

3-1-1990

The Underground Conflict: Should Caves Be Designated as Wilderness?

Lorenzo Miller

Follow this and additional works at: <https://digitalcommons.law.byu.edu/jpl>

 Part of the [Land Use Law Commons](#), and the [Natural Resources Law Commons](#)

Recommended Citation

Lorenzo Miller, *The Underground Conflict: Should Caves Be Designated as Wilderness?*, 4 BYU J. Pub. L. 133 (1990).
Available at: <https://digitalcommons.law.byu.edu/jpl/vol4/iss1/8>

This Comment is brought to you for free and open access by BYU Law Digital Commons. It has been accepted for inclusion in Brigham Young University Journal of Public Law by an authorized editor of BYU Law Digital Commons. For more information, please contact hunterlawlibrary@byu.edu.

The Underground Conflict: Should Caves Be Designated as Wilderness?

I. INTRODUCTION

In the southern regions of New Mexico, miles from any interstate, lies Carlsbad Caverns National Park. On arrival at the park, visitors are informed by radio that the three-mile tours through the cavern are strenuous and difficult. But visitors can cut the distance and difficulty by using the park's elevators. These motorized vehicles bypass the first mile of winding pathways, allowing access to all those wishing to see the cavern's many vistas.

Approaching the cave, one notices that the mouth of the cave is tremendous, spanning 100 feet in width and approximately 60 feet in height. The trail winds its way down the throat of this massive pit that rapidly envelopes visitors in stone. The outside world becomes lost as one descends underground.

Below the surface, a vast array of cave decorations and marvels fill the immense space carved out of rock. The roof of the cavern rises to over 200 feet in height, and artificial lighting illuminates the cave decor which becomes more intricate and delicate with depth. Soda straws, stalactites, stalagmites, columns, flowstones, draperies, rimstone, and shelfstone have formed from calcite deposited over thousands of years.¹ Every bend is stunningly beautiful. The lighting adds color and life to the pitch-black cavity, and many of the formations join to create artistic sculptures. Visitors spend hours just naming the different decorations found along the trails.

Unknown to most park visitors, another more pristine and possibly more scenic cave lies nearby, virtually unspoiled by human presence. Lechuguilla, as named by those few who have actually entered, is more beautiful, longer, deeper, and contains decorations not seen in Carlsbad. Some of its depths and various decorations are unique and found in only a few caves throughout the world.

Currently the National Park Service (NPS) manages Lechuguilla as wilderness, supposedly "stopping the destructive exploitation that

1. For definitions of the various cave formations, see generally W. WHITE, *GEOMORPHOLOGY AND HYDROLOGY OF KARST TERRAINS* 220-63 (1988).

Carlsbad receives."² This management policy currently allows only "experienced" cavers to enter, preserving the cave for future generations.

One might ask, "What could be more wonderful?" But something about this idea is wrong. Does society want to designate caves and underground caverns as "wilderness"? Is that what "wilderness" is all about? Reflecting on the thought, one must soon realize that if the NPS continually manages Lechuguilla as wilderness, most Americans will never be able to visit or enjoy the vast decorations and wonders confined within the cave.

Even though cave wilderness is needed for cave preservation, the designation of cave wilderness creates unique problems of wilderness management. Because there are such problems, a compromise must be struck between wilderness preservation and cave exploitation. This compromise should be to set aside significant caves for wilderness preservation while leaving substantial portions of these caves to accommodate the general public.

II. CAVE USE AND PRESERVATION

Today hundreds of thousands of known caves exist throughout the world; the United States alone has over 40,000 caves,³ more than 4,200 located on federal lands.⁴ Of these federally-owned lands, fifteen national parks have caves located within their boundaries.⁵ Millions of summer vacationers visit commercial caves, both public and private, throughout the states.⁶ Mammoth Cave National Park alone receives over 1,500,000 visitors each year.⁷

2. Ranger's Talk, Interpretive Program, New Cave, Carlsbad National Park, Carlsbad, N.M. (Dec. 29, 1988).

3. S. REP. No. 559, 100th Cong., 2d Sess. 5, *reprinted in* 1988 U.S. CODE CONG. & ADMIN. NEWS 5938; Davies & Morgan, *Geology of Caves*, U. S. GEOLOGICAL SURVEY (GPO 1986).

4. See The Federal Cave Resource Protection Act S. 927 and H. R. 1975: A Statement Prepared by the National Speleological Society, Inc., 1 (Apr. 1987) (unpublished manuscript, available from the National Speleology Society). The United States Forest Service (FS) lands contain more than 2,974 caves, and the Bureau of Land Management (BLM) land contains more than 1,237 caves. See also S. REP. No. 559, *supra* note 3.

5. See Davies & Morgan, *supra* note 3, at 16-17. The National Park Service (NPS) manages over 15 parks which have natural caverns, and thirty or more state parks also manage caves.

6. According to the NPS, over 5,000,000 people visit the six major National Park caves each year. These caves include Mammoth Caves, Wind Caves, Carlsbad Caverns, Jewel Caves, Lehman Caves, and Timpanogas Caves. See National Park Statistical Abstracts for the years 1904 through 1988, obtainable through the Statistical Unit of the Denver Service Center, National Park Service, P.O. Box 25287, Denver, Colo. 80225 (telephone: 1-303-969-2100).

7. The 1988 tourist season brought 1,636,300 visitors to the park. Information obtained from the Statistical Unit of the Denver Service Center, National Park Service (Feb. 3, 1989). Compare D. JACKSON, PLANET EARTH, UNDERGROUND WORLDS 38 (1982); Bessone, *Welcome to the*

Numerous caving clubs and speleological societies exist throughout the world.⁸ The United States alone has three major speleological societies with 5,000-6,000 members.⁹ These groups foster the discovery, exploration, scientific study and protection of cave resources.¹⁰ Numerous books, magazines and articles are published each year on the joys of experiencing these underground worlds.

A. *Special Interest Groups and Conflict*

With the great number of people visiting caverns, many special interest groups have emerged. Cave entrepreneurs want to follow the footsteps of their money-seeking predecessors by developing caves to their maximum-visitor-potential. By adding elevators and walkways, dynamiting passageways, and adding handrails and lighting, these cave exploiters increase cave usage and maximize people potential. Other groups, such as the National Speleological Society (NSS), focus on preserving caves for those few who dare press underground to explore the absolute darkness with only flashlights or lanterns.

Great conflict arises between these two extremes: Should society designate caves as wilderness areas at the cost of excluding the majority of potential cave visitors, the seasonal vacationers with little or no cave experience; or should society exploit the natural wonders of underground caverns, thus risking the permanent destruction of the pristine environment and scenic wonders now available to those few cavers who have the technical knowledge and equipment to explore without Park Service guides? The old debate¹¹ over the "true" purpose of preserving

Cave of Contention, Outside, Jan. 1990, at 15, 16.

8. J. MIDDLETON & T. WALTHAM, *THE UNDERGROUND ATLAS: A GAZETTEER OF THE WORLD'S UNDERGROUND CAVE REGIONS* 232-33 (1986).

9. The National Speleological Society, Inc. (NSS) has 4000 plus members, the Cave Research Foundation (CRF) has 400 plus joint-ventures. The American Cave Conservation Association (ACCA) current membership is unknown to author. See *infra* note 10.

10. Telephone interview with Sarah Bishop, member of both NSS and CRF, CRF Director and Chair-person of the Cave Wilderness Subcommittee of the NSS (Feb. 3, 1989) [hereinafter S. Bishop]; Telephone interview with Janet Thorn, chair-person of the Cave Conservation Committee of the NSS (Feb. 9, 1989) [hereinafter Thorn].

11. Telephone interview with Ron Kerbo, Cave Specialist, Carlsbad Caverns National Park (Mar. 7, 1989) [hereinafter Kerbo]. See generally D. DUSTIN, L. McAVORY & J. SCHULTZ, *STEWARDS OF ACCESS CUSTODIANS OF CHOICE: A PHILOSOPHICAL FOUNDATION FOR THE PARK AND RECREATION PROFESSIONAL* (1982); J. SAX, *MOUNTAINS WITHOUT HANDRAILS* (1980); R. NASH, *WILDERNESS AND THE AMERICAN MIND* (3d ed. 1982); C. ALLIN, *THE POLITICS OF WILDERNESS PRESERVATION* (1982); James Watt, Remarks at the Brigham Young University Natural Resources Law Symposium (Feb. 17, 1989) (available through the Brigham Young University Law School, Public Lands and Natural Resources Forum).

our national heritage starts anew in this "Golden Age"¹² of cave science and exploration.

B. *Cave Protection Begins*

These questions may never be answered. As with the NPS, which to this day has not fully defined its purpose in our expanding society, the answers may be a reflection of societal values which never remain consistent or stable.¹³ However, the mechanisms for cave protection have certainly been set into motion. As early as the 1800's, Josip Jersinovic¹⁴ realized that the famous Adelsberg Caves of Yugoslavia¹⁵ could not withstand constant abuse by its visitors. Accordingly, he established a commission that "regulated every aspect of the cave's operation" and protected the fragile underground environment from those who would destroy it.¹⁶ But cave preservation was not confined to Europe.

In 1903, America's interest in caves reached the United States Congress and the President, urging them to enact legislation to preserve underground caverns for present and future generations.¹⁷ Beginning with Wind Cave National Park, the United States set aside the first land to preserve a natural cavern.¹⁸ By 1988, 85 years later, Congress and several presidents had set aside over fifteen areas containing caverns, designating them as either national parks or monuments.¹⁹ These reserves have been managed by the NPS, under the Department of the Interior.²⁰ Numerous state legislatures have also set aside caves as state monuments or parks.²¹ The statutory purposes articulated in laws, setting aside these lands, are strikingly similar: to protect and

12. See Roberts, *Caving Comes into Its Golden Age*, SMITHSONIAN, Nov. 1988, at 52-64.

13. For a more complete and informative history of the National Park Service and the Wilderness Act, see C. ALLIN, *supra* note 11, and R. NASH, *supra* note 11.

14. Jersinovic was a 19th century district official who was in charge of the world famous Adelsberg Cave of Yugoslavia. This early cave developer is known for establishing a cave commission to protect Adelsberg from "the depredations of souvenir hounds." He was most likely the first true entrepreneur of cave tourism. His innovations include modern park service developmental tools such as cave bridges, stairways, leveled paths, locked gates, log books, and specially trained tour-guides. D. JACKSON, *supra* note 7, at 28-32; see also T. SHAW, *HISTORY OF CAVE SCIENCE* (1979).

15. D. JACKSON, *supra* note 7, at 32.

16. *Id.*

17. Wind Cave National Monument was the first cave set aside (January 9, 1903) specifically for preservation. See 16 U.S.C. §§ 141, 142 (1988).

18. *Id.*

19. See Davies & Morgan, *supra* note 3.

20. See 16 U.S.C. §§ 1 and 1a-2 (1988); 16 U.S.C. §§ 431 (1988). National Parks and Monuments are managed by the Department of the Interior under the direction of the Secretary of the Interior.

21. See Davies & Morgan, *supra* note 3.

preserve the caves for present and future generations and to encourage public use and enjoyment.²²

C. *The Cave Protection Act*

On November 18, 1988, Congress enacted legislation preserving the United States' national heritage in caverns, along with their numerous formations and decorations.²³ This legislation, called the Federal Cave Resources Protection Act, originated in 1982 when the National Speleological Society's (NSS) Board of Governors commissioned its Conservation Committee to persuade Congress to enact legislation preserving cave resources on a national level.²⁴ The committee quickly started the wheels in motion. By convincing Democratic Congressman Frederick C. Boucher, of Virginia, that such nationwide protection was seriously needed,²⁵ acceptable language for a new bill was developed. The bill, later to be known as H. R. 1975, passed the House of Representatives on March 29, 1988.²⁶ Meanwhile, a similar measure was introduced in the Senate by South Dakota Senator Tom Daschle on April 7, 1988.²⁷ The Senate Subcommittee on Public Lands, National Parks and Forests met to hear both measures on June 16, 1988.²⁸ On September 22, 1988, the bill went to the Senate Committee on Energy and Natural Resources which "ordered H. R. 1975, as amended, favorably reported."²⁹ The bill passed Congress and was signed into law by President Reagan on November 18, 1988.³⁰

III. CAVE PROTECTION NOT ENOUGH

The Federal Cave Resources Protection Act has not quenched the NSS' desire for national cave protection. The organization's conservation committee has assigned to one of its subcommittees the task of convincing Congress and the President that America needs cave wilderness

22. *Compare* Proclamation No. 799, 35 Stat. 2180 (1908) (Jewel Cave); Proclamation No. 1618, 42 Stat. 2260 (1922) (Lehman Cave); Proclamation No. 1640, 42 Stat. 2285 (1922) (Timpanogas Cave); Proclamation No. 3413, 75 Stat. 1058 (1961) (Russell Cave); 16 U.S.C. § 431 (1988) (Carlsbad Caverns); 16 U.S.C. § 404 (1988) (Mammoth Cave).

23. *See* Federal Cave Resources Protection Act of 1988, 16 U.S.C. §§ 4301-4309 (1988) (previously Pub. L. No. 100-691, § 2, 102 Stat. 4546). The act specifically applies to "significant caves" on federal lands. 16 U.S.C. § 4301(b) (1988).

24. Thorn, *supra* note 10.

25. *Id.*

26. *Id.*

27. *Id.*

28. *Id.*

29. *Id.* *See also* A History of H.R. 1975 (undated manuscript obtained from the N.S.S.)

30. *See* 16 U.S.C. § 4301 (1988). The final bill passed with 30 co-sponsors in the House of Representative and 8 co-sponsors in the Senate. Thorn, *supra* note 10.

to assure the preservation of our national cave resources in their pristine state.³¹ If the NSS achieves its goal, many caves of national significance may eventually become wilderness, barring all possible commercial exploitation using mechanical devices or non-natural improvement.³² The NSS intentions are to introduce legislation banning any "improvements" from within cave wilderness boundaries.³³

A. *Wilderness Defined*

Wilderness can be defined in two principal ways: (1) the wilderness philosophy; and (2) the statutory definition codified by Congress in the Wilderness Act.³⁴

1. *The wilderness philosophy*

The first definition, the wilderness philosophy, classifies land on the basis of American history and sentimental values glorifying the unknown and the untamed. As authors Richard W. Watson and Philip M. Smith wrote:

Wilderness is land that can provide man with wilderness experience. This definition is not circular, for wilderness experience can be defined as follows:

Wilderness experience consists of feelings of aesthetic appreciation, of self-reliance, and of remoteness from the ordinary activities and works of man.³⁵

The white man's first impression of wilderness was that it was more a threat to survival than a beauty to behold. Robert Nash, a well-known authority on wilderness, wrote that "[w]hen William Bradford stepped off the *Mayflower* into a 'hideous and desolate wilderness' he started a tradition of repugnance."³⁶ Wilderness was a threat which compelled the Colonists to struggle for their very existence and sur-

31. Thorn, *supra*, note 10.

32. *Id.* The use of the word "improvement" does not mean improvements to the cave. The word implies those modifications allowing easier access to humans. Compare National Wilderness Preservation System Act of 1964, Pub. L. No. 88-577 (codified at 16 U.S.C. §§ 1131-1136 (1988)).

33. Thorn, *supra* note 10.

34. 16 U.S.C. § 1131 (1988).

35. Stitt & Bishop, *Underground Wilderness in the Guadalupe Escarpment: A Concept Applied*, BULLETIN OF THE NATIONAL SPELEOLOGICAL SOCIETY 77, 80 (1972) (citing Watson & Smith, *Underground Wilderness: A Point of View*, 2 INTERNATIONAL ENVIRONMENTAL STUDIES 217-20 (1971)).

36. R. NASH, *supra* note 11, at 23-24 (citing a quotation from W. BRADFORD, OF PLYMOUTH PLANTATION 62 (1952)).

vival.³⁷ As the colonies grew in population and a young nation was born, the early states began to expand deeper into the land they were learning to tame. The young country acquired such vast amounts of land that it seemed inexhaustible.³⁸ "Americans failed to treasure their natural resources because they perceived [them as] perpetual surpluses. . . . [The] wilderness condition was favorable to widespread property ownership, but not to the 'population density, factor mobility and . . . ease of communications . . . upon which the development of a complex economy depends.'"³⁹ Until after the Civil War, preservation of wilderness was of little concern. Indeed, the physical taming of America's vast lands "gave meaning and purpose to the frontiersman's life."⁴⁰

However, after the Civil War, the "first buds of wilderness preservation" began to appear in America.⁴¹ These "buds" were transplanted from a small minority of wealthy-elite, literary scholars of Europe.⁴² These romantics were people who only "faced wilderness by choice" and not necessity.⁴³

Eventually men such as David Thoreau, Estwick Evens, and George Catlin began to write about the glories of wilderness and the need for its preservation. Wilderness took on a new meaning. "[T]here [was] something in the very name of wilderness which charm[ed] the ear, and sooth[ed] the spirit of men."⁴⁴ The transcendentalists even saw religious significance in wilderness. To them, it was "a force for the liberation of the best in the human spirit."⁴⁵

By the twentieth century, men such as Robert Marshall and Aldo Leopold were crying for wilderness preservation.⁴⁶ By the mid-1960's, their cries reached the United States Congress and the President. On September 3, 1964, the Wilderness Act was signed into law.

37. C. ALLIN, *supra* note 11, at 5.

38. *Id.* at 9.

39. *Id.* at 12 (citing P. JONES, AMERICAN'S WEALTH 6-12, 34 (1963)).

40. R. Nash, *supra* note 11, at 40.

41. *Id.*

42. *Id.* at 13.

43. *Id.*

44. *Id.* (citing E. EVANS, A PEDESTRIOUS TOUR OF FOUR THOUSAND MILES THROUGH THE WESTERN STATES AND TERRITORIES 335 (1819)).

45. C. ALLIN, *supra* note 11, at 13-15.

46. Marshall, one of the leading proponents of the national wilderness preservation system, argued that wilderness should provide an "opportunity for complete self-sufficiency." Nash interpreted wilderness as "a place where users are responsible for their own safety, where a physical and mental challenge to survive exists, and where self-reliance reigns." Lucas suggested that wilderness should offer "the fascination of the natural scene, the observation of natural processes at work, and the challenge of essentially undeveloped land." *Id.*

2. *The Wilderness Act*

The definition contained within the Wilderness Act is the second principal method of defining wilderness. The Act defines wilderness as:

[A]n area of underdeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural condition and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of men's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.⁴⁷

Accordingly, the Act protects only public lands which lend themselves to the specified congressional definition, even though true wilderness may exist elsewhere.⁴⁸ Indeed, some argue "wilderness is not land. . . . It is an abstraction, a quality that people ascribe to the landscape. [A]s such, it has the potential to be perceived in a variety of settings, not just in those meeting the specifications of the Wilderness Act."⁴⁹ "Recognition of this [fact] is crucial for those who are charged with the responsibility of planning wilderness recreation opportunities because it means that wilderness resource is not as limited as we have been led by our language to believe."⁵⁰

3. *Combining philosophy and the Act*

Under both statutory definition and the wilderness philosophy explained above, many caverns can fit comfortably as designated wilderness without offending the wilderness concepts contemplated by Congress, the NSS, or the parks and recreation managers throughout the nation. Many caves in the United States currently fall within the statutory definition of wilderness because they: 1) possess "primeval character and influence, without permanent improvements or human habita-

47. 16 U.S.C. § 1131(c) (1988). For in depth reading on the history of this act see: R. NASH, *supra* note 11; R. MONTGOMERY, *LIVING WILDERNESS* (1964); McCloskey, *The Wilderness Act of 1964: Its Background and Meaning*, 45 OR. L. REV. 288-321 (1966); Mercure & Ross, *The Wilderness Act: A Product of Congressional Compromise*, CONGRESS AND THE ENV'T (1970); J. SUNDQUIST, *POLITICS AND POLICY: THE EISENHOWER, KENNEDY, AND JOHNSON YEARS* (1968).

48. See D. DUSTIN, L. McAVORY & J. SCHULTZ, *supra* note 11.

49. *Id.* at 110 (footnotes omitted). See also R. NASH, *supra* note 11, at 300; Merriam & Knopp, *Meeting the Wilderness Needs of the Many*, WESTERN WILDLANDS 17-22 (1976).

50. D. DUSTIN, L. McAVORY & J. SCHULTZ, *supra* note 11, at 110.

tion;" 2) "generally appear to have been affected primarily by the forces of nature, with the imprint of men's work substantially unnoticeable;" 3) have "outstanding opportunities for solitude or a primitive and unconfined type of recreation;" 4) "contain ecological, geological, or other features of scientific, educational, scenic, or historical value;" and 5) have "at least five thousand acres of land or [are] of sufficient size as to make practicable [their] preservation and use in an unimpaired condition."⁵¹

B. Lechuguilla Cave: The Perfect Example of Cave Wilderness

A perfect example of such a wilderness is Lechuguilla Cave, located within Carlsbad Caverns National Park, New Mexico. This cave, consisting of over 37 miles of known passages, was recently rediscovered on May 25, 1986.⁵² Other prime examples of possible wilderness caves exist throughout the United States.⁵³

1. Primeval character, no improvement, and affected primarily by nature

Using Lechuguilla as the example, the first wilderness requirement is met within the cave. After entering, the caver finds himself immersed in a natural cavern carved out of rock, millions of years old. The interior is decorated with formations that have taken nature thousands of years to create. Much of this cave's decor has never been seen by man. No other wilderness setting falls so naturally within the meaning of "primeval, without permanent improvement." There are no buildings, no roads, nor man-made paths to clutter the cave's natural environment. Man's work is not only "unnoticed," it is entirely absent. The passages have been carved entirely by nature and her erosion processes. Not many wilderness areas may make this claim.

2. Solitude

The second wilderness requirement, "solitude," is also met in Lechuguilla. The cave's number, depth and length of passages create an atmosphere void of the noise heard above ground. There are no air-

51. See 16 U.S.C. § 1131(c) (1988).

52. Roberts, *supra* note 12, at 55-56. The cave was first discovered in 1914 when locals mined it for bat guano. However, the cave was thought to be only a short cave with little decoration. Because passages ended in a pile of fallen rubble, hiding the vast cavern lying just on the other side, it was not until 1986 that the cave was really discovered. *Id.* at 54-55. Additional information obtained from Thorn, *supra* note 10, and Kerbo, *supra* note 11.

53. Two possibilities are select parts of the Mammoth Cave system in Kentucky (over 330 miles of passages) and the Friar's Hole System in West Virginia (over 40 miles of passages).

planes nor motor vehicles to disturb or pollute the air circulating beneath the surface. The only sound to be heard is the natural dripping of water. Not even the voices of fellow companions may be heard if they wander just a short distance away. Nowhere else on Earth can one escape so completely from the every day bustle that awaits those who emerge from true wilderness settings. Peace and solitude abound throughout the cave. While pondering over the natural beauty, one can truly understand what it is to be alone.

3. *Ecological, geological, and other features*

Lechuguilla contains ecological, geological, and other features of scientific, educational, scenic and historical value as well. Since the cave's discovery in 1986, spelunkers have been vigorously exploring and mapping the underground world. Currently the cave extends 1,501 feet below the earth's surface and may possibly extend deeper than any other cave in the United States.⁵⁴ The cave contains the more common and beautiful stalactites, stalagmites, columns, soda straws, flowstones and rimstones. But more spectacular features also exist in this scenic extravaganza. Growing within the cave are bladed gypsum crystals, twisted helictites, cave pearls, gypsum beards, hydromagnesite balloons and sand gypsum flowers. Some decorations are so unique they are found only in this cave. Others are extremely rare. No where else in the world are all these scenic wonders combined in one cave.⁵⁵

Not only are there cave formations worth seeing, but many scientists find caves, such as Lechuguilla, useful in their fields of research as well.

a. *Scientific research.* The study of hydrology is conducted in caves and is very important to modern civilization. Researchers study the flow of water through caverns which are "natural conduits for underground rivers."⁵⁶ These studies become necessary tools for compre-

54. Columbine Crawl in Wyoming extends 1,550 feet below the earth's surface. See Roberts, *supra* note 12, at 60.

55. Thorn, *supra* note 10; Kerbo, *supra* note 11. See also Roberts, *supra* note 12, at 52-64. Even though many of the cave formations are common and can be seen in other caves throughout the United States, their shapes, sizes and locations within Lechuguilla create special effects and vistas as uniquely different from other caves as Old Faithful is from other geysers, Niagara Falls is from other falls, and the Grand Canyon is from other gorges. For this reason alone, Lechuguilla should be preserved. Indeed, the Federal Cave Resources Protection Act of 1988 will most likely protect the cave, but the Act does not guarantee preservation of the cave's pristine state. The Act merely protects "significant caves"; it does not prevent the utilization of non-wilderness resources for cave promotion if the Secretary of the Interior and park managers concur that improvements such as elevators and pathways should be installed.

56. The Federal Cave Resources Protection Act: A Statement Prepared by the National Speleological Society, Inc., 3 (Apr. 1987).

hending the effects of pollution on wells that are supplied with water from underground aquifers.⁵⁷

Through hydrologic research, scientists discover the effects that septic systems, garbage dumps, industrial wastes, and improperly managed landfills have on the environment.⁵⁸ A typical example of what pollution can do to the nation's underground water supplies was manifest in the 1930's. After a small town and milk treatment plant dumped their sewage into a sinkhole, waste materials gradually infiltrated the ground water below. Hidden River Cave, a privately owned cave near Horse Cave, Kentucky, began to reek of the catastrophic results of pollution. Soon the cave owners were forced to close the cave's waterways and walking paths because a wretched smell billowed from the once clear waters. Today the water remains contaminated and lifeless. It is devoid of the once abundant pearly blindfish that swam in its waters when the cave was first discovered in 1916. The magnificent cave has become nothing more than a large, beautifully packaged "underground sewer."⁵⁹

The Hidden River Cave disaster is by no means unique. Cave life (not to mention our water supplies) can be wiped out in a matter of hours. The study of our underground water systems remains a vital science, and wilderness caves can assist researchers in understanding our numerous underground reservoirs.⁶⁰

b. Geology. The study of geology advances through cave research. The formations found within caverns, such as Lechuguilla, have been studied since the days of Édouard-Alfred Martel,⁶¹ who roamed the European continent exploring and mapping underground caverns. Since his time, scientists have discovered many of the secrets behind soda straw, stalactites, and helictite formations.⁶² They have discovered

57. Aquifers like the Edwards Aquifer in Texas supply water to large cities throughout the United States.

58. See *supra* note 56. See also J. DAVIDSON & W. BISHOP, *WILDERNESS RESOURCES IN MAMMOTH CAVE NATIONAL PARK: A REGIONAL APPROACH* (1971) (obtainable from the Cave Research Foundation, 206 W. 18th Avenue, Columbus, Ohio 43210).

59. See D. JACKSON, *supra* note 7, at 156. Additional information from telephone interview with Sarah Bishop, Feb. 9, 1989.

60. See D. JACKSON, *supra* note 7, at 33-87; J. DAVIDSON & W. BISHOP, *supra* note 58, at 9-22.

61. Born in 1859, Martel became known as the founder of speleology, amassing volumes of data about cave geology, hydrology, meteorology, flora and fauna. D. JACKSON, *supra* note 7, at 63. During his lifetime, he fought to protect underground water sources from contamination caused by dumping refuse in nearby springs. His immense additions to technical caving equipment and methodical cave exploration greatly advanced the science of speleology as well. *Id.* at 63-86. See also W. HALLIDAY, *AMERICAN CAVES AND CAVING* 250 (1974). For a good review of the history of cave science, see T. SHAW, *supra* note 14.

62. See W. WHITE, *supra* note 1, at 220-263.

and unveiled the enormous eroding power of water, which combines with carbon dioxide and calcium carbonate to create carbonic acid strong enough to carve large limestone recesses.⁶³ They have also discovered how the limestone-laden water forms the numerous cave decorations through chemical reactions.⁶⁴

c. Biology. Another science studied in caves is biology. "Caves are important, and often essential, habitat for numerous animal species. In the delicately-balanced cave ecosystem, with naturally occurring controls on climate, humidity, and other environmental factors, unique species have evolved with adaptations to survive in complete darkness and with a limited food supply."⁶⁵ Many cave creatures are found only in the moist cave environments. Cave researchers study the evolution process that helps cave species such as blind troglodites, southern cavefish, and cave crickets adapt to their dark underground environment.⁶⁶ The numerous life forms, living in cave ecosystems, also provide biologists with abundance sources of biological data.⁶⁷

d. Space experiments. Recent cave experiments include research for NASA and space exploration. At least one study has focused on the effect isolation has on humans when they are left alone for extended periods of time.⁶⁸ Another project being researched in caves, like Lechuguilla, is the effect of darkness on human sleeping habits and everyday routines when no clocks are present to measure the time of

63. For an excellent scientific explanation of speleology and geomorphology of limestone caverns, see W. WHITE, *supra* note 1.

64. *Id.* at 220-63. See also J. JENNINGS, KARST GEOMORPHOLOGY 159-76 (1985); G. MOORE & G. SULLIVAN, SPELEOLOGY—THE STUDY OF CAVES 41-72 (1978); S. TRUDGILL, LIMESTONE GEOMORPHOLOGY 71-95 (1985).

65. The Federal Cave Resources Protection Act: A Statement Prepared by the National Speleological Society, Inc., 4 (Apr. 1987). G. MOORE & G. N. SULLIVAN, *supra* note 64, at 73-117, offers interested readers a general introduction to cave biology and the organisms found beneath the earth's surface.

66. As many as fifty species of fauna may be found living in caves. Of these, some 27 exist only in cave environments. Cave fauna includes flatworms, segmented worms, snails, isopods, amphipods, shrimp, crayfish, spiders, phalangids, mites, pseudoscorpions, millipedes, diplurans, collembola, crickets, book lice, beetles, various cavefish and other amphibians, and also various birds, reptiles, and mammals which inhabit the cave during their lives. See J. DAVIDSON & W. BISHOP, *supra* note 58, at 16-17. For further information on cave fauna, see G. MOORE AND G. SULLIVAN, *supra* note 66, at 72-117; Barr, *The Blind Beetles of Mammoth Cave, Kentucky*, 69 AM. MIDLAND J. 278-84 (1962); Barr, *Ecological Studies of the Mammoth Cave System of Kentucky. I. The Biota*, 26 INT'L J. OF SPELEOLOGIE, 147-204 (1967); C. MOHR & T. POULSON, *THE LIFE OF THE CAVE* (1966); Poulson & White, *The Cave Environment*, SCIENCE, Sept. 5, 1969, at 171-81.

67. See *supra* note 66.

68. Information obtained from an interpretive program while author was visiting Carlsbad National Park (Dec. 27, 1988) [hereinafter Visit 1988]. Additional information obtained from Ron Kerbo phone interview (Mar. 7, 1989).

day.⁶⁹ Other studies are still emerging within the minds of future scientists. American history is rich with the research ideas involving caves.⁷⁰

4. *At least 5,000 acres or sufficient size*

The final criteria of prospective wilderness area under the Wilderness Act is that it consist of "at least five thousand acres of land or [has a] sufficient size as to make practicable its preservation and use in an unimpaired condition."⁷¹ Lechuguilla currently consists of thirty-seven miles of known passages, presently within Carlsbad Caverns National Park. Because there are potentially many more miles of passages that are presently unexplored, Lechuguilla's size is currently unknown.⁷² Even now cave expeditions spend weeks inside the cave exploring these vast passages.⁷³ Furthermore, there is no doubt: caves create definite boundaries, and these boundaries can be defined sufficiently to make "practicable . . . the preservation and use [of the caves] in an unimpaired condition," meeting the Wilderness Act's criteria.⁷⁴

By definition Lechuguilla seems to fit the concepts of wilderness as defined by both the Wilderness Act and wilderness philosophy without conflict, but there is more to wilderness designation than mere definition. In designating wilderness, the government should consider the purpose and intent of the Wilderness Act as well as the effect that such designation will have on wilderness use.

IV. THE CONFLICT

Caves create special problems found in no other wilderness setting. These problems are intensified by designating caves as wilderness areas.

A. *Wilderness Boundaries*

Defining the boundaries of an underground wilderness creates special difficulties associated only with caves. The question of how to define the specific wilderness management boundaries becomes compli-

69. Visit 1988, *supra* note 68; Kerbo, *supra* note 68.

70. G. MOORE & G. SULLIVAN, *supra* note 64, at 131-133. *See generally* T. SHAW, *supra* note 14.

71. 16 U.S.C. § 1131(c) (1988).

72. S. Bishop, *supra* note 10.

73. Kerbo, *supra* note 11; S. Bishop, *supra* note 10. *Compare* Davies & Morgan, *supra* note 3.

74. *See* Stitt & Bishop, *supra* note 35, at 77-88 (suggesting that installing gates and access controls make practicable the preservation of caves in a wilderness state). *See also* J. DAVIDSON & W. BISHOP, *supra* note 58.

cated when the traditional method of designation (choosing the area and mapping the surface) is unworkable because the very area to be protected lies undiscovered below the surface.

Cave mapping allows land managers to know the exact above-ground boundaries in which the caverns are contained once they are completely explored.⁷⁵ But this does not entirely solve the problems. Exploration may take years or decades to fully accomplish. Indeed, Carlsbad still has unexplored passages.⁷⁶

Many solutions have been proposed to solve the boundary problems,⁷⁷ but no one solution is completely without complications. Some are more serious than others, and no one method is truly practical. Caves such as Lechuguilla have miles of passages that twist and turn in every direction. These passages can run directly beneath private lands without the knowledge of the surface owners. Surface boundaries above unknown passages can cover miles of developed land.

Condemnation of unknown acres could be required to federally possess private lands containing potential cave wilderness passages. The alternatives might leave vast underground passages unprotected and waiting for destruction. The protection of passages also requires the protection of water flowing through the cave environments as well.

Without preserving water rights and managing above-ground

75. S. Bishop, *supra* note 10.

76. Kerbo, *supra* note 11.

77. The following are the current suggestions:

1) Use the "Yellowstone method" of over-designation—creating boundaries sufficiently broad to guarantee total inclusion of unknown areas, thus insuring the protection of potential future discoveries. C. ALLIN, *supra* note 11, at 27-37. This method calls for the total incorporation of all unknown area into the wilderness boundaries. It was first used in the designation of Yellowstone because the early explorers had not fully mapped the area Congress intended to designate as the National Park. In order to preserve all the scenic wonders, Congress chose to designate an area sufficiently large enough to include all conceivable areas containing natural wonders worth preserving. *Id.* See also Stitt & Bishop, *supra* note 35, at 80-82; J. DAVIDSON & W. BISHOP, *supra* note 58, at 23-32.

2) Confine wilderness boundaries to all known areas, leaving future outer limits unprotected. See Stitt & Bishop, *supra* note 32, at 80-83; J. DAVIDSON & W. BISHOP, *supra* note 55, at 23-32.

3) Confine wilderness to the boundaries established by the above-ground land management agencies—once the cave passages leave the governing agency's boundaries, they lose their wilderness designations. Kerbo, *supra* note 11.

4) Confine wilderness boundaries to known areas above ground and provide for the taking (through eminent domain) of subsurface rights for cave passages that extend beyond the surface wilderness designation. *Id.* Thorn, *supra* note 10.

5) Confine the wilderness to the cave entrance and subsurface areas only (those specifically bounded by the cave's floor, walls and ceiling), leaving surface and other non-cave areas as non-wilderness designation. Kerbo, *supra* note 11; Thorn, *supra* note 10.

6) A combination of the above. Kerbo, *supra* note 11; Thorn, *supra* note 10.

water, the subsurface environment can easily be destroyed by above-ground pollutions. Since water is the forming agent of caverns, even its slight pollution or diversion can upset a cave's natural life-cycle.⁷⁸

Moreover, each suggested solution can potentially be challenged by the opposition to cave wilderness. Thus, the boundary problems that cave wilderness creates do not go away simply because caves fit comfortably within the statutory definition of the Wilderness Act.

B. Wilderness Access

Because caves are different from the typical wilderness setting, access is also a problem. The only entrance into the cave is through its natural openings, unless man creates others. Lechuguilla has only one known entrance, and that entrance is steep and very threatening—a prime example of the danger that awaits cave wilderness visitors. The entrance is a ninety-foot vertical shaft that cavers must descend using ropes and rappelling equipment.⁷⁹ Within less than an hour, the entering caver must descend a second 150-foot vertical shaft named Boulder Falls. This pit gained its name from “the tendency of cavers to dislodge large chunks of rocks and send them bouncing into the void” below.⁸⁰ As writer David Roberts explains, “potentially it is a dangerous place.”⁸¹

Hidden dangers lurk throughout the cave, as manifest by some of Lechuguilla's more popular path names: Freak-Out Traverse, The Rift, and Captain Hook's Ladder.⁸² Roberts explains that the intensity of caving lies partly in the danger that forces a caver to be always on guard. Because cave rubble has never been exposed to outside forces, many fallen boulders are “as teetery as pick-up-sticks . . . [and] the small, dark shadow just beyond your next step may be a shaft plunging to unseen depths.”⁸³ These inherent risks a caver must endure to see the cave make it virtually impossible for anyone other than experienced cavers to behold Lechuguilla's grandeur. The numerous treasures hidden below Carlsbad Caverns National Park are securely tucked away in the wilderness designation of the area.

78. See generally W. WHITE, *supra* note 1, at 381-405.

79. Roberts, *supra* note 12, at 55-56.

80. *Id.* at 56. Roberts described himself as a climber that was not “perturbed at rappelling into the pit,” even though 70-feet of the descent would be “pirouett[ing] in space, touching no walls.” But yet he still declared, “[T]he last thing I wanted to do was hit Boulder Falls on the way out and find myself too tired to haul myself up the long fixed rope.” *Id.*

81. *Id.*

82. *Id.*

83. *Id.*

1. *No physically handicapped allowed?*

Without the aid of elevators or the use of stairs and blasted pathways, the great majority of Americans are deprived of any chance of seeing Lechuguilla's beauty. The physically handicapped, those tied to walking devices or wheelchairs, are permanently denied access to the cave.⁸⁴ Even the great majority of non-handicapped adults, and virtually all small children, are unable to withstand the physical strain true cave exploration requires.

An experienced caver must spend approximately four hours to reach the 750-foot level of Lechuguilla.⁸⁵ The trek includes numerous feats of rappelling down vertical shafts, scaling walls, crawling through narrow passages, and vaulting over deep crevasses. Even after arrival to their chosen destination, cavers must reverse their direction of travel to exit the cave—ascending or descending the same obstacles, only this time more tired than before.⁸⁶

2. *No children, no families, no vacations?*

Ordinary people who spend most of their days working, going to school, raising children or just growing up will never be able to visit Lechuguilla without elevators. They lack the necessary training, equipment and technical know-how to ever be allowed in the cave.⁸⁷ Above-ground wilderness creates no such problems. The amount of wilderness experience one receives on the surface can be altered by the depth one wishes to travel into the wilderness setting. Even the physically disabled may enter wilderness by horse, boat or piggy-back.

All of America's 470 national wildernesses demonstrate a traditional-wilderness feature: No one is totally excluded simply because of physical ability or age. By designating an inaccessible cavern as wilderness, the land managing agency may face civil suits by those handicapped individuals who also wish to visit the wilderness facility.⁸⁸

84. The term "permanently" is not used literally. Realizing the great achievements that have been made by people with physical disabilities, one should be fully aware that a few such people may some day push the outer limits of their disabilities deep within caves. After all, mountain-climbing, sky-diving, and SCUBA diving were all once thought to be impossible for the physically immobile. One should also realize that these sports create less of a burden on physical capabilities than does cave exploration in pristine caves such as Lechuguilla.

85. Kerbo, *supra* note 11.

86. *Id.* See also Roberts, *supra* note 12, at 52-64.

87. Kerbo, *supra* note 11.

88. See 42 U.S.C. § 4151 (1982); 29 U.S.C. § 792 (1982). See also Goldman, *Architectural Barriers: A Perspective on Progress*, 5 W. NEW ENG. L. REV. 465 (1982). "Architectural barriers are discriminatory in that they deny qualified persons their most fundamental rights: access to and participation in society. Accessibility permeates all other aspects of disabled persons' civil rights. Without access . . . rights to be 'abroad in the land,' and the full panoply of protections and

3. *No rescue?*

The next problem created by cave wilderness designation is wilderness rescue. Cave wilderness poses problems of evacuation when a person or party becomes trapped deep below the surface. Like proponents of "no rescue wilderness," cave wilderness proponents claim that true wilderness is that environment where one can become self-reliant and take the consequences of one's own actions. True wilderness is a place where skill and daring are the only limitations placed upon one's wilderness experience. Persons should enter at their own risk and not disturb the environment, even if they get into trouble.⁸⁹ The use of tunneling or digging would be forbidden to free a trapped or injured caver under the Wilderness Act; these man-made impacts on the cave would deface the cave's pristine nature.⁹⁰

4. *Wilderness training, qualification, certification and guides?*

Another problem associated with the designation of cave wilderness is the regulation and training of those visitors entering the cave.

duties can be rendered meaningless." *Id.* at 466 (footnote omitted). "Congress sought to insure that all public buildings designed, constructed, or altered in the future by or on behalf of the federal government . . . be accessible to and usable by physically handicapped persons. It intended that the term building be given the broadest possible interpretation and, thus, the term include[s] any structure used by the public." *Id.* at 469 (citing S. REP. NO. 538, 90th Cong., 1st Sess. 3, reprinted in 1968 U.S. CODE CONG. & ADMIN. NEWS 3216) This statute may be broad enough to encompass wilderness cave facilities so long as they are open to the public. Indeed, many national parks comply with the notion that handicapped persons have the same right to see the same vistas as the unimpaired.

If 42 U.S.C. § 4151 (1982) and 29 U.S.C. § 792 (1982) are not sufficient to protect the rights of the disabled to enter a wilderness cave, the legislation being considered by the 101st Congress should be sufficient. See AMERICANS WITH DISABILITIES ACT, S. 933, 101st Cong., 1st Sess. § 507, 135 CONG. REC. S10961 (daily ed. Sept. 12, 1989); 135 CONG. REC. S10734-S10735 (daily ed. Sept. 7, 1989) (statements of Rep. Hatch and Rep. Kennedy); 135 CONG. REC. 10788 (daily ed. Sept. 8, 1989) (statements of Rep. Hatch and Rep. Armstrong). Compare H.R. 3485, 101st Cong., 1st Sess. § 1 (1989) (an amendment to the REHABILITATION ACT OF 1973); 135 CONG. REC. E3472 (daily ed. Oct. 18, 1989) (statement of Rep. Hansen introducing H.R. 3485 as a bill to "end wilderness discrimination and ensure that all Americans are, indeed, created equal.").

For similar legislation and debate, see 135 CONG. REC. H8838 (daily ed. Nov. 16, 1989) (discussion of S.974, 101st Cong., 1st Sess. (1989)) (NEVADA WILDERNESS PROTECTION ACT OF 1989) which provides access for the handicapped); 135 CONG. REC. H7059 (daily ed. Oct. 16, 1989) (statements of Rep. Lagomarsino that the Los Padres National Forest should leave access roads for children, the elderly and the handicapped).

89. See McAvory & Dustin, *The Right to Risk in Wilderness*, 79 J. OF FORESTRY 150-52 (1981).

90. Some will argue that "this is no different from any other wilderness." They are mistaken. All other wilderness allows for rescue that does not permanently damage the environment. Helicopter landings and motorized vehicles are able to enter other wilderness areas for emergency evacuations. See 16 U.S.C. § 1133(c), (d)(1) & (d)(4) (1988). No such entries can be made into a cave wilderness having permanent walls, ceilings and floors.

Because inherent dangers of cave exploration exist, regulations must be employed to guarantee visitor safety and cave preservation. Potential cave explorers will need some form of cave certification or guidance to be allowed in the cave. Currently the NPS limits the number of persons that may enter Lechuguilla,⁹¹ and only qualified persons are allowed.⁹² Generally a person becomes qualified by exploration in other caves and by having an experienced guide to point the way.⁹³ Presently, the NPS requires no specific qualifications other than those mentioned above, but only 300 or so people have entered this cave thus far. All have been required to have at least one "second-time visitor" in their group.⁹⁴ Such a requirement is unnecessary for other wilderness settings. Usually people are allowed access to wilderness whether or not they have previous experience. Unless guides become available through the Park Service or private clubs, only those elite persons with inside contacts will ever be able to see the cave. Cave wilderness will become similar to the Grand Canyon, where commercial companies (which rule the river) book daily trips for high-paying tourists. Non-commercial rafters and kayakers wait five years to receive permits hoping to float the canyon in solitude, only to find themselves surrounded by commercial venturers.⁹⁵

The requirement to have a guide will create a concept truly foreign to the traditional wilderness contemplated by the proponents of the Wilderness Act (i.e., self-reliance, solitude, and a non-commercialized environment).⁹⁶ The question of guide certification also arises. Who will be responsible for training these guides? Will a single organization gain the monopoly on who can visit each wilderness cave? Or will the

91. Kerbo, *supra* note 11; S. Bishop, *supra* note 10. The management and coordination of cave expeditions have become difficult for the NPS to handle due to the numerous cavers wishing to enter the cave. Ron Kerbo, NPS Cave Specialist in charge of issuing permits, has allowed Lechuguilla Cave Project, Inc. to assume the major responsibility for organizing those who may enter the cave. Kerbo, *supra* note 11.

92. *Id.*; Thorn, *supra* note 10; S. Bishop, *supra* note 10.

93. S. Bishop, *supra* note 10; Kerbo, *supra* note 11.

94. S. Bishop, *supra* note 10; Kerbo, *supra* note 11.

95. Corporations are already moving in on this new area of cave exploitation. Lechuguilla Cave Project, Inc. has become the Lechuguilla's primary method of securing visitation rights to see the cave. See *supra* note 91. By allowing a company the opportunity to regulate those who may enter, the NPS encourages the commercialization of America's wilderness heritage, as found in the Grand Canyon. The next step may be reservation and processing fees charged by commercial organizations to cover their costs of managing the public's resource. Finally, one can imagine commercial corporations charging visitors high prices to be guided down the scenic passages set aside for solitude and primitive recreational experiences. Even though 16 U.S.C. § 1133 (d) (5) specifically allows commercial services to be performed in wilderness areas, this cannot be the same wilderness the 88th Congress imagined. Compare 16 U.S.C. §§ 1131 & 1133 (d) (5) (1988).

96. 16 U.S.C. §§ 1131-1136 (1988). See generally R. NASH, *supra* note 11; R. MONTGOMERY, *LIVING WILDERNESS* (1964); McCloskey, *The Wilderness Act of 1964: Its Background and Meaning*, 45 OR. L. REV. 288-321 (1966).

NPS (or respective land agencies) be required to assure tour safety?

Cave wilderness guides create problems for cave wilderness designation. To preserve the wilderness cave, someone must be designated to guide cave explorers through the cave, or at least someone will be required to fleece the wilderness cave to check on cleanliness or clean the various passages. Again Lechuguilla is a prime example. No one may enter the cave without being led by the hand.⁹⁷ According to the Wilderness Act, wilderness must have "outstanding opportunities for *solitude* or a primitive and *unconfined* type of recreation."⁹⁸ Certainly solitude does not include the presence of guides.

5. *Limited numbers?*

Cave preservationists argue that because of the cave's fragile environment, only a very limited number can ever be allowed in the cave. This precaution is to assure that the cave will not be destroyed through over-use.⁹⁹ But this argument ignores the fact that each year over 870,000 people visit Carlsbad Caverns, next door, and more than 1,500,000 visit Mammoth Cave to the east.¹⁰⁰

Large visitor numbers create special problems for the managing agency's personnel. Maintenance crews must constantly monitor the cave for trash and vandalism. The NPS personnel routinely harvest the growing numbers of coins thrown into the cave's pools of Carlsbad, and they constantly clean the cave's formations of lint, hair, and human skin to stop the growth of mold and algae.¹⁰¹ However, Mammoth and Carlsbad have been open since 1821 and 1923, respectively. The for-

97. See *supra* text accompanying notes 91-93.

98. 16 U.S.C. § 1131(c) (1988) (emphasis added).

99. The estimated carrying capacity of Lechuguilla is presently unknown. NPS officials are currently accumulating data in order to obtain the cave's carrying capacity. Information on cave size, volume, depth, air flows, fauna, speleothems, and speleogenesis (the processes which combine to create the cave's development) is required before any reasonable carrying capacity can be calculated. This data is compared with the massed volumes of data obtained through research and development completed in other caves. Only after such a comparison can the NPS formulate a carrying capacity that will maintain the formation of the cave. Areas of the cave that are highly fragile must be classified accordingly, and the carrying capacity of these areas will be reduced. Thus, carrying capacity throughout the cave may vary depending on the specific cave area being preserved.

Until Lechuguilla's carrying capacity is determined, the cave's use is limited to four expeditions a year. These expeditions are limited to 70 persons, with no more than 20 persons entering the cave at one time. Additional groups have occasionally been permitted to enter, accounting for another 100 persons. But under present management, no more than 380 persons a year enter the cave. Kerbo, *supra* note 11.

100. Statistics obtained from telephone interview with the Statistical Unit, Denver Service Center, National Park Service (Feb. 3, 1989).

101. Roberts, *supra* note 12, at 62.

mer has had over 50,000,000 visitors and the latter has had over 28,000,000 visitors.¹⁰² Neither cave shows signs of over-use, nor is the NPS expressing concern about closing them for reasons of deterioration. Management keeps these caves clean and well preserved. The philosophy that greater preservation equals greater exploitation rings true.¹⁰³

6. *Carrying capacity and over-use?*

Even limiting cave visitation to small numbers creates the same problems associated with over-use. If persons are not monitored and properly instructed on cave etiquette, group size alone will not eliminate vandalism, litter or the occasional pitching of pennies. Furthermore, the Federal Cave Resources Protection Act already protects caves from such abuse without creating a new area of exploitation for special interest groups.¹⁰⁴

7. *Cave lighting?*

The lighting requirements needed to attract the great majority of cave sightseers create problems associated with cave exploitation. People not only bring themselves into caves, but they bring food and garbage with them. Fallen crumbs and trash combine with artificial light to attract plant and animal life foreign to the natural cave environment.¹⁰⁵ Rodent populations increase while other natural cave creatures move to unlit passages.¹⁰⁶ A cave's biosphere can degenerate to that more prominent biosphere of surface structures.¹⁰⁷ But even this degeneration must be weighed against the consequences of no lighting—few cave visitors and very little societal interest in preserving caves.¹⁰⁸ Man-

102. *Id.* See also D. JACKSON, *supra* note 7, at 34-35; Telephone interview with Statistical Unit, *supra* note 100. See also National Park Statistical Abstracts, *supra* note 6, for the years 1904 through 1988.

103. D. JACKSON, *supra* note 7, at 32. Jersinovic realized early in the 19th century that cave destruction would eventually lead to a loss in cave revenues at Adelsberg Cave, so he commissioned men to protect the cave's fragile environment. *Id.*

104. The Act places penalties upon persons engaged in the destruction of significant cave resources. 16 U.S.C. §§ 4306 to 4307 (1988). First time violators may be imprisoned for not more than one year or fined in accordance with Title 18, U.S.C., or both. Subsequent offenders may be imprisoned for not more than three years, or fined in accordance with Title 18, U.S.C., or both. Additionally, offenders may face civil penalties of up to \$10,000 per violation. *Id.*

105. J. DAVIDSON & W. BISHOP, *supra* note 58, at 16-19.

106. *Id.*

107. See *id.*

108. If industrious cave entrepreneurs, such as Jersinovic, Gorin and Stebbins, had not exploited cave environments through the use of artificial lighting, smoothed paths and man-made bridges, caving would never have gained popularity, nor would it have gained so much national and world-wide attention. By exploiting the underground world, these enterprising men brought

agers can achieve the proper biosphere balance by allowing lighting in only limited areas of the cave and maintaining other passages in their natural unlit state. This technique is used in both Carlsbad and Mammoth. Of course, cave wilderness should prohibit the permanent installation of man-made lighting, unless one can reasonably argue that artificial lighting meets the "substantially unnoticeable" test of the Wilderness Act.¹⁰⁹

C. *Wilderness: The Disappearing Resource*

An aspect that makes caverns different from surface wilderness is the fact that they are not a disappearing resource.¹¹⁰ New caves are constantly being discovered throughout the United States.¹¹¹ Indeed the U.S. is the world's leader in long caves. With twenty principle karst regions,¹¹² containing long or deep caves, approximately fifteen percent

caves from their dark ages to their current age of enlightenment—or the "Golden Age." Without their exploitation, it is doubtful that the millions of cave visitors, both past and present, would have ever seen the unique beauty hidden underground. Those sub-surface passages would be just as far removed from the general populous as space exploration is today. Little, if any, societal interest would be generated in speleology. It is also doubtful that cave preservation would rate high enough a priority to merit national legislation. For a more comprehensive understanding of the role cave exploitation plays in preservation, see generally: Davies & Morgan, *supra* note 3, D. JACKSON, *supra* note 7, Stitt & Bishop, *supra* note 35, J. DAVIDSON & W. BISHOP, *supra* note 58.

109. The Wilderness Act has no specific section dealing with artificial lighting. The only applicable section that would possibly prohibit the installation of permanent lighting fixtures is subsection (c) which provides that wilderness retain "its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural condition and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of men's work substantially unnoticeable." 16 U.S.C. § 1131 (1988). Lighting in the cave setting is not an improvement of human habitation, nor are light fixtures substantially noticeable if hidden behind cave formations. Cave wilderness proponents will argue that that is absurd because lighting is not natural to the cave environment, and its rays are substantially noticeable. This argument, however, lacks merit. The Wilderness Act only prohibits commercial enterprise, permanent structures and roads, motor vehicles, motorboats, motorized equipment, aircraft, and other forms of motorized transportation. See 16 U.S.C. § 1133(c) (1988). The Act allows placement of such utilities as transmission lines, water lines, and telephone lines within wilderness boundaries under special provisions. 16 U.S.C. § 1133(d)(4) (1988). Permanent artificial lighting is neither a road, a commercial enterprise, nor motorized equipment. Even though one may argue that light fixtures are artifacts of human usage, they are no different than the currently permitted utilities under the Wilderness Act. *Id.*

110. Compare 16 U.S.C. § 1131 (1988).

111. Compare Davies & Morgan, *supra* note 3 (only 17,000 known caves in the United States in 1986); S. REP. NO. 559, 100th Cong., 2d Sess. 5 (1988) (over 40,000 known caves in the United States in 1988). See also D. Jackson, *supra* note 7, at 160 ("Despite the enthusiastic efforts of generations of cavers, only a small fraction of the earth's caves have so far been discovered, let alone explored."); J. MIDDLETON & T. WALTHAM, *supra* note 8, at 203-221.

112. A karst is a landscape distinguished by having underground drainage, commonly through caves. J. MIDDLETON & T. WALTHAM, *supra* note 8, at 239. See generally W. WHITE, *supra* note 1.

of its continental surface is cave-forming limestone, dolomite, marble, or gypsum.¹¹³ Estimations on the total number of caves are unreliable because complete state-wide inventories are lacking in many states.¹¹⁴ But the national estimate varies from 30,000 to 40,000 known caves.¹¹⁵ Over 320 U.S. caves exceed 2.5 miles in length, and at least 37 of these caves exceed the length of 12 miles.¹¹⁶ More than 53 caves exceed depths of 500 feet, eight of which exceed 1000 feet.¹¹⁷ The number of caves lying beneath American soil is tremendous, and there is still considerable potential for new discoveries.¹¹⁸

Of the twenty karst regions found in the United States, most are considered to be rich in potential cave discovery.¹¹⁹ The twenty principle karst regions may contain several large unknown caves as spectacular as Lechuguilla.¹²⁰ In this "Golden Age" of cave exploration, the possibility is high that many more significant caves will be discovered, creating even more potential cave wilderness areas. This growing discovery of new wilderness area is a twist from the "vanishing" wilderness contemplated by the 88th Congress when enacting the Wilderness Act.¹²¹

D. *Wilderness Is for All, Not the Few*

Finally, wilderness is statutorily set-aside by the Wilderness Act for the purpose of preserving America's heritage in wildlands for the "use and enjoyment of the American people."¹²² By designating cave wilderness, land managers will deny cave access to those very people by eliminating commercial exploitation of these resources. The millions of people that visit America's commercial caves will be turned away from cave wilderness settings.¹²³ Children, elderly, handicapped, and people without previous cave experience will be told to visit other less pristine caves because caves such as Lechuguilla are reserved for only those few

113. J. MIDDLETON & T. WALTHAM, *supra* note 8, at 203.

114. *Id.* at 205

115. *Id.* Most of these caves are less than a mile long and less than 250 yards in depth.

116. *Id.*

117. *Id.*; Updated information obtained from Sarah Bishop, Sept. 22, 1989 (citing the NAT'L SPELEOLOGICAL SOC'Y NEWS, Sept. 1989 (available from the National Speleological Society)).

118. J. MIDDLETON & T. WALTHAM, *supra* note 8, at 203.

119. *Id.* at 205-13.

120. Thorn, *supra* note 10; Kerbo, *supra* note 11. See also Roberts, *supra* note 12, at 60-64.

121. See *supra*, note 47.

122. 16 U.S.C. § 1131(a) (1988); the preface to the act states, "To establish a National Preservation System for the permanent good of the *whole people* . . ." Pub. L. No. 88-577, § 2, 78 Stat. 890 (codified as amended 16 U.S.C. § 1131 (1988) (emphasis added).

123. See *supra* text accompanying notes 79-104.

(3000 or less a year)¹²⁴ who are qualified to enter their domain. Cave wilderness will stand for the exclusion of millions and the preservation for a "fortunate few."¹²⁵ Such wilderness preservation is not the same wilderness contemplated under the Wilderness Act,¹²⁶ nor can it be the same wilderness contemplated by the great majority of Americans today.

V. CONCLUSION AND PROPOSAL

This paper is not intended to solve the problems arising by designating cave wilderness, nor is it intended to suggest that these problems are completely resolvable—for many may never be solved. The sole purpose is to bring to light the true conflict that cave wilderness creates. By preserving America's most pristine wild resource (scenic caves) as wilderness areas, the majority of Americans lose the ability to visit or even see those very resources they struggle to preserve. As designated wilderness, only one American in 3,000,000¹²⁷ will ever be able to view the spectacular vistas that caves such as Lechuguilla offer. The future generations to see these caverns will, in all actuality, be a very small minority.

A compromise must be reached between cave preservation and cave exploitation, allowing the American majority the privilege of seeing the beauty confined below our earth's surface. The compromise must strike a balance between America's great interest in preserving its national resources and America's greater interest of giving its present and future generations the right to see them.

This goal can be achieved in the same fashion by which several caves are managed today. Carlsbad Caverns National Park illustrates a prime example of compromise. The park is open to all those who wish to visit the caves. Elevators and paved pathways provide access to three miles of the most beautiful portions of the main cave. Other less accessible areas provide cave passages that only the most experienced cavers

124. *Id.*; Kerbo, *supra* note 11.

125. As one author wrote, most of America's true cavers, those few who will be able to see Lechuguilla, spend their lives "nurs[ing] desultory careers, free from 9-to-5 demands, simply to support their caving habit[s]. . . . A case in point is [a man] who scratches out a meager income selling his home-raised honey at [local] flea markets; he lives for caving." Roberts, *supra* note 12, at 64.

126. See 16 U.S.C. § 1131(a) (1988). For a comprehensive review of the Wilderness Act, the reader should refer to R. NASH, *supra* note 11, and C. ALLIN, *supra* note 11; D. ROTH, *THE WILDERNESS MOVEMENT AND THE NATIONAL FORESTS: 1964-1980* (1984).

127. The United States population in 1987 was estimated at over 243,773,000 people. U. S. BUREAU OF CENSUS, *STATISTICAL ABSTRACT OF THE U.S.*: 1988, at 7 (108 ed. 1987). With the cave carrying capacity of less than 2500, less than .01 percent of Americans will actually be able to see Lechuguilla.

can enter.

Caves such as Lechuguilla should be managed similarly. The National Park Service and other land agencies of the federal government have a duty to protect their resources for the public. To do so, they must designate some scenic caves as wilderness areas. But in doing so, they must also designate a percentage of those spectacular scenic caves for the general public. This will provide opportunity for all those who wish to see wild and scenic caves. As in Carlsbad Caverns or Mammoth Caves, for every ten miles of cave wilderness, the federal government should provide elevators and paved pathways to the most beautiful mile of that wilderness—thus creating a needed balance between preservation and exploitation.

Lorenzo Miller