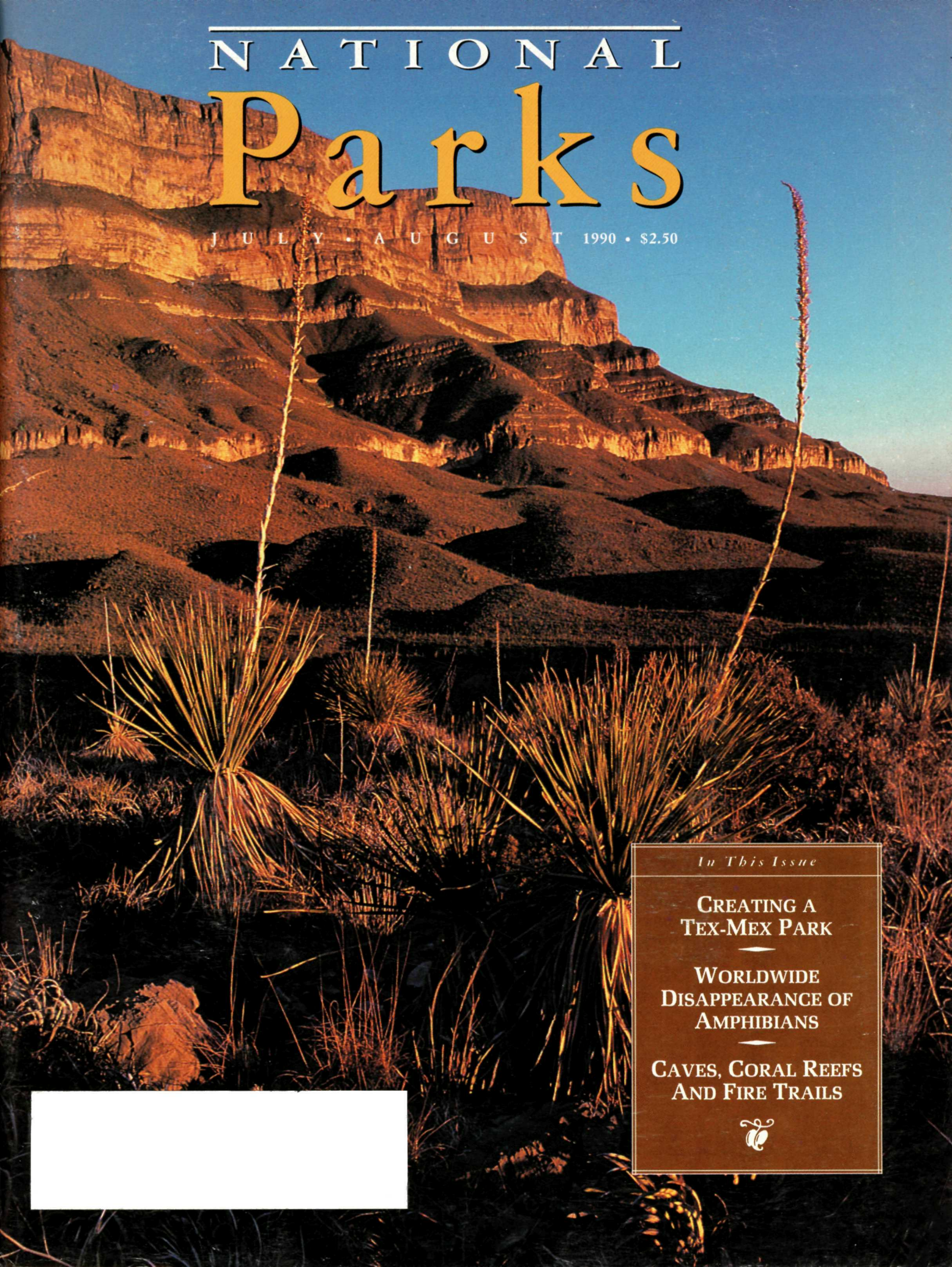


NATIONAL Parks

JULY • AUGUST 1990 • $2.50

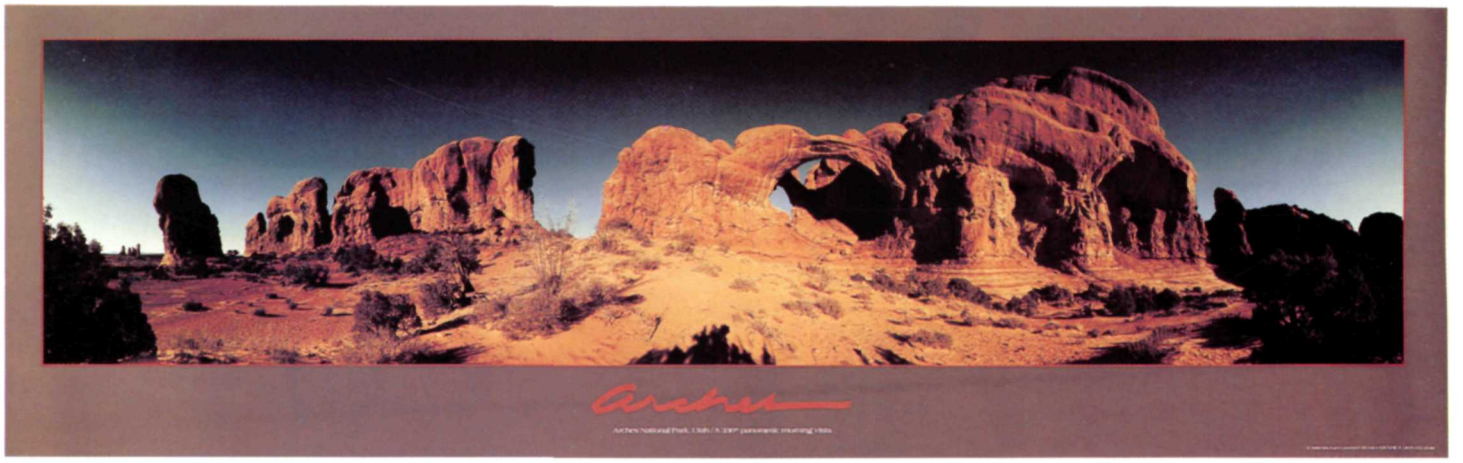
In This Issue

SPECIAL OFFER

YOSEMITE NATIONAL PARK, *California*

Yosemite, *a 290° panoramic ground view of the Yosemite Valley, the Merced River in the foreground. El Capitan is lit by the morning sun with Bridalveil Falls to the right. Each year over a million visitors come to see these wonders, which are some of the most rugged and beautiful in the nation.*

ARCHES NATIONAL PARK, *Utah*



Arches, *a 330° morning vista. Located in eastern Utah it has the highest density of natural arches in the world, created over millions of years. If you visit Arches after a spring rain you may see the unexpected: a vast field of wildflowers appearing on the desert floor.*

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JUDY HILE/UNICORN PHOTOS

Amphibian decline, page 18

EDITOR'S NOTE

Often small things provide the biggest clues to ecological health. Lichen, for example, may seem just a lacy fringe attached to the moist side of a rock, but scientists have found them to be a good "indicator species." As an indicator species, lichen can warn scientists about the extent to which acid rain has invaded an ecosystem. Rising or declining amounts of algae in a stream or krill in the ocean tip off researchers to the health of those respective environments.

Amphibians—frogs, toads, salamanders—are also good indicators, and amphibians are telling us there's trouble, worldwide trouble. Within the past year or so, scientists have measured dramatic worldwide amphibian declines, and no one really knows why. One thing, however, is clear. In order to find out what's wrong with a food chain, it makes sense to begin at the bottom.

NATIONAL PARKS

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NATIONAL Parks

THE MAGAZINE OF THE NATIONAL PARKS AND CONSERVATION ASSOCIATION

Vol. 64, No. 7–8
July/August 1990

OUTLOOK

FEATURES

DEPARTMENTS

Cover: *Sierra del Carmen, Mexico, by George Wuerthner. Across the border from Big Bend National Park, plans are underway to create a Tex-Mex park that would be the world's largest protected area.*

Established in 1919, the National Parks and Conservation Association is the only national, nonprofit, membership organization that focuses on defending, promoting, and improving our country's National Park System while educating the public about the parks.

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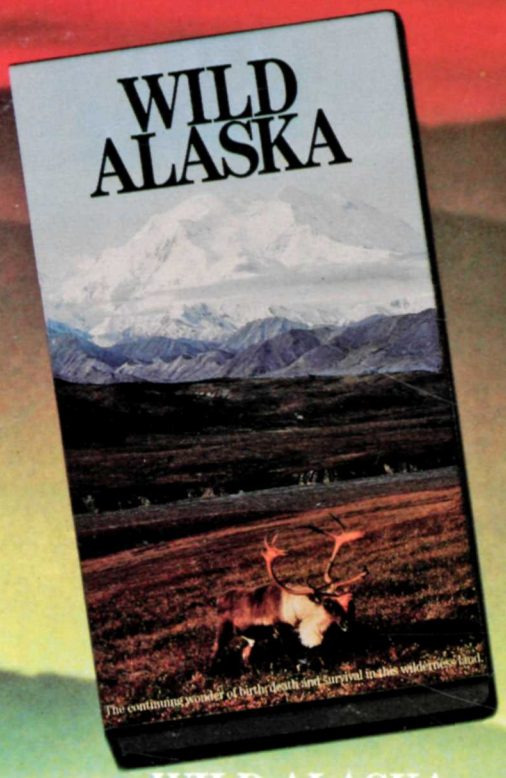
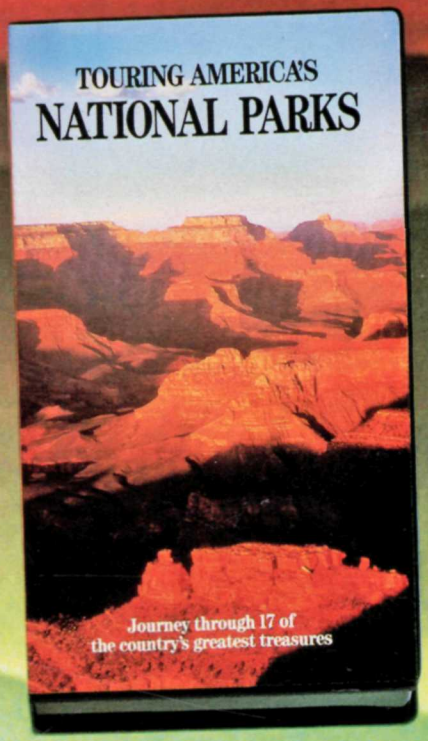
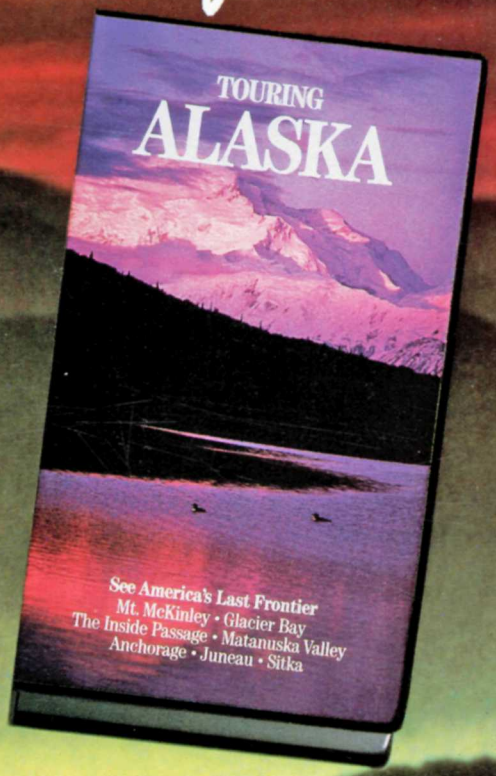
ON VIDEO







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Assessing Earth Day

AFTER ALL THE MARCHES, the speakers in Central Park, the elephants stomping aluminum cans, the planting of trees—after all of this, it seems important to assess what we have learned from Earth Day and where we go from here.

The consensus of Dennis Hayes, Henry Diamond, Norman Cohen, and other leaders who wrote in our Earth Day issue of the magazine is that we have not overcome the challenges that faced us the first Earth Day. Some feel things have gotten considerably worse.

The next 20 years could see the end of viable rain forests in many nations. The next 20 years will see the loss of hundreds, if not thousands, of species, many on endangered species lists and some that are unknown to us at present.

The next 20 years will be a period of increased deforestation and increased desertification. The next 20 years will also see the growth of the ozone hole and, as a result, the decline of plankton and other basic organisms so crucial to all forms of life.

For the parks, the next 20 years will see doubled visitation: twice as many campsites, more facilities, more and wider roads, and wildlife that will be twice as difficult to find. In some cases—such as Virgin Islands National Park—development of private lands within parks is increasing significantly. Resultant land values are becoming so astronomical that the federal government may not be able to afford purchasing the two million acres of private inholdings within the national parks.

From biodiversity in the parks to the ozone layer, we must do something about these environmental time bombs. One challenge is to replace gasoline-fueled automobiles with vehicles that use nonpolluting or low-polluting fuels, as Canada and other nations are doing.

A second challenge is the mountains of trash that are destroying our landscape and natural resources. We must make it economically practical for industry to recycle, reuse, and reduce the amount of materials we use as packaging.

A third challenge is to accelerate recovery of endangered plants and animals. How unwise it is to destroy plants and animals that are crucial to the chain of life and may even be critical to developing medical cures for our own species.

NPCA has found that we cannot save park plants and animals if their habitats outside of parks are not protected. Therefore, NPCA has initiated Nature 2000. With the support of Florida Governor Bob Martinez, we seek to restore healthy populations of Florida's 500 endangered plants and animals. It is our hope that this program will expand to other states as quickly as possible so that, by the year 2000, we will have reversed the rate of loss of important plants and animals.

Although 2000 is just another year, people seem especially concerned about assessing the past and looking into the future at the turn of a century. There's no more fitting time than during this last decade of the 20th century to test options and begin a new, environmental pattern of life for the next century.

National Parks and Conservation Association

The National Parks and Conservation Association would like to extend its sincere thanks to the following companies, clubs and organizations for making the first ever nationwide walk for the environment, *March for Parks*, possible. Thanks to all of you, we *did* make a difference!

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Treasure Mountain Middle School
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LETTERS

Praise for Petroglyphs

I wish to express my thanks for your support of legislation to establish Petroglyph National Monument in New Mexico. Petroglyphs are critical to the preservation of American Indian culture in the Southwest.

As a lifelong New Mexican, I grew up learning about the petroglyphs; they have always been important to my understanding of early American Indians. This educational opportunity must be available to all Americans, and, with your help, we are moving toward the establishment of a national monument that will ensure the preservation of New Mexico's prehistoric treasures.

Manuel Lujan, Jr.
U. S. Secretary of the Interior
Washington, D.C.

The Name Game

As the organization most concerned with the national parks, you above anyone else should make clear that only those areas designated as such go by that name.

Therefore, it was with dismay that I read in "Island Allure" ["Access," January/February 1990] about the Apostle Islands "National Park." My purpose here is not to act as grammar police, but is instead an effort to avoid the confusion evident among members of the public, lawmakers, and even the National Park Service about a system that suffers from too much diversity.

George Childs
Miami, Florida

Save the Dunes

On Friday, March 30, by the action of Representative Morris Udall's (D-Ariz.) House Committee on Interior and Insular Affairs, the integrity of the Indiana Dunes National Lakeshore was protected for yet another day. Park ownership of the Crescent Dune property, included in 1976 within the congressionally authorized lakeshore boundary, had been once again threatened by the utility company that now owns the dune.

Crescent Dune is not yet a part of the lakeshore. The future hope for park acquisition of this and approximately 2,000 more acres of similar rare dune lands is now proceeding through the legislative process as H. R. 3209, a park expansion bill sponsored by Representative Peter Visclosky (D-Ind.).

Should the Crescent Dune site remain in private hands for lack of funds, the effect would not be confined to this one case. Developers around the nation would be encouraged to "undedicate" many more such desirable national parks for fast buck development. It is clear few parks are immune to this threat.

I have written this letter not as a board member of Save the Dunes, but as an NPCA member of many years' standing. Over these years I have seen the cause of more than one conservation group helped by NPCA suppport. Save the Dunes Council now wants to attract wider support to the issues related to the dunes.

Henry Rooney
Gary, Indiana

Recycle

I've just been reading the latest National Parks—the big Earth Day issue. How ironic that it is not printed on recycled paper!

Dorothy Hippensteel
Findlay, Ohio

At present, high-quality, coated recycled paper is not available. We will, however, continue to pressure printers and mills for such a recycled stock.

—the Editors

Spokes Woman

NPCA consistently does a good job of pointing out threats to our national parks, but the March/April issue glorifies one of those threats without a serious discussion of the dangers. I'm speaking of Anne-Marie Praetzel's mountain biking article "Biking the White Rim."

Many "environmentalists" are seriously discussing allowing mountain biking in our already overused and abused national park backcountries and wilderness areas.

The excuse is used that mountain bikes cause less damage than horses. True! Let's get rid of horses, though, not add another use/abuse.

Ray O'Neil
Julian, California

Putting aside the larger issues raised by mountain bikes in national parks, "Biking the White Rim" included one horrifying paragraph: "Someone pops a tape into the truck stereo, and slick British reggae fills the desert... And, surprisingly, I am not bothered by this modern intrusion."

So Ms. Praetzel isn't bothered by "slick British reggae" booming out into the desert! Did it ever occur to her that others might not share her taste in music—or that some people might go into the desert for tranquility and solitude that would be totally destroyed by loud music echoing against the rocks?

Arthur D. Hellman
Pittsburgh, Pennsylvania

Hopefully, these visitors will find time to write to their legislators, asking them to sponsor Representative Wayne Owen's (D-Utah) Wilderness Act of 1989. The bill, (H. R. 1500), calls for wilderness designation of 5.1 million acres of Utah's wildlands.

Howard Gross
Boulder, Colorado

New Geography

Concerning the "Fate of the Northeast Kingdom" [January/February 1990] cover photo and story, Adirondack State Park is in New York State. New York State is not in New England.

Barbara N. Ward
Burlington, Vermont

Write "Letters," National Parks, 1015 Thirty-first St., NW, Washington, D. C. 20007. Letters may be edited for space.

NEWS
NPCA

Congress Expands New Mexico Parks

New Mexico's Native American, colonial, and frontier history gained new status in May when the House and Senate passed bills adding a new national park area in the state and expanding an existing one.

The legislation authorizes Petroglyph National Monument, the first national park site devoted to the Southwest's ancient rock art, and Pecos National Historical Park, created from a smaller national monument. President Bush is expected to sign the bills in June.

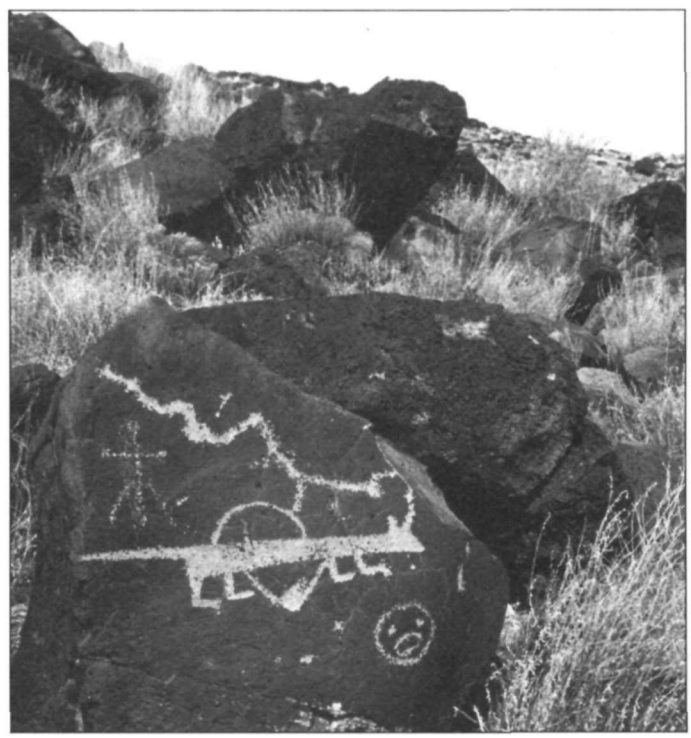
NPCA has long sought both protection for the petroglyphs and expanded preservation at Pecos. Bruce Craig, NPCA cultural resources coordinator, said, "Our nation's archeological resources are rapidly disappearing due to urban development and looting, but with Petroglyph as a part of the National Park System, at least this area will be protected in perpetuity."

The 7,272-acre Petroglyph National Monument will preserve one of the world's largest collections of prehistoric rock carvings, or petroglyphs. The rock art site stretches 17 miles along Albuquerque's West Mesa.

Between 15,000 and 17,000 petroglyphs are etched into the mesa's rock. They portray animals and birds, anthropomorphic "star beings," flute players, and ceremonial kachina masks.

Most of the rock art was created by Pueblo artists between 1300 to 1650 A.D. The oldest petroglyphs are geometric patterns that may date back 3,000 years, the work of prehistoric hunter-gatherers. Other carvings were left by Anasazi Indians, who farmed the area between 700 and 1300 A.D. During the colonial period, Spanish sheepherders etched crosses into the rock.

Development, however, has increasingly threatened the petroglyphs, as Albuquerque expands westward. Residential developments come up to the monument's edge, and several houses have been built within its designated boundaries. Rock art has been vandalized, stolen, and damaged by target practice, off-road vehicles, and illegal trash dumping. In 1989, the National Trust for Historic Preservation named the monument area one of the nation's most endangered historic properties.



IKE EASTVOLD

A new national monument will preserve ancient rock art.

Petroglyph National Monument came about as the result of cooperation between city, state, and federal officials, the area's Pueblo Indians, and descendants of settlers granted rights to the land by the king of Spain. Especially important were the efforts of local citizen groups, most notably the group Friends of the Albuquerque Petroglyphs.

The legislation also establishes a center for the study of rock art within the monument, and adds Petroglyph to the Masua Trail, an automobile touring route that links historic and prehistoric sites throughout New Mexico.

Advocates of the monument are concerned about the effect highway and airport projects may have upon it. City plans are underway to build a four-lane highway through the monument. While a city council resolution specifies that the road should not be widened, conservationists are worried that the current blueprints allow for eventual expansion of the road to six lanes.

They are also concerned about Albuquerque plans to expand the Double Eagle II airport, separated from monument grounds by a wire fence. The city wants to transform the airport into a jet

maintenance facility and enlarge the airport's runways and build new hangars in order to accept large commercial planes.

Congress also passed a bill authorizing the expansion of the 365-acre Pecos National Monument by 5,500 acres and renaming the site Pecos National Historical Park.

The land to be added to Pecos comes from the adjacent Forked Lightning Ranch, owned by actress Greer Garson.

The ranch envelops the existing Pecos National Monument and contains historical sites that reflect the Upper Pecos Basin's role as main gateway between the Great Plains and the Rio Grande Valley.

Pecos was the center of trade between Pueblo and Plains Indians and between Spanish colonists and French traders. The first Europeans to explore the area, the Coronado expedition, arrived at Pecos in 1541. It was also a major stop on the Santa Fe Trail.

The current monument, located in the Upper Pecos Basin near Santa Fe, contains the ruins of the enormous Pecos pueblo, built more than 500 years ago. The monument also contains 17th- and 18th-century Spanish missions.

Spread throughout the land to be added are archeological sites representing prehistoric, Pueblo, Apache, and Spanish settlements. These include ancient pueblo and Spanish colonial ruins, as well as well-preserved wagon ruts from the Santa Fe Trail. The ranch also contains sites connected with the Civil War battle of Glorieta Pass.

Because of recent development threats, conservationists were eager to see the Forked Lightning Ranch added to Pecos. In January, a Florida developer attempted to purchase the ranch and announced plans to build several thousand vacation homes, an airport, and a shopping center on its grounds. Public outcry caused the deal to fall through.

The House and Senate bills establishing Petroglyph National Monument and Pecos National Historical Park were sponsored by the entire delegation from New Mexico. In 1989 NPCA's Board of Trustees traveled to Pecos to visit the site and to express support for the monument's expansion.

House Clean Air Bill Protects Park Views

In late May, the House of Representatives passed, 401-21, a bill updating and strengthening the Clean Air Act. The bill contains strong protections for national parks from air pollution that causes low visibility and from acid rain.

The next step is a conference process that may take up much of the summer as legislators strive to resolve differences between the House bill and one passed by the Senate in April and combine the two bills into a single package.

The House bill includes a strong amendment, sponsored by representatives Ron Wyden (D-Ore.) and Silvio Conte (R-Mass.), that would designate as Class I areas all national parks of 6,000 or more acres created since 1977. Class I areas are given the highest level of air quality protection by the Clean Air Act. In 1977, when Congress last amended the Clean Air Act, all then-existing national parks of 6,000 or more acres received Class I protection.

The new national parks that would receive Class I status are Channel Islands in California, Biscayne in Florida, Great Basin in Nevada, Badlands in South Dakota, the National Park of American Samoa, and seven national parks in Alaska.

UNION PACIFIC RAILROAD

The Grand Canyon's spectacular views are often obscured by air pollution.

The Wyden-Conte amendment not only extends air quality protection to new parks, but also makes that protection even stronger, especially for western parks. It requires the EPA to develop new regulations within two years on air pollution from a variety of sources. The regulations would protect and improve visibility in western Class I areas.

The amendment also increases the power of federal land management

NEWSUPDATE

▲ **Grand Canyon overflights.** A report shows that 96 percent of pilots are complying with two-year-old restrictions regulating airplane and helicopter flights over Grand Canyon National Park. The restrictions are intended to help preserve the Grand Canyon's natural silence.

▲ **Antarctica.** In April, Jacques Cousteau and other conservationists testified before Congress against a proposed international minerals treaty that would open Antarctica to mining. Witnesses said mining would destroy the fragile ecosystem of the continent, which helps regulate world climate. As part of the Alliance for Antarctica, NPCA supports an Australian plan to preserve Antarctica as an international wilderness park.

▲ **Medal for Rockefeller.** In May President Bush signed a bill awarding a Congressional Gold Medal to conservationist Laurance Rockefeller.

▲ **Protection for whales.** NPCA has asked the president to pressure the International Whaling Commission to extend its current moratorium on commercial whaling until the year 2000.

▲ **Mather award.** NPCA is currently accepting nominations for the Stephen Tyng Mather award. The recipient will be the National Park Service employee who has risked his or her job or career for the principles and practices of good stewardship during 1989. One-page letters of nomination may be submitted until July 31 to David J. Simon, NPCA, 1015 31st Street, NW, Washington, DC 20007.

agencies, including the National Park Service, to protect their lands from potential sources of air pollution.

"I am thrilled that the Wyden-Conte amendment was adopted by the full House. It reflects the affection Americans have for their National Park System and their desire to have the system protected from the ravages of air pollution," said Elizabeth Fayad, NPCA park threats coordinator. NPCA has worked hard for strong national park visibility protections.

While many parks were established in part for their clear, far vistas, Park Service monitoring has shown that now more than 90 percent of the time human-caused air pollution affects these views.

The Senate bill contains less sweeping provisions for park air. It would establish a five-year study and a set of regional commissions to investigate low visibility.

The other clean air issue that most affects national parks is acid rain. Like the Senate bill, the House bill seeks to end acid rain by requiring utilities to halve their emissions of sulfur dioxide by the year 2000. The House provides more favorable incentives to utilities in the Midwest and Appalachia, which burn their regions' high-sulfur coal. The Senate sets incentives more favorable to the cleaner utilities of western states.

Either way, some relief may be in sight for forests and lakes ravaged by years of acid rain.

In general, the House and Senate bills are in virtual agreement on some issues, such as toxic industrial emissions and chlorofluorocarbons, but differ on others, such as solutions to high urban ozone levels and smog.

"In the conference we hope the best, most environmentally sound sections of both bills will be incorporated into the final product. That is what we will be working for," Fayad said.

After the chambers of Congress combine their two bills into one in conference, each house will vote on the new compromise bill. They will then present it to the president for his signature or veto. The 101th Congress has set October as the goal for a new version of the Clean Air Act, but that will require a high degree of cooperation.

Bill to Stabilize Flow Of Colorado River

While the Interior Department conducts a long-term evaluation of how Glen Canyon Dam affects the Colorado River and Grand Canyon National Park, Representative George Miller (D-Calif.) has introduced a bill calling for more immediate changes in the dam's operation.

Miller's bill would require Interior to stabilize the flow of water from the dam within 90 days to prevent further damage to Grand Canyon.

Glen Canyon Dam regulates the flow of the Colorado River, which enters Grand Canyon 15 miles to the south, in Arizona. The dam primarily supplies power to western states at times of peak electricity use, such as hot afternoons. The amounts of water released vary from 1,000 to 30,000 cubic feet per second, changing the level of the river by as much as 13 feet a day.

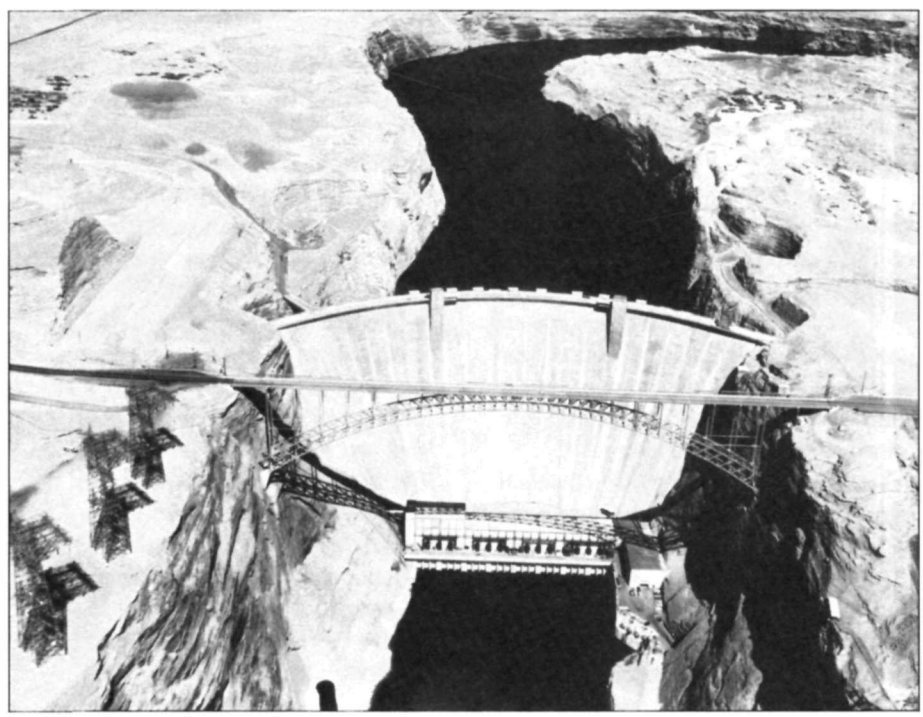
Conservationists have been concerned about the effects of Glen Canyon Dam for 15 years. In 1989, Interior Secretary Manuel Lujan ordered an environmental impact statement (EIS) prepared on the dam's effects on Grand Canyon. Studies show that the Colorado's shifting levels endanger visitors who are fishing or boating and erode shoreline vegetation. Fluctuations also erode park beaches, since the dam blocks sediment to rebuild them. The dam also has decreased the Colorado's temperature, causing decline of native fish such as the endangered humpback chub.

The bill would direct Lujan to establish interim criteria for operating the dam until the EIS is completed in June 1992. In order to stabilize the level of the Colorado River, these criteria would specify minimum and maximum amounts of water the dam can release.

Miller's House Interior Subcommittee on Water, Power, and Offshore Energy Resources held an April 26 hearing to investigate the dam's effects. At the last minute, however, Lujan barred appearances by officials from the U.S. Fish and Wildlife Service and the National Park Service. Their testimony about damage from the dam's operations was expected to provide support for the bill, which Interior does not support.

At a second hearing on May 22, Interior suggested making interim changes in the dam's operation in November 1991, 90 days after it completes research on the flows' effects.

Fluctuations in water released by Glen Canyon Dam damage the Grand Canyon.



BUREAU OF RECLAMATION

HATTERAS LIGHTHOUSE STAYS PUT FOR NOW

After ten years of study, debate, and controversy over how to preserve Cape Hatteras Lighthouse, the National Park Service has decided to let the lighthouse remain on its precarious bed for now. When the lighthouse—the tallest one made of brick in the United States—was opened in 1870, it was 1,500 feet from the ocean. Constant erosion of North Carolina's Outer Banks has brought the sea within 250 feet of the base of the lighthouse.

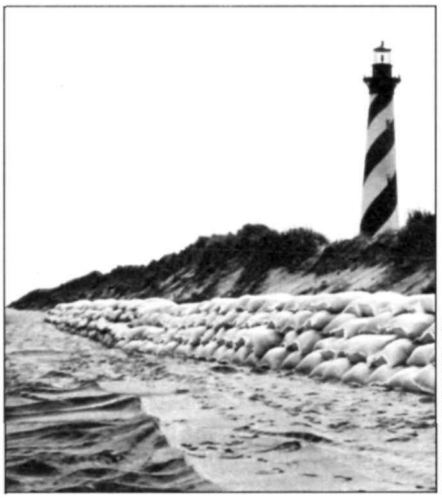
In a study commissioned by the Park Service in 1988, the National Academy of Sciences endorsed moving the 208-foot beacon a half-mile inland on a specially constructed railroad to save it from the sea. The Park Service, however, has not sought from Congress any of the estimated $8.7 million it will cost to make that move because it feels the lighthouse is not in immediate danger of toppling into the sea.

"The decision was made to move it, and this is still the selected alternative," said Robert Woody, public information officer at Cape Hatteras National Seashore. "The move will occur when the risk of loss by erosion equals or exceeds the risk of loss through the move effort." According to engineers who have moved large structures before, Woody said, moving the lighthouse "will be a piece of cake."

The lighthouse will not be considered in immediate danger until there is a reoccurring need to reinforce the sandbag revetment that bolsters the lighthouse base. It has not needed reinforcing in six or seven years. "Between now and then, we are planning for the move so that when the time comes, we can move quickly," Woody said.

The Park Service is also using the $7 million appropriated by Congress for preservation to help rehabilitate and stabilize the structure, said George Berklacy of the Park Service.

But the controversy is not over yet. Some people are opposed to moving the lighthouse from its historic location, while others feel delaying the move puts it in jeopardy.



NATIONAL PARK SERVICE

A sandbag revetment helps protect Cape Hatteras Lighthouse from the sea.

"The Park Service is not supposed to move historical buildings," said F. Ross Holland, former NPS assistant director of cultural resources and NPCA trustee. "But faced with the prospect of this magnificent structure being taken by the sea, I just can't see letting this thing fall."

RANGERS STRUGGLE WITH LOW PAY, POOR HOUSING

Congress recently held a hearing to investigate the status of national park rangers and other employees of land management agencies. Witnesses testified that low salaries and few chances for advancement are among the factors making it increasingly difficult for the National Park Service to attract and retain highly qualified employees.

The House Interior Subcommittee on National Parks and Public Lands and the House Subcommittee on Civil Service held the joint hearing on April 5. The National Park Service, other land management agencies, NPCA, and two park rangers' associations testified.

"When employee needs and basic expectations are not met, the result is demoralization, and the mission of the Park Service—the protection of the parks—is endangered," testified William Lienesch, NPCA federal activities director. As part of its 1988 *National Park System Plan*, NPCA documented problems currently facing park rangers.

James Ridenour, director of the National Park Service, stated that NPS faces a problem common in civil service: an overabundance of "baby boom" employees who, by their numbers, decrease advancement opportunities for one another and for younger workers.

Witnesses and members of Congress suggested, however, that the range and seriousness of problems that NPS employees face go beyond those common across civil service. They cited the low levels of pay and rank as perhaps the most important of these problems.

While federal salaries average 22 percent lower than private sector salaries, pay for park rangers falls even farther behind. "Our salaries and benefits are well below those of other agencies with similar responsibilities," stated George Durkee, president of the National Alliance of Park Rangers and Firefighters.

As of March, 50 percent of year-round rangers were classified, in the government's General Schedule (GS) pay and rank system, at the relatively low grade of GS-7, which pays a minimum of $20,195 per year, and 24 percent at GS-5, which pays a minimum of $16,305.

In a survey published by the Association of National Park Rangers last year, rangers reported relying on second jobs or on a spouse's income to make ends meet, having to take out personal loans or deplete life savings in order to cover daily expenses, and even receiving food stamps and child care assistance.

"One cannot feed a family on sunsets," Representative Constance Morella (R-Md.) quoted a ranger. One witness called rangers a "threatened species."

Witnesses also testified that rangers find little chance to move up within NPS. A former ranger stated that he felt forced to leave the Park Service because "I was told that if I remained in NPS, I had only a one-in-15 chance of ever making GS-9," or $24,705 per year.

NPCA's *National Park System Plan* found that it is not uncommon for rangers to remain at one grade level, with the same duties and pay, for five to ten years.

According to testimony, the turnover rate among rangers has increased. "It was practically unheard-of during the first years of the 1970s for an employee to

leave a career as a park ranger. . . . By the end of the '80s, park units in proximity to large urban areas were often losing 20 percent and more of their permanent rangers each year," Ridenour stated.

A range of witnesses, including Ridenour, suggested that NPS change the way ranger jobs are classified in order to mitigate these problems.

Representative Robert Lagomarsino (R-Calif.) expressed concern over housing conditions for rangers, as did several witnesses. They stated that, for rangers who live outside parks, rents cause an increasing financial strain. Rangers in some positions are required to live within, and rent from, parks. Witnesses said park-owned housing, as well as housing rangers are able to afford outside parks, is often in poor condition.

According to Ridenour, over half of the housing NPS owns is in "fair to poor or obsolete condition." He cited as an example Yellowstone rangers who live year-round in unwinterized trailers.

Representatives Bruce Vento (D-Minn.), who convened the hearing, and Gerry Sikorski (D-Minn.) questioned government witnesses particularly closely about the state of seasonal rangers. During the peak summer season, witnesses told them, NPS employs approximately 7,000 rangers, more than half of whom are hired for the season only. Seasonal rangers do not receive health or retirement benefits, or year-to-year raises. More than 90 percent are grades GS-5 or below.

Many rangers take seasonal positions in the hope of eventually gaining permanent ones. Vento pointed out, however, that they may serve for as many as ten years before permanent openings arise.

SECT'S FUEL TANKS LEAK NEAR YELLOWSTONE

In April, fuel tanks within a religious sect's bomb shelter complex near Yellowstone National Park leaked 32,500 gallons of diesel fuel, threatening a tributary of the park's Yellowstone River.

The incident increased concerns about the effects of Church Universal and Triumphant (CUT) activities upon

TED WOOD

An aerial view of the church's complex.

the park. It also resulted in a court order suspending construction of the complex until the state completes a review of its environmental impacts.

"Although it obviously was not intentional, the fuel spill confirms our fears about the high risk of accidents and adverse impacts from the development," Terri Martin, NPCA's Rocky Mountain regional representative, stated.

CUT, a controversial survivalist sect, operates a 33,000-acre ranch and 756-person fallout shelter complex in Montana's Paradise Valley, five miles north of Yellowstone and several hundred yards from Mol Heron Creek. Mol Heron is a pristine cutthroat trout spawning stream that flows into the Yellowstone River just beyond the park boundary.

The spill occurred April 13 and 14 when three of CUT's 35 underground tanks ruptured, leaking fuel into the earth. The tanks have a total capacity of 634,500 gallons.

In the days after the leak, the Montana Department of Health and Environmental Sciences monitored a clean-up effort at the site. Workers drained and removed the tanks, drilled wells to discover the underground path of the spill, and dug trenches to intercept its flow toward the creek. In late May, they were still removing and cleaning the soil containing the spilled fuel.

According to Glenn Phillips of Montana's Department of Fish, Wildlife, and Parks, the spilled fuel was diverted quickly enough that little actually reached Mol Heron Creek. Phillips said none of the creek's fish appear to have been killed by the spill, although aquatic insects on which they feed were affected.

"It could have been a lot worse," said Steven Pilcher, chief of Montana's water quality bureau. "If no more fuel leaks into Mol Heron Creek, I'll say we dodged a pretty fatal bullet."

A week after the spill, a Montana judge ordered CUT to halt work on the fallout shelter complex until the state completes an environmental analysis of the shelters and their facilities.

In early 1989, NPCA and other conservation groups filed a lawsuit questioning state-issued permits that allowed the sect to proceed with construction. NPCA held that an environmental impact statement the state had conducted on CUT's construction projects was insufficient. A court ruling for the state that May allowed development to continue.

Last July, news reports revealed, however, that the church had not included the underground bomb shelters or fuel tanks in the plans it submitted for the environmental impact statement.

This February, the Montana Department of Health and Environmental Sciences ordered that a supplemental environmental impact statement be conducted, examining the shelters and their facilities, such as the fuel tanks and sewage system. This ruling means that CUT must halt construction until this supplemental statement is completed.

CUT installed the 35 tanks in November and December of last year. State officials say the tanks may have ruptured as the frozen earth in which they were buried thawed and expanded. CUT holds that the accident was due to a flaw in the tanks themselves.

The group has denied criticisms that it buried the fuel tanks during the winter in order to avoid a new state law on underground storage tanks that went into effect April 1.

The tanks form part of CUT's preparation for global catastrophes it expects shortly. Its leader, Elizabeth Clare Prophet, believes that a 12-year period of "bad karma" will descend upon the world soon in the form of nuclear war or accident, economic collapse, and environmental poisoning. CUT has prepared by building the shelters and stockpiling weapons and fuel and food supplies.

PARKLAND TRUST FUND MAY GAIN NEW STRENGTH

The Senate held a hearing in April on legislation to reform a national fund for expanding parks and open space. As of this writing, the bill, S. 370, is before the Senate Public Lands, National Parks and Forests subcommittee. In July 1989 the House Interior Committee passed a similar bill, H. R. 876.

The current parkland fund, the Land and Water Conservation Fund (LWCF), was created in 1965 to be a steady source of monies for acquiring national, state, and local parkland and for building state and local recreational areas.

A share of federal revenue from offshore gas and oil leases, a tax on motorboat fuel, and sales of federal real estate goes into LWCF. Its yearly funding comes to $900 million.

The sum of money actually available for parklands, however, has been much lower. This figure depends on the amount the administration recommends and the amount Congress appropriates. In each of its last three years, the Reagan administration recommended less than $20 million, amounts boosted by Congress to $200 million, but still far short of Land and Water Conservation Fund's authorized level.

S. 370 would create a strengthened LWCF, to be renamed the American Heritage Trust. It would build American Heritage Trust from unused Land and Water Conservation Fund monies, adding each year's funding. American Heritage Trust would function much like a trust fund, with interest going toward parkland purchases. The bill contains a similar provision for the Historic Preservation Fund.

In his testimony before Congress, NPCA President Paul C. Pritchard stated, "A rejuvenated Land and Water Conservation Fund with a higher and more stable level of funding would be a cornerstone of our nation's conservation programs."

Both bills have strong congressional support. S. 370 is sponsored by Senator John Chafee (R-R.I.) and 38 other senators. H. R. 876, sponsored by Representative Morris Udall (D-Ariz.), has 223 co-sponsors. The powerful House Appropriations Committee, however, believes that the legislation would reduce its budgetary power. Senators resistant to federal land acquisition also oppose the measure.

INCINERATOR PLANNED NEAR PIPE SPRING

Leaders of a Native American tribe in northern Arizona may allow construction of a hazardous waste incinerator on their reservation, which surrounds Pipe Spring National Monument.

The plan has caused concern among park officials, local residents, and environmental groups. They are worried that the plant threatens Pipe Spring, nearby national parks such as Zion, Bryce Canyon, and Grand Canyon, and the surrounding area with air pollution and reduced water flow.

"The project could potentially wreak havoc on Pipe Spring National Monument, destroying the historic spring, and causing air quality degradation and general commercial disturbance," stated Russ Butcher, NPCA Southwest and California regional representative.

Pipe Spring preserves a Mormon pioneer fort and ranch. It was a major stopping point for settlers traveling west. The monument is located within the reservation of the Kaibab Paiute tribe.

Waste-Tech Services, Inc., a Golden, Colorado, subsidiary of Amoco Oil Company, has proposed building a hazardous waste incinerator on the reservation. The incinerator would burn petroleum by-products shipped in from California, Nevada, and Utah. The tribe is reportedly divided over the issue.

Waste-Tech would build the plant, at a cost of between $50 and $100 million, in two phases. The incinerator would first burn 50,000 tons of petroleum

sludge each year, and then, as business grew, expand to burn 100,000 tons of waste each year.

Tribal leaders and Waste-Tech officials have not selected a site for the plant but are considering several. Sources in the Park Service say that at least one may be within two miles of Pipe Spring and visible from it.

Park officials are concerned that the plant would impair the otherwise unobstructed view of the surrounding area from Pipe Spring. They are also concerned that air pollution from the plant would contaminate air quality, not only at Pipe Spring, but at Zion and Bryce Canyon national parks and Glen Canyon National Recreation Area in southern Utah, and 60 miles away at Grand Canyon National Park.

Grand Canyon already suffers from a heavy wintertime haze, whose primary source is a Page, Arizona, power plant.

Park officials are also worried that the flow of the historic spring, around which the settlers built their fort, would be diminished by Waste-Tech plans to pump groundwater for use in the incinerator.

In the last two decades, the spring has shrunk to less than half its historic level. Not enough is known about the area's geology to determine what has caused the decreased flow or what the effect of groundwater drilling would be.

In addition, officials and local residents are troubled by the effect buried ash from the incinerator could have upon the region's groundwater and by plans to haul hazardous material through the area. Opponents of the plant say the area is not equipped to deal with a hazardous waste spill.

Local residents have also expressed apprehensions that the spring water area farmers use for irrigation would be diminished, that pollution from the plant could pose health risks, and that the area's tourism industry, property values, and ability to attract other kinds of business would decline.

Cecil Scott, Paiute business manager, has stated that Waste-Tech is interested in locating on Native American reservations because of the "allure of bypassing city, county, and state regulations." The incinerator would have to meet federal regulations, but, because it is designated for tribal land, there are no state, county, or municipal laws to which the project must conform.

If the tribe accepts Waste-Tech's offer, the Bureau of Indian Affairs would conduct an environmental assessment of the project and then, if it judges that one is necessary, an environmental impact statement.

Unemployment is high in the 250-member Paiute tribe, and Waste-Tech has offered its members hiring preference on the plant's payroll, which the company has estimated at $3 million yearly. Waste-Tech has also offered the tribe lucrative annual fees during the planning period and lease fees after the plant's construction.

Bill Calls for Study Of Park Boundaries

A bill before the House of Representatives would direct the National Park Service to undertake studies of national park boundaries and recommend changes that would improve protection for the parks.

H. R. 3383, sponsored by representatives Bruce Vento (D-Minn.) and Jim Lightfoot (R-Iowa), instructs NPS to complete studies of the boundaries of at least 25 parks within three years of the bill's passage. NPS would then make recommendations for boundary changes to protect the parks' natural, cultural, and recreational features and to improve park management. It would also develop criteria for future studies of park boundaries.

"A study of this kind is long overdue," said William Lienesch, NPCA federal activities director. "In order to make informed decisions about park boundaries, Congress needs the kind of thorough data this bill calls for."

The border drawn around a park often does not include key elements of the ecosystem it was meant to preserve or the entire site of the historic event it commemorates. Early parks, such as Yellowstone and Yosemite, were simply outlined as squares around their most dramatic features.

Since then, park boundaries have often been drawn out of political, rather than natural or historical, considerations. Borders may, for example, cut a cliff or a watershed in half or exclude the greater part of an endangered species' range.

Insufficient boundaries may leave vulnerable the very features the park was intended to preserve. At Manassas National Battlefield, developers planned to build a shopping mall on a section of the original battlefield just outside the park's boundary. At Everglades National Park, dramatic fluctuations in water sources, which were outside of park boundaries and park control, caused severe ecological damage to the park.

In both cases, Congress mandated boundary changes for the parks in order to help preserve them. Since inception of the National Park System, Congress has made more than 500 boundary adjustments to nearly 200 parks. It made a dozen such changes in 1987 and 1988.

In testimony before Congress, NPCA President Paul Pritchard said, "Today, parks are increasingly becoming islands amid a sea of development," making emergencies like those at Manassas and Everglades more likely. The bill is designed to identify needed boundary changes before such crises occur.

In 1988, NPCA completed a study entitled *Park Boundaries: Where We Draw the Line* as part of its comprehensive park system plan. The study concluded that 69 percent of parks preserving natural areas and 41 percent of those representing cultural or historic sites were in need of boundary adjustments.

FORUM

Bones of Contention

THE CONTROVERSY OVER DIGGING UP HUMAN REMAINS IN PARKS

BY BRUCE CRAIG

MOST AMERICANS WOULD NOT dream of placing the remains of Vietnam veterans in hermetically sealed caskets so that, someday, a scientist could analyze the war wounds inflicted by North Vietnamese regulars as compared to wounds inflicted by the Viet Cong.

Neither should society consider excavating the remains of Chief Sitting Bull or any other Native American merely in order to conduct scientific studies. Such acts are sacrilege. Excavated, catalogued, and displayed, these remains are, in many cases, someone's ancestors.

Yet, one of the most divisive and controversial issues confronting federal land managers today focuses on the human remains contained within our nation's museums, universities, and parks.

By some estimates, the skeletal remains of between 110,000 and 200,000 Native Americans are in the possession of such institutions. The Smithsonian alone contains the remains of more than 18,500 Native Americans, and it is estimated that the bones of approximately 3,500 individuals repose in the custody of the museum collections of our national parks.

For many, especially Native Americans, the prospect of archeologists digging up their ancestors, handling their bones, possibly cutting them up for sophisticated laboratory analysis, and then displaying them is disturbing if not horrifying. Many Native American groups view the remains of their ancestors and the funerary objects associated with them as crucial to the spiritual well-being of the groups.

Consequently, Native Americans Rights Fund, Association on American Indian Affairs, and National Indian Education Association, as well as other such organizations, steadfastly object to these intrusions.

The concerns of Native Americans are shared, in part, by some veteran organizations who see little reason for displaying fragments of fallen American soldiers simply to create interpretive exhibits that, for example, attempt to explain 19th-century surgical techniques. To many, it is offensive to exhibit human bone fragments shattered by bullets and cannon balls merely to bring home the point to visitors that "war is hell."

On the other hand, federal law and some archeologists view such bones and associated grave goods not just as human remains but also as "archeological resources." Some contend that human remains are unique and rich sources of information that can tell scientists much about American prehistory and history. Archeologists often argue that such "scientific specimens" belong to society in general.

While the archeological community does not unanimously agree on this issue, some archeologists, as well as cultural anthropologists, see great value in retaining such human remains in museum collections for present and future scientific analysis. My experience has been that the scientific community has little compunction about "tastefully displaying" bones in museums and visitor centers for purposes of "interpretation."

Native American groups have objected to displays in the Smithsonian Institution as well as in publically funded museums, such as Dixon Mounds, Illinois, which actually displays a simulated gravesite.

In some cases objections raised by groups are respected. For example, two years ago NPCA lodged objections to a surgical exhibit that displayed human remains from Gettysburg National Military Park. Our concerns were quickly addressed by the superintendent of the park who ordered the display removed.

Today, the policy of the National Park Service is to prohibit the display of Native American remains. As yet, no similar policy applies to the remains of American war dead. Interior Secretary Manuel Lujan recently announced plans to revamp policies governing the protection and treatment of human remains and sacred objects on federal lands. In addition to supporting stronger protections against looting, Lujan says, "This is a subject of much concern to many Americans and especially to American Indians."

Excavated, catalogued and displayed, these remains are someone's ancestors.

No doubt excavation of human re-

mains will continue to some degree in our national parks. In some cases excavation is necessary and appropriate. Periodically, the National Park Service discovers human remains on park-owned land, and managers must interpret vague policies in an effort to determine how to treat the remains.

According to NPS policy, human remains are generally to be left *in situ*. Under special circumstances, however, human remains may be excavated. For example, NPS may excavate graves discovered while constructing a new park road or visitor center. In many instances, once excavated and subjected to scientific analysis, the remains are reburied, often in the same spot.

In *Guidelines for the Disposition of Archeological and Historical Human Remains*, Interior Department regulations outline how federal agencies should handle human remains. Although the 1982 guidelines were developed to assist federal land managers in this sensitive area, the National Park Service recently decided to initiate a review of the guidelines in response to concerns expressed by Interior Secretary Lujan.

As applied in National Park System areas, NPS standards are generally more sympathetic to the concerns of Native Americans than are guidelines for many other federal agencies. Even so, the guidelines have been criticized as being "pro-science and anti-Indian." The comprehensive reassessment of the issue is long overdue.

My personal experience is that because of loose language contained in National Park Service regulations and guidelines, many park managers find it easy to place scientific and educational claims above moral, religious, and ethical concerns, although the latter are of primary importance to ethnic groups and veteran organizations.

Saratoga National Historical Park is a case in point. A few years ago, officials at this park failed to comply with certain provisions of the National Historic Preservation Act of 1966.

Most notably, they failed to consult adequately with concerned citizen groups before reinterring—near the park visitor center—the remains of two Revolutionary War soldiers and a civilian. The citizens had wanted the remains reinterred in a designated burial ground with military honors.

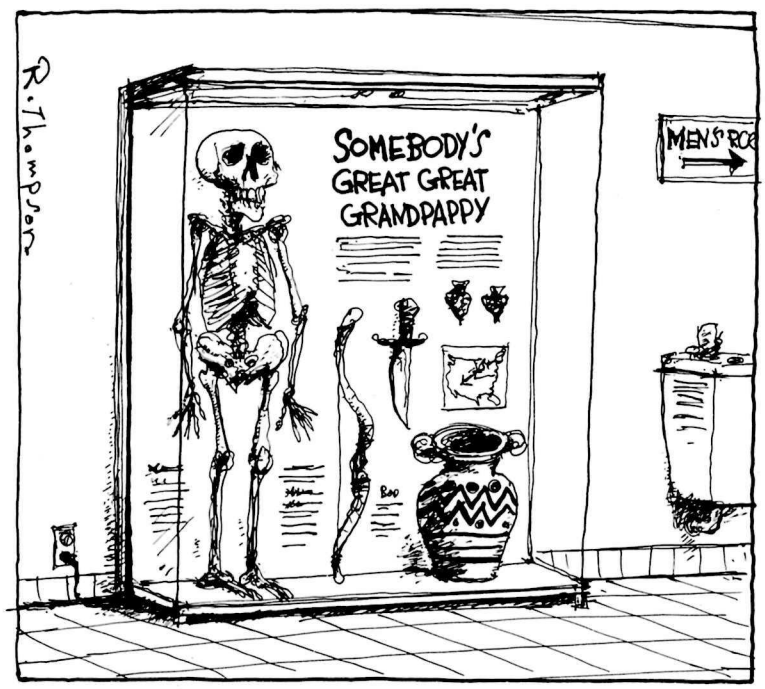


ILLUSTRATION BY RICHARD THOMPSON

Today, the remains are in "underground museum storage"—that is, reburied but still considered museum objects. Park managers contend that someday these remains may need to be exhumed for further scientific analysis. Because of their location near the visitor center, the graves remain a curious interpretive display for park visitors.

I find this attitude morally repugnant, and I have great sympathy with Bill Tall Bull, spiritual leader of a Northern Cheyenne tribe. Tall Bull, testifying before a Senate committee on the Archeological Resources Protection Act, said that retaining human remains as "artifacts" is "savage . . . barbaric . . . inhuman. It is sick behavior. It is un-Christian."

The scientific community places too high a value on the potential scientific uses of human remains—to the detriment of other values. In most societies there is a shared belief in the sanctity of the remains of the dead.

Although human remains can be archeological resources, the fact is they are also the remains of deceased human beings, entitled to rest in peace. This aspect has yet to be adequately recognized in law and in policy.

Potential solutions do exist. For instance, once human remains have been excavated and scientifically analyzed, they could be *permanently* reburied. The remains would no longer be accessible for further scientific analysis. Morally and ethically such an approach makes sense, as most people—whether Native American or any other ethnicity—do not view their dead ancestors as "specimens."

We should keep in mind that, occasionally, scientific research may necessitate longer-term curation. Eventual reburial of human remains, however, should serve as the rule rather than the exception.

Desecration of graves is a problem of national concern, tied—in large part—to the issue of ownership. With so great a number of Native American skeletal remains stored by federal agencies, public and private universities, and museums, as well as private collections, a national policy is needed regarding the treatment of human remains.

We must strengthen federal law to provide a judicious, rational, and sensitive national policy for human remains found on both public and private lands.

Bruce Craig is cultural resources coordinator for NPCA. Craig, a former National Park Service interpreter, was the 1982 winner of NPCA's Freeman Tilden Award for park interpretation. His opinions are his own and do not necessarily reflect those of NPCA.

Unlikely Harbingers

The Sudden, Worldwide Disappearance of Amphibians Alerts Scientists to Ecological Breakdown

By Michael Milstein

HIGH IN CALIFORNIA'S Sierra Nevada Range, just north of Yosemite National Park, lies an isolated alpine lake where Lawrence Cory could always find frogs. A biology professor at St. Mary's College in northern California, Cory spent nearly a decade in the 1960s studying mountain yellow-legged frogs, abundant throughout the glacier-tilled Sierra. Whenever he ventured to Koenig Lake, it was teeming with many hundreds of the speckled creatures hopping about, and thousands of their young tadpoles basking at the edge of the water.

In 1988, Cory returned to Koenig Lake after almost 20 years. This time, it was eerily still and silent. This time, there was not one frog or tadpole to be found. Quickly, he checked a half-dozen other lakes that had been astir with frogs in the past, and discovered them vacant, too.

"It was the first time I had an emotional reaction to a change in the environment. I was shocked," Cory recalls. "It's like being in downtown San Francisco at rush hour and not seeing any cars. Something's got to be wrong."

Around the nation and the world, scientists are now uneasily echoing that sentiment. Prolific frogs, toads, and salamanders are mysteriously disappearing, even in untouched national parks and wilderness areas. They are disappearing from the pure, high mountains of the Northwest and the arid lowlands of Arizona, from the Austra-

YOSEMITE TOAD, BY GEORGE D. LEPP/BIO-TEC IMAGES

lian interior and the green, tropical hills of Costa Rica.

In what could be a potent omen of human-wrought environmental damage, lakes, ponds, and streams once melodic with frogs' deep, intimate mating calls have now fallen deadly quiet. This strange silence may mean more than the simple loss of a familiar childhood playmate, or an expected boom in swarms of mosquitoes once kept in check by amphibian appetites.

Northern red salamander in the Great Smoky Mountains.

JEFF FOOTT

In February, David Wake, a biologist at University of California (Berkeley), led a hastily convened National Research Council conference to discuss worldwide amphibian declines. "There's no question this is the result of human meddling," he now concludes. "Frogs dying off may just be an early sign of the harm we're doing to the environment."

While scientists know that many once-common amphibians are becoming extinct or are already extinct, no one knows exactly why. No single theory explains all of the missing species. There are few corpses in this mystery, and fewer clues.

No theory explains all the missing species. There are few corpses and fewer clues.

Many of these ecologically sensitive creatures are clearly gone because their wetland homes have been wrecked by trampling cattle, uncontrolled logging, or other human development. Inescapable acid rain and snow is also a possibility, as are pesticides, drought, and competition from exotic species. Most alarming, though, are inexplicable, simultaneous amphibian declines in America's protected, relatively pristine national parks and wilderness areas.

"These are some of the last places you would expect to see such common creatures becoming extinct before our very eyes," says Andrew Blaustein, an Oregon State University herpetologist who has watched several species of western frogs vanish from much of their homeland. "If they're dying in undisturbed wilderness, it proves nothing, no place is safe anymore."

Uniquely adapted to altitudes above 6,000 feet, the Yosemite toad, for example, has largely disappeared from its namesake park. Completely gone from Yosemite now, yellow-legged frogs have also declined in Sequoia and Kings Canyon national parks, farther south in the Sierra. Once common within Oregon and the Northwest's wild Cascade Range, amphibians such as the western spotted frog and the Cascade frog are now seen there rarely.

Early settlers near Mesa Verde National Park in southern Colorado reported thousands of amphibians along the Mancos River. Although spadefoot toads are still common, leopard frogs have not been seen for years. In and around northern Colorado's Rocky Mountain National Park, boreal toads (close relatives of Yosemite toads) and leopard frogs are gone from up to 90 percent of their former haunts. Tiger salamanders and chorus frogs are also missing from some sites.

Such swift declines in far-flung locales do not bode well for a class of animals that has persisted in generally the same form for more than 75 million years. Today's amphibians are descendants of the first creatures to evolve from a waterborne existence and successfully adjust to life on land. They lost ground when dinosaurs became dominant, but persevered by plying the damp zone straddling air and water.

In bridging that gap, ancient amphibians became the conduit onto land for all modern birds and mammals, including people.

Since their intermediate anatomy is vital in understanding more advanced animals, frogs are examined in classrooms everywhere. Studying humans without comprehending amphibians, biologists say, would be like studying U. S. history without considering the American Revolution.

"When you look at a toad or frog, you're looking at a representative of the earliest, most primitive forms of life on land," explains David Martin, a biologist at San Jose State University. "If they hadn't made that jump from the water, none of us would be here."

Each year, just as snow melts and small ponds begin to brim with runoff, amphibians emerge from their winter's sleep in soggy burrows or rotten logs.

Leopard frogs are quickly disappearing.

JUDY HILE/UNICORN PHOTOS

MICHAEL HAVELIN

Non-native eastern bullfrogs prey on declining species.

Then, they look for romance. Like sweet-talking Romeos, these familiar harbingers of spring voice loving croaks to help them lure available mates.

As females lay hundreds of eggs in the water of a still pond, males then douse them with a milky cloud of sperm. Salamanders differ only in that females fertilize their eggs internally, after gathering male sperm from the pond bottom. They later attach the eggs, as do most frogs and toads, to submerged plants, rocks, or logs.

Broods of frogs, toads, and salamanders develop in two distinct stages from long strands of eggs or from softball-sized, jellylike egg masses. Young, gilled tadpoles that emerge from the egg mass must stay immersed until they mature into adults, when they can also survive on land.

In adapting to their niche, adult amphibians have evolved the unique ability to breathe through their moist skin. Thus, they can absorb oxygen either above or under water. On land, they can also use humanlike lungs.

Such special devices, which allow amphibians to live in two environments, also make them overly vulnerable to ravages in each. Their permeable skin can easily absorb toxins from both air and water. Absorbed toxins can then be passed on to eagles, herons, raccoons, and others that eat frogs.

Because tadpoles are low on the food chain and adult amphibians are much higher, amphibious species are affected by environmental vagaries at both stages. That exposes their kind to a broad spectrum of problems.

Amphibians are, therefore, notable "indicator" species, biologists say, a vibrant thread in the environmental fabric. Like the proverbial canary used to detect invisible but deadly fumes in a coal mine, frogs are telling bellwethers of wide environmental change.

Yet when the creatures began disappearing sometime in the early 1970s, few really noticed. Slimy, uncomely amphibians rank low in the hierarchy of wildlife research compared to money-making game animals such as elk, bears, or deer. So, frogs and their kind were never much studied to begin with.

Amphibians' permeable skin can easily absorb toxins from both air and water.

"People have kind of ignored things like frogs and toads because they're not charismatic species," says David Stevens, a biologist at Rocky Mountain National Park in Colorado, where surveys have shown that frogs and toads have disappeared from alpine ponds.

Federal researchers will continue on a shoestring budget at Rocky Mountain this summer, after finding one surprisingly healthy toad community last year. They hope to discover what conditions have allowed this one population to survive.

Biologists trying to explain the amphibian eclipses are shackled by a dearth of scientific data. To document declines, many have returned to ponds where species were recorded decades ago. But accurate records are rare, since there was never a need for them—until now.

"All our frogs were so common a couple decades ago that nobody even bothered to write them down," Yosemite wildlife biologist Jeff Keay says, lamenting the lack of information. "You wonder how many other critters are having the same problems."

To confuse matters, amphibian species, in some areas, are still doing fairly well. And, scientists could explain earlier declines in terms of natural boom-bust breeding cycles typical of frogs and toads.

Until scientists at the first world herpetology congress in England last fall finally realized that they were all seeing similar declines, some researchers had figured these die-offs to be just routine, local events.

"We never knew whether or not to make anything out of it," remembers Marty Morton. A biologist at Occidental College, California, Morton studied Yosemite toads through the 1970s with colleague Cynthia Kagarise Sherman. As they were finishing their work, they noticed a sharp loss of toads where there had been hundreds breeding each spring.

"Now," Morton muses, "we may have some of the only good information on a dying species."

JEFF FOOTT

Canyon tree frogs scale heights in Zion.

The pair expects to return to Yosemite this summer to compare past and present toad numbers, but none of the small, olive-green residents have been noted in the park for the past two years.

Outside of the West's remaining wildlands, perhaps the most visible but least appreciated threat to amphibians is the outright loss of their habitat. Much of their matchless wetland home has been flooded or dried out by giant reclamation projects such as those that have damaged the Everglades. Even more has been razed and paved to make room for human homes and progress.

Little-publicized federal research has shown clearcut logging even more devastating to forest amphibians than to the renowned spotted owl, an icon of battles over virgin Northwest forests. By changing the forest climate and dirtying streamside habitat, clearcutting—an economical method of felling vast tracts of timber at once—may isolate and extinguish longtime amphibian residents.

Or, habitat destruction can be more subtle. Biologist Martin has seen simple disorder, such as vehicle traffic or lumbering cattle, throw off the Yosemite toad's careful mating rituals and interrupt their sonorous croaks. At many lakes under heavy fishing and recreational pressure, toads are few and far between.

The vocal sac swells with each call of the Yosemite toad.

GEORGE D. LEPP/BIO-TEC IMAGES

Even within their habitats, amphibians are at risk. Trout and other fish planted in mountain lakes high in the Sierra and Rockies feed voraciously on amphibian eggs and tadpoles. A century ago, no native fish lived in any of Yosemite's 339 lakes—now about a third contain rainbow, brook, and other exotic trout. National park managers still stock some lakes to please anglers, although they are now reevaluating that policy.

POSSIBLY THE MOST ominous specter hovering over world amphibians is the airborne poisons hidden in acid rain and snow. Prevalent for decades in the eastern United States and growing worse in the West, acid precipitation results when industrial and automobile sulfur and nitrogen exhaust binds with atmospheric elements to create sulfuric and nitric acids. These acids then fall back to earth cloaked in raindrops and snowflakes.

The most ominous specter hovering over amphibians is the airborne poisons hidden in acid rain.

Some amphibians, and especially their waterlogged eggs, have proven extremely sensitive to increased acidity. When exposed in a laboratory to acid amounts that were only slightly higher than is normal, some eggs died, while other eggs grew into deformed tadpoles.

Acidity in the water can also slow the growth rates of young amphibians, keeping these creatures from maturing before the water in their temporary pond refuges evaporates during the heat of the summer.

When exposed to caustic moisture, frogs' sperm is even more vulnerable than eggs. Since frogs fertilize their eggs in open water, any acid present could kill their sperm instantly, rendering males impotent.

"All the way around, acidity is extremely detrimental," says Benjamin Pierce, a Baylor University herpetologist and one of the first to study effects of acid on amphibian breeding. "These frogs can't help but expose themselves to it simply by the way they live."

Most precipitation falls in mountain ranges as snow. When the snow melts, it then fills the small ponds where amphibians breed and lay their eggs.

Even at areas such as Sequoia and Kings Canyon national parks, where unusual acid levels are uncommon, researchers have detected a fast, concentrated "pulse" of acidity flushed out of melting snowbanks in a matter of hours. This acidic pulse washes into ponds and lakes just as frogs and toads begin mating.

"It was coming right at the most crucial and unprotected time in their lives," says U. C. Berkeley biologist John Harte, who has come closest to linking acid pulses to a threefold decline of tiger salamanders in one watershed in the Colorado Rockies. "It's not yet as clearcut an effect as smoking and lung cancer, but it's there."

In the East and at lower elevations, plentiful limestone and thick soil help absorb acidity like Pepto Bismol soothes stomach pain. Some eastern amphibians, such as the pine barrens tree frog of New Jersey and the Carolinas, are even tolerant of their boggy, acidic habitat. Scientists theorize these frogs may have evolved in the inhospitable habitat to avoid undue competition.

Such unique adaptations as well as buffering soils and stone may have kept amphibians from disappearing in the East—so far.

In the West, younger, higher mountains are carved from impenetrable granite, covered with little buffering soil. It is an ecosystem intolerant of the rapid changes humans have wrought in just a century. Neither the western environment nor its wild residents, including frogs, fish, and other species, can handle the influx of acids, overused pesticides—the diverse assortment of pollutants that have appeared.

Weather patterns that deliver acid rain seem to coincide with many amphibian declines. In the late 1960s, biolo-

PACIFIC TREE FROG IN JEFFREY PINE, YOSEMITE. BY KERRY T. GIVENS

gist Cory found residues of the pesticide DDT in yellow-legged frogs at some of the highest elevations in the Sierra.

Conversely, amphibians in Yellowstone and Grand Teton national parks, geographically less exposed to air pollution, still seem in good shape.

ACIDITY DOES NOT EXPLAIN all the lost amphibians. Once the most abundant species in Oregon's lush Willamette Valley, where no measurable acid rain has been found, the red-legged frog is now extremely rare. Western spotted frogs, once common throughout the mountainous West, are now extinct over nearly half their former range and are a new candidate for the federal endangered species list.

In California's Calaveras County, native frogs have been either eaten by people or exotic eastern U. S. bullfrogs, caught by scientists or youthful collectors, or killed by toxins in mining waste. Now, the notorious jumping frogs of Calaveras County—famous around the world—exist only in the tales of Mark Twain.

While acid snow is present in the southern Rockies, the Fish and Wildlife Service–NPS survey that included Rocky Mountain National Park found similar losses of boreal toads and leopard frogs in southern Wyoming. Acid levels measured there were not low enought to disturb them.

"There is no smoking gun to explain this right now," says Bruce Bury, one of the two U. S. Fish and Wildlife Service biologists who conducted that survey. "It could turn out to be very simple, or it could be something bigger than we realize."

There are a few reassuring signs. In a wilderness section of Michigan's Isle Royale National Park, David Smith, a Williams College research scientist, watched numbers of chorus frog young plummet from 20,000 to less than 5,000 in the early 1980s. They have since recovered to around 13,000 tadpoles last year, but these fluctuations are not well understood.

In Sequoia National Park, biologists will try to reintroduce now-absent foothill yellow-legged frogs to lower elevations, and see if they survive. Some species, such as the Pacific tree frog in California, seem to be holding their own. They may be less sensitive to acid rain, or it might be something else altogether. Frog eggs, for instance, can also be ruined by ultraviolet light making it through the Earth's failing ozone layer.

What is most urgently needed now, biologists say, is research to prove exactly what is killing frogs and their kin. Backcountry rangers working in several national parks, including Canyonlands, Yosemite, and Sequoia, will be on the lookout for healthy amphibian populations this summer.

Scientists such as Cory, Martin, and Morton can then compare areas of healthy populations to those where amphibians have declined or disappeared altogether.

Maybe something can be done to rectify the damage, even if it is only to halt subsidies of exotic, frog-gobbling trout. Or, it may already be too late. Amphibians may join the 15 percent of the world's animals expected to be extinct in the next 30 years.

"A lot of what we know is only anecdotal bits and pieces," says UCLA biologist David Bradford.

Last summer, Bradford found frogs in only one of 46 Sequoia National Park ponds where he had studied them in the 1970s.

"You'd expect people to disappear before frogs, because of their proven adaptability," he says. "When you look at some of these crashes together, though, it is extinction. It's for good."

KERRY T. GIVENS

Acidic water and UV light can kill amphibian eggs.

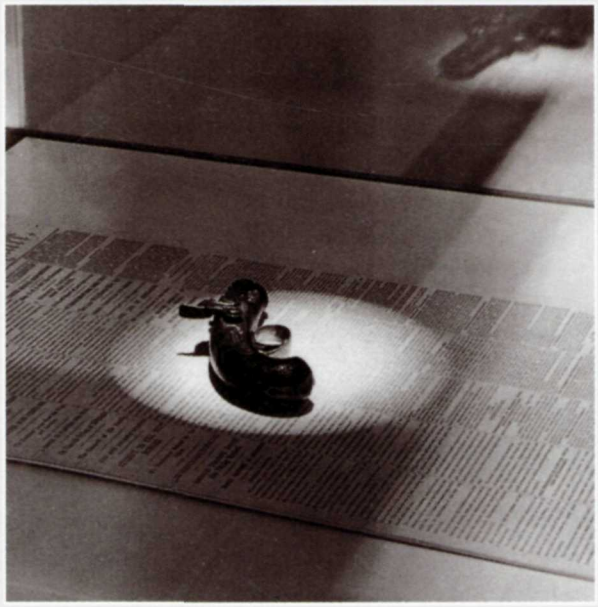
The tiger salamander is the largest land-dwelling salamander.

WELDON LEE

Frequent contributor Michael Milstein, a reporter for the Billings Gazette *and a former park ranger, last wrote for* National Parks *on hydrothermal discoveries in national park lakes.*

THE Death OF A President

The National Park Service Confronts The Disturbing Subject of Assassination



BY KRISTIN EDDY

LIKE A POLITE HOST pretending not to notice a guest's bad manners, the Lincoln Museum did its best to ignore the unpleasantness people associated with the site by shooing memories into a corner. Now the museum, located in the basement of Ford's Theatre where Lincoln was shot in 1865, has been extensively renovated and expanded into an exhibit that leaves behind the old, timid approach.

"The previous Lincoln exhibit was planned not long after the Kennedy assassination," explained Ben Miller, chief exhibit planner for the Lincoln Museum. "This is conjectural, but knowing how cultures react, they decided to focus largely on Lincoln's life, rather than on the assassination. The assassination and the confederates were treated in the exhibit, but they were put aside and, pretty deliberately, the museum did not focus on these individuals, I guess in order not to give them any credit."

"However," Miller continued, "people still wanted to see the derringer [used by Booth to shoot President Lincoln] and this was the number-one attraction."

Ford's Theatre National Historic Site, located in Washington, D. C., and a part of the National Capital Parks, was restored in January 1968. At that time, the exhibition in the Lincoln Museum could best be described as rudimentary. Three alcoves followed the

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The presidential box and the outside of Ford's Theatre were decorated for Lincoln's visit and for his death.

OVERLEAF: JOHN WILKES BOOTH'S DERRINGER BY NATIONAL PARK SERVICE

life of the president from birth to the presidency. Self-guided tours allowed visitors to view a split rail, a chair from Lincoln's law office, a bench from his home, and other artifacts.

There was no mention of Petersen House across the street in which Lincoln died. The "assassination alcove," which held two-thirds of the exhibition's artifacts and drew the most visitors, was tucked into a 10-by-20-foot space in a corner and obscured behind a large exhibit case that contains a funeral flag.

"You could have as many as 300 people in the museum and that's where they would all go," said Ford's Theatre curator Frank Hebblethwaite. "There was the feeling in the previous exhibit that we're going to try to tell the story of Lincoln's whole life, which to me is unrealistic."

Besides, said Miller, "exhibits sort of have a life. They become dated looking."

So when the new museum was being designed, exhibit planners brought in a professional designer. During the redesign the museum was closed to the public for more than a year.

THE REDESIGNED space has a rather sleek, modern look. Soft overhead lights illuminate grey "marble" classical columns made of avonite, a material composed of crushed granite and plastic.

Brand-new display cases, designed with proper climate control and built-in security systems, house the artifacts now. These changes are a switch from the open displays that characterized the old exhibit.

An axe that was used as a prop on the campaign trail, which used to be within the reach of visitors, still bears tiny nicks from the fingernails and pocket knives that carved out souvenirs.

Free-standing displays greet visitors with videos on three themes: "The Temper of the Times," which explains the immediate post-war political climate as a possible factor and backdrop to the assassination; the "Lincoln Assassination"; and the "Legacy of Lincoln," which deals with the response to Lincoln's death and the almost immediate deification of the man.

In the center of the floor, standing on a reproduction of the carpeting in his theatre box, is a full-length model of Lincoln wearing the clothes he wore the night he was shot. Nearby is the Brooks Brothers greatcoat he wore. Sewn into the lining is an eagle with "One Country" under one wing and "One Destiny" under the other.

"The display case is right in the middle," said Hebblethwaite, "with no obstructions and all the neat things—the door next to his theatre box, some of the wallpaper—all the things people want to see."

Also on display are hoods worn by the eight alleged coconspirators during their trial. Two of these hoods are reproductions. The other six are original hoods; they are on loan from the Smithsonian and will be returned and replaced with reproductions after the first six months of the exhibit.

(Twelve days after Lincoln was assassinated, John Wilkes Booth—the ninth and most famous coconspirator—was found and killed, without recourse to a trial.)

Unlike the previous exhibit, this one presents more graphic reminders of the tragedy: pieces of a bloody towel, a blood-stained pillow upon which Lincoln rested, and the stained shirt cuff of attending physician Dr. Leale.

The deliberate placement of these mementos marks a departure not only for the museum, but also for the National Park Service, which has traditionally shied away from such unpleasant associations.

At the time, Lincoln's assassination was an exceedingly sensitive public issue. In more recent history, the assassinations of Kennedy and Martin Luther King shocked the American public, once again making assassination a subject to display cautiously.

"There is some question about what extent the details of an assassination should be focused on," said James Charleton, a historian for the National Park Service. "The content is important, but we do not want to make it so excruciatingly graphic that it is morbid or so it dwells on the morbid."

The Park Service manages other sites memorializing slain presidents, but these, too, focus almost exclusively on the *life* of each president. In the case of the John F. Kennedy National Historic Site in Brookline, Massachusetts—Kennedy's boyhood home—remembrance is devoted primarily to his childhood.

"We focus very little attention on his assassination," said park ranger Deborah Potee. "The rangers get very few questions about his death, although a lot of people come in saying they remember where they were when he was shot. We deal with that kind of question mainly from international visitors who are curious, but we usually try to deflect it or de-emphasize it."

James Garfield is another president whose death is handled somewhat obliquely. In 1881, four months after he took office, Garfield was fatally shot by a disappointed office-seeker. At James A. Garfield National Historic Site in Mentor, Ohio, the assassination attempt has been treated as an opportunity to discuss poor medical care in the 1880s.

"Garfield lingered on for two and a half months, so we have an opportunity to point out how far we've come, medically speaking," said guide Eunice May.

"The gunshot wound itself was not fatal, but because there were no X-rays and no antibiotics, the probing around in the wound caused an infection, which he died from. I find myself in the position, as gory as it sounds, of comparing presidential assassinations," she said.

It is one thing to design a home as a memorial site, be-

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The new exhibit at Ford's Theatre no longer shies away from the tragedy of Lincoln's assassination.

cause it is associated with memories both pleasant and unpleasant, but it is quite another matter when the site is connected solely with a tragedy, say many historians.

The decision to turn the Texas School Book Depository, from which Lee Harvey Oswald allegedly shot Kennedy, into a visitor center faced the same challenges as Ford's Theatre did.

Conover Hunt, who is the former project director and curator of what is now called the Sixth Floor Exhibit in Dallas, explained the initial difficulty in getting support for the project.

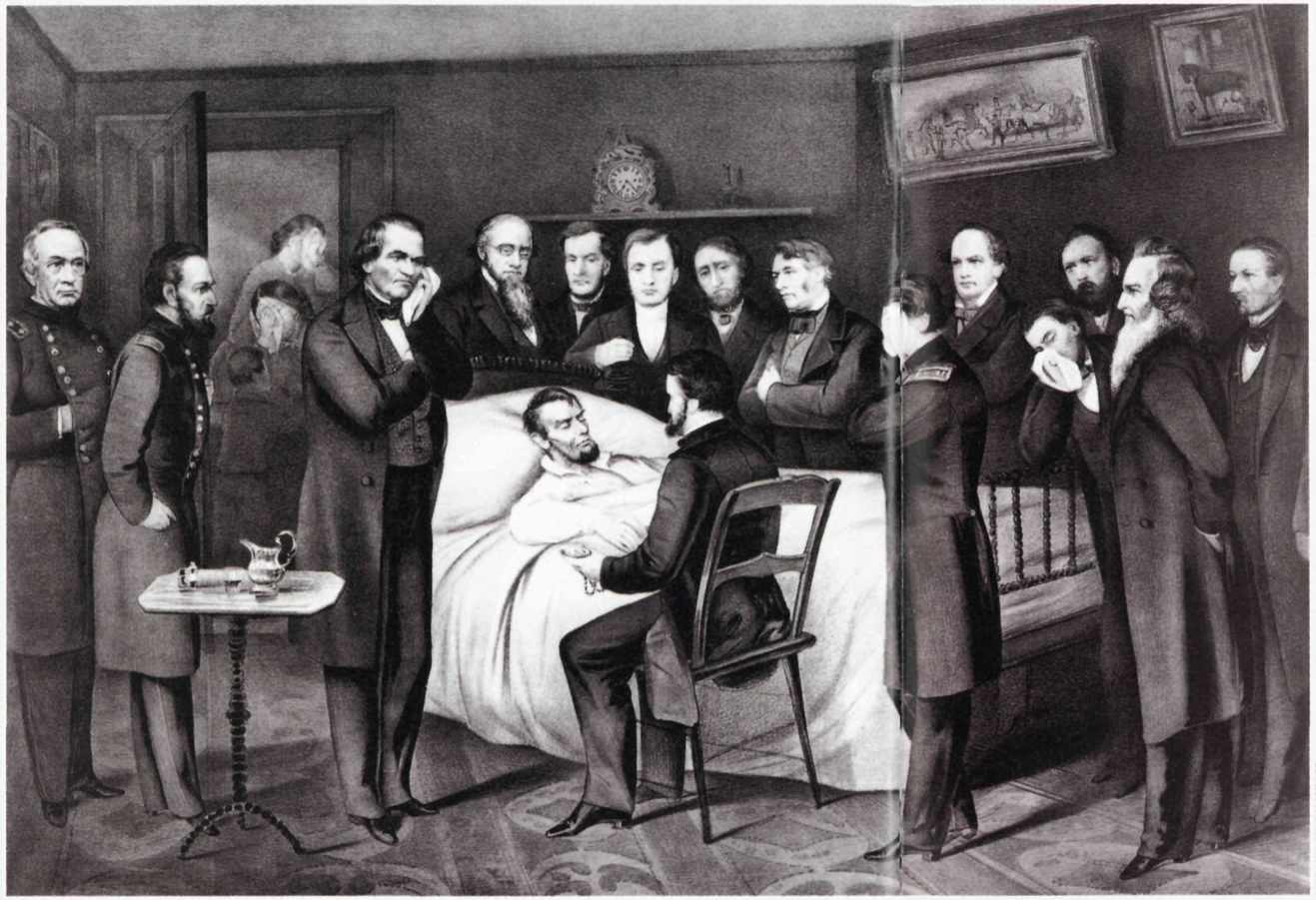
"There were a series of problems," she said. "It was an event of recent history from which the public had not healed. No one had a chance to put it to rest, but ultimately the community has to deal with it, particularly because people were coming to the site.

"Dallas was strongly blamed in a hysterical reaction, and the community has a painful feeling about that reaction," said Hunt.

"There is a strong tradition in this country of celebrating history by preserving the good news rather than the bad," she added. " And you have to get to the point where no one remembers personally, where it's all a legacy and not personal experience."

"There is another fundamental issue that has to be taken into account," said NPS historian Charleton, "There is a need for the very careful weighing of the effect on the public. Within our lifetime there has been one president assassinated and several attempts on others. A visitor with an unhinged mentality must be considered, and we have to be careful of glamorizing the event by displaying the assassin on par with the president."

For whatever reason, from fascination with the morbid to just plain curiosity, visitors are drawn to the artifacts of Lincoln's assassination housed at the National Museum of Health and Medicine, located at Walter Reed Army Medical Center in Washington, D. C. Some of these assassination artifacts are more graphic than the National Park Service is willing to display.



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Family, friends, and physicians attended Lincoln on his deathbed the morning of April 15, 1865.

According to Hebblethwaite, the items connected with the assassination—including Booth's diary, the derringer, the knives and carbines belonging to the conspirators—were given to the National Park Service in 1940 by the War Department.

But some of the artifacts were declared too gruesome even to remain in storage, much less be displayed at the park area.

So, in 1945, skull fragments and hair, a medical probe used to locate the bullet, and the bullet itself were sent back to the medical center, which now displays them in their museum.

The prickly question of which artifacts to feature came up only in this century, because it seemed for a time that the theatre itself would not be open to the public.

When John Ford announced plans to reopen the theatre in July of 1865, an irate citizen sent an anonymous threat that the building would be burned if theatre entertainment continued in the wake of the assassination. The War Department ordered the theatre closed and immediately began leasing the building from Ford.

"People did not want to see entertainment in the place where Lincoln was shot," said Hebblethwaite. "While they were leasing it they tried to prohibit Ford from using it as a theatre, but John Ford was an aggressive personality."

A year later, the War Department finally purchased the building, completely gutted the interior, and turned it into office space.

Under the management of the Park Service, the Lincoln Museum opened in 1932 with artifacts bought from Osborn Oldroyd.

A private collector, Oldroyd was so obsessed with Lincoln that, in 1893, he moved into Petersen House, which is across the street from Ford's Theatre, with his 3,000-piece collection of Lincoln memorabilia.

The government bought Petersen House in 1896 and, in 1926, purchased Oldroyd's collection for $50,000. The year after the Lincoln Museum opened, the management of Petersen House was transferred over to the National Park Service.

Now that the National Park Service has expanded its display to include the harsher mementos of Lincoln's assassination, students looking for a historical treatment of the conspirators will find a piece of the rope used to hang coconspirator Mary Surratt (the first woman hanged by the federal government) and photographs of the hanging scene.

Perhaps because the public has some distance from the distressing subject of presidential assassination, all of the artifacts relating to the conspirators are on public display for the first time.

The famous derringer used by Booth, a great attraction in the previous exhibit, is more prominently featured than before, but first-time visitors may find the lethal weapon surprisingly small.

And Booth has a display case to himself, of course. In the case is his photograph with a legend above it reading, in part, "John Wilkes Booth was a handsome young actor."

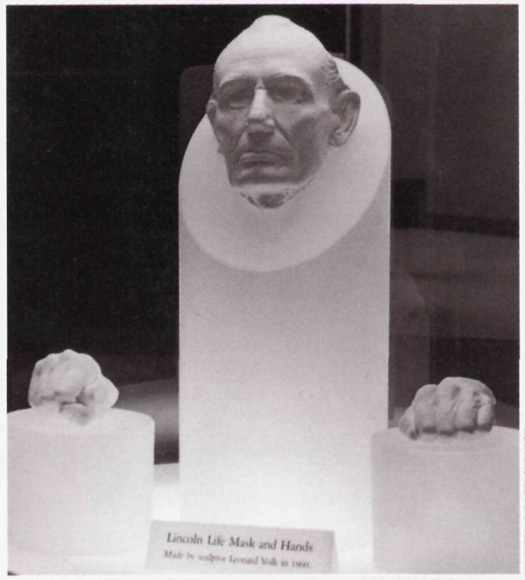
But for all the interest the public will take in the new exhibit, all the people who were involved with developing the new museum are going to be equally satisfied with it.

"The pleasure for me is infinite," said Hebblethwaite. "It's a real museum now."

Kristin Eddy is a staff writer for the Washington Post.

The Lincoln Museum is located in Ford's Theatre, 511 10th Street, NW, Washington, D.C., (202) 426-6924; TDD (202) 426-1749. Open daily, 9 a.m. to 5 p.m. Admission is free. Audio cassettes are available for the visually impaired. There is no wheelchair access to the Lincoln Museum.

A copy of Lincoln's life mask and hands has been displayed since Ford's Theatre was restored (below) in 1968.



NATIONAL PARK SERVICE

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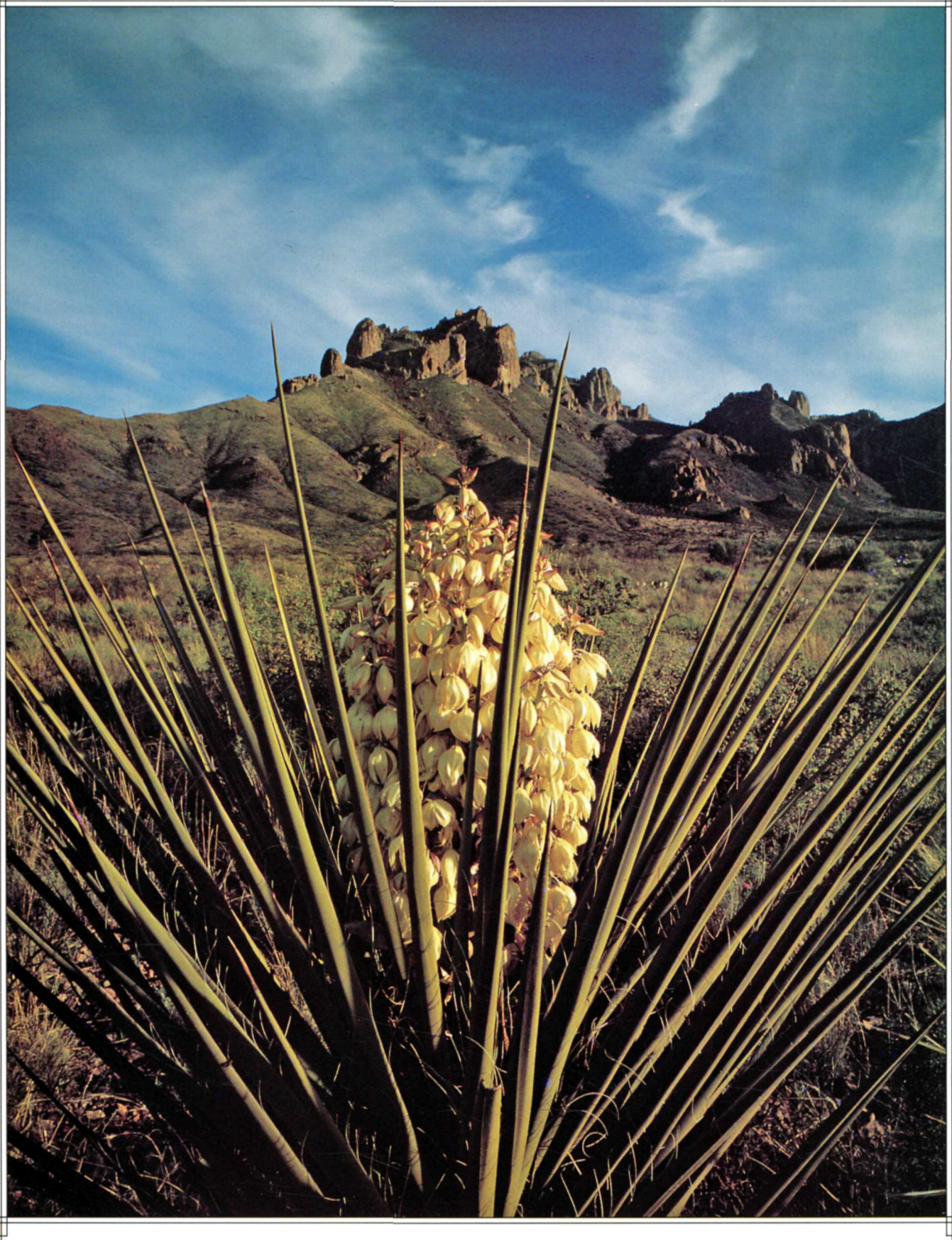
TEX MEX PARK

THE RIO GRANDE, the most important river in hundreds of miles, seems lost in the vastness of the Chihuahuan Desert. Mile after mile, the desert stretches from southeastern New Mexico deep into Mexico, covering much of West Texas. Here and there mountains rise from the desert valleys. ~ The towering limestone escarpment of Mexico's Sierra del Carmen dominates the landscape, rising 5,000 feet above the emerald green ribbon of the Rio Grande. ~ This lush mountain range, largest in the area, may soon be the centerpiece of a new Mexican national park or preserve and will surpass the grandeur and importance of the Chisos Mountains in its twin, Big Bend National Park in Texas. If the Mexican plans continue forward, a huge new international park may straddle the Rio Grande at Big Bend.

MAKING MEXICO'S SIERRA DEL CARMEN A SISTER PARK TO BIG BEND

BY LAURENCE PARENT



LOST MINE PEAK, BIG BEND NATIONAL PARK, BY DAVID MUENCH

The governor of the state of Coahuila in Mexico, Eliseo Mendoza Berrueto, has begun working for some form of park or preserve designation for the Sierra del Carmen and much of the adjoining desert. His efforts, however, are not the first.

Since 1935, when Big Bend National Park was authorized, Mexican and American officials have tried several times to create an international park. World War II and delays in establishing Big Bend National Park scuttled the first attempt.

President Franklin Roosevelt and Mexican President Manuel Avila Camacho made another try at the end of the war, but they failed. The following years saw several more unsuccessful attempts.

GEORGE WUERTHNER

Prairie falcons are among 100-plus bird species that nest in Big Bend.

Why were the efforts unsuccessful? In the past, too much of the impetus for creation of the park probably came from the United States. Mexicans are wary of any attempt to dictate their affairs because of past American interference in Mexico. In addition, many Mexicans feel that they need to develop the area for timber, grazing, and mining, rather than preserve it. This time, however, the chance of success is greater since the initiative to create the park began in Mexico.

Mexican academics and park officials have long studied the Sierra del Carmen. Inspired by their work, the governor saw an opportunity for both environmental preservation and economic development for the poor villages of northern Coahuila.

The governor realizes the tourism potential of the area. More than 250,000 people visit Big Bend National Park, which is largely desert, every year. Most visitors stay for several days. If better access and facilities existed, the cool, lushly forested Sierra del Carmen just across the border might draw a number of these tourists.

Texans will drive for days to reach the mountains of Colorado and New Mexico. With improved roads, Texans could be hiking in fir and aspen within a few hours of Del Rio, Texas. Mexico's beaches attract millions of Americans, why not its mountains?

American officials would like to see the area become a park, but they are careful not to interfere with the Mexican process. Governor Berrueto and Mexican park officials have met several times with Big Bend management for assistance with park planning.

The Mexican government tentatively plans to protect 1.2 million acres adjoining Big Bend National Park, entirely encompassing the Sierra del Carmen, along with parts of several smaller mountain ranges. Different parts of the area might be designated as a national park, a state park, or some form of national preserve.

More than a million acres of land on the Texas side are already protected in Big Bend National Park, Black Gap Wildlife Management Area, and Big Bend Ranch State Natural Area. If the Mexican efforts are successful, a total of more than two million acres of Chihuahuan Desert could be preserved.

According to Jim Carrico, superintendent of Big Bend National Park, the basic management of the parks would be handled by each country's own national park system, even though they might be designated an international park by the two countries' governments. The system would be similar to the system used at the international Glacier–Waterton parks along the U. S.–Canadian border. Tourists from Mexico and the United States would be able to cross freely into each other's park without the usual customs and visa requirements, provided that they stay within the parks' boundaries.

Although each side of an international park would have its own management, Carrico expects that some form of joint management council would evolve. Such a council would create a forum to solve common problems, initiate joint programs, and communicate each park's concerns and plans to the other.

When even the wealthy United States has trouble ade-

quately protecting its national park resources, however, how well will Mexico be able to prevent its park resources from being exploited by a fast-growing population?

At Big Bend National Park, cacti are stolen, roadkill is high, mountain lions range out of the park and are killed by hunters, and Mexican livestock frequently cross the river to graze on the American side. Serious air pollution, much of it from heavy industry in northern Mexico, shrouds the park much of the year.

As bad as they are, Big Bend's problems pale beside those of Mexico. Improving the standard of living for Mexico's fast-growing population without also damaging the environment has no easy solutions.

While northern Coahuila is lightly settled now, a Mexican park successful in attracting large numbers of American tourists might draw additional settlers from deep within Mexico. Thus, ironically, the Mexican effort to preserve the Sierra del Carmen may create additional environmental stress in the Big Bend area.

"I would like to see the area designated as a park with public access and protected resources," Superintendent Carrico says.

Realistically, however, Carrico knows that the Mexican park will not be managed like Big Bend. Like Mexico itself, the Mexican park system is still developing. Mexico does not have the resources to staff and manage its parks as intensively as in the United States.

Unlike the United States, Mexico cannot give such strong emphasis to environmental preservation. Instead, it must compromise more with economic development for the local people.

Most people in the villages across from Big Bend make their living by ranching and farming. Even without a national park, tourism already boosts the economy in Boquillas, a small village at the base of the Sierra del Carmen.

Although a Mexican park will not give full preservation to the Sierra del Carmen, Carrico believes that park designation gives the area some protection and is an important first step. People will live in the park and some grazing, mining, and logging will probably continue, but he hopes that consumptive uses of the land will diminish if increased tourism improves the economy of the area.

On the Texas side, some Big Bend management problems might decrease with creation of the Mexican park.

"The park [Big Bend] has some unique law-enforcement problems because of the river and our long border with Mexico," says Charlie Peterson, former Rio District ranger at Big Bend and now chief ranger at Bryce Canyon. Mexican livestock frequently cross the river into the park to graze, and poaching and harvesting of candelilla (wax plant) still occur.

Illegal immigration is a minor problem. "About five to ten aliens per month are caught by the Park Service," Peterson says. The large area of empty desert on both sides of the river discourages illegal aliens from crossing at Big Bend.

Drug smuggling, however, is a growing problem at Big Bend, as a recent incident demonstrates. For several days a motor home sat alone in the sun at the edge of Cottonwood Campground, while other campers grouped under the trees in more desirable sites. An older couple was seen around the motor home occasionally, but their activities did not seem quite normal to park rangers. When the RV finally left the campground, it was riding low on its springs.

Douglas fir and the cool heights of Sierra Fronteriza contrast with desert heat.

LAURENCE PARENT

On a hunch, an observant ranger radioed the Border Patrol and discreetly followed the vehicle as it drove northward out of the national park. When Border Patrol officers stopped the motor home just south of Marathon, Texas, they were astounded to discover more than 700 pounds of pure cocaine.

Officials hope that an economy improved by tourism would lessen the pressure on individuals to make a living by smuggling, poaching, or other illegal activities.

Fortunately, drugs are not the only import into the park. According to Rick LoBello, Big Bend Natural History Association director, black bears are moving into the Chisos Mountains from the Sierra del Carmen.

"There were 27 sightings in 1989, including a sow with three cubs," LoBello points out. "We are pretty sure that we have a new resident population of bears in the Chisos."

Other than a possible few bears in the Guadalupe Mountains and an occasional Mexican stray at Big Bend, the black bear has been extinct in Texas for decades. Conflicts with ranching interests and the pressures of sport hunting nearly eliminated the entire population of black bears by the time the park was created in 1944.

"According to Dr. Julio Carrera, the director of the Mexican national park system, northern Coahuila has the healthiest black bear population in Mexico," LoBello says. The return of bears to the Chisos indicates to LoBello that the ecosystem at Big Bend is recovering from the abuses of man.

LoBello wants to see the creation of the Mexican park but worries that inadequate protection could threaten the bears in Mexico. Bear meat and parts bring a high price, especially in the

international market where dried bear gall bladder sells for $500 and more an ounce as a panacea in Oriental pharmacies.

"Increased attention could bring poachers hunting gall bladders and other body parts," he says.

He also feels that the new Big Bend bears are at risk from fast-moving cars on national park roads and from the increasing potential for human–bear conflicts in the heavily visited Chisos Mountains.

Despite these problems, the natural world dominates within the Big Bend area, relatively undisturbed by man. The Spaniards avoided the area they called *El Despoblado*, the uninhabited land. Native American tribes from the Jumanos to the Comanches lived in the area until late in the 19th century. A few cattle ranchers and miners moved into Big Bend country in the late nineteenth century, but few others settled the area.

Only tenacious, hardy plants and animals survive in the Chihuahuan Desert on both sides of the Rio Grande. All have developed strong defenses. The lechuguilla plant, with its rosette of dagger-like leaves, blankets rocky hillsides, waiting to spear the ankles of unwary hikers. Sotol plants look similar to pampas grass from a distance. Close inspection, however, reveals rows of hook-like thorns on the leaves.

Creosote dominates the valley bottoms, secreting a chemical that discourages the growth of other plants. Even in Big Bend National Park, protected for more than 45 years, the former desert grasslands have only recovered a little from past abuse.

Plowing and overgrazing long ago destroyed Big Bend's grasslands and stripped the topsoil. Lack of topsoil and invading creosote bushes continue to slow the return of the grasslands.

Mountains rise from the Chihuahuan Desert flats like islands in a sea, shimmering on the horizon in hazy blue tones. A few rise high enough to trap moisture and support isolated forests.

The Chisos Mountains lie in the heart of Big Bend. From their highest point, Emory Peak, almost any other part of the park can be seen. The igneous mountains support a scrub forest of pinyon and juniper, with a few scattered ponderosas, Douglas firs, and aspens in sheltered sites.

As the southernmost range in the United States, the Chisos Mountains are host to species that occur in Mexico, but whose U. S. population grows only in this one small mountain range. The Colima warbler and the Mexican drooping juniper, for example, live nowhere else in the United States.

The Rio Grande forms an international border recognized by humans but not by nature.

DAVID MUENCH

To the north, the Guadalupe Mountains and Davis Mountains are higher, wetter, and cooler and support larger stands of conifers. But the largest range in the area is unquestionably the Sierra del Carmen of Mexico.

The mountains begin far to the north of Big Bend National Park and rise as they approach Mexico. Forming the eastern boundary of the park, their rugged, waterless character probably earned them the name of Dead Horse Mountains.

At the Mexican border, the Rio Grande cuts an enormous gash through this range, winding for miles through the sheer limestone walls of Boquillas Canyon. Dense stands of cane and tamarisk line the sandy banks below the canyon walls.

Then the mountains rise rapidly from the canyon on the Mexican side of the river, cresting in a towering west-facing limestone escarpment, the Sierra del Carmen. The massive white cliffs, visible from much of Big Bend National Park, turn pink with the last rays of the setting sun. Behind the 7,000-foot rim lie rich grasslands with scattered patches of pinyon, juniper, and ponderosa woodland.

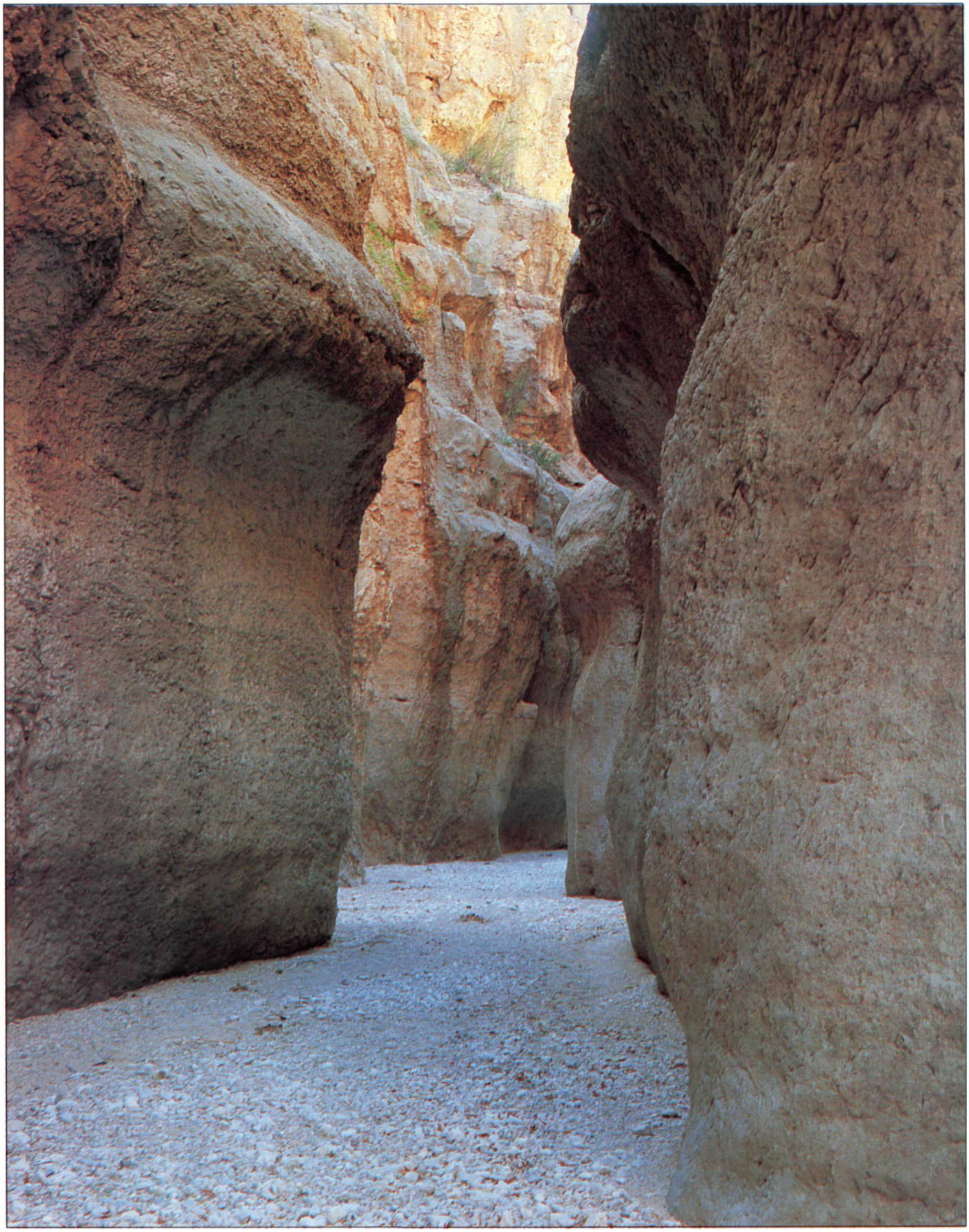
Adjoining the escarpment to the south lies an even higher part of the Sierra del Carmen known as the Maderas del Carmen or Sierra Fronteriza.

Unlike the limestone of the Dead Horse Mountains or the massive escarpment, the Sierra Fronteriza had its origins in a more violent volcanic past. Its rugged igneous crags rise abruptly to 9,000 feet, more than 7,000 feet above the Rio Grande at Boquillas Canyon and almost 2,000 feet higher than the rest of the Sierra del Carmen.

Hidden behind its forbidding ramparts lies a lush forest, more reminiscent of the mountains of New Mexico than of the arid Big Bend country. Dense stands of Douglas fir and ponderosa pine blanket the mountains. Aspen groves thrive in sheltered stands. Mixed in with the conifers is Arizona cypress, which grows only in a few southwestern American mountains, reminding visitors that they are south of the border. Permanent streams tumble down several of the canyons.

The mountains make many American wildernesses seem tame. No one lives in the mountains and no livestock graze the thick grassy meadows. The southern part of the Sierra Fronteriza was logged many years ago, but the forest has regrown, and the roads have washed out. The northern part of the Fronterizas, riven by deep canyons and crowned by craggy peaks, looks virtually impassable.

Marcos Paredes, an outfitter from Terlingua, Texas, has been



BOQUILLAS CANYON, MEXICO. BY LAURENCE PARENT

leading groups of travelers and naturalists into the Sierra del Carmen since 1984. After 30 or 40 visits, Marcos can attest to the mountains' wild character.

"In all my trips, I've never run into anyone up in the mountains," Paredes says. "I've seen bear about half the times that I've been up there."

The size of the mountains attracts severe weather both in winter and in summer. To illustrate this, Paredes related the experience that Mario Falcon, his Mexican wrangler, and a friend had on a hunting trip they took one winter.

LAURENCE PARENT

The dry, desert grasslands burn in the distant Sierra del Carmen.

"The sky suddenly closed in, and the clouds came down while we were separated from our horses," Paredes translated for Falcon. "We built a fire and stayed by it for three days, moving only once to find more fuel.

"We had no food or warm clothes. Everything was with the horses. My friend even tried to eat tree bark. Over two feet of snow fell."

On the fourth day, when the weather lifted, the two men struggled through the drifts on foot to get out of the mountains. Both got severe frostbite, not something visitors expect in Big Bend country.

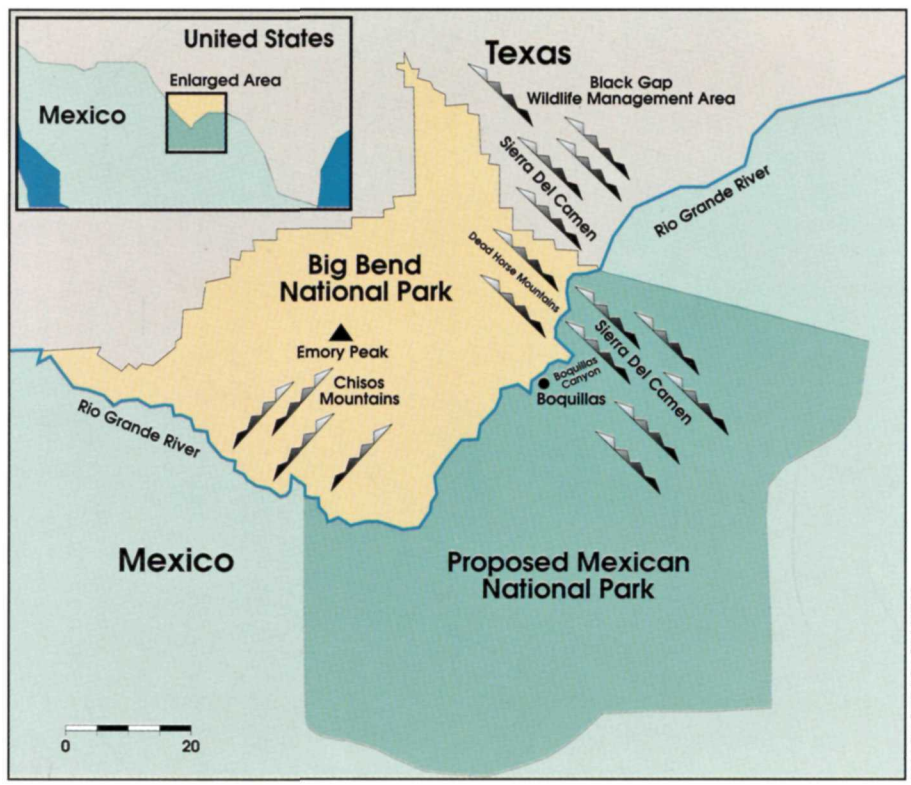
The Rio Grande forms an international boundary through this area, recognized by humans but not by nature. The ecosystem of the Chihuahuan Desert does not stop at the river, and the mountains continue across the river, broken only by the canyons of the Rio Grande.

People living along the border maintain close ties across the river. Added to the land already protected on the Texas side, the proposed Mexican park could create one of the largest protected ecosystems in the world.

As in the United States, creating a new park is a slow, laborious process. Part of the land in the proposed park is privately owned and agreements must be made with the landowners. Although the Mexican government might be able to proclaim a national park and condemn the land, the preferred option is to negotiate purchase or use agreements.

Although the Mexican federal government is proceeding slowly in its park creation process, Governor Berrueto is not waiting. For at least the interim, he is working toward creating a state park in the Sierra del Carmen.

In the past year power lines have been built into Boquillas. Hotel construction is proposed for the nearby Mexican hot springs. The road south of Boquillas past the Sierra Fronteriza has been turned from a high-clearance nightmare into a bridged, smoothly graded, all-weather road. Pavement may follow. Creation of the park is Mexico's decision, and, for the first time, more than just talk has ensued.



MAP BY O'TRACY GRAPHICS

Phil Koepp, chief ranger at Big Bend, does not doubt it should be a national or international park. "The Chisos Mountains are just a suburb to the Sierra del Carmen," Koepp says.

Laurence Parent, who explored the Sierra del Carmen by horseback, last wrote for National Parks *on Lechuguilla Cave.*

Trails Into the Unknown

SPELUNKING AND SNORKELING AWAIT THE ADVENTUROUS

BY ESTHER BARTFELD

FOR THE DO-IT-YOURSELF naturalist, educational trails in the national parks open a window on the natural world, revealing hidden meanings and relationships often overlooked by the casual observer.

For some of the most innovative approaches to discovering a region's unique features, take a tour of a cave's winding labyrinths, explore fire-scarred landscapes with a children's storybook hero, snorkel along luxurious coral reefs, or ponder a shipwreck from the turn of the century.

Jewel Cave Spelunking

Beneath the pine forests and flowering meadows of the Black Hills in South Dakota lies the intriguing subsurface world of Jewel Cave. Since its discovery at the turn of the century, more than 80 miles of passageway have been unraveled, revealing one of the world's most extensive caves.

Full of scenic and scientific wonders, Jewel Cave is accessible to the general public only on Park Service tours.

The spelunking tour, conducted from June through August, is a challenging adventure into the cave's dark passageways. Unlike the scenic tour, which follows a paved and lighted path through a portion of the cave, the spelunking tour introduces visitors to caving while teaching about cave formation, geology, and conservation in this extremely fragile environment.

After descending into the cave by elevator, you spend the next four to five hours climbing, crawling, and squeezing wormlike through tiny passageways to reach exquisite chambers. Maneuvering through a cave's tight passageways is often as demanding mentally as physically. At first it looks impossible to squeeze through the tiny 8.5-by-24-inch opening known as the "brain drain." Yet one by one, spelunkers disappear headfirst into the dark hole, before re-emerging into a long passageway.

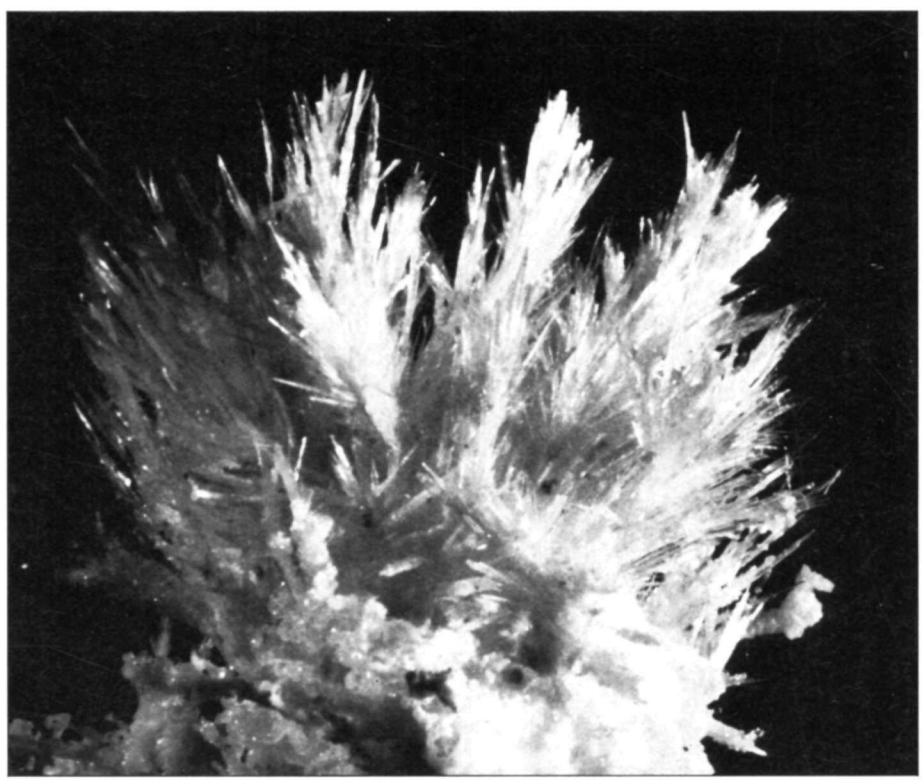
Illuminated only by the glow of a headlamp, the alluring cave environment, a constant 47 degrees, is unlike anything seen above ground. Clear, nearly invisible gypsum filaments, often as thin as human hair, protrude from the walls.

Stalactites hang like icicles from the ceilings, and stalagmites rise up from the floors, often meeting to form columns and pillars. Most unusual are the tiny, silver hydromagnesite balloons, rare and delicate bubbles seen only on this tour of the cave and found in few other caves in the world.

Turn off the lights and you find yourself immersed in a haunting, impenetrable darkness.

On the tour, the guide explains that millions of years ago acidic water seep-

Frostwork and other fragile formations decorate the chambers of Jewel Cave.



NATIONAL PARK SERVICE

ing into cracks and crevices dissolved parts of the limestone and hollowed out the passages of Jewel Cave. When the water table lowered, caverns lined with jewel-like calcite crystals, known as nailhead spar, remained. Water continues to seep into the cave today, slowly altering its delicate formations.

The Park Service provides helmets and lights. Visitors are expected to provide any other necessary equipment, including warm, light clothing; boots; optional knee pads and gloves; and a change of clothing.

Reservations are required and can be made up to 60 days in advance. The fee for the tour is $5.

For more information, contact Jewel Cave National Monument, Route 1, Box 60AA, Custer, SD 57730; (605) 673-2288.

Yellowstone Fire Trail

Who can forget the spectacular fires that swept through Yellowstone during the summer of 1988? Certainly not the nation's schoolchildren, whose overwhelming number of letters and contributions spurred the creation of a new Children's Fire Trail.

Opening this summer, the Children's Fire Trail illustrates the park's extraordinary regeneration. It is the only one of several new fire ecology trails in Yellowstone dedicated especially to children, with exhibits funded entirely by private donations, most of which were from schoolchildren.

Located seven miles east of Mammoth Hot Springs in a mixed habitat of aspen, lodgepole pine, and grassland, the handicapped-accessible boardwalk trail winds through a patchwork of forest and meadow. Walking in and out of the burnt woodland, you will learn about the area's forest ecology and witness the vital role of fire in the forest and grassland ecosystems.

Mountain man Joshua Grimes, hero of the popular children's story *Expedition Yellowstone,* teaches children about the region's fire history through a series of illustrations along the trail.

Though charred tree trunks remain in the woodlands, many new aspen seedlings have sprouted, providing a favorite food for the elk population. The recovery in the grasslands has been even more phenomenal. Fireweed and lupine burst from the burned meadows in one of the largest displays of wildflowers in the park's history.

This new trail is part of a three-part fire ecology educational project that also includes a companion story and activity booklet and a fire ecology teaching unit for educators. Together, these materials illustrate that fire does not signal the death of a forest, but instead provides a jolt to its living systems.

Contributions for Yellowstone's fire recovery project are still welcome. Checks should be made payable to the National Park Service (specifically designated for the Children's Fire Trail) and mailed to the Superintendent, P. O. Box 168, Yellowstone, WY 82190. Contact Yellowstone National Park at (307) 344-7381 for more information.

Fireweed and lupine burst from the burned meadows in one of the largest displays of wildflowers in Yellowstone's history.

Virgin Islands Underwater Trails

The living coral reef is the world's most diverse marine ecosystem, a splendid example of a balanced natural habitat where humans are a noticeable intrusion. Here, coral polyps work as nature's underwater architects, forming the building blocks for a vibrant underworld arena that decorates the ocean floor. Purple sea fans and multicolored sponges cling to the fragile corals, creating a brilliant background for the schools of electric blue and yellow fish and other marine creatures that thrive in the warm waters of the Caribbean Islands.

Underwater nature trails developed by NPS enhance the tropical reef snorkeling experience. For the finest reef exploration, underwater aficionados venture to Buck Island Reef National Monument, one of the nation's few marine parks, just a mile and a half northeast of St. Croix.

An unusual barrier reef surrounding the eastern shore of the island protects the placid, emerald lagoon from the waves of the open sea. In these gentle currents, snorkelers glide through dazzling marine gardens of trees, spires, and other sculpted coral formations. Geometrically shaped angelfish and porkfish scurry between well-developed staghorn and elkhorn coral forests. Arrow markers along the ocean floor and new signs installed for this summer guide snorkelers through this fantasyland and explain the symbiotic relationships of the coral formations with the sea life.

Because Buck Island can be reached only by boat, it has been spared the crowds that converge daily on other more accessible reefs. Several skippers operate small boats between St. Croix and the island and furnish necessary snorkeling equipment. Scuba diving is permitted only on the north side of the park, not along the nature trail.

For more information, contact Buck Island Reef National Monument, Christiansted National Historic Site, P. O. Box 160, Christiansted, St. Croix, VI 00820; (809) 773-1460.

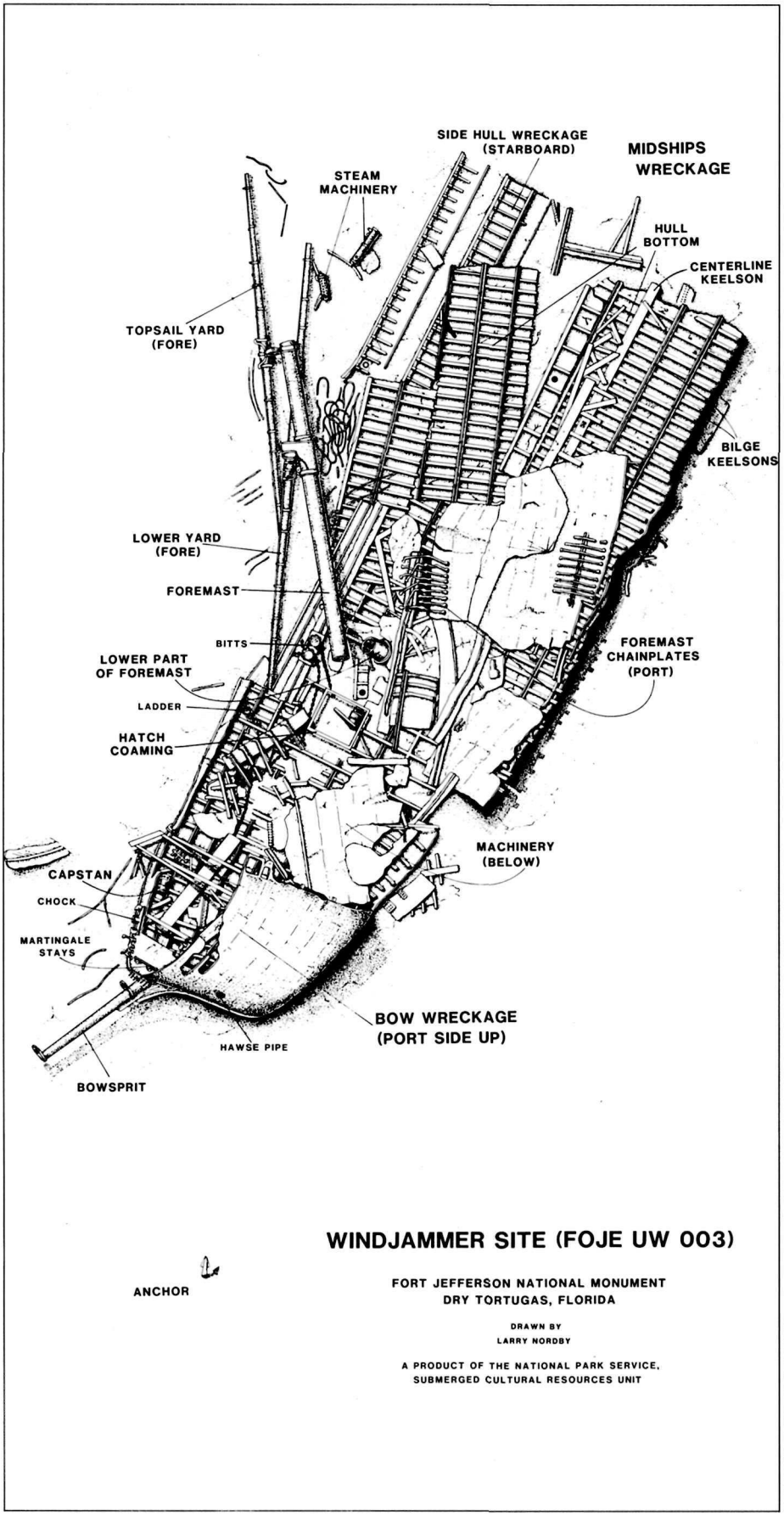
The island of St. John in Virgin Islands National Park features the park system's first underwater nature trail. Because of its easy access to one of the world's finest beaches, Trunk Bay is more crowded than Buck Island, but it is an ideal introduction to reef exploration where divers can see more than 30 species of marine creatures.

Contact Virgin Islands National Park, #10 Estate Nazareth, St. Thomas, VI 00802; (809) 776-6201.

Fort Jefferson Shipwreck

Scarcely one-fourth mile south of Loggerhead Key in the Gulf of Mexico, a ship's gunnel protrudes from the clear waters. It is a grim reminder of the hazards of navigating the rocky shoals of the Dry Tortugas.

This string of reef islands trailing westward off the coast of Florida comprises the remote Fort Jefferson Na-



MAP BY NATIONAL PARK SERVICE

tional Monument. Fort Jefferson itself, located on Garden Key, was the largest of the seacoast fortifications built by the United States in the early 1800s. It was used primarily as a military prison for deserting soldiers during the Civil War.

Famous for its bird and marine life as well as for legends of pirates and sunken gold, the Florida straits were the main thoroughfare for Caribbean trade and the famed treasure ships since the 16th century. Today, shipwrecks litter the ocean floor.

Beginning this summer, divers will have an unusual opportunity to explore one of the best preserved iron wrecks, the Norwegian-owned *Avanti*, which ran aground on the coral shelf south of Loggerhead Key in 1907.

Since its demise, a striking coral forest has grown up around the ship's frame, creating an unusual refuge for an abundance of tropical fish. The coral reefs, among the most pristine in North America, provide a spectacular setting for this important artifact, interweaving human history and natural history.

Swimming above the clearly recognizable bow and stern remnants, you try to imagine the crew sailing this three-masted, iron-hulled windjammer, one of the fastest and most efficient ships of the late 1800s. With a new, waterproof map that attaches to diving clothes with string, you can identify the major pieces of the ship's skeletal remains.

If this informative project is successful, the NPS Office of Submerged Cultural Resources, in conjunction with Everglades National Park, will develop interpretive material for several other wrecks in the nearby waters.

Fort Jefferson is one of the more isolated units of the National Park System, accessible only by boat or airplane. Charter boats are available out of Key West or Naples, and snorkeling equipment can be rented from the Park Service. Maps of the *Avanti* are available from the ranger station in the fort. For more information, contact Everglades National Park, Box 279, Homestead, FL 33030; (305) 247-6211.

Esther Bartfeld is development coordinator at NPCA.

Linking the Trails

In 1921, Benton MacKaye walked a route connecting the towns, villages, and wilderness areas of the eastern mountains from Maine to Georgia. Sixty-nine years later his path, known as the Appalachian Trail, has become an intrinsic part of the natural and cultural character of our country.

Today McKaye's route remains a part of the eastern landscape, due to the dedicated work of volunteers who built the trail and lobbied legislators to acquire lands, change zoning laws, and provide adequate funding for trail maintenance and development.

More than 900 miles of trail link the communities of Appalachia, but there is no unified plan that takes into consideration the recreational needs and resource protection of all trails in the United States.

Leaders in the trails community had a chance to share their ideas for a comprehensive Mid-Atlantic trail system at a meeting held in March through the combined efforts of the National Park Service (NPS) and NPCA. The Mid-Atlantic region will be used as a pilot region for the development and implementation of a national trails plan.

"The Park Service hopes that a national plan will help emphasize the need for programs. We need people at the local level to tell Congress trails are important," said Laura Szwak, regional trails manager of the National Park Service.

The impetus for the plan is a 1983 congressional mandate for a national plan that identifies existing and potential trail corridors. NPS began the planning process of trails on public and private lands in the Mid-Atlantic Region. This compilation led to *Trails of the Mid-Atlantic Region,* a directory of trails for the general public. The Park Service then asked NPCA to join with grassroots trail organizations and examine the feasibility of a regional trails system while identifying obstacles to interstate trails development.

This cooperative effort will lead to a trail system evolved from grassroots support rather than a government-imposed plan. The plan ultimately will present an interstate corridor system that reflects and incorporates the goals, needs, and realities of all trail advocates.

NPCA and NPS facilitated three planning meetings this past June in an effort to reach out to grassroots trail advocates. The meetings were informal sessions that involved leaders of Mid-Atlantic trail groups, such as the Potomac Appalachian Trail Club and the New York–New Jersey Trail Conference. Discussion from these meetings led to the development of an agenda for more formalized planning meetings that are slated for this fall.

Once the planning process is solidified in the Mid-Atlantic states, each region will develop a trail plan until a complete national trail program is established. The next targeted area will be the Pacific Northwest.

McKaye's plan led to the evolution of a nearly complete Appalachian Trail by tying together local, state, and federal resources and volunteer efforts. Regional plans may direct resources from federal conservation assistance programs to state and local interests. In addition, these plans may clarify what federal and state agencies and organizations can do to establish new trails and protect valuable land resources.

In total, the Mid-Atlantic region (New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, and the District of Columbia) is home to almost 15,000 miles of trail—two feet of trail per person in the region. This includes trails on local, state, and federal lands, both public and private. Although Mid-Atlantic trails cover a large number of miles, existing trails are not distributed evenly or equally accessible to all persons in the region.

To rectify this situation, both NPS and the U. S. Forest Service have programs

The Mid-Atlantic region is the pilot area for development of a national trails plan.

NATIONAL PARK SERVICE

that provide technical and financial assistance for trail and river projects through federal resources. In 1989, NPS worked with the Horse-Shoe Trail Club in Pennsylvania to complete a protection plan.

The plan includes a strategy for a 140-mile hiking and equestrian trail linking Valley Forge National Historic Park and the Appalachian Trail.

In cooperation with private landowners, the Mid-Atlantic division of NPS allocated $4,500 in resources for the trail's preservation. This NPS effort resulted in a comprehensive study that was released this summer.

Another joint effort, the Forest Service Challenge-Cost Share program, is targeted to connect urban areas to nearby forests. In many cases this can be achieved through development of a short trail.

By helping local citizens to lay this trail, the Forest Service provides more recreation opportunities to the public and fosters a local sense of ownership in trail resources.

The Forest Service funded a Challenge-Cost Share grant in 1989 to help the Superior Hiking Trail Association in Minnesota build sections of a 200-mile ridgeline trail that skirts the shores of Lake Superior. The trail passes through two national and six state forests.

NPCA and NPS encourage everyone to get involved. For more information about planning meetings for the Mid-Atlantic Region or to get on the mailing list for project updates, contact Jennifer Seher, NPCA, 1015 Thirty-first Street, NW, Washington, D. C. 20007; (202) 944-8530.

Carrying Capacity Study

In 1946, visits to 133 units in the national parks system totaled less than 20 million. Today, almost 300 million recreational visits are made to more than 350 national park areas each year.

With increased attendance rates, park managers are no longer challenged to attract visitors to the system. Park officials now are confronted with one of the most serious threats facing public recreation lands today—visitor overuse.

As visitor numbers soar, managers are finding it difficult to preserve resources while providing for visitor needs.

This summer, National Parks and Conservation Association will release two reports that address the problems of visitor overuse. The reports develop an integrated process through which visitor impacts on vegetation, soils, water quality, wildlife, and visitor experiences are evaluated and managed.

Recreation Impacts and Carrying Capacity: A Review and Synthesis of Ecological and Social Research is a comprehensive study summarizing existing research on visitor impacts. The 256-page report examines the differences and similarities between the ecological and social impacts of recreation.

Recreation Impacts and Carrying Capacity: A Visitor Impact Management Framework describes a scientific approach for park managers to evalute and manage visitor impacts.

The publication of these reports follows a 1978 congressional mandate requiring the National Park Service to establish a visitor carrying capacity for the National Park System. NPCA offered its assistance to meet this mandate.

Working with three independent scientists—Fred Kuss, University of Maryland; Alan Graefe, Penn State; and Jerry Vaske, University of New Hampshire—researchers spent six years gathering data and traveling to many national parks to consult with park staff and observe typical impact problems.

Laura Loomis, NPCA project coordinator, said the study is unique because this is the first time anyone has developed a system to manage visitor impacts affecting national parks.

"There's a great deal of research out there—for instance, research done on soil and vegetation impacted by visitors. Conversely, there is little research on the impact of visitor use in regards to wildlife," Loomis said.

Most importantly, the authors said the study is vital because it sets objectives for park visitation.

"It is no longer adequate for park managers to simply say 'We need to provide for our visitors' enjoyment,' or 'We don't want to see our trails trampled,' " Loomis said. "Park managers have to be very specific in establishing guidelines for park use," she added.

After reviewing literature related to the subject, the authors concluded there are five major issues that should be incorporated into any visitor impact management program:

- Identifying various visitor impacts and the relationship between all these impacts.
- Identifying the relationship between use levels and impacts.
- Determining various tolerance levels to impacts.
- Determining how various activities affect the rate of impact.
- Identifying site-specific influences, such as the time an activity occurs.

Copies of both Visitor Impact Management publications are available from NPCA. For further information on these publications, please write to NPCA, Carrying Capacity Project, 1015 Thirty-first Street, NW, Washington, D. C. 20007 or call (202) 944-8530.

NATIONAL PARKS AND CONSERVATION ASSOCIATION'S PARK EDUCATION CENTER

PARK PUBLICATIONS SUMMER 1990

NPCA PARK POLICY BOOKS

Investing in Park Futures: The National Park System Plan: A Blueprint for Tomorrow: *Executive Summary*	L102	$ 9.95
Greenline Parks: *Land Conservation Trends for the Eighties & Beyond*	L103	$12.95
Our Common Lands: *Defending* the National Parks	L107	$24.95
National Parks in Crisis	L106	$13.95
Visitor Impact Management: A Systematic Approach To ***VOLUME 1:*** RECREATION IMPACTS AND CARRYING CAPACITY: *A Review of Research Related to Visitor Impact Management*	L113a	$12.95
VOLUME 2: RECREATION IMPACTS AND CARRYING CAPACITY: *A Visitor Impact* Management Framework	L113b	$ 9.95
Full 2-Volume set	L113c	$19.95

NPCA GIFT ITEMS

NPCA Baseball Cap	N105	$ 4.95
NPCA Suntanner Visor	N106	$ 4.95
NPCA Nylon Tote Bag *(blue only)*	N127TB	$ 5.95
NPCA Lapel Pin	N107	$ 3.50
NPCA Park Pin set of 9	N108	$ 8.00
NPCA T-shirts *(white only; adult* S,M,L,XL; 100% cotton)	N114	$ 9.95
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Yellowstone National Park	Q119	$ 6.95
Zion National Park	Q121	$ 6.96
Colorado National Monument	Q106	$ 6.95
Guadalupe Mountain National Park	Q112	$ 6.95

OFFICIAL NATIONAL PARK HANDBOOKS

North Cascades National Park	A113	$ 5.50
Yosemite National Park	F123	$ 5.50
Washington, DC	F124	$ 5.50
Canyon de Chelly	D115	$ 5.50
Great Smoky Mountain National Park	F113	$ 7.00
Everglades Wildguide	F104	$ 6.50
Glacier Bay	A105	$ 7.00

SPECIAL TITLES OF INTEREST

Biological Diversity: *A Curriculum for* Teachers and Interpreters	L112	$19.95
The National Parks Trade Journal: *Guide to Living & Working in the* Great Outdoors	W109	$12.95
Field Guide to Edible Wild Plants	Z102	$12.95
Field Guide to Eastern Birds	Z103	$12.95
Field Guide to Western Birds	Z104	$12.95
Field Guide to Wild Flowers	Z105	$12.95
Yellowstone Wilderness Besieged	C168	$16.95
Ancient Ruins of the Southwest	D146	$10.95

For an expanded listing of books, videos, hiking guides, maps, and official guides to national parks call 1-800-NAT-PARK

MAIL ORDERS TO:
The National Parks and Conservation Association
Park Education Center
1015 31st Street
Washington, DC 20007

Please allow 4–6 weeks for delivery
ALL RUSH orders require a $3.00 additional charge
NOTE: Prices are subject to change without notice

Recycling in Parks

THE DEPARTMENT OF INTERIOR formed a recycling partnership with two chemical companies to improve the waste management problem at the national parks.

Recycling of plastic, glass, and aluminum will begin this spring and summer in Acadia, Maine; Great Smoky Mountains, Tennessee and North Carolina; and Grand Canyon in Arizona.

Visitors will be asked to throw their recyclables in bins provided by the Dow Chemical Company and Huntsman Chemical Corporation. The chemical companies will arrange for collection, transportation, and recycling.

Recycling has been a part of the Yosemite National Park experience since 1975. Visitors can bring aluminum, glass, plastic, newspaper, and cardboard to two recycling centers run by the Yosemite Park and Curry Company that are open 24 hours daily. The park also recycles waste produced in-house, such as motor oil, kitchen grease, and office paper. The Curry Company is looking into recycling high-density plastic and tin.

Trash is a growing problem in all national parks. Below: Earth Day in the parks.

CATHERINE FREEDMAN

Preserving National Monuments

There are a number of fine books chronicling the history and evolution of the national parks, but until the publication of Hal Rothman's *Preserving Different Pasts: The American National Monuments* (University of Illinois Press, Urbana, 1989), none has paid adequate attention to the evolution of an important component of our nation's park system—the national monuments.

Most of the original monuments were designated as a direct consequence of the passage of the Antiquities Act in 1906. This landmark preservation act empowered a president to preserve areas as "national monuments" with a stroke of the pen, rather than wait for Congress to pass legislation establishing a national park.

Rothman is critical of early national park leaders, including Stephen Mather and, especially, Horace Albright. Though they concentrated efforts on building the image of the national parks, they neglected the monuments. Rothman points out that recent presidents have been reluctant to designate monuments for a variety of reasons, mostly the fear of congressional objection.

Back in 1978, President Jimmy Carter, however, used his authority to proclaim large sections of Alaska as national monuments in order to give Congress time to determine which areas should be set aside as national parks or preserves. President Carter's use of the Antiquities Act in that situation demonstrates that the law is a viable yet underutilized tool for preservation.

Preserving Different Pasts is a must-read book for the serious student of the preservation and park movements.

—Bruce Craig
NPCA cultural resources coordinator

Earth Magazine for Kids

Among the recent explosion of environmental magazines is one especially for kids.

P3 (Planet 3: Earth is the third planet from the sun) is a colorful, fun magazine for ages seven to 12 with the message that Earth is the "coolest, hippest planet to live on, and that it's up to us all to keep it that way." The stories are reviewed by environmentalists, editors, teachers, parents, and children.

Through comics, photo essays, interviews, and activities, *P3* features people in all walks of life whose actions demonstrate that they care about kids and the world they will inherit. Because the issues it deals with can be scary, *P3* focuses on the positive—what children and families can do to protect Earth.

P3 is free to all elementary schools and available to individuals by subscription for $14 per year. To order for school or home, write *P3*, P. O. Box 52, Montgomery, VT 05470.

Helping Out

Summer is the perfect time to get outside—and work.

From May through June, park rangers at Florida's Canaveral National Seashore employ volunteers 18 and older to help protect the nests of threatened and endangered sea turtles by placing screens over them.

For more information, contact Ms. Tammy Wert, Canaveral National Seashore, 2532 Garden St., Titusville, FL 32796; (407) 867-4077.

The spring/summer issue of *Helping Out in the Outdoors*, a directory of volunteer work and internships on America's public lands, is available for $3 from the American Hiking Society, 1015 31st Street, NW, Washington, D. C. 20007.

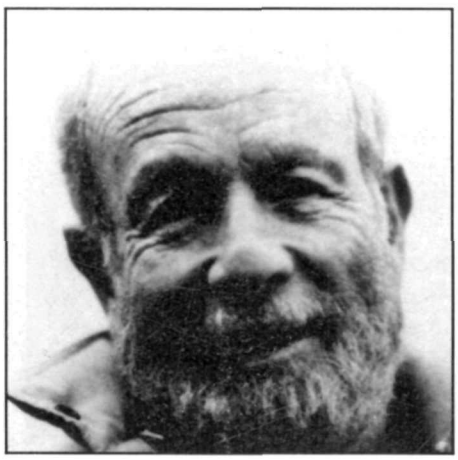
For a comprehensive approach, *The National Parks Trade Journal* lists more than 100,000 seasonal and career opportunities in parks, ski resorts, lodges, outdoor schools, and worldwide environmental organizations.

To order the journal, send $14.50 postage-paid to *The National Parks Trade Journal,* P. O. Box 2221, Wawona Station, Yosemite National Park, CA 95389; (209) 375-6552.

TRIBUTE TO EXCELLENCE

Marjory Stoneman Douglas Award

The Marjory Stoneman Douglas Award is presented by the National Parks and Conservation Association and the Bon Ami Co. to recognize an individual for an outstanding effort that results in protection of a unit or a proposed unit of the National Park System. The award is named in honor of Marjory Stoneman Douglas for her many years of dedication to preserving the fragile ecosystem of the Florida Everglades.



1987 RECIPIENT

DR. EDGAR WAYBURN. For forty years, Dr. Wayburn has been a leading environmentalist. He was the principal conservation architect for the establishment of Redwood National Park and Golden Gate National Recreation Area, and for the 1980 Alaska National Interest Lands Conservation Act.

1988 RECIPIENT

ROBERT CAHN. A Pulitzer Prize winner for his Christian Science Monitor series on the state of the national parks, Mr. Cahn has also served on seminal environmental councils and, through numerous books and articles, furthered the cause of conservation.

1989 RECIPIENT

POLLY DYER. For decades, Mrs. Dyer has led the fight to protect and preserve Olympic National Park. Her activism at Olympic began in the 1950s, when she headed the effort to block logging and a coast road slated for the park. Mrs. Dyer continues her work as president of the Olympic Park Associates.

The Faultless Starch/Bon Ami Co. wishes to congratulate the recipient of this award and thank them for the excellent contribution they have made to the protection of our environment.

The Bon Ami Co. has actively supported the efforts of organizations such as National Parks and Conservation Association for over 100 years and will continue to work toward the goal of preserving our natural resources for future generations.

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Miscellaneous

LET THE GOVERNMENT FINANCE your small business. Grants/loans to $500,000 yearly. Free recorded message: 707-449-8600. (KL8)

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Publications

MY YELLOWSTONE YEARS. Recently published. The story of Donald C. Stewart's 13 summers as a park ranger, 1951-1963. Many other wilderness books. Free catalog, call 1-800-852-8652

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Videos

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Professional video produceer touring October-September will make commercial park videos. Videos are important for elderly, handicapped. GAB PRODUCTIONS (404) 628-5194.

Photography

Turn your photos into unique computer paintings. Send photo and $12.95 to Rivelt Studios, 2435 E. North St., Suite 138, Greenville, SC 29615.

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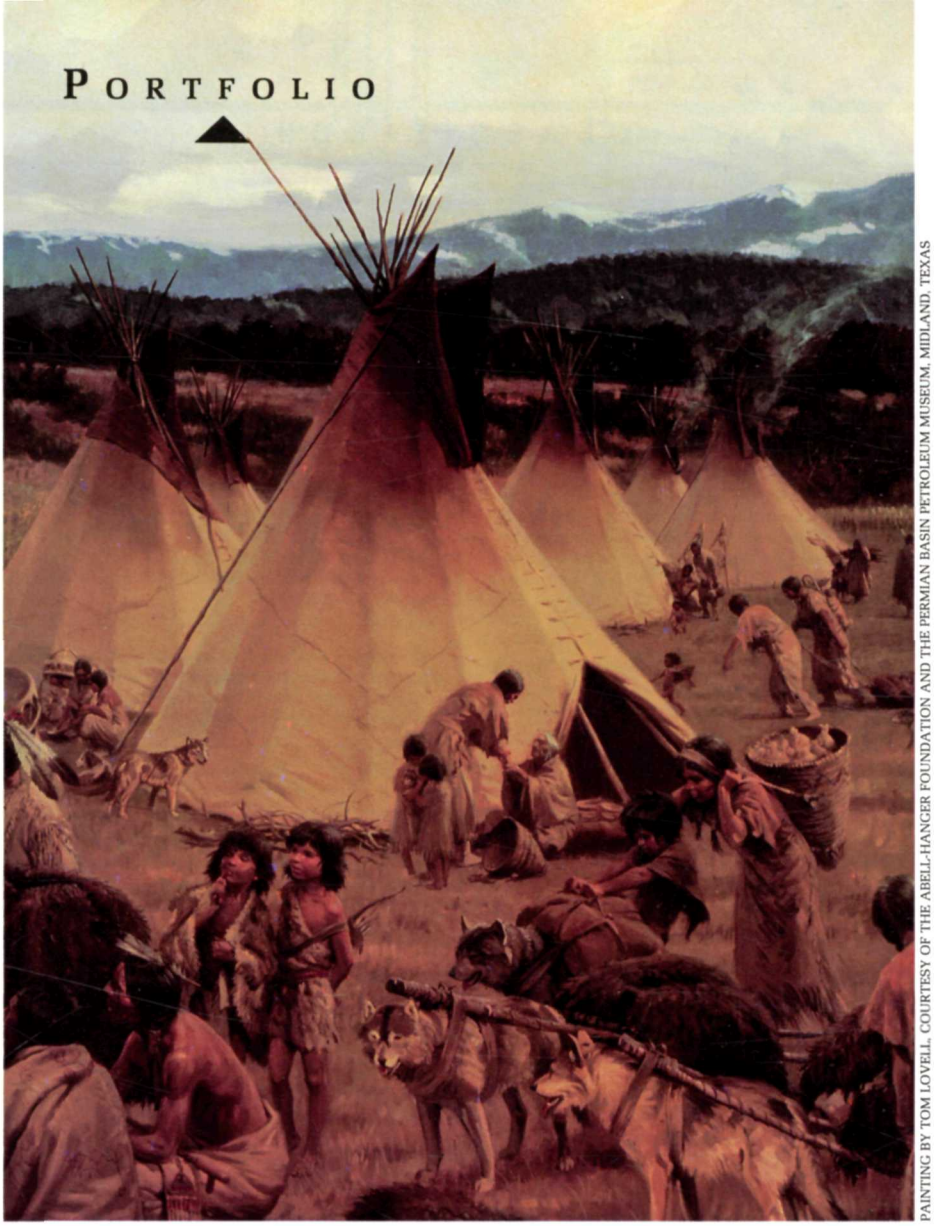
DAVID MUENCH



PAINTING BY TOM LOVELL. COURTESY OF THE ABELL-HANGER FOUNDATION AND THE PERMIAN BASIN PETROLEUM MUSEUM, MIDLAND, TEXAS

Pecos National Monument

THERE ARE MANY remarkable historic sites in the Southwest protected and interpreted by the National Park Service, but Pecos National Monument in New Mexico stands by itself. This site is the setting of a continuous story of human activities covering a period of at least 7,000 years.

Geologic circumstance and geographical location have made Pecos a cultural crossroads for centuries. Human activities here have centered on the Glorieta–Pecos corridor, a 30-mile-long natural passage eroded between the Sangre de Cristo Range and Glorieta Mesa by mountain streams.

The high middle section of this corridor is Glorieta Pass. Since prehistoric times travel and commerce between people of the upper Rio Grande Valley and the Great Plains have funneled through this strategic portal.

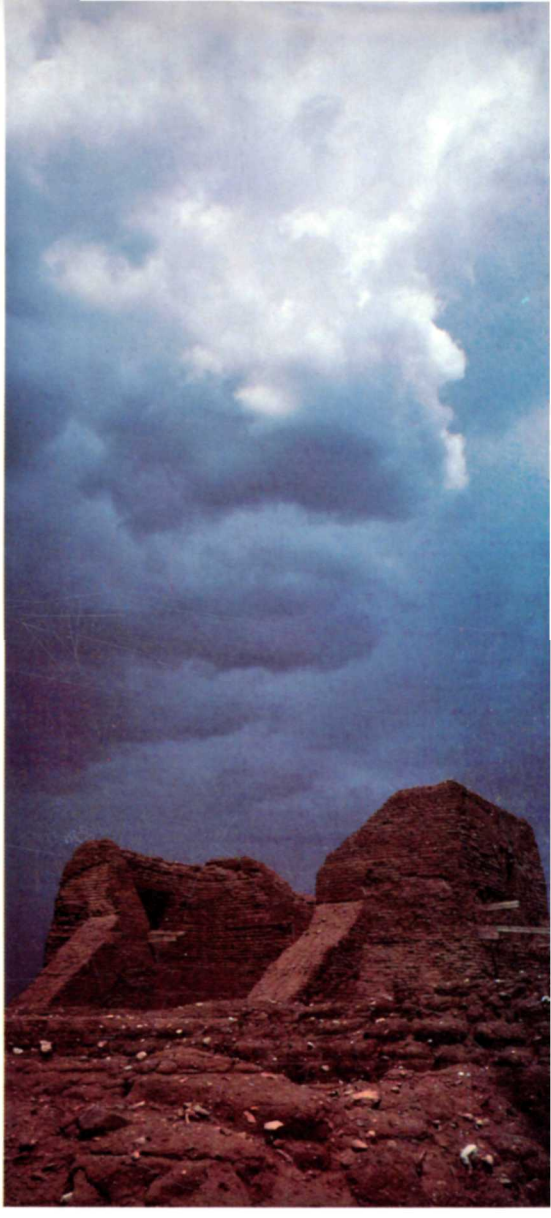
Three geologic provinces join in the vicinity of Pecos. To the north and east, the Rocky Mountains reach their southernmost extension in the Sangre de Cristo Range.

The mountains and basins of the Basin and Range province begin on the south and west of Glorieta Mesa and the Rio Grande Depression and continue south into central Mexico. To the east are the Great Plains, stretching for nearly 900 unbroken miles to the Mississippi River.

Excerpted from Pecos: Gateway to Pueblos & Plains, *edited by John V. Bezy and Joseph P. Sanchez. Available from NPCA Park Education Center, 1015 Thirty-first St., NW, Washington, D.C. 20007; 142 pp, pb, color, $19.95.*

GEORGE H. H. HUEY

GEORGE H. H. HUEY



DAVID MUENCH

From left to right: Seeds from a wide variety of plants, including grasses, were a relatively dependable source of food for the nomadic hunters who roamed the Pecos 11,000 years ago.

During the 16th-century trade fair at the pueblo of Pecos, the open grassy valley was transformed into a rendezvous of visiting Apaches with clusters of tipis, running children, and the smoke of a hundred fires.

Portiúncula, the mission established to convert the Pecos to Christianity, was named after the town in Italy where St. Francis of Assisi started the Franciscan order.

Rugged Glorieta Pass was a corridor to other worlds for the Pecos.

The huge church at Pecos was destroyed in the 1680 Pueblo revolt.

In a small way, this chick with a French name has been helping to clean up planet earth for 103 years.

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*In our letter to Stewart Brand, about the ecological beauty of the original Bon Ami cake, published in *Whole Earth Epilog*, September, 1974, page 594.

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