



CANYONS & CAVES

A Newsletter from the Resources Stewardship & Science Division

Issue No. 27

Winter 2002



Winter clouds hang low over Slaughter Canyon. View is looking north from Highway 418. (NPS Photo by Dale L. Pate)

Edited by Dale L. Pate
Proofreading: Paula Bauer

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Look for Issues of *Canyons & Caves* at the following websites:
<http://www.nps.gov/cave/pub-pdf.htm> Thanks to Kelly Thomas and Bridget Eisfeldt all issues can be downloaded as a PDF file from the park website. <http://www.caver.net/> Once there, go to the Canyons & Caves icon. Bill Bentley has placed all issues on his personal website and can also be downloaded as PDF files.

Park Address: 3225 National Parks Highway, Carlsbad, New Mexico 88220

RESOURCE NEWS

NEW DIRECTOR – Congratulations to Louise Hose who has been selected as the permanent Director for the National Cave & Karst Research Institute. Dr. Hose begins her duties in mid-December in Carlsbad, New Mexico.

Zelda Bailey, Interim Director for the Institute from 2000 to 2002, has done an excellent job in moving the Institute from ideas on a piece of paper to an actual entity. Thanks for all the hard work and dedication in establishing the Institute. Your efforts are greatly appreciated.

CARLSBAD CAVERN PROTECTION PLAN & EA – In the works for at least 3 years, this Environmental Assessment has been approved for release by the Regional Director and is at the printers. This plan, based on information from an infiltration study, begins the long process of removing structures or mitigating their potential impact to the cave below. The document will soon be available electronically at the park website listed in the Table of Contents or a hard copy can be obtained by writing to the Superintendent. We encourage anyone with an interest to provide comments during the public review period (which has not been announced at this time, but should be soon). The comment period will be open for 90 days to give everyone the opportunity to review this document.

LINT CAMP 2002 – Lint Camp 2002 occurred September 30 to Oct. 4 with 15 participants this year. The camp, led by Pat Jablonsky removed thirteen pounds of lint from numerous locations along the main paved trail in the cave. The group donated 270 hours in this effort to keep the cave lint free.



Lint Camp 2002 crew. BACK ROW: Pat Jablonsky, Mike Kienker, Dave Owens, Cindy Collins, Dan Shultz, May Matthews, Marc, Kathryn and Veronica Myrsell, Margo Butner, Travis Owens, Iana Henson. KNEELING IN FRONT: Clarence Williams, Tem Hornday, Greg Glasner

RINGTAILS IN CARLSBAD CAVERN

by Myra Barnes and Dale Pate

Ringtails (*Bassaricus astutus*) are small mammals found throughout the Southwestern portion of the United States. Commonly called ringtail cats, ringtails are actually a member of the raccoon family and are not cats at all. Ringtails are nocturnal, preferring rocky canyon ledges, crevices, caves and other dark areas to nest and live in. Ringtails are excellent climbers, easily capable of ascending vertical walls and fitting into very small holes. Vernon Bailey, in his book *Animal Life of Carlsbad Cavern* published in 1928, even calls the ringtail the Ring-Tailed Cave Cat. The ringtail is well known for entering and living inside of caves and for traveling far into the dark zone of caves. Bailey even begins his section on the ringtail by saying that the ringtail is one "Of the few mammals that reach to the farthest ends of the deepest and darkest halls of the great Carlsbad Cavern and inhabit all the other numerous caves of the regions...."



A ringtail trapped and removed from the Underground Lunchroom. (NPS Photo by Myra Barnes)

Carlsbad Cavern is a significant natural area that wild animals utilize and inhabit throughout the year. It is humans that are not natural to this setting. We are the visitor. In late fall each year, reports of ringtail observations or ringtail scat (droppings) and trash containers tipped over along the self-guided trail in Carlsbad Cavern increase. As the weather cools, insects decrease, reptiles and some rodents hibernate,

and fruits from native vegetation are less common. In winter, Carlsbad Cavern is often warmer than the surface and does not have rain or snow. Scavenging for scraps of food or water in the cave may be easier than foraging on the surface, especially during cold weather. The odor of food from the Underground Lunchroom is probably especially attractive. In the dark zone of the cave ringtails cannot see any better than a person. However, they are able to navigate using scent trails they have marked along the trail, through other passages, and anyplace else in the cave where they find water or food.

To reduce the attractiveness of the cave to foraging ringtails, Carlsbad Caverns National Park removed all of its trash containers from the self-guided trail in Carlsbad Cavern at the end of November. Cavern Supply repaired a leaking faucet and improved animal-proof food storage in the Underground Lunchroom. Visitor orientation includes a message reminding visitors that food is not allowed in the cave and that no trash containers are available along the trail. Unfortunately, there are people who discard trash in the cave, whether there are trash containers or not.



This captured ringtail became injured when it tried to chew its way out of the trap. (NPS Photo by Myra Barnes)

With a constant temperature and no predators, ringtails may have dens in the cave, especially during the cold winter months. Ringtail scat collected in the dark zone along the Main Corridor trail and in the Big Room contains juniper berries and other vegetation, insect parts, fur, and occasionally plastic trash. This shows that ringtails are foraging on the surface as well as in the cave. During the summer, ringtails forage between the Natural Entrance and Bat Cave on fallen bats that are victims of collisions as the large number of bats fly out to forage each night. Only a few hundred bats remain in December so are less likely to collide resulting in few or no bats for scavenging ringtails. In the winter, natural food is limited to cave crickets and other small insects. Without the supplemental food from trash containers, ringtails are attracted to the odors and potential rewards from the Underground Lunchroom. Four ringtails have been live-trapped and relocated from the Underground Lunchroom at the request of Cavern Supply. Unfortunately, live trapping is not risk-free for the ringtails. One animal was injured in the trap while trying to chew its way out.

Relocating an animal away from its territory with familiar foraging or den sites and places to escape from predators reduces its chance of survival. It may be unwelcome in another ringtail's territory. Several photos are taken and physical features are recorded before release to help identify individuals. The four ringtails trapped in the Underground Lunchroom were different individuals.

Ringtails are common in the park, especially in the developed area around Carlsbad Cavern and along Walnut Canyon, but they are a species of concern in New Mexico. The mission of the National Park Service includes protection of natural resources, especially species of concern. It is also important to remember that Carlsbad Cavern is a natural area. When human food is no longer assessable in the cave, ringtails will switch to a natural, healthier diet. However, they may still be observed in the cave drinking from pools, foraging on cave insects or looking for a warmer winter den.

BATS INHABITED THE BIG ROOM 45,850 YEARS AGO

by Pat Jablonsky

Until recently, guano deposits found in the Big Room of Carlsbad Cavern were thought to be approximately 14,000 to 17,000 years old. This information was presented to the cave visitor via the now abandoned audio tour guides. When the new CD ROM audio tours were being produced, consideration was given to use this information again, but after a literature and reference search, no information could be found to validate this date. Therefore, a decision was made to exclude the age of the guano. It has been postulated that the date given on the old audio tour guide may have been based on some earlier guano dating results taken at Slaughter Canyon Cave and extrapolated to Carlsbad Cavern. There was a fair amount of information in Park files regarding guano and dating results from Slaughter Canyon Cave.

Since documentation of a date specific to the guano in the Big Room could not be located in a reference search, it became clear that analyses of the guano in the Big Room would be useful. Therefore, in 1998, a permit was obtained to gather samples of guano from the Big Room.

A sample was sent to Beta laboratory in Florida for analysis using Accelerator Mass Spectrometry techniques (AMS). Analysis indicated a conventional C14 age of 44680 +/- 1200 years before present (YBP). This was a much older date than expected. Therefore, to validate the age given by the laboratory in Florida, additional samples were collected and sent to other laboratories. The University of California at Berkeley and Stafford Research Laboratories in Boulder, Colorado were selected for additional testing of the Big Room guano. The additional samples collected were taken from the same location as the first sample. The date provided by Berkeley was 50, 300 +/- 2200 YBP and Stafford Labs provided a date of 42,510 +/- 700 YBP. When averaging the three dates, the age of the guano is 45,830 +/- 1366 YBP. This average date is much older than previously reported in

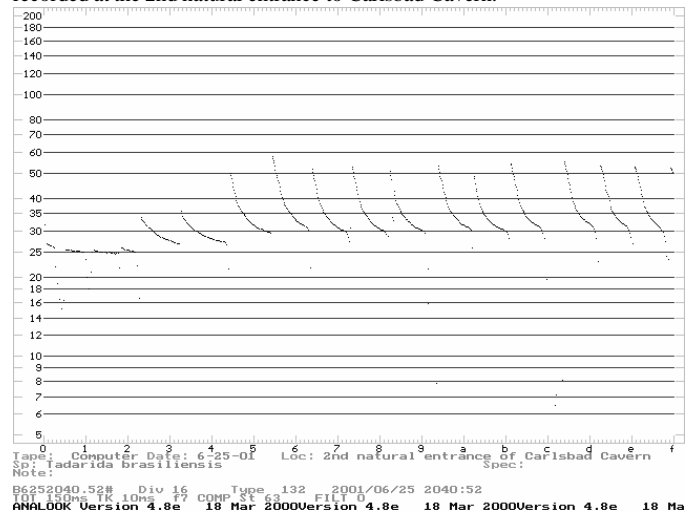
the old audiotapes and on the signage located on the Big Room tour. Though we know the age of the guano in the Big Room, we do not know the bat species that left the deposit there.

NEW DISCOVERIES FROM BAT ECHOLOCATION PATTERNS

by Myra Barnes

Each bat species uses a different pattern of echolocation frequencies to navigate and search for food. There is some variation between individual bats and the rate of echolocation may vary with activity. The nearly horizontal pattern of Mexican Free-tailed Bats when they are flying changes to a more rapid, nearly vertical pattern when they are closing in on an insect. Some *Myotis* species echolocation patterns appear similar while others are distinctively different. Mist netting verified that Fringed *Myotis* and Cave *Myotis* roost in Left Hand Tunnel. While Cave *Myotis* echolocation patterns are similar to several other *Myotis* species, Fringed *Myotis* use a different echolocation range. Using the Anabat bat detector, it is easy to tell the difference between the two species in Left Hand Tunnel. The Anabat is connected to a laptop computer and the patterns appear on the screen whenever a bat flies by using echolocation. Species can often be identified in the field as they fly by but the patterns can also be saved on the computer for more detailed analysis later. The echolocation patterns become part of the permanent record of bat observations. Recordings of echolocation patterns can be sent to experts for identification or verification.

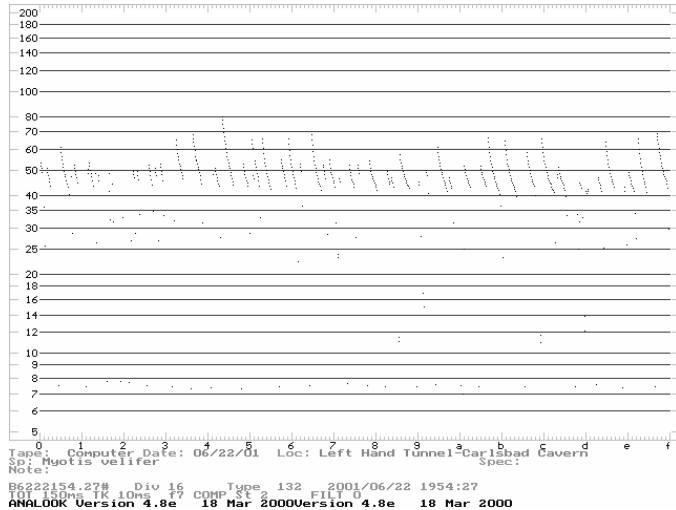
Echolocation signature for *Tadarida brasiliensis* (Mexican Free-tailed Bat) recorded at the 2nd natural entrance to Carlsbad Cavern.



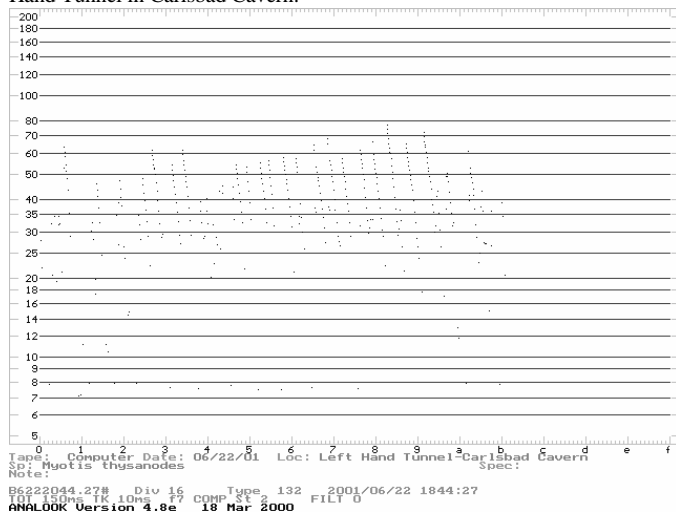
The Anabat bat detector can be used inside caves, at cave entrances, springs, foraging areas or anyplace else bats might be found. Anabat can't be used to determine population size since several bats may fly out together and it can't differentiate between bats flying in or out of the cave. However, when paired with a night vision scope or video camera with infrared illumination, it is possible to estimate a population of a few hundred bats or less within about 10%. The Carlsbad Caverns-Guadalupe Mountains Association's

Adopt-A-Bat fund donated a video camera with infrared illumination that allows us to videotape bats in flight, even in the dark zone far from the cave entrance. Estimates of populations in the thousands or hundreds of thousands, like the Mexican Free-tailed Bats emerging from Carlsbad Cavern, require more sophisticated recording and analysis methods.

Echolocation signature for *Myotis velifer* (Cave Myotis Bat) recorded in Left-Hand Tunnel in Carlsbad Cavern.



Echolocation signature for *Myotis thysanodes* (Fringed Myotis Bat) in Left-Hand Tunnel in Carlsbad Cavern.

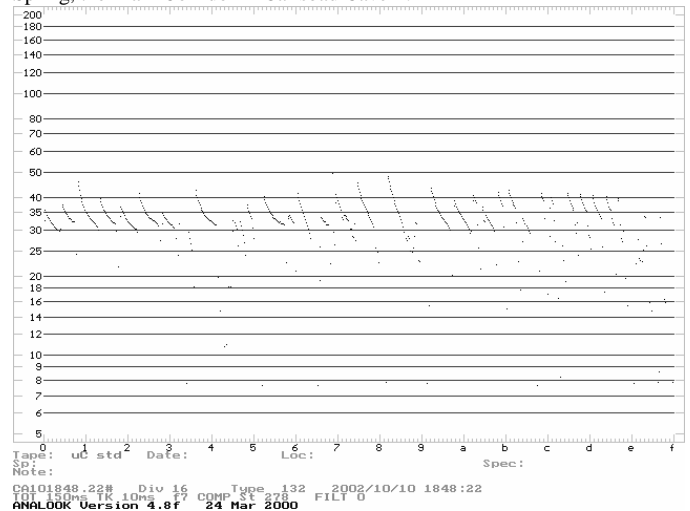


Mexican Free-tailed Bats, Fringed Myotis, and Cave Myotis were known to return to Carlsbad Cavern by late April and depart in early November. However, the early arrival and late departure dates for each species have not been observed and recorded regularly. This year all three species were recorded emerging from Carlsbad Cavern in mid-March using Anabat. At the end of November, a few thousand Mexican free-tailed bats and several dozen Fringed Myotis remained in Carlsbad Cavern. Cave Myotis were not recorded after early October. It is not known if this is an unusual year with so many bats remaining in Carlsbad Cavern. In November, most of the bats don't emerge from the cave until it is almost dark or after dark and the flights are very small compared to the impressive summer flights. However, knowledge of arrival and departure dates is

important for planning any activities in the roosts, along flight routes, or on the surface above the cave.

Anabat can also be used to identify spring and fall migrants that are less common. Late each summer bats are occasionally observed flying around in the twilight zone of Carlsbad Cavern in the late afternoon. One species is obviously larger than the other. People often assume they are Mexican Free-tailed Bats since they are not far from the entrance to Bat Cave. However, the small bats were Western Pipistrelle and the larger bats were Pallid Bats. Several hundred Pallid Bats were observed emerging from the second, somewhat smaller, Natural Entrance in September. No one knows where they roost in Carlsbad Cavern but using the Anabat we know that the roost is below Devil's Spring. By monitoring from different places in the cave we may be able narrow down the location of the roost. While monitoring from Devil's Spring, which is down the trail from Bat Cave with its large Mexican Free-tailed Bat roost, we recorded Pallid Bats, Fringed Myotis, a few Cave Myotis, and several Mexican free-tailed bats in October. Apparently not all of the Mexican Free-tailed Bats roost in Bat Cave. We also recorded a very unique echolocation pattern that looked like a Ghost-faced Bat. No other bat species has an echolocation pattern of similar shape and frequency. This would be the first record of a Ghost-faced Bat for the park and southeast New Mexico. They are found from southeast Arizona to southwest New Mexico and southeast of the park in Texas.

Echolocation signature for *Antrozous pallidus* (Pallid Bat) at Devil's Spring, the Main Corridor in Carlsbad Cavern.



Using the Anabat, Red Bats, Silver-haired Bats, Big Brown Bats, and a few Townsend's Big-eared Bats are among the species recorded at the pond at Rattlesnake Springs, in addition to the species known to roost in Carlsbad Cavern. Not all bat species roost in large groups in caves. Some roost in rock crevices, boulder fields, and in trees. Interesting use patterns emerged at Rattlesnake Springs. For the first half hour bats were present, over 90% of the recordings were Red Bats. Then for the next hour the Red Bats disappeared from the pond and Mexican Free-tailed Bats and Western Pipistrelles were the most common. We know very little about the habitat requirements, abundance, distribution, and

behavioral interactions of these other bat species in Carlsbad Caverns National Park. Next year in addition to using Anabat to monitor bats in and around Carlsbad Cavern, we will begin monitoring bats visiting springs and roosting in backcountry caves with Anabat recorders that can be left in place for several weeks before data is downloaded and analyzed.

Carlsbad Cavern is known for the large Mexican Free-tailed Bat colony. At the Natural Entrance, the large number of Free-tailed Bats obscures the other species using Carlsbad Cavern for maternity, bachelor, or migratory roosts. By recording echolocation patterns from the Second Natural Entrance, Underground Lunchroom, Left Hand Tunnel, Devil's Spring and other locations in the cave throughout the year, we are learning more about other bat species. While the Mexican Free-tailed Bat is the most popular species in Carlsbad Cavern, the Fringed and Cave Myotis are species of concern. Knowledge of species presence and cave use patterns is essential for conservation of all our bat species.

VOLUNTEERS IN PARK THE LINT PICKERS

by Pat Jablonsky

A unique group of resource conservation volunteers had their origins in Carlsbad Caverns National Park fifteen years ago. This group and their activities have spawned duplicate efforts in public access caves across the country and even abroad. Meet the Lint Pickers. Since 1988, this group of Volunteers in Parks has tackled one of our caves least obvious, but extremely critical environmental problems, the accumulation of lint. To understand this subtle threat, we should define the word. Lint is debris consisting primarily of small fibers of clothing, dead skin cells, hair, and other materials that fall off visitors as they stroll through the cave. While one person's contributions of lint may be a fraction of a gram, multiply that by the number of visitors to a given cave and you have an accumulation of enormous proportions. Approximately one-half million visitors tour Carlsbad Cavern and about that same number, one-half million, visitors tour Mammoth Cave each year. Multiply lint accumulation amounts by the number of years the cave has been open to the public and you can see that the potential can be immense.

If lint is allowed to stay in a cave, it can provide an environment for exotic ecological systems to establish a foothold in the cave. Lint is known to provide a food source for some foreign biota systems as well as provide a nice nesting place. Dense lint deposits have been observed in association with corrosion of cave formations as well. If left long enough on the walls of a cave or on a formation, it can become attached by the flow of calcium carbonate-rich waters permanently cementing the lint and changing the formations' texture.

Now that we have defined lint, we will look at the Lint Pickers themselves. Since 1988, there have been fourteen "lint camps" at Carlsbad Caverns National Park. During

those fourteen camps, two hundred and thirty-five volunteers have arrived at Carlsbad Cavern to participate in the efforts of abating lint. Many of those volunteers are veteran pickers returning year after year. Contribution of volunteer time has reached five thousand hours and yielded nearly two hundred and thirty pounds of lint.

How does one measure two hundred and thirty pounds of lint? Collect lint from your clothes dryer for two weeks, with the lint on kitchen scales, and then compare the volume of lint to the weight. Visualize a volume larger than a sub-compact car but less than a one-car garage. This is an enormous amount of lint!

Eliminating two hundred and thirty pounds of lint from a cave environment is difficult and quite tedious. One would assume that a vacuum cleaner would be the better choice but in actuality, vacuum cleaners work only marginally well in caves. Unless the vacuum cleaner is one of the newer HEPA-type cleaners, much of the lint will be redistributed back into the cave in smaller particle size. The smaller particles "hang" in the air currents longer and are carried to areas further offtrail. Another factor is that the filters on all vacuums clog constantly with the very humid lint. Sweeping is a poor option as well, for like the vacuum cleaner, it throws portions of the lint back into the air currents to settle somewhere else. The best and most effective method of removing lint involves labor-intensive use of various small brushes and tweezers.

Lint Abatement Activities 1988-2002 Carlsbad Caverns National Park

Year	# of Volunteers	#lbs of Lint	Hours
1988	25	25	600
1989	12	15	288
1990	9	12	216
1991	25	20	600
1992	25	18	600
1993	22	14	530
1994	7	12	160
1995	21	20	460
1996	25	27	540
1997	9	12	210
1998	8	10	188
1999	No Camp		
2000	25	20	500
2001	10	13	250
2002	12	12	270
Totals	235	232	4,962

Note: The number of pounds of lint collected is based on approximation. Not all debris can be removed from the lint collected. The lint is sorted, with as much dust and foreign objects removed, then strained through a sieve and weighed.

Articles about lint picking and the volunteers who pick lint have appeared in numerous publications. These include the Wall Street Journal, New Mexico Magazine, Rocky

Mountain News, Western Photographers Magazine, the Museum Quarterly of the Denver Museum of Natural History, and the NSS News of the National Speleological Society. Recently, cave lint was mentioned in a short news item on the cable program, National Geographic Today. Nevada Barr mentioned lint pickers in the mystery novel, Blind Descent. In 1995, the National Caves Association, the trade association of commercial cave managers, recognized research on lint with an award. In 1996, the Lint Pickers Project was awarded the National Speleological Society's Certificate of Merit award in recognition of the projects effort to reduce environmental damage of lint in Carlsbad Cavern and other significant show caves in the United States.

Finally, what are other show caves of the world doing about lint accumulations? All National Park Service cave parks have a lint abatement program in place as well as numerous privately owned show caves in the United States and Australia. Remember, "Lint is not limited to belly buttons alone."

1998 EMPLOYEE REUNION REVEALS GLIMPSES OF CAVE PAST

by Bob Hoff

Cultural history is an ongoing process and even recent, everyday experiences add to the rich cultural heritage that is Carlsbad Caverns National Park. In 1998 the park held an employee reunion. For this reunion former employees were asked to submit written accounts of some of their experiences while working in the park. These experiences and memories were then combined into a book titled "Memory Book" by retired NPS employee Peggy Justice. What follows is a sampling of these experiences from this book that shows the creativity, humor, diligence, and integrity employees experience everyday on the job.

() Indicate the years they worked at CAVE

Stephanie (Smith) Cheek (1978 – 1983)

A Walking, Talking Stalagmite – When Clifford Stroud, Carol Metzger and Hi Parent were cave supervisors, most of their summer staff was young college or just-graduated kids with few outside commitments. We socialized after hours and also gladly got together on our own time to build props and to present our special programs to park visitors. The walking, talking stalagmite was the funniest interpretive prop for Clifford's crew. It was a six-foot tall paper-maché stalagmite that we constructed to fit over the body of a ranger. We would haul it down to the scenics where it would be set up slightly off the trail on the rubble floor of the King's Palace. One of us would wait inside of it until we saw visitors on the trail. Then the stalagmite would say something to them. It was so funny to watch the faces of children, and even some adults, as they approached, disbelieving, this talking formation. One ranger absolutely loved working the stalagmite, and we could always tell that it was Howard Vasquez from his perfectly groomed Corfam shoes that protruded from underneath the stalagmite.

Life-Size Bat on the Loose – Another fun project was the life-size freetail bat costume. Cathy Rudy and I were often seen in our bat costume walking through the scenics teaching visitors (mostly children) about bats. I remember coming up from the Green Lake Room late one afternoon. It was a slow time of the day; the sweep had already begun. I could hear a pair of voices echoing above me by the Iceberg Rock. Keeping in character, I started flapping my wings and ran up the trail to meet whoever was coming down. The trail zigzags from the top of Iceberg Rock down to the scenics, and somehow the two young men whose voices I'd heard only caught a glimpse of me running and flapping my wings before I disappeared into a tunnel. I overheard one say to his friend, "...did you see the size of that bat? Run, run back up the trail!" Well, you can imagine their embarrassment, and mine, when we met up about twenty seconds later.

Hal Cottingham, the Park Prankster – I (Stephanie) remember walking up the New Cave trail on a 100° day with Hal Cottingham, New Cave crew supervisor. He nonchalantly informed me that it was my turn to carry the kerosene up to the cave for our lanterns. I naively accepted the responsibility of carrying all six cans up the hill. With three cans on each side of me, I trudged up the hill to greet park visitors at the entrance to the cave. As usual, we were running late, so I had to jog as we neared the top of the trail. Now Hal had a special spot identified on the trail as his sweat-drying and air-conditioning location. It was just below the entrance at the last turn in the trail where Hal and the other two rangers sat airing out their armpits as I came huffing and puffing up that trail as a pack mule. Just as I was about to catch my breath and rest a bit, Hal said, "Well, it's time to get up there. We don't want to keep the visitors waiting." Hal, I still think of that walk up to New Cave. I don't forget, and I don't forgive.

Note: Stephanie's husband Jim also worked at the caverns. Today he is a doctor and he and Stephanie have two children. Hal works at Guadalupe Mountains National Park.

Peter J. Alvarado (July 1979-September 1985)

Stuck Visitor Toe Sends Ranger to the Rescue – One day a young boy came running into the Visitor Center asking for assistance because his mother was in trouble. I grabbed a crash kit and followed the boy to his small but fully self-contained motor home and found his mother seated in the bathtub with her toe stuck in the faucet. In her struggles to free herself she had cracked the tub and tore down the shower curtain leaving her exposed in all her glory. I removed the faucet from the wall by breaking it off, her toe still attached, and was able to work her toe loose by pouring liquid soap over it. No report was made - to protect the innocent!

Mr. Alvarado is currently working at the Hobbs prison.

Neal Bullington (1967- 1970)

Stops People From Smoking in the Cave – Best achievements: discovering the Naturalist Room in Lower Cave along with Seasonal Guide Dwight Pitcaithley who is

now the NPS Chief Historian; suggesting and achieving the prohibition of smoking in the Cavern .

Note: Mr. Bullington, author of *Who Discovered Carlsbad Caverns*, retired from the NPS in March of 2002. He has told me on the phone that he would be happy to help me with any information that he can.

Frank W. Hodnett (1965-1966)

Some Park Guide Experiences – I worked at Carlsbad Caverns as a summer seasonal in 1965 and 1966. Claude Fernandez was the Chief Guide and Olive (Johnnie) Johnson was his assistant. Viola Shannon was another old-timer that worked with me during those summers.

My first summer started off with a week on the elevators. I started a week early and Claude did not have any place to use me, except on the elevators, until I went through the training for new employees. We were given a daily schedule that varied each day and was rotated among the crew; it told us where we were to be and when. Claude's watchful eye was always on us, and his comments about how our uniform should look, or that we needed a shave or whatever, were taken to heart and heeded.

We would make 12 complete tours of the Caverns each day. The rest of the day was used on the information desk or parking lot duty. We would have a variation of cave tours, maybe two walk-ins and a Big Room, or two Big Rooms and a walk-in. The parking lot duty was a hot but enjoyable duty. It was our duty to make sure that the cars were parked close together and that the traffic moved smoothly.

As a first year seasonal, we were not allowed to vary from our schedule, and there was the ever-watchful eye of Claude to keep us in line.

I also worked during the summer that the Big Room was self-guided for the first time. Quite different. We were given walkie-talkies and sent on our prescribed beat. There were only a very few places that the radios worked, but we tried to keep close enough that we could get the most important message of all, "Claude is coming. Repeat. Claude is coming." One day we were walking along and a voice came on the radio saying, "Claude is coming, Claude is coming." Right on the heels of that message came another message, "This is Claude, who said that?" It was amazing that not one guide in the Big Room answered his question. We had lots of fun with Claude, but we knew when he meant business and we did our job right to keep him off our back. Claude was fair and hard working and he expected everyone to be the same.

Note: Mr. Hodnett is the President of *Cavern Supply* today. Olive Johnson, revered by all who worked with her, is 87 and almost totally blind. Her career spanned 1943 - 1973. In April 2000, she returned to the park to tell the rangers about her experiences. Just this month, she moved into a retirement home.

The cultural history of Carlsbad Caverns National Park is rich with people and experiences. From this history, we have learned how to better protect the cave and our resources, how to educate the visitor, and we have learned about ourselves. Those of us working at the park today are building a storehouse of personal experiences. We are making history everyday.

**CHALLENGE COST SHARE HELPS
ESTABLISH LECHUGUILLA INVENTORY
& MONITORING PROGRAM**

by Paul Burger

Over the past several years, the park has been revising and standardizing its inventory program. The inventory sheet consists of a list of cave features (stalagmites, clay, pools, etc.) that may be present. If a certain feature is found during a cave survey, the station name is written next to the feature on the list. This way, all of the stations that have a given feature are recorded. This data is kept in a spreadsheet that can be queried with ArcView to find the occurrences of certain features in the cave. These data can then be used by the cave managers and researchers to locate areas where special management may be needed or to focus research on specific features. The new system was successfully field tested in Carlsbad Cavern as part of the resurvey of the cave. The Cave Resources Office decided to begin mandatory use of this new system in Lechuguilla Cave beginning with all exploration and survey trips in 2002.

Research had raised concerns about the impacts of survey and exploration on Lechuguilla Cave as well as the impacts of the new airlock gate on the cave. Cave pools are used as a water source for multi-day exploration and inventory trips in the cave. Human-caused contamination (E coli and other coliforms) has been detected in several of these pools. The biggest sources of cave-pool contamination are the urine dumps located near the in-cave camps. Based on the recommendations of researchers, the park decided to implement a program to monitor the cave environment, monitor cave pool contamination, and initiate a urine mitigation study.

The park did not have the staff or money to accomplish these tasks, so had to rely on volunteers and a generous cost-share agreement with the NPS Challenge Cost Share Program (CCSP). Using the volunteer value as a match, the park received over \$23,000 to begin the inventory and monitoring of Lechuguilla Cave.

In 2002, caver volunteers contributed over 6,615 hours (\$98,100.00 equivalent) to survey and inventory more than 1,500 stations (6% or 6.3 miles of the whole cave). Combining these data with information compiled from past researchers, brought the total amount of inventoried cave to more than 5,200 stations (21% or 21 miles of cave).

Using the CCSP monies, the park purchased several loggers to monitor temperature and humidity changes in Lechuguilla, especially in the entrance area, to determine the

effectiveness of the new airlock environmental gate. These loggers will provide long-term data on the effects of the gate and the effects of surface conditions on the cave.

Using some of the money from this CCSP project to help offset equipment costs, researchers at New Mexico Tech have volunteered their time to help develop a method of treating the urine in the cave to reduce the impact. The park also obtained portable field-testing kits to measure the amounts of human contamination on the cave pools and monitor the contaminant level changes through time. These kits will also be used to monitor the effectiveness of urine treatment on cave pools.

Thanks to the Challenge Cost Share Program, the park has established a program for inventory and monitoring in Lechuguilla Cave. With the help of caver volunteers, more than 21% of the cave has been inventoried to date. The park is developing a photo catalog to aid cavers in identifying cave features. The park is continuing to monitor the cave environment and contamination levels in cave pools to identify any future mitigation measures that may need to be taken. The CCSP and dozens of volunteers have helped to protect the cave and identify the unique resources of Lechuguilla Cave.

2002 LECHUGUILLA CAVE EXPLORATION AND SURVEY SUMMARY

by Stan Allison

Exploration and survey in Lechuguilla Cave during 2002 focused on fixing bad loops and resurveying surveys that had sketches not up to Carlsbad Caverns Survey Standards. Along with the fixing of past surveys, much new survey was accomplished with the discovery of a new boneyard area under Hard Daze Night Hall called Paris, TX. As of January 2002, Lechuguilla survey was 107 miles long. By December the survey had grown to 109.23 miles in length. Over 2 miles of resurvey was performed and 2.2 miles of new survey was done. The number of loop closures that exceeded 2 standard deviations was reduced from 442 or 25.6% to 312 or 17.2%. The overall standard deviation of the cave improved to 1.376. Three twelve-person expeditions and three smaller expeditions were approved for 2002. August 10-17 was the first Lechuguilla Exploration and Research Network (LEARN) trip to Lechuguilla Cave for 2002. Ron Delano led the trip. Participants were: John Lyles, Daniel Chailloux (France), Phillippe Guillemain (France), Mark Andrich, Peter Bosted, Ann Bosted, Chuck Cummings, Paul Fowler, Roger Haley, Dave Jones and Scott Linn. Total new survey for the trip was 3,208 feet and total resurvey was 3,999 feet. One team camped in the Grand Guadalupe Junction camp and worked in the Far East. Another team camped in the Big Sky Camp and worked in the South. The other two teams camped at Deep Seas and worked in the West.

The Far East team returned to the Kachina Lakes area and did several climbs, none of which went very far. A low, crawly area in the MEE survey was found which extended

away from known cave. The South team spent most of their time fixing bad loops in the Chandelier Maze, quite possibly the most complicated area known in Lechuguilla. Their efforts paid off in numerous bad loops fixed. The highlight of the two West teams work was the discovery of a new boneyard area under Hard Daze Night Hall. Named "Paris, TX" in honor of the French cavers. Many leads were left continuing in this area. New survey was also done in the Rainbow Room.

Joel Despain led a 6-person expedition from August 18-24. Trip participants were: Vivian Loftin, Robert Childs, Shane Fryer and Kate Despain. Work was done in both the Western Branch and the South Branch. Work in the West focused on the Needle Park Maze and ABC's Room area where Joel and Vivian are drawing quad maps. Later in the week the team moved to the Southern Branch where they performed resurvey.

John Lyles and Peter Bosted led an expedition from September 14-20. Participants were: Brian Alger, Hazel Barton, Daniel Chailloux (France), Jennifer Foote, Peter Haberland, Andy Howe, John Lyles, Glen Malliet, Gary and Jenny Whitby (Australia). Everyone camped in the Deep Seas Camp and worked the Western Branch. New survey accomplished was 1,979 feet along with 2,186 feet of resurvey.

Work continued in the Paris, TX area. Two green stalactites resembling barite stalactites found elsewhere in the cave were discovered. This area was named "Cephalopodunk" for its fossils and small dimensions. Much work was accomplished in the Chandelier Graveyard aiding in efforts to complete the quad map for that area. A trip was made to the Mother Lode where a lead was surveyed and a profile of the room was done utilizing a laser range finder. Maximum ceiling height in this well decorated room was 143 feet.

Jeb Steward led a small expedition focused on climbing leads in the Southwest from September 20-26. Participants were: Chuck Cummings, Karlin Meyers (Switzerland), and Stan Allison. Camp was set at the Big Sky Camp. New survey accomplished was 1,183 feet and 25 stations were resurveyed. Most of the work focused in the Lechy's Lair area where several climbs were done. One in particular led to an upper level passage called the "Belfry" due to the two bat skeletons found there. A large diameter 100-foot deep previously unexplored pit was dropped at FLP21, which connected to the BIG survey. On the last day a climb was started in Hoodoo Hall. Named Hoodoo Dancers, the climb overhangs 20 feet in 30 feet of vertical.

The second LEARN expedition was from October 19-26 and led by Dick LaForge. Participants were: Cathy Borer, Art Fortini, Ron Miller, Dick LaForge, Steve Maynard, Ken Lyon, Chris Andrews, Lyle Moss, Brian Davies, Rob Gillespie, Pat Roberson and Pete Tschannen. Two teams camped in the Deep Seas Camp and worked the Western Branch of the cave, while the other two teams camped in the Grand Guadalupe Junction Camp and worked the Far East

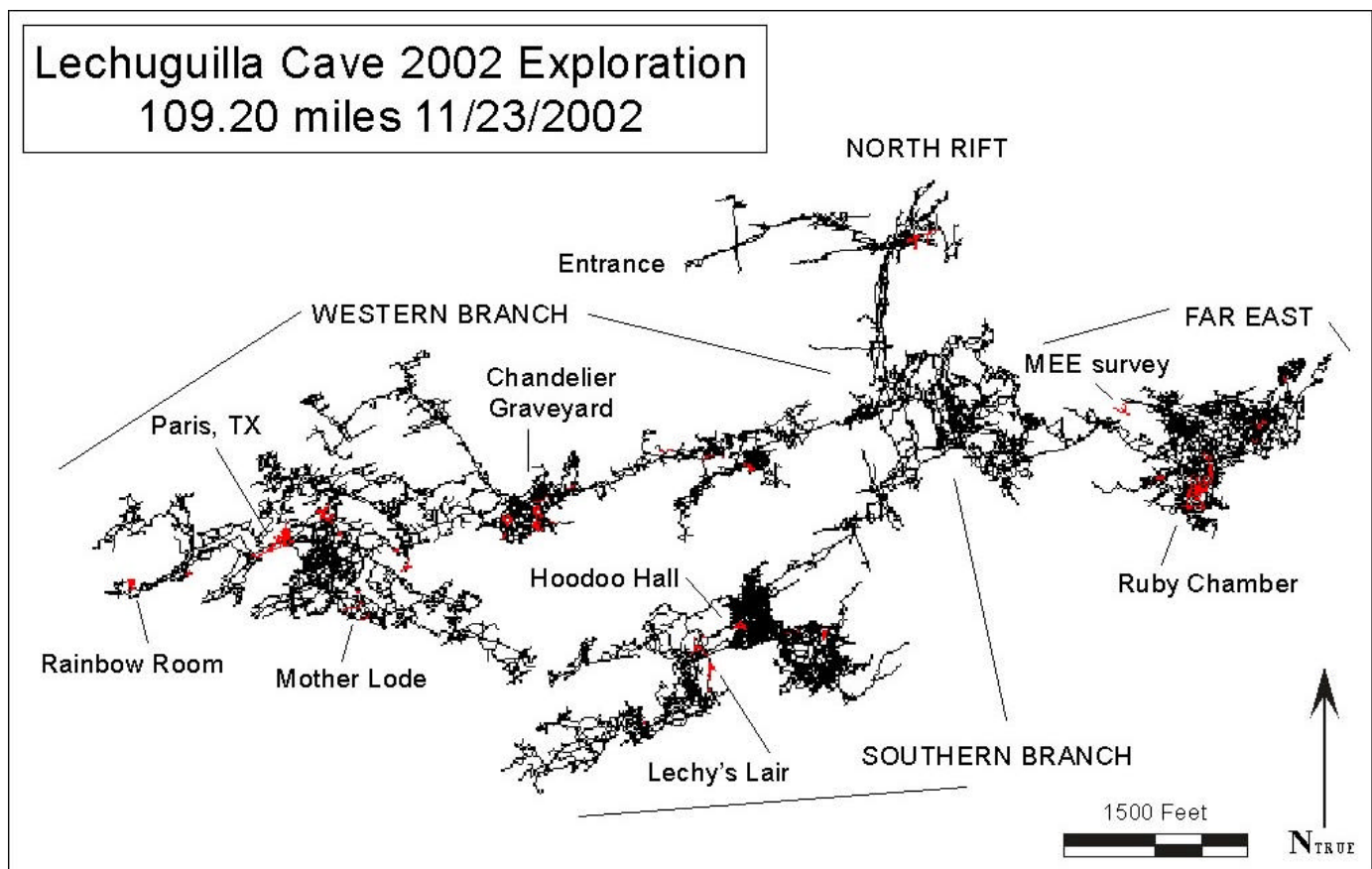
area. A total of 3,144 feet of new survey was accomplished along with 6,607 feet of resurvey.

The Far East teams resurveyed and fixed numerous bad loops. The Ruby Chamber and Wild Black Yonder were resketched and a climb was done in Big Bug Dome that led to a couple of hundred feet of cave. On the last day of the trip a climb was done into a lead out of the Ruby Chamber. This passage had airflow and was leading away from known cave. The discovery team ran out of time and left the lead going and blowing.

The Far west teams also resurveyed and fixed numerous bad loops. Some work was done in the Paris, TX area, Weasels Ripped My Flesh and in the Chandelier Graveyard area.

Steve Reames led a series of day trips to the North Rift area of Lechuguilla Cave to perform both survey and resurvey in order for him to complete a quad map for the area. The first trip was July 12th. Participants were: Steve Reames, Evan Anderson, Stephanie Juth, Paul Burger, Bruce Albright and Barb Smith. The second trip was October 13th. Participants were: Paul Burger, Amy and Carl Bern, Bruce Albright, Tom Dotter and Robin Barber. A final trip occurred November 24. Participants were: Paul Burger, Amy and Carl Bern, Barb Smith, Tom Dotter and Skip Withrow.

Exploration and survey expedition proposals for 2003 are due by December 31, 2002. Permitted expeditions will be announced February 1, 2003.



Red represents the passages surveyed in 2002 in this line plot map produced by Stan Allison.

CARLSBAD WILDERNESS

by Dale L. Pate

One of the great gifts to future generations that came out of the environmental movement of the 1950's and 60's was the Wilderness Act of 1964. This Act recognized the value to the nation and to mankind of leaving areas of land untouched and primeval. The National Park Service has responded to this Act by including large tracts of land into the Wilderness System. Carlsbad Caverns National Park is one of the park units that have been fortunate enough to contain lands that qualified for this recognition and additional protection. This article includes a brief history of how this wilderness designation came about in the park and current management strategies in place today. Included is also a glimpse into the future for management practices.

NPS WILDERNESS

Within the National Park Service, there are 45 park units, including Carlsbad Caverns, that contain congressionally designated wilderness. These park units comprise 43,287,523 acres of wilderness. Wrangell-St. Elias National Park and Preserve contains the largest designated area at 9,078,675 acres. There are 19 additional parks that have lands within them that have been recommended for wilderness status, but await congressional approval. Among others, these parks include well-known places such as Big Bend, Grand Tetons, Great Smokey Mountains, Rocky Mountains, Yellowstone, and Zion National Parks. In addition, there are numerous other park units in the process of developing wilderness proposals.



A typical rocky ridge in Carlsbad Wilderness. (NPS Photo by Dale Pate)

CARLSBAD WILDERNESS

History

Data collecting to determine if Carlsbad Caverns National Park held land suitable for wilderness designation began in 1970. By November 1971, the National Park Service proposed designating 24,000 acres inside the park as Wilderness. Public meetings were held in the town of Carlsbad and El Paso to seek input on this proposal. During

this public comment period, 1696 written or oral comments were received from individuals as well as organizations, as well as from local, state and other federal agencies on the proposal. This included a petition with 1076 signatures. Of these comments, 200 agreed with the NPS proposal, 1391 wanted the NPS to enlarge the acreage size, 5 wanted less designated wilderness, 16 wanted no wilderness at all and 84 had no specific comments or recommendations. In August 1972, a wilderness recommendation study was completed and sent to Congress recommending that 30,210 acres become designated Wilderness.

More than six years later on November 10, 1978, Public Law 95-625 established 33,125 acres (with 320 acres of privately held land as potential wilderness) within Carlsbad Caverns National Park as designated Wilderness. This law also called for a Wilderness Reevaluation Study to be submitted to Congress by January 1, 1980. This study would re-evaluate land inside the park that had not been designated as Wilderness to see if it did meet the criteria after all.

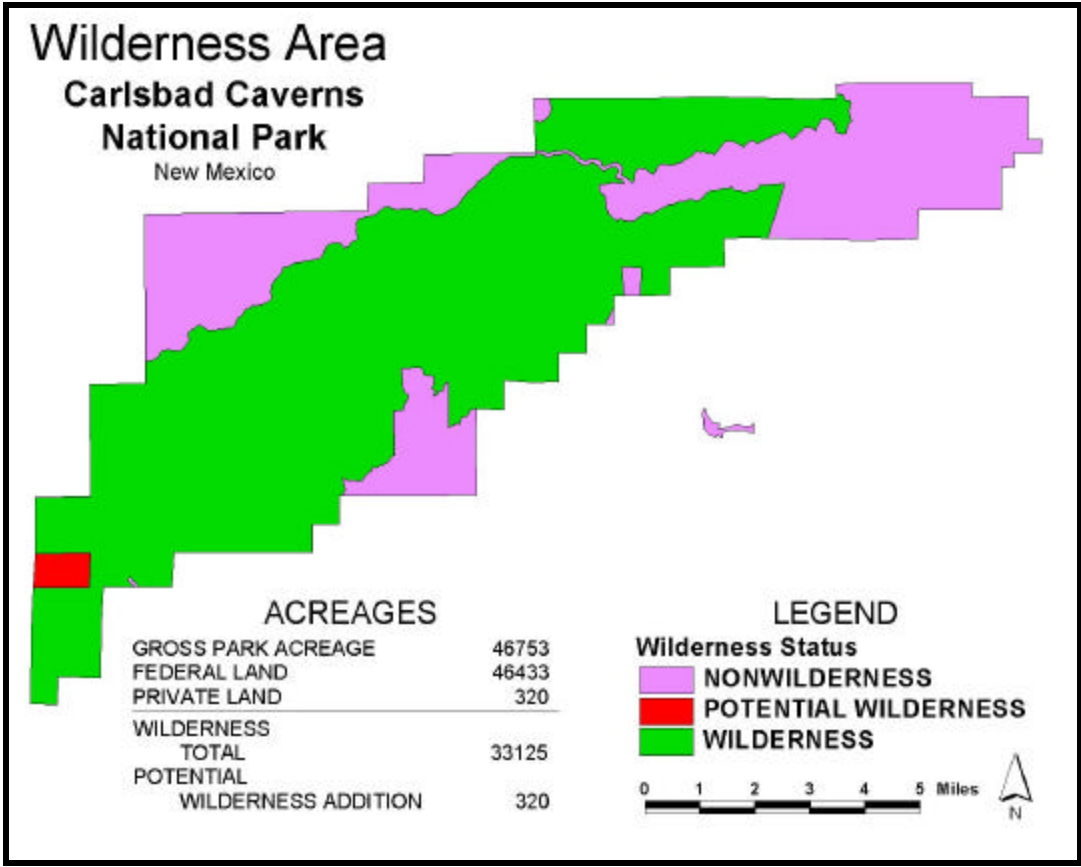
By April 1980, the NPS produced an environmental assessment for public review that had no proposed alternative from three separate described alternatives. A public meeting was held in Carlsbad in November 1980. During this comment period, a total of 29 written or oral comments were received. Of these, 23 called for no additional wilderness, 3 favored adding additional wilderness, and 3 had no specific comments or recommendations. By January 1981, a report recommending no additional wilderness to be added to the Carlsbad Caverns wilderness area was prepared and submitted to Congress.

Current Management

The wilderness and the non-wilderness areas are currently managed through the Backcountry/Wilderness Plan and Environmental Assessment approved in 1991. Additional directions for wilderness management are stipulated in the parks General Management Plan and Environmental Impact Statement approved in 1996 and in a number of planning documents and congressional acts, including the more recent National Park Service Management Policies 2001. Trail maintenance standards were recently developed and approved through a Superintendent's memorandum. To better protect backcountry areas not in designated wilderness, these are managed as de facto wilderness.

The Future

The goal is to preserve for future generations the park's wilderness and backcountry areas, including its unique geology and ecosystems, while providing visitors a primitive, natural experience. And while the current Backcountry/Wilderness Plan provides adequate direction for the management of this area, a new Backcountry/Wilderness Plan is to be prepared in the next few years to address a number of issues and to update management philosophy and direction.



Park map depicting wilderness area courtesy Dave Roemer and the park GIS office.