

Managing Cave Resources In a Recreational Park

By Christopher M. White

Editor's Note: The following is an edited version of the paper given by Christopher M. White, Supervisory Park Ranger (Interpreter) at Ozark National Scenic Riverways, Van Buren, MO, at the National Cave Management Symposium at Rolla, MO, in October 1984.

Over eons, the Current and Jacks Fork rivers (located in southeast Missouri) cut into the slowly uplifting dolomite and limestone underlying the area. Water flowing underground slowly dissolved and carved out numerous caves. A tremendous amount of the underground water reappeared as enormous springs, one flowing as much as 200 million gallons a day. Steep bluffs, sharp hills, and rocky soil were a result. Most of the "hills" are actually knobs left from the early streams and rivers. Early man probably followed the rivers upstream to settle the floodplain. Indians settled in several places along the Current where a broad bench made for enough fertile soil to raise crops.

During the Civil War, caves in the area were put to several uses. Powder Mill Cave is reported to have been used for saltpeter production. Hospital Cave got its name when both sides used it for a recuperation facility. Courthouse Cave was used to hide records relating to the town of Eminence. Other caves were used by civilians to hide possessions or themselves as roving bands of quasi-military troops from both sides swept through on periodic raids. Jesse James and his gang are purported to have used several caves for hideouts. These caves are now within the boundaries of Ozark Riverways.

During the late 1890s, extensive cutting of the enormous stands of virgin timber caused a boom period that lasted into the late 1920s. The cutting practices of the time resulted in gravel-choked streams, clogged springs, and the discovery of many of the caves we explore today.

Coinciding with the lumber era was the arrival of the railroads, opening the area to easy access; fisher-

men, hunters and recreationalists took full advantage. People began to notice the scenery; clear streams, big springs, well-decorated caves, and talk began about setting aside the area.

During the 1930s and 40s, the State and U.S. Forest Service acquired cut-over forest land that had been abandoned by the timber companies. The State purchased land along the Current and Jacks Fork rivers at Round Spring, Alley Spring and Big Spring. These were designated as state parks and developed by the Civilian Conservation Corps in the 1930s. Cabins, campgrounds, restrooms, museums, picnic shelters and a dining lodge were built. Branson Cave near Alley Spring also was purchased and developed, with a walkway leading into the cave.

A Corps of Engineers study in the 1940s identified the Current and Jacks Fork rivers as ideal for a dam. Threatened with development, the rivers were the subject of many columns in the regional newspapers supporting the idea of setting aside the rivers under the protection of the National Park Service. In 1955, a serious push began, and after a long series of political maneuvers, legislation was passed in 1964 declaring the two rivers to be part of Ozark National Scenic Riverways. An area one mile long on each side of the towns of Eminence and Van Buren was left outside the Park boundary. Public Law 88-492 specifically mentions both air and water-filled caves (read springs) for preservation.

But in some ways, the job had just begun. Many of the caves in the long, narrow Park boundary were well-known to local residents and had been subjected to much use and abuse. Designation as a unit of the National Park System brought increasing visitation.

There are three categories of cave users. The first is the experienced caver who comes to go caving. Properly prepared, this group has few problems and does little disturbance to the resource. More potential for abuse lies with some local residents. Trips into a cave are often the measure of one's macho image and evidence of such visits is available in the form of broken cave formations and empty liquor bottles. However, not many caves are visited and this impact, although perhaps heavy on a few caves, is not a problem compared to the largest group of users. This third group is the "incidental caver," one whose caving experience is only a small part of the reason to visit Ozark Riverways. Of the incidental cavers, the largest group are canoeists.

In 1973, there were 1.5 million visitors to the Riverways. Of that, 9.7 percent, or 146,000 were canoeists. Ten years later, total visitation was 1.8 million, but the percentage of canoeists had almost doubled - to 16.7 percent, or 303,000. This is important to cave management, since many of caves in the Riverways are easily accessible and/or visible from the river.

Over one-third of the canoeists are in groups of 20 or more. Most use the upper Current on summer weekends. They have little or no formal canoe handling training, have one or two flashlights, and often are drinking copious amounts of beer. It's not unusual in July or August to have 600-800 canoes launch from one landing to float a river the width of five cars parked side by side.

Caves in the Riverways are in dolomite, tend to be

performed and as the "bugs" are removed from the data base, the degree of correspondence between predicted and observed species occurrence undoubtedly will increase.

We feel that WHR systems can be useful to resource managers working in NPS locations throughout North America. Any NP that has not yet conducted a Resources Base Inventory (RBI) can utilize this system to query what wildlife would be expected to occur within the park. However, WHR is not a substitute for first-hand knowledge or on-site experience.

The WHR system also can be utilized by resource managers to assess the potential impact on wildlife of various management decisions they might make. As WHR becomes available to more NPS areas, a Systemwide usage could occur. Moreover, NPS managers who choose to utilize WHR, would put themselves in contact with numerous state and federal agencies and would thus foster more cooperative work with other management agencies.

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small (400-1,000 feet), and horizontal in development. Over 225 are located within the narrow Park boundaries and their total could be as high as 300. They tend to be wet with a stream or two, muddy, at one time well-decorated, and most have at least a few examples of cave life. Many of the incidental cavers are repeat visitors and the location of many of the popular caves are handed down in canoeists' lore from year to year. So far, very few accidents have been reported and no fatalities.

Cave management at Ozark National Scenic Riverways is reflected in its cave management studies and inventories. Few such reports are known before the 1950s. Several local histories mention caves used for different purposes. However, comprehensive survey was not done until 1965, when J. Harlan Bretz mentions in his "Caves of Missouri," several caves within the Riverways boundaries. Some years later, Jerry Vineyard completed his master's thesis on Devil's Well, a prominent feature in the Riverways. At the same time, the fledgling Missouri Speleological Society was exploring and preparing reports on caves in the area.

In "Report on Ozark Rivers National Monument Proposal" (NPS, 1960), several pages are devoted to the springs and caves of the area. The report notes that some of the caves are "quite extensive and magnificently decorated with dripstone." It goes on to mention Jam-Up and Round Spring caves and the numerous sinks. The karst features of the area were considered important enough to the Monument Proposal to be worth highlighting.

In 1973, Tom Aley, then a hydrologist with the U.S. Forest Service, published "An Approach to Cave Man-

agement." Although he was addressing the adjacent Mark Twain National Forest, many of the problems he wrote of were and are endemic in the Riverways. It was an early attempt at rating caves based on hazards, cave life, etc. In it, Aley also recognized problems with heavy cave use, . . . vandalism, trampling, muddy tracks on cave formations and bat disturbance.

Another study important because of its omissions, was "Safety Evaluation of River-Use at Ozark National Scenic Riverways," (Weaver, 1975). In the report, Weaver was to identify "hazardous and potentially hazardous conditions and practices within the Riverways associated with recreational use of the area." Comments were made about launch area problems, injuries and their cause, hiker's problems, etc. No mention is made of caves or any associated problems.

Brief mention of floater problems is found in "Impact of Floaters on Ozark National Scenic Riverways," (Sutton, 1976). Sutton looks at "the effects of floaters on the Current and Jacks Fork rivers of the Ozark National Scenic Riverways." His emphasis was on soil typing and a short study of soil erosion along the riverbank. Under "recommendations," Sutton noted that heavy use of certain cave sites was causing erosion, vegetation deterioration, and soil compaction and recommended several mitigating actions such as construction of boat landings and permanent trails.

Sutton's study, a master's thesis, is the first about the Riverways the author is aware of that mentions man problems associated with caves. No report thus far had touched on resource problems inside the caves. It was four more years before this was dealt with.

In a 1977 report, "River Recreation Research at

Ozark National Scenic Riverways," the problem of "damage and vandalism to natural features inside the caves" is discussed. No mention is made of habitat destruction. The report recommends "site hardening" at popular sites (steps, moorings, etc.) and a "limited amount of resource manipulation." Caves were recognized as part of a floater's experience and some suggestions were made to restrict or lessen impact. This is the first study that attempts to deal with user-related problems.

The Riverway contracted with Tom Aley to do the first cave management study of Riverways' caves. It was completed in 1980. In the first of two comprehensive reports titled "Cave Management Investigations in the Ozark National Scenic Riverways," Aley "evaluated the significance and extent of cave resources within the Riverways, identified the situations and problems affecting cave resources within the Riverways, and assessed 19 caves and complexes of caves and developed management conclusions and recommendations for these caves."

Based largely on cave location reports from the Missouri Speleological Society, Aley visited 19 caves. He gave a brief description of the cave and an inventory of cave life. At the end of each report, Aley includes a set of management conclusions and recommendations. Signing is suggested for most of the caves. One item of special note is the statement that "not much is known about the type or extent of visitation to these and other Riverways caves." Not until the summer of 1985 will this essential study be done. The importance of Aley's report is that for the first time, Riverways' management acknowledge that caves are a resource to be managed along with the canoeists and other recreationists.

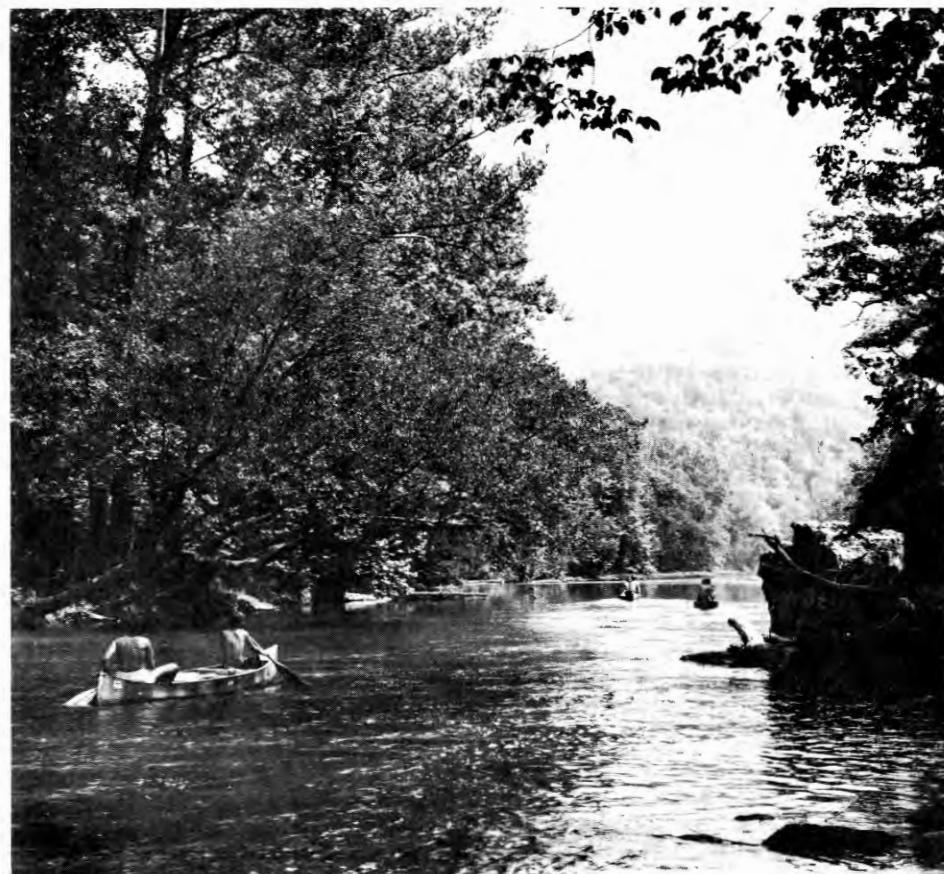
Phase II of Aley's report dealt with an additional 60 caves within the Riverways' boundaries. In addition to the Phase I objectives, Aley looked for signs of archeological resources. Of note in his introduction is the statement; "There are probably more caves within the Ozark National Scenic Riverways than in any other National Park Service-administered area in the United States. Based upon our estimates of the number of visitor days of non-guided cave use, total cave use within the Riverways exceeds that which occurs in any other NPS-administered area in the United States."

Although he did not extensively explore all the caves, Aley did produce, in Phase II, an impressive document to guide managers in protecting the cave resources. These reports compiled a great deal of information from different sources and pointed the way for cave management in the '80s.

In December of 1981, the Riverways released the Draft General Management Plan (GMP) for the Riverways. Under "Resource Management," a full page deals with caves. It notes that eight are listed as outstanding natural features. The fragile nature and chance for serious injury in caves is discussed. Objectives for caves:

"include the protection of irreplaceable resources while providing for visitor use, promoting appreciation through interpretation, and furthering education and scientific research. The proposed course of action for cave resources is to complete inventories and management plans for all caves, with increased development and maintenance of some for visitor use."

Finally, a brief listing of needs included continuing cave inventories and additional research in several areas. The GMP succinctly sums up needs in the Riverways. Final GMP approval came in October, 1984.



More than 300,000 canoeists a year take to the waters of the Ozark National Scenic Riverways, many of them becoming "incidental cavers" in a haphazard, unplanned way.



Along the Current River, Nill Cave is easily accessible to canoeists and other river users.

The most recent reports are by James E. Gardner and John Taft, Parts I and II of "Cave Resources of Ozark National Scenic Riverways – An Inventory and Evaluation," 1983 and '84. In it, the authors conducted a biological inventory of caves based on Aley's list, made some management recommendations and suggested a cave classification system for both cave life and cave hazards.

The guidelines and management recommendations of these reports are an essential step – without them there would be no direction. However, the more difficult problem remains – how to get cave manage-

ment started in a multi-resource park. Remoteness of caves, low visibility or resource degradation, lack of public pressure, and low funding priorities... all interrelated conditions... exacerbate the problems.

Ozark Riverways caves are physically remote from the people who are making management decisions. One can easily drive through a campground, check a visitor center or drive along part of the rivers. But to see the caves requires a good deal of time and preparation. The people in the field are busy dealing with the floods, canoeists, or immediate repairs to picnic areas, campgrounds, day use, etc. Few have time or the interest to go into caves to clean up litter or check for vandalism.

Public pressure for cave preservation is little and low-key. Few visitors see cave environments as fragile and easily destroyed. The crowding and litter along the rivers are their immediate concern. They can easily compare the condition of a campground, launch area or restroom. Jet boats and innertubes intrude on their recreational experience. These, then, are the subjects of letters to the Riverways or to their Congressmen. So, these are the issues dealt with by the staff based on its meager resources.

Finally, there is little money made available to deal with the problem. Priorities are set based on perceived need. Broken restroom doors, littered campsites, and crowded river conditions are given high funding priority. Caves, out of public and staff view, without baseline studies or public pressure, are low on the lists of perceived needs.

Many other Park resources suffer from these same problems. The key difference is that damage to caves or cave life takes so very long to recover. Hillsides denuded of trees during the early 1900s' lumbering era are now covered with new growth. Streams choked with gravel are slowly stabilizing, and gravel bars are re-vegetated. In little more than one generation much of the habitat disruption is healing. Deer, turkey, raccoon, fox, and other surface wildlife have come back so well through resource management that hunting is again allowed. But the gray bat and the Indiana bat, and in particular the speleotherms of many caves, need hundreds or thousands of years to recover. As managers, we can afford to delay decisions on resource preservation of surface features for several years with few ill effects.

Delay the same underground decisions and the damage may never heal.

What can be done to deal with the problems of cave management in the multi-resource Ozark Riverways? The answer lies in one word: Education... the education of both the Riverways' staff and general public. An immediate need is educating management staff members. In the long term, it is making visitors more aware of the unique and easily destroyed cave resources.

A continuing activity is an ongoing project by the Missouri Speleological Society (MSS) to survey and map caves within the Riverways' boundaries. Topographical maps of the river corridor are marked with the location of all known caves. Copies are donated to the Riverways. Currently, more than 120 caves have been mapped, about half of all known caves. Also, the MSS provides us copies of trip reports to these caves that describe in detail many features found in them. The maps and reports can be used to locate likely archeological cave sites, cave life, or bat habitats. They can help make the managers and field staff aware of the caves in their part of the Riverways and provide vital information in case of cave accident.

This past year (1984), guidelines were developed for diving in the Riverways' springs and caves. These are intended to allow continued use of the resource by experienced divers doing research... the first of their kind for any NPS area. Based on a great deal of research, they incorporate many existing guidelines of the NSS and other agencies.

The Riverways is a member of the Missouri Caves Association, a group of show cave owners from both Missouri and northern Arkansas. Bi-yearly meetings allow an exchange of ideas with the private sector.

This spring, the Park will start on a Cave Management Plan. Before becoming final, it will receive public review at several meetings.

With a grant from the American Cave Conservation Association, a survey will be made this summer of cave visitation and use. Emphasis will be on establishing estimated visitation at some of the more popular caves and developing profiles of types and percentages of cave users by seasons. Under the direction of Alan Everson (University of Missouri-Columbia), the survey will employ both direct and indirect sampling of cave visitation and users. Results of the study will be used to help develop the Cave Management Plan for the Riverways.

Public education takes many forms. Formal tours two hours long are given in mile-long Round Spring Cave. Emphasis is on deterring people from damaging caves while also helping one-flashlight groups whose batteries died halfway out.

A new cultural demonstration at Pullite Spring will feature spring hydrology. Law enforcement rangers assist by warning or ticketing canoeists caught with speleotherms or found damaging caves. Evening programs at the five major campgrounds include various aspects of caves and springs. Emphasis is on the fragility of the resource and the need for conservation. Guided hikes at one area take interested visitors to a small wild cave to help teach proper caving skills and etiquette. Printed material includes brochures that warn of the hazards involved in caving.

The final step in the education process is the placing of advisory signs and in a few instances, gating. Starting this summer, signs will be placed in the cave entrances of many of the more popular caves. They will stress proper cave behavior and briefly cover cave systems. Gates have been placed on only four, and it is unlikely that more than 10 caves out of more than 240 ever will be gated.



Horseshoe Bend Cave is easily accessible to canoeists floating the Current River.