

CANYONS & CAVES

A Newsletter from the Natural Resources Offices
Carlsbad Caverns National Park

Issue No. 6

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Edited by Dale L. Pate

Special thanks to Kelly Bridges & Paula Bauer

TABLE OF CONTENTS

Resource News	1
Species Found In The Park Today	2
Bats Found In Carlsbad Cavern	2
Prescribed Fires: Reintroducing Fire In The Desert Ecosystem	3
On Underground Wilderness	3
New Discoveries In Lechuguilla Cave	4
Resurvey Of Carlsbad Cavern: An Update	5
Rattlesnake Springs Amphibians & Reptiles	5
Rainfall in CCNP 1988-1997	7
Letters To The Editor	7
Calendar Of Events	8

RESOURCES NEWS

ADIOS to Bill and Karin Route (Tanna and Logan also). Bill accepted a job at the International Wolf Center in Ely, Minnesota. We will miss your hard work and dedication to the job, as well as your sense of humor. Dave Roemer will be filling in as Acting for the Surface Resources Management position.

THANKS to Travis Greig and Jed Holmes for volunteering this summer in the Cave Resources Office.

CONGRATULATIONS to Dave Roemer for successfully defending his Master's thesis on prairie dogs. He will receive his Master's of Science degree at the end of the current semester.

WELCOME to **Michelle Abodeely** who will be working with the surface resources crew as an SCA. Also welcome to **Rebecca Lee** who will be an SCA for cave resources and **Tom Kaler**, a volunteer for cave resources.

INFILTRATION STUDY COMPLETED - The park received copies of the final report from researchers at the Colorado School of Mines. This study looked at man-made structures located above Carlsbad Cavern and

how they may be effecting the cave below. Park personnel are now reviewing this document.

MONCRIEF APD'S - Controversy has arisen over several Applications for Permit to Drill (APD) submitted to the BLM by Moncrief, an oil and gas company that holds leases in the Cave Protection Zone that was established by Congress north of the park. . The Roswell District BLM is seeking ways to allow Moncrief to drill in this protected area. The NPS maintains that the Record of Decision for the Dark Canyon Environmental Impact Statement and the Lechuguilla Cave Protection Act of 1993 does not allow surface occupancy for any prior leases in the Cave Protection Zone.

DERMESTID BEETLES are found in most major Mexican Free-tailed bat caves, but these voracious beetles are not found in Carlsbad Cavern. Numerous other species of beetles are found in bat cave, but dermestids have never been seen in the cave. Dermestid beetles are known to devour fallen bats in just minutes, leaving only the bones behind. It usually takes hours, if not days, for the beetles and other insects found in bat cave to accomplish the same thing.

SURVEYING IN BAT CAVE - This past winter, employees from Westinghouse performed a precision survey on the roosting area of bat cave. Norbert Rempe was the lead on this project. This volunteer work was done in conjunction with the infrared photography project to help document the size of the Mexican free-tailed bat colony. This precise survey will help us in determining the exact square footage of ceiling space in bat cave. From this information, we can hopefully obtain a better count for colony size each year. Many thanks to our Westinghouse volunteers.

BLACK BEARS IN CCNP - Are there bears in Carlsbad Caverns National Park? In 1990, Dennis

Carruth came across bear tracks in the western part of the park when on lion transects. More recently, August 15, 1992, a visitor reported an adult female and cub standing in the middle of Scenic Loop Road. The bears were not bothered by the visitor and eventually walked across the canyon floor and disappeared.

WHILE CRUISING WALNUT CANYON in their new Mazda Miata (with the top down of course), Sandy and Gary Vequist recently had to stop while a mother lion and her three adult-sized cubs crossed the paved road.

WALT DISNEY PICTURES - Cave resources personnel spent 3 days in August with Producer Don Hahn and a crew from Walt Disney Pictures. They were doing research for an upcoming animated feature titled "Atlantis " which is due out in the year 2000. This crew's most recent work was Disney's "Hunchback of Notre Dame".

MEXICAN WOLVES - The first release of Mexican Wolves into the Blue Range Wolf Recovery Area in Arizona and New Mexico is planned for early 1998.

NUMBERS OF SPECIES FOUND IN THE PARK TODAY

Amphibians - a total of 11 species

Salamanders - 1 species

Toads - 6 species

Frogs - 3 native species & 1 introduced species
(the bullfrog)

Birds - 313 species

Fish - a total of 2 species

Invertebrates - Unknown at this time

Mammals - a total of 65 species

Order Insectivora

Shrews - 1 species

Order Chiroptera

Bats - 16 species

Order Lagomorpha

Rabbits & hares - 2 species

Order Rodentia

Squirrels - 5 species

Pocket gophers - 2 species

Pocket mice & kangaroo rats - 5
species

Rats & mice - 14 species

Porcupines - 1 species

Wolves, coyotes, & foxes - 3 species

Bears - 1 species

Raccoons & relatives - 2 species

Weasels, skunks, & relatives - 5 species

Cats - 2 species

Order Artiodactyla

Peccaries, deer, pronghorns, sheep, goats - 5 native species

This list of mammals does not include 5 species which have been extirpated (meaning that they have been eliminated) from the park. The extirpated species are Black-tailed Prairie Dog, Gray Wolf, Grizzly Bear, Bighorn Sheep, and American Bison.

Plants - Not included at this time

Reptiles - a total of 41 species

Lizards - 19 species (includes geckos, skinks, and whiptails)

Snakes - 19 species (includes 6 species of rattlesnake)

Turtles - 3 species

BATS FOUND IN CARLSBAD CAVERN

by Dale Pate

"Bats of Carlsbad Caverns National Park" by Ken Geluso, Scott Altenbach, and Ron Kerbo was published in 1987. In that publication they listed 16 species of bats that had been found in the park. Since 1987, one more species has been identified bringing the total number of species of bats known from Carlsbad Caverns National Park to 17. In 1992, Ken Geluso netted a Western Small-footed Myotis (*Myotis ciliolabrum*) at Lowe Spring. Also during that year, Pat Jablonsky identified skulls that had been collected out of Carlsbad Cavern as belonging to that species. In her 1996 report on bat remains from Lechuguilla Cave, Pat Jablonsky lists 29 of the 50 studied bat skeletons being from this species. This may indicate that this species used to be more prevalent in the park in the past.

Of interest, of the 17 known species in the park the extinct Constantine's Free-tailed Bat is the only one not documented to have been found in Carlsbad Cavern. Of the remaining 16 species, 13 have been captured and identified in Carlsbad Cavern. Five of these 13 have only been captured during the bat flight at the entrance and not actually observed inside the cave. The remaining 3 species have been identified from skulls found in the cave. These 3 species are the Long-legged Myotis, the Yuma Myotis, and the Western Small-footed Myotis.

BAT SPECIES LIST FOR CCNP

Common Name (Scientific Name)

Big Free-tailed Bat (*Tadarida macrotis*)

Constantine's Free-tailed Bat (*Tadarida constantinei*)
 Mexican Free-tailed Bat (*Tadarida brasiliensis mexicana*)
 Pocketed Free-tailed Bat (*Tadarida femorosacca*)
 Big Brown Bat (*Eptesicus fuscus*)
 California Myotis (*Myotis californicus*)
 Cave Myotis (*Myotis velifer*)
 Fringed Myotis (*Myotis thysanodes*)
 Hoary Bat (*Lasiurus cinereus*)
 Long-legged Myotis (*Myotis volans*)
 Pallid Bat (*Antrozous pallidus*)
 Red Bat (*Lasiurus borealis*)
 Silver-haired Bat (*Lasionycteris noctivagans*)
 Townsend's Big-eared Bat (*Plecotus townsendii*)
 Western Pipistrelle (*Pipistrellus hesperus*)
 Western Small-footed Myotis (*Myotis ciliolabrum*)
 Yuma Myotis (*Myotis yumanensis*)

**PRESCRIBED FIRES
 REINTRODUCING FIRE IN THE DESERT
 ECOSYSTEM**
 by Gary Vequist

Wildfires in Carlsbad Caverns National Park (CCNP) are regularly started during lightning storms. These grassland fires are well documented in the historic record. Most fires are relatively small, but some burn tens of thousands of acres.

Fire has played a major role in sustaining the grasslands, which once dominated the park's landscape. There can be little doubt that vegetation in the park has undergone change, especially during the last century. Photographs taken at CCNP less than 70 years ago give evidence of extensive grass-covered slopes. Aggressive wildfire suppression and extensive grazing have altered the grasslands favoring an increased abundance of shrubs and succulent desert plants.

BENEFITS OF PRESCRIBED FIRES

* Prescribed fires can decrease the probability of catastrophic wildfires by reducing accumulated fuels (dense woody shrubs). Wildfires that start in previously burned areas cause less resource damage and are less expensive to control.

* Prescribed fires can be used to reinstate natural processes in the park ecosystem. Fire creates a natural mosaic of plant communities with diverse wildlife habitats. Biological diversity is a key indicator of ecosystem health.

* Prescribed fires can restore and maintain a healthy grassland ecosystem. Fire prepares the land for new

growth of grasses that are rejuvenated and perpetuated by fire.

PRESCRIBED FIRE MANAGEMENT POLICY

The NPS Management Policies (1988) recognized: "In ecosystems modified by prolonged exclusion of fire, prescribed burning may be used to restore fuel loading or vegetation composition to natural levels followed by a natural fire program." In keeping with this policy, fire management plans for CCNP designate areas for prescribed burns.

PLANNING PRESCRIBED BURNS

Until 1968, the National Park Service followed a policy of suppressing natural wildfires, based on the belief that natural fires were deleterious to the ecosystems. After scientific review it was determined that years of fire suppression actually cause dangerous ecological changes increasing the likelihood of catastrophic fires. Prescribed fire is an essential tool to restore a park's out-of-balance ecosystem.

Since 1993, a total of 16 prescribed fires have been ignited by NPS fire management teams and over 5,000 acres have been burned.

ON UNDERGROUND WILDERNESS

by Steve Oakes

What? Lechuguilla cave is not our country's first designated underground wilderness area!!!! Say its not so.

Okay, it's not so. But it would be correct to say that at one time Ron Kerbo, former Carlsbad NP cave specialist and William Penn Mott Jr., former Director of the National Park Service, as well as a good deal of other NPS staff members, wanted Congress to pass a separate act establishing Lechuguilla as an underground wilderness area. It is also correct to say that Lechuguilla lies within the boundary of the Carlsbad Caverns congressionally designated wilderness area.

In 1978, before "Lechuguilla" was "discovered", Congress declared that over 33,000 acres of Carlsbad Caverns National Park possessed those wilderness values and characteristics outlined in the Wilderness Act of 1964. The 1978 act changed how those "wilderness" acres within Carlsbad Caverns National Park could be managed and put that acreage in the National Wilderness Preservation System.

Has Congress recognized the special qualities that Lechuguilla possesses? Yes, a bill introduced by Senators Pete Dominici and Jeff Bingaman on March 9, 1989 came close to an exclusive title of underground wilderness. In Senate Bill 558, titled the Lechuguilla Cave Study Act of 1989, the act in Section 3 (a) stated:

"In recognition of the international significance of Lechuguilla Cave at Carlsbad Caverns National Park, the Secretary of the Interior is authorized and directed to conduct a study of the most appropriate way to protect and interpret Lechuguilla Cave. The study shall include but not be limited to an evaluation of the feasibility of constructing facilities to provide public access to the cave and an evaluation of the feasibility of designating the cave as wilderness."

In my research through park files, it does not appear the bill made it through committee. It may have become apparent that any construction to Lechuguilla would have been in violation of the act in 1978 declaring the area around Lechuguilla as wilderness. So maybe it was a good thing the bill didn't go any further than it did.

In defense of Congress, the unique attributes of Lechuguilla are given a bit more protection than other special areas within the National Wilderness Preservation System. The Lechuguilla Cave Protection Act of 1993 gives the cave and surrounding area increased importance. Subject to existing rights, the act withdraws 6,280 acres of adjacent federal lands from mineral exploration and development.

To conclude, technically it is incorrect to tell our visitors or co-workers that Congress designated Lechuguilla as the first underground wilderness, in the world, or the United States. It is correct to say when one is underground in Lechuguilla Cave, one may discover one of the finest, purest examples of wilderness in the world. No jet contrails or engine noise, no air or water pollution, no exotic plants or animals and a place where humans are only visitors that do not remain. I have been to several other Congressionally designated wilderness areas and been disappointed. I have not visited Lechuguilla Cave, but I hope to see its grandeur one day. But if I don't, I'm proud to know that the NPS and Carlsbad Caverns National Park staff are hard at work to protect its wilderness values and characteristics for future generations.

NEW DISCOVERIES IN LECHUGUILLA CAVE

Harry Burgess

During the most recent LEARN expedition into Lechuguilla Cave, approximately 4900 feet (0.88 miles) of passage were surveyed, bringing the cave's current length to 92.13 miles. This newly surveyed passage includes a climb in the main passage of the Western Borehole, some "clean-up" survey in the Southwest, and an exciting new breakout off Jackpot.

The expedition lasted seven days, with up to four teams of three people in the cave at any one time. The cavers were somewhat unenthused about their efforts until the last day of the expedition, when a team was able to negotiate a tight squeeze and a maze of breakdown to find themselves in a 230' x 125' x 40' room. There was an intersection of two fractures in the ceiling, which looked like a giant cross, and the room was named the Sanctuary. At the far end of this room are two large leads with obvious airflow characteristics (corrosion residue). These leads are heading north, away from any known parts of the cave. By the time this room was discovered, however, it was time for the team to exit and thus these passages remain unentered.

Another recent discovery of a different nature involves the extraction of DNA from the corrosion residues found within Lechuguilla Cave. Diana Northup of the University of New Mexico and Sue Barnes of Sandia National Laboratories have been working together on this project. This discovery is significant because it indicates the presence of a life form within what was considered to be an inanimate geological feature. There is always the possibility that some of the extracted DNA was introduced by cavers traveling within Lechuguilla, so a team was recently sent into the newly discovered Sanctuary to take samples of corrosion residues from a relatively pristine area. If these samples also contain DNA, it could alter our perception of the life processes within caves.

What is corrosion residue? It is a spongelike deposit of material on the walls of caves, originally believed to be the insoluble residue of subaerial corrosion. It can appear in many colors, from red to yellow to brown, and when it falls to the floor of a passage it can be slick to walk on and stains all clothing with which it comes into contact. It has a colorful descriptive name, which won't be printed here, but can be compared to grease when in a moist form. For those of you who have been to Spider Cave, there is corrosion residue all over the walls in

several of the passages there, mainly maroon or brown in color, most obvious in the Gnome Dome Room.

Corrosion residue is not a new discovery. It has been a large part of exploration in Lechuguilla Cave, and has been within arm's reach in other caves of the Guadalupe's for many years. What is new about corrosion residue are the studies associated with it. These studies, associated with the discovery of new rooms, may provide a basis for a new understanding of the cave environment. The next exploration expedition into Lechuguilla Cave is scheduled for the last week in September, and there is much anticipation over what will be found beyond the northward trending leads.

RESURVEY OF CARLSBAD CAVERN: AN UPDATE by Jason Richards

The resurvey of Carlsbad Cavern has been in progress for approximately two years and remarkable progress has been made. Along with the Cave Research Foundation (CRF), we have had some very dedicated, talented cave surveyors working in various parts of the cave.

Joe Sumner, from Austin, Texas has organized four expeditions and is scheduled for two more before the end of the year. Joe's group has been assigned the Right Hand Fork (RHF) of Left Hand Tunnel (LFT) area and is doing an exceptional job. Due to the fact that RHF is on the LHT data set it is hard to figure their progress in miles, but you can be assured they've added a great deal to the total.

Pat Seiser, from Vienna, West Virginia and Brian Holcomb, from Albuquerque, New Mexico have also organized four expeditions and been assigned the Secondary Stream Passage area. Pat and Brian's assignment has broadened to the Devil's Den and has also connected to the Cave Pearl area. So far, Pat and Brian's team efforts have netted 1.18 miles of passage. More recently, Pat and Brian's efforts were shifted to Pickle Alley and a thorough survey was accomplished. Rod Horrocks, cave specialist for Great Basin NP and Timpanogos NM, organized a twelve person team to tackle the Cave Pearl Room area in the main corridor of the caverns. During their week stay, Rod's expedition netted 1.13 miles of passage.

Paul Burger, from Boulder, Colorado, Richard and Shannon Knapp, from Dallas, Texas, and Chuck Bitting, cave specialist from Buffalo National River, mapped Hoxie's Blowing Lead and Christmas Room area, connecting to RHF, Troll Town and other areas of LHT.

Andy Belski, from Durango, Colorado and his team did an exceptional job in the Troll Town area of

LHT. Andy said there is still lots to do and is organizing another expedition.

Don Doucette, Pat Malone, and Harvey Miller, from the Colorado Springs area, are responsible for all the spectacular climbs in the Big Room and Chocolate High, their combined footage now is in the miles.

Barbe Barker, from Dallas, Texas, is the Guadalupe Escarpment Area Manager with the Cave Research Foundation. Barbie represents a group of intrepid cavers that volunteer five times a year. Besides doing restoration projects, they do excellent survey and have been concentrating in Left Hand Tunnel, Lower Cave, New Mexico Room and the Guadalupe Room.

There are other noteworthy cavers that have made invaluable contributions to the resurvey effort of Carlsbad Cavern, unfortunately, too many to name.

The completed map (old survey), was just under 31 miles, 30.85 miles to be exact. We've barely scratched the surface of Carlsbad Cavern, and in less than two years, the new survey is 20.58 miles and growing. Considering that in 1992, the Caverns had less than 20 miles of mapped passage, I feel we will have a **very big** cave when the survey is complete.

RATTLESNAKE SPRINGS AMPHIBIANS AND REPTILES

by David Roemer

Rattlesnake Springs is a complex riparian ecosystem that is only beginning to be studied and understood. This area is threatened by large numbers of the introduced bullfrog (*Rana catesbeiana*) which is a potentially destructive non-native species in the spring's area. Little is known of the herpetofauna (collective term for amphibians and reptiles) for the entire park (including Rattlesnake Springs), and of New Mexico in general (Degenhardt et al. 1996). This lack of information is particularly a problem for effective resource stewardship at Rattlesnake Springs where rare riparian species occur.

Bullfrogs, present at Rattlesnake Springs since 1985, are voracious predators capable of eliminating local populations of amphibians and reptiles (Moyle 1973, Hammerson 1982, Schwalbe and Rosen 1988). Bullfrogs have been a significant contributor to declining wetland herpetofauna in Arizona (Hayes and Jennings 1986), and have completely eliminated all riparian vertebrates in some locations in Mexico (Degenhardt et al. 1996).

1997 Preliminary Study

Jim Krupa (School of Biological Sciences, University of Kentucky) through Adopt-a-Bat funds was contracted to undertake a pilot study of the herpetofauna at Rattlesnake Springs in May and June of this year. The aim of this research was to describe the herpetological riparian community, assess the relative abundance of native Rio Grande leopard frogs (*Rana berlandieri*) and introduced bullfrogs, and assess the impact of bullfrogs on the riparian community. Jim has provided the park with a summary report of his findings along with management recommendations for maintaining the native herpetofaunal community.

Major findings of the Krupa study include:

Turtles: There is an absence of resident turtle populations at Rattlesnake Springs. Transient turtles are sometimes present, including the state-endangered western river cooter (*Pseudemys gorzugi*) and the slider (*Trachemys scripta*). Three sliders have drowned in the flume gates in 1997. The park will construct and install grates to prevent this from happening in the future.

Frogs: Cricket frogs (*Acris crepitans*) are absent, yet expected at Rattlesnake Springs. Leopard frogs are present, although adults were greatly outnumbered by adult bullfrogs in most habitats. Bullfrogs were the most abundant amphibian, and may be consuming young leopard frogs.

Fish: We still have a dense population of exotic green sunfish (*Lepomis cyanellus*), which is likely consuming tadpoles and the two native fish species at Rattlesnake Springs, roundnose minnow (*Dionda episcopa*) and greenthroat darter (*Etheostoma lepidum*). The sunfish, like the bullfrog, is a threat to native biodiversity at the springs.

Bullfrog Impacts: Analysis of the stomach contents of 49 bullfrogs captured in May and June revealed a varied diet of vegetation, invertebrates, and vertebrate mammals and amphibians. This data, taken by itself, does not strongly implicate bullfrogs as a major predator of native herpetofauna, although a later sample of bullfrogs collected by Ken Geluso in July may show differently. This sample will be analyzed by Krupa in December.

Recommendations

Jim's recommendations include: 1) setting traps to prevent green sunfish from becoming established in the pool and to reduce their numbers in the stream; 2) active bullfrog removal at least monthly during the summer; 3) installation of grates to prevent turtles from drowning in the flume; 4) long term monitoring of frog populations through a regular census of calling frogs;

and 5) increasing the amount of water that is released to the natural riparian watercourse.

The Krupa study is an excellent beginning towards improved understanding and management of the complex riparian ecosystem at Rattlesnake Springs. Look for a copy of this report in the park library (available soon). The park will receive support from the Southwest Region science fund to expand herpetological monitoring at Rattlesnake Springs and other park habitats in 1998.

Literature Cited

- Degenhardt, W. G., Painter, C. W., Price, A. H. 1996. *Amphibians and Reptiles of New Mexico*. University of New Mexico Press. 431 pp.
- Hammerson, G.A. 1982. Amphibians and Reptiles in Colorado. Colorado Div. Wildl. Publ. DOW-M-I-27-82. 131p.
- Hayes, M. P. and Jennings, M. R. 1986. Decline of ranid frog species in western North America: are bullfrogs (*Rana catesbeiana*) responsible? J. Herpetol. 20:490-509.
- Moyle, P. B. 1973. Effects of introduced bullfrogs, *Rana catesbeiana*, on the native frogs of the San Joaquin Valley, California. Copeia 1973:18-22.
- Schwalbe, C. R. and Rosen, P. C. 1988. Preliminary report on the effect of bullfrogs on wetland herpetofaunas in southeastern Arizona, pp 166-173. In Szaro, R.C., Severson, K. E., and Patton, D. R. *Management of amphibians, reptiles, and small mammals in North America*. USDA Forest Service, General Technical Report RM-166. 458 pp.

RAINFALL AT CCNP

Compiled by Lorie Hardin

1988	16.33 inches
1989	9.04inches (approximate)
1990	10.75 inches (approximate)
1991	19.23 inches
1992	15.60 inches
1993	10.11 inches
1994	10.34 inches
1995	13.68 inches
1996	18.89 inches
1997	13.88 inches up to Sept. 22

Average annual rainfall 1988-96 - 13.77 inches

fact as he does is an error. The theory is not endorsed wholly by the scientific community. There is still much debate as to whether the asteroid, comet or meteor's collision led to the global and evolutionary changes the theory suggests.

I appreciate the opportunity to contribute and I look forward to reading the next issue.

Steve Oakes

LETTERS TO THE EDITOR

I'm glad to see that "Canyons and Caves" has been used to update park staff on continuing projects or to announce new ones in the park. I'm also glad to see it being used to clear up misinformation in a non-confrontational manner. Along that line, I have submitted my own clarification to the misnomer that Lechuguilla is the first declared underground wilderness.

Also, for the sake of clarity, I take issue with Mr. James Krupa's statement in the last issue of Canyon and Caves. In his article on the bullfrog, he states "the asteroid that slammed into Mexico 65 million years ago ended the age of dinosaurs, but made it possible for the adaptive radiation of mammals. Thus our very existence in this age of mammals is due to a single event."

Although I generally agree that the cosmological event he describes is a very likely scenario, to state it as

CALENDAR OF EVENTS

Sept. 28 - Oct. 3	Lint Camp led by Pat Jablonsky
Sept. 28 - Oct. 5	Survey in Lechuguilla led by Ray Keeler
Oct. 6 - 9	Mountain Lion Transects
Oct. 7 - 10	National Cave Management Symposium in Bellingham, Washington
Oct. 11 - 19	Survey in Carlsbad Cavern led by Pat Seiser/Brian Holcomb
Oct. 16 - 17	Mountain Lion Transects
Oct. 22 - 24	Mountain Lion Transects
Oct. 25 - Nov. 2	LEARN Surveying in Lechuguilla
Nov. 1 - 7	NASA Science Work in Lechuguilla
Nov. 8 - 16	Survey in Lechuguilla led by Rod Horrocks/Pat Kambesis
Nov. 13 - 16	Restoration Work in Lechuguilla led by Jim and Val Werker
Nov. 19-21	CCNP SAR Training
Nov. 22 - 26	Survey in Carlsbad Cavern led by Joe Sumbera
Nov. 27 - 30	CRF Survey and Restoration in Carlsbad Cavern
Dec. 6 - 14	Survey in Lechuguilla led by Peter Bosted