

# INSIDE EARTH

## A NEWSLETTER OF THE NATIONAL PARK SERVICE CAVE & KARST PROGRAMS

*Edited by Dale L. Pate*

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#### Website Address:

<http://www2.nature.nps.gov/grd/geology/caves/newsletter.htm>

**Webmaster:** Jim F. Wood: [jim\\_f\\_wood@nps.gov](mailto:jim_f_wood@nps.gov)

### NATIONAL CAVE AND KARST RESEARCH INSTITUTE STEERING COMMITTEE MEETS

*by Ronal Kerbo*

A steering committee meeting for the start-up of the National Cave and Karst Research Institute (NCKRI) was hosted by the Geologic Resources Division's Science and Technical Services Branch in Denver, Colorado August 18-19. Attending for the National Park Service were: Rod Horrocks (WICA), Joel Despain (SEKI), Mike Wiles (JECA), Dale Pate (CAVE), Larry Norris (IMR), Ron Kerbo (GRD); Jim Goodbar, BLM; also asked for input but unable to attend this meeting were: NPS: Rick Olson (MACA), and Lindsay McClelland (GRD); Jerry Trout, USFS, and Bob Currie USFWS.

The Geologic Resources Division is providing the steering committee chair for the remainder of the fiscal year for start-up of the National Cave and Karst Research Institute. This role has been added to the current duties of the Science and Technical Services Branch's National Cave Management Coordinator. Among several tasks before the NCKRI Steering Committee was to (1) refine the stated mission, goals, and objectives of the NCKRI,

and (2) develop a draft position description for an interim institute director, (3) draft recommendations for alternatives for the structure of the Institute and (4) participate in finalizing the organizational model.

The first meeting resulted in a potential draft of the institute director's PD; a refined mission and a set of recommendations for the start up of the Institute. Of particular concern to the steering committee members was the following:

#### That the Institute in order to-

##### -foster sound science will-

- (1) create a Chief of Science on staff.
- (2) appoint a science advisory board.
- (3) function as a central clearinghouse.
- (4) will keep no cave locations or sensitive information.
- (5) will support issue driven science supporting resource management.
- (6) not support research projects that are not locally approved.
- (7) should be interdisciplinary and include all aspects of speleology.
- (8) promote sustainability in karst systems and resources.



From upper right side around table clockwise: Mike Wiles, NPS (JECA); Joel Despain, NPS (SEKI); Jim Goodbar, BLM; Rod Horrocks, NPS (WICA); Dale Pate NPS (CAVE)

**-support cave education programs that should-**

- (1) include an educational coordinator on staff.
- (2) plug into the Learning Center initiative.
- (3) support Web and internet based education.
- (4) network with cave groups.
- (5) support educational programs already being conducted.
- (6) provide outreach to the public and agency staffs in forums such as seminars and symposia.
- (7) provide information and assistance to the NPS Interpretive Division.

**-support centralization of speleological information and protection of sensitive information, and provide expertise the Institute should -**

- (1) not be a repository for sensitive information and locations.
- (2) be a resource for informational sources and contacts.
- (3) provide for database management and web site management.

**-address research needs on federal- lands the NCKRI goals should include-**

- (1) a Service wide assessment of needs.
- (2) agency dependent protocols.
- (3) identifying needs through land use planning systems such as Resource Management Plans.
- (4) a call for research "needs".
- (5) maintain a database of the "needs".
- (6) maintain a list of funding sources.
- (7) channel funding to researchers.

**-provide services that are-**

- (1) balanced for all agencies.
- (2) based on consultation and provide assistance for writing proposals.

## PARK UPDATES

### Carlsbad Caverns National Park

*by Dale Pate*

**Lechuguilla Cave** – Five survey and exploration expeditions have been completed during 1999 with two more scheduled for September and October. Normally, six expeditions are allowed in one year, but a postponement of one expedition last year brought this year's total number of expeditions to seven. The five expeditions this year have added approximately 3.7 miles to bring the total length of the cave to 104.37 miles (167.97 kilometers).

**Rubble Removal** – Members of the Permian Basin Speleological Society (PBSS) continue to volunteer hours and muscles in the long-term project of removing rubble from the Old Lunchroom area of *Carlsbad Cavern*. It is thought that this rubble pile was left over from the blasting of the elevator shafts around 1930. PBSS members have removed literally tons and tons of broken rock and debris from this area over the last few

years. Interspersed within the rubble are various historic items including coke bottles, coffee mugs, and other remnants of the old days. Working with the Cultural Resources Office staff and the New Mexico State Historic Preservation Office, these historic items are accessioned into the park's museum. Thanks to all the PBSS members for their back-breaking labor of love and for their continued support over the years. You have made a difference.

**NOVA Filming** – In August, the park was host to a film crew led by Martin Beldersen and Sid Perou who are producing a film for NOVA, a science program from the Public Broadcasting System (PBS). Penny Boston, Carol Hill, and Diana Northup will talk of cavern formation in the Guadalupe Mountains and recent discoveries in the several fields including microbiology. Caves featured in the film from the park include *Lechuguilla*, *Carlsbad Cavern*, and *Spider*. As anticipated, filming went smoothly with little or no additional impacts occurring to the caves.

**Development Concept Plan EA** - Paul Burger has been added to the staff of the Cave Resources Office in a temporary, full-time position to write the Environmental Assessment for the Pre-design Plan. This plan is the next step in the process for evaluating and making decisions concerning the active and potential sources for pollution to *Carlsbad Cavern*. See Paul's article in this issue for more information on the Pre-design Plan.

## Great Basin National Park

*by Jon Jasper*

The *Lehman Cave* Rehab Project is the main focus of cave management. The project has completed the installation of non-slip surfaces, stainless-steel handrails, and drains; the repair of airtight doors, the replacement of corroding light fixtures and electrical boxes, and the establishment of a GIS inventory of the cave. The project is currently involved with the construction and installation of fiberglass stairs with stainless-steel handrails to replace the existing wooden stairs. The project also is scheduled to update the cave's electrical system and improve the cave's lighting.

The project of installing bat friendly cave gates to *Snake Creek Cave*, *Wheeler's Deep*, *Systems Key*, *Root Cave*, *Ice Cave*, *Crevasse Cave*, and *Model Cave* has been completed. The purpose for these cave gates is to protect populations of Townsend's Big-eared Bat and to promote cave conservation and safety.

Cave restoration is an ongoing project. *Lehman Caves* second annual Lint Camp is scheduled on the weekend of October 1-3. Great Basin National Park (GRBA) is also taking advantage of volunteer help to remove foreign debris like old rotting wood from old handrails, old electrical wiring, and asphalt from the old surface of the

trail. GRBA also is starting to look into repairing some of the cave's broken formations.

GRBA's Cave Management Specialist position is still vacant. GRBA is hoping to fill this position sometime next fiscal year. Having this position filled again should allow GRBA to develop new cave restoration and monitoring projects.

### **Pinnacles National Monument** *by Chad Moore and Amy Fesnock*

Pinnacles has two outstanding examples of talus caves. Fault action and erosion opened angular slot canyons that were later filled by large boulders. The voids between these boulders create rooms ranging from squeeze size to house size. There are literally hundreds of skylights and entrances, a diverse set of microclimates, and a stream running through them half of the year.

The laissez-faire cave management at Pinnacles was turned on its head when a large colony of the bat *Corynorhinus townsendii* with approximately 300 individuals moved into **Bear Gulch Cave**, a popular visitor cave. The Superintendent supported an immediate cave closure during the summer maternity season, and continued the closure when about 120 individuals from the same colony used the cave as a winter hibernaculum. Another talus cave, **Balconies Cave**, remained open for visitor use.

The gravity of the situation pulled several experts to the park. Ron Kerbo assisted the park in forming a small task force to help develop a bat management plan and give further guidance to resource management staff. David Ek (NPS), Robert Curry (USF&W), Dixie Pierson (private consultant), Joel Despain (NPS), and Bruce Rogers (USGS), came to our aid in March 1999. The discussion was formulated into a Bat Management Plan, and built a solid foundation for cave management within the Monument.

One important issue was cave trespass. With so many entrances, standard gating practices wouldn't work. We developed a "soft" gating solution for 10 of the most used entrances. Fence wire was threaded through eyes on four bolts fixed to the opening. Then, plastic fencing was then fastened to the wire frame, looking like a small vertical trampoline. This solution has greatly reduced trespass into the cave system, and appears to be an effective deterrent to all but the most determined explorer. We have recently received funding from the Cluster to fund and monitor these gating efforts.

Bruce Rogers, a USGS geologist whose real job has nothing to do with caves, donated much time to assist the park and has developed a beautiful map of the **Bear Gulch Cave System**. This map will be used to plot cave temperatures, bat locations, colony movements, and for general planning. One idea being discussed is opening up

a portion of **Bear Gulch Cave** that is not used by *Corynorhinus townsendii*. The map will be essential in that effort.

Never a dull moment at Pinnacles, we are also dealing with rock fall hazards in **Balconies Cave**. Jim Ellis, USGS retired, was called upon to investigate unstable talus boulders embedded in the walls and ceiling of the cave. We'll keep you posted on that issue as well.

### **Wind Cave National Park** *by Rod Horrocks*

On August 6, 1999 at 12:56 PM, several members of the **Wind Cave** staff experienced a 3.0 earthquake while inside the cave. Each person reported hearing a "thunder-like" rumbling sound from overhead that lasted for several seconds, but felt nothing. On the surface, a sonic boom-like sound was heard and two quick jolts shook the buildings and rattled windows. Although, we know it was a very shallow earthquake, the epicenter remains unknown since only one USGS station recorded the event.

It was recently discovered that approximately 40 to 60 bats are using the historic tour route in **Wind Cave** as a day roost. After noticing an unusual number of bats during public tours, the cave management staff conducted a visual survey of the natural entrance and walk-in entrance at dusk. The bats were observed and video taped exiting the cave through a small, 3/4" x 1 1/4" hole on top of the revolving door in the walk-in entrance.

During the May 1999 **Wind and Jewel Caves** Restoration Camp, 15 cavers from around the US, helped remove 885.4 pounds of dust and lint from along the tour route, between the natural entrance and the Post Office. The T-shirt for this event, which was designed by Bonnie Curnock, won 2<sup>nd</sup> place at the salon at the 1999 NSS Convention in Filer, Idaho.

The Lakes at the deep point in the cave have continued to rise during this unusually wet year. Since May they have risen 1.3 feet, with a total rise of 19.6 feet since 1993. The six main lakes have now all merged into a single large lake. A smaller perched lake, which started filling in 1996, and is located before the Emperor Maximus, is currently rising at a rate of one inch a month. It has now all but sumped the route to the lakes. Another manifestation of this wet year is a small stream that has flowed throughout the summer into the **Snake Pit** entrance.

The new elevators have been up and running for two months now. These new elevators travel at a rate of 703 feet a minute in the 212-foot shaft between the Assembly Room and the surface.

After designing new cave survey and inventory sheets for the **Wind Cave** survey project, the cave management

staff recently had those sheets printed on weather resistant paper that fits in the standard yellow six-ring notebooks used by many cave surveyors. This project included a cave survey title page customized for *Wind Cave* use and a data page that is similar to Carlsbad Cavern's format, but allows for 16 stations instead of 11. The sketch page was also printed with a preprinted bar scale, north arrow, and fill in the blank cave name, date and page number fields. This is seen as a positive step towards standardization of data collection at *Wind Cave*.

Marc Ohms recently finished checking the *Wind Cave* survey data set for errors, looking for blunders and incorrect tie-ins. He identified numerous mistakes, correcting 33% of the loop closure problems in the data.

Recent survey and inventory work at *Wind Cave* has concentrated in the Colorado Grotto, Historic, Club Room and Half Mile Hall sections of the cave. The current surveyed length of *Wind Cave* is 84.72 miles, maintaining it as the eighth longest cave in the world and the fifth longest in the U.S.

## CARLSBAD CAVERN: PLANS FOR THE DEVELOPED AREA

*by Paul Burger*

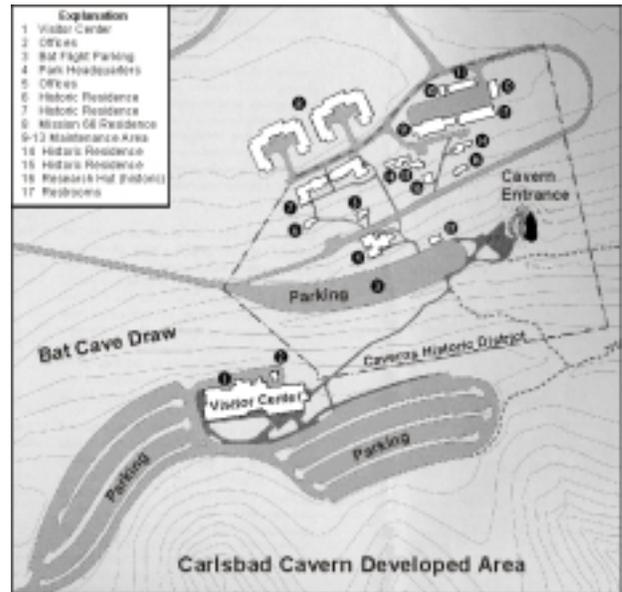
### BACKGROUND

*Carlsbad Cavern* and the surrounding surface areas have been developed to provide access and support for 600,000 to 700,000 annual visitors to Carlsbad Caverns National Park. Hydrochemistry and infiltration studies have been performed in the park to evaluate the impacts of these facilities on the cave and groundwater resources. Land use and surface activities have contaminated some of the water in *Carlsbad Cavern* and continue to threaten cave resources.

### PROPOSED OPTIONS

Several options have been developed by the resource staff at Carlsbad Caverns NP and the Denver Service Center to reduce or eliminate the potential sources of contamination. The biggest dangers to cave resources are the sewage lines, underground fuel storage tanks at the maintenance yard and behind the Visitor Center, and parking lot runoff including spills from vehicle accidents or fires.

All of the alternatives include several possibilities for addressing the sewage contamination problem. At a minimum, the sewage line would be replaced with better materials. The sewage lines may be re-routed so that the sewage is carried off the escarpments in as short a distance as is possible to minimize the potential for cave contamination. Another possibility is developing a sustainable living machine with algae, other plants, and fish to treat the waste.



### ALTERNATIVE A: CHANGE LAND USE

Alternative A is the most comprehensive of the alternatives. All of the non-historic buildings in the developed area would be removed except for the Visitor Center. Natural vegetation and drainage would be restored to those areas. The use of the historic buildings would be redefined and possibly used for archive and storage purposes. The parking areas around the Visitor Center would be removed and relocated off the escarpment. The Visitor Center would be used as a staging area for visitor shuttles from the new parking facilities. Runoff from the remaining paved areas and structures would be contained, filtered, or redirected into the new sewage system.

### ALTERNATIVE B: MITIGATION

Alternative B primarily involves modification of land use. Parking immediately north of the Visitor Center would be eliminated and the western parking lot would be closed during the slow season. All of the paved areas would be sealed, and parking lot runoff would be contained, filtered, or redirected into the new sewage system. All of the underground fuel storage tanks would be removed, but all of the buildings would remain in place. The park would establish a policy to reduce the impacts of auto repair and fertilizer use by park personnel.

### ALTERNATIVE C: MITIGATION PLUS

Alternative C involves both modification of land use policy and removal of some facilities in the developed area. The paved area in Bat Cave Draw would be reduced to a single access road. The maintenance functions and underground storage tanks would be removed. All of the paved areas would be sealed, and parking lot runoff would be contained, filtered, or

redirected into the new sewage system. The park would establish a policy to reduce the impacts of auto repair and fertilizer use by park personnel.

### WHAT HAPPENS NEXT?

The Park will select a preferred alternative based on the preliminary draft of the EA, and on the recommendations of the resource management staff. The revised draft EA will then be open for public comment. We are hoping that the draft EA will be made available on the Web, and comments can be sent to us via email as well as through the regular mail. We are currently compiling a list of people interested in the Development Concept Plan and the impacts of this plan to the cave and groundwater resources in *Carlsbad Caverns*.

Once the comment period is over, each suggestion will be evaluated and a final EA will be developed. Based on the final EA, the Park will decide what existing or modified alternatives would protect the cave and groundwater resources with the least impact on the environment.

### SUMMARY

The developed area above *Carlsbad Cavern* is negatively impacting the cave and groundwater resources. The Park has developed several plans to eliminate or mitigate the impacts of these facilities. Each of these options will be evaluated by both the public and the Park to determine which course of action would best protect the cave while minimizing environmental impacts. The resources of Carlsbad Caverns National Park cannot be protected without your help. To get involved and get your name on the mailing list, contact Paul Burger or Dale Pate at the address listed on this page.

### CONTRIBUTORS TO THIS ISSUE

Paul Burger  
Carlsbad Caverns National Park  
3225 National Parks Highway  
Carlsbad, New Mexico 88220  
Phone: 505/785-2232, ext. 363  
Email: paul\_burger@nps.gov

Amy Fesnock, Wildlife Biologist  
Pinnacles National Monument  
5000 Hwy 146  
Paicines, CA 95043  
Phone: 831/389-4485, ext. 223/246  
Email: amy\_fesnock@nps.gov

Rod Horrocks  
Wind Cave National Park  
R.R.1, Box 190  
Hot Springs, South Dakota 57747-9430

Jon Jasper  
Great Basin National Park  
Baker, Nevada 89311  
Phone: 775/234-7331  
Email: jon\_jasper@nps.gov

Ronal Kerbo  
NPS-GRD  
P.O. Box 25287  
Denver, Colorado 80225-0287  
Phone: 303/969-2097  
Email: ron\_kerbo@nps.gov

Chad Moore, Physical Scientist  
Pinnacles National Monument  
5000 Hwy 146  
Paicines, CA 95043  
Phone: 831/389-4485, ext. 223/246  
Email: chad\_moore@nps.gov/

Dale Pate  
Carlsbad Caverns National Park  
3225 National Parks Highway  
Carlsbad, New Mexico 88220  
Phone: 505/785-2232, ext. 368  
Email: dale\_pate@nps.gov

#### A Message From the Editor Dale L. Pate

We live in exciting times. All major Federal land management agencies have recognized that cave and karst features are significant and should be managed in a way that protects these features. Though we still have a ways to go, we have come a long ways from the dark days when caves and karst features were great places to fill with garbage, logging slash and used as natural sewer lines. The U.S. Forest Service and the National Park Service have created National Cave Coordinator positions while the Bureau of Land Management, and the U.S. Fish & Wildlife Service have positions that include national cave issues in their duties. In addition, Congress has created the National Cave and Karst Research Institute that will help ensure that management of these features will be based on sound scientific research and principles. These changes will help to protect cave and karst systems everywhere.