
- May 2004 Total visitation surpasses 750,000

Care in Construction



Materials were tested for impact on cave. Many things needed to be modified or replaced to protect the cave from fungus and mold growth.

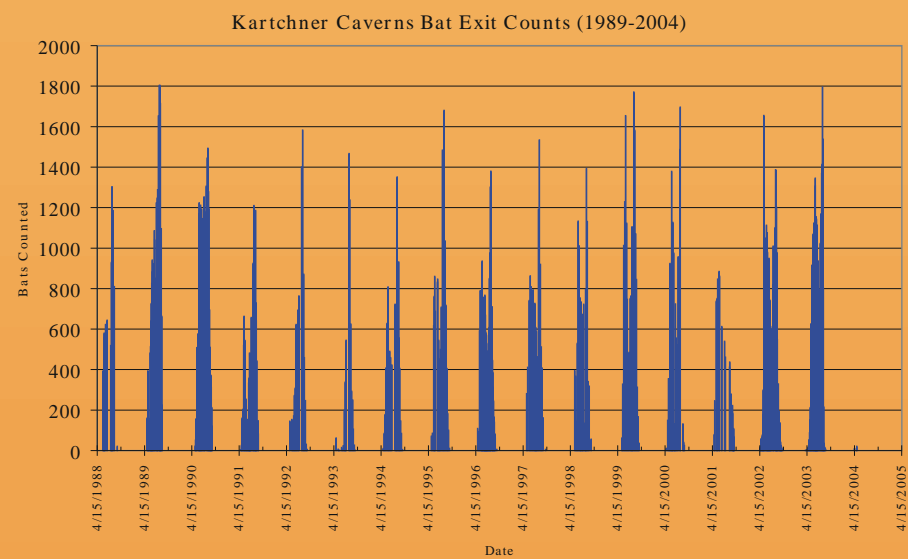


During construction, plastic barriers protected the cave from messy or destructive activities.



Park staff continually monitor environmental conditions of the cave.

Continued Monitoring



Bat populations have remained stable from pre-development studies to the current year. The Big Room is closed for six months each year to allow the bats to roost.