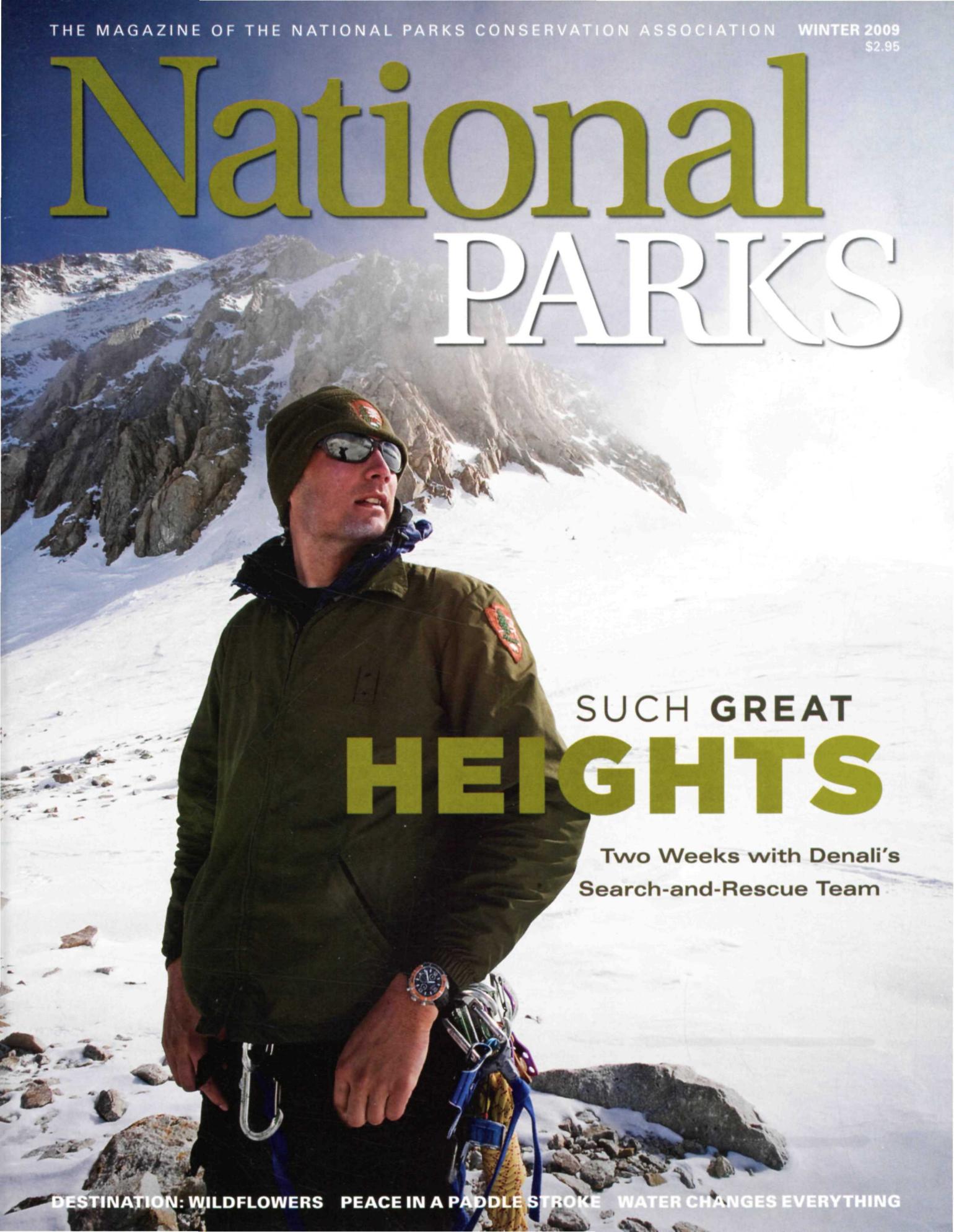
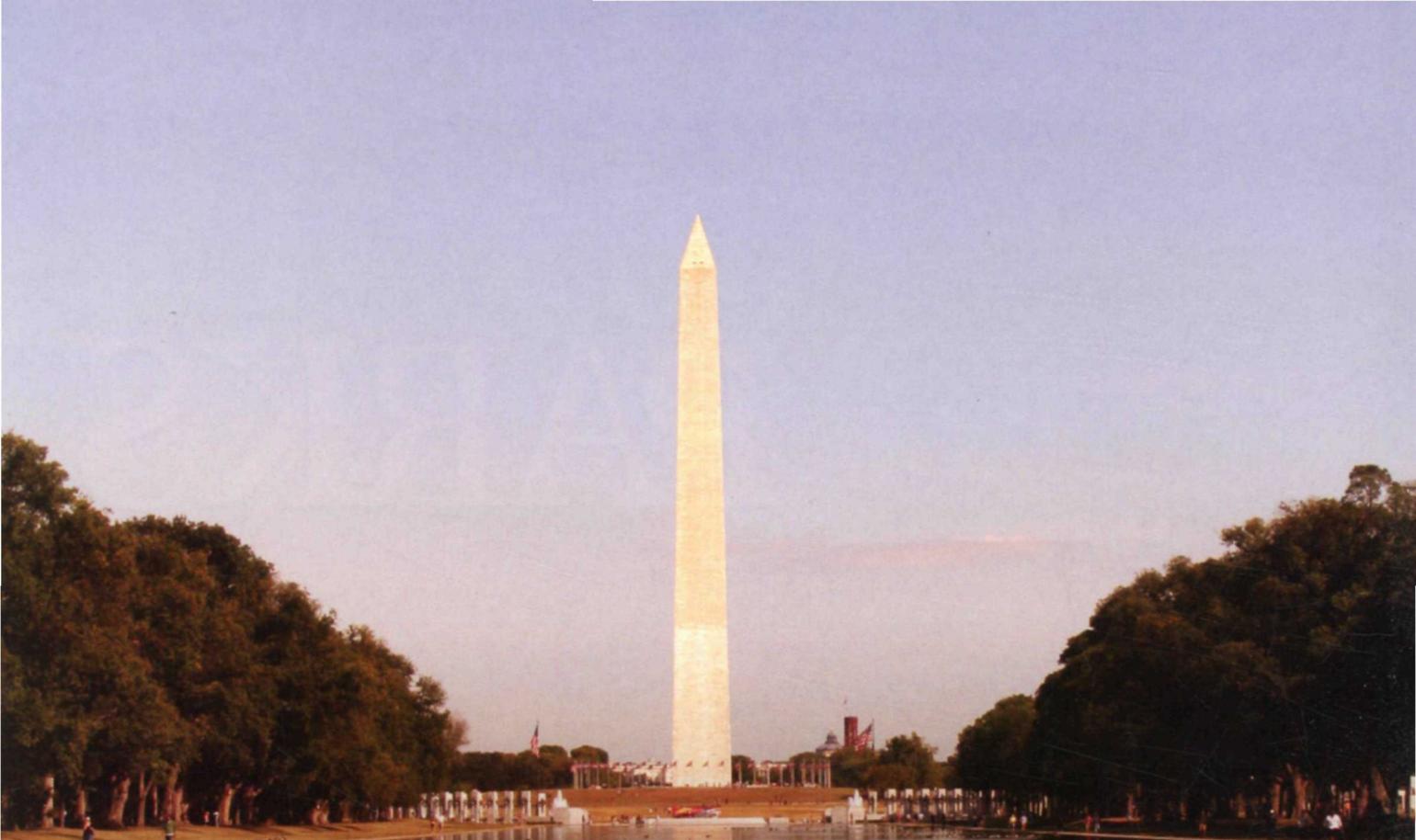


National PARKS

A man in a green jacket and balaclava stands in a snowy mountain landscape. He is wearing sunglasses and has a watch on his left wrist. He is holding a climbing rope and has a carabiner on his belt. The background shows snow-covered mountains and a clear sky.

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HEIGHTS

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Search-and-Rescue Team



Our National Parks

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You can help with a simple letter. Visit NPCA.org/mall. Or call 1-800-NAT PARK.



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MOUNTAINEERS TREK SINGLE-FILE toward a 16,500-foot ridgeline on Mt. McKinley. © IAN SHIVE

COVER PHOTO: PARK RANGER JOHN LEONARD, Denali's lead climber and one of the world's top search-and-rescue experts, pauses at "Windy Corner," 13,500 feet above sea level. © IAN SHIVE

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The National Park Service's 100th birthday is fast approaching. Gear up for the big anniversary—and the opportunities ahead—by watching an inspiring video presentation at www.npsca.org/2016film.



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Another New Deal?

Shortly after Franklin Delano Roosevelt took the oath of office in 1933, he laid out an ambitious plan to put the United States back on its feet. Suffering from the worst economic catastrophe in its history, the country needed a recovery package to jump start the economy and put Americans back to work.

In his inaugural address, Roosevelt reassured the nation that the “only thing we have to fear is fear itself,” and over the

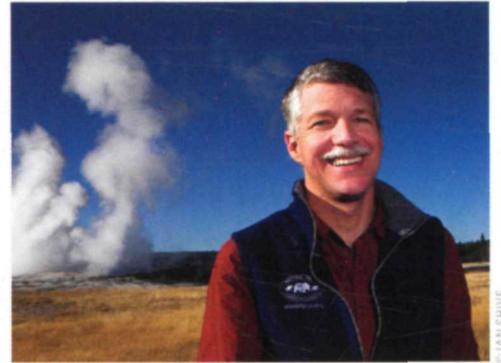
next 100 days he worked with Congress to pass recovery legislation that included a variety of new agencies and initiatives, among them the Civilian Conservation Corps (CCC).

For more than a decade, the CCC provided jobs for thousands of unemployed young men, supported families in Depression-weary America, and stimulated the economy of countless local communities, including many outside national parks. Young men working with the corps erected buildings in Big Bend and Death Valley National Parks, and constructed Skyline Drive through Shenandoah National Park. They built 97,000 miles of fire roads, arrested erosion on 20 million acres, and constructed 3,000 fire towers. At its peak in 1935, the CCC employed 500,000 Americans in 2,600 camps across the United States.

When President Obama takes the oath of office in a few weeks, he'll be faced with the worst economic crisis since that era. In the coming months, Congress and the Administration will consider an economic recovery package, to do something about it. NPCA believes a significant portion of those funds should be devoted to the national parks, to restore their roads, buildings, and deteriorating infrastructure, a fact I spelled out during testimony before the House of Representatives' Transportation Committee in October,

Although it is not their primary purpose, our national parks are central to the economies of many communities. Investments to improve our national parks would benefit the parks themselves as well as the mostly rural communities nearby. Right now, the national parks require nearly \$1 billion worth of investment to fix roads, trails, and historic structures, not to mention “green” initiatives that could create more than 20,000 jobs. In addition, our national parks could play a central role in providing low-cost employment to disadvantaged youth and aging baby boomers through a service program built on the AmeriCorps model.

The next few years promise to be challenging ones for our country. During the 1930s, our national parks thrived, in part, because visionary leaders saw a way to both provide economic support for the nation and protect one of our most enduring treasures. With their approaching centennial, our national parks can play a central role in helping our society meet some of its most pressing challenges. In the coming weeks, we will ask Congress and the Administration to consider these ideas and seek your continued assistance, guidance, and support. To view the latest news and to find out additional ways you can help, please go to our website at www.npca.org.



© JIAN SHIVE

THOMAS C. KIERNAN

One Drop at a Time



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Denali's search-and-rescue team walks on water.

It should come as no surprise that my office is covered with images of the national parks—but I'm a word-lover, too, so I've also tacked a few quotations to the walls. One of my favorites describes the startling simplicity of water: "When small, it is weak. When great, it tumbles mountains, rendering great cliffs sand." The passage goes on to explain that water's strength comes from its movement. Rock can hold still water in a lake for hundreds of years, but the smallest stream can carve a canyon valley, if given enough time.

This issue of *National Parks* illustrates the power and fragility of water in many ways. You'll spend some time on the Potomac River, in Great Falls, Maryland, where wounded veterans of the Iraq War dig their paddles into whitewater as a form of physical and mental therapy. You'll spend two weeks with Denali's elite search-and-rescue team, immersed in a completely different kind of whitewater—snow and ice. And you'll trace a path through several of Florida's parks, where hurricanes and saltwater wreak havoc on Dry Tortugas, boaters struggle to navigate the Everglades' Florida Bay, and complex water-management decisions take a toll on Biscayne National Park. Even as you page through smaller articles on mountaintop mining in the Big South Fork of the Cumberland River and concerns over solar energy on the fringes of Mojave National Preserve, you'll discover how water's abundance—and its absence—can affect our national parks in ways you might have never imagined.

SCOTT KIRKWOOD
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National PARKS

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National Parks Conservation Association®
Protecting Our National Parks for Future Generations®

WHO WE ARE

Established in 1919, the National Parks Conservation Association is America's only private, nonprofit advocacy organization dedicated solely to protecting, preserving, and enhancing the U.S. National Park System.

WHAT WE DO

NPCA protects national parks by identifying problems and generating support to resolve them.

WHAT WE STAND FOR

The mission of NPCA is to protect and enhance America's National Park System for present and future generations.

EDITORIAL MISSION

National Parks magazine fosters an appreciation of the natural and historic treasures found in the parks, educates readers about the need to preserve those resources, and illustrates how member contributions drive our organization's park-protection efforts. The magazine uses the power of imagery and language to forge a lasting bond between NPCA and its members, while inspiring new readers to join the cause.

MAKE A DIFFERENCE

Members can help defend America's

natural and cultural heritage. Activists alert Congress and the administration to park threats; comment on park planning and adjacent land-use decisions; assist NPCA in developing partnerships; and educate the public and the media. Please sign up to receive Park Lines, our biweekly e-mail newsletter. Go to www.npca.org to sign up.

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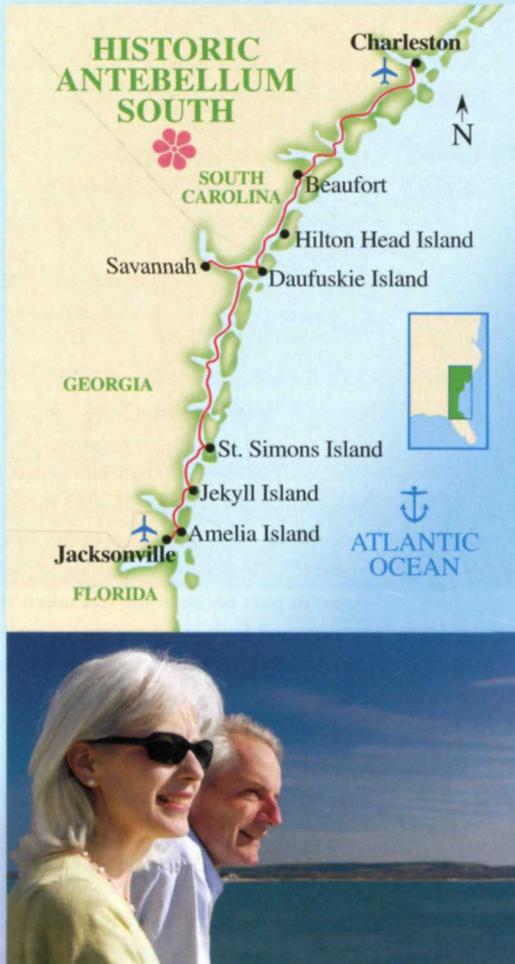
QUESTIONS?

If you have any questions about your membership, call Member Services at 800.628.7275. *National Parks* magazine is among a member's chief benefits. Of the \$25 membership dues, \$6 covers a one-year subscription to the magazine.

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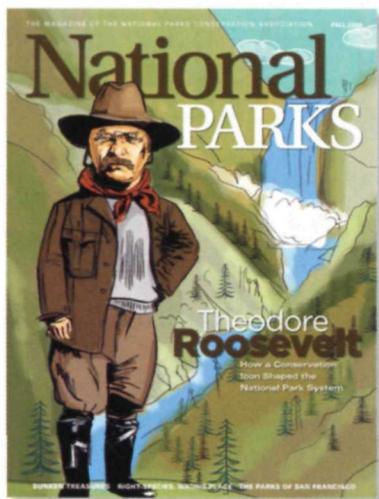
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WHY WE LOVE TEDDY

I deeply appreciate your article highlighting the contribution of our 26th President to the cause of conservation ["To Dare Mighty Things," Fall 2008]. His vision setting aside the Grand Canyon National Monument was a testament to this forward-thinking trail-blazer. He was a "progressive" in the truest sense of the word and operated from a core set of personal beliefs. He was not an individual to hold his finger up to the political winds in order to get elected.

JAY L. PETERS
Durham, NC

OFF ROAD, OFF POINT?

I heartily applaud and thank NPCA, Wildlands CPR, and Friends of the Earth for forcing the National Park Service to develop a plan to curb illegal recreational off-road vehicle (ORV) use in the National Parks ["Off-Road to Recovery," Fall 2008]. I was sorely disappointed, however, to see that the article, and by implication NPCA, seems to unabashedly condone "legal" riding in units of the National Park System. Off-roading may be "a popular pastime in places like North Carolina's Cape Hatteras National Seashore," but that doesn't make it right. ORV use in our national seashores can put rare, threatened, and endangered wildlife species at totally unnecessary and unjustified risk; such noisy, polluting use can seriously degrade or destroy the recreational experience of the majority of visitors who travel on

their own feet. Millions of acres of multiple-use public lands are open to recreational ORV riding. There is no need, nor place, for recreational ORVs in the National Park System, where the public has always expected—and should observe—the highest level of protection for both tangible and intangible resources and values.

CLIFF EAMES
Kenny Lake, AK

NPCA does not support motorized use that could impact wildlife in any park, and we have supported many efforts to limit ORV use in units like Cape Hatteras where such recreation is legal. In the end, however, Congress decides where to allow motorized use, and our legal team can only tackle so many issues. But NPCA does fight for natural quiet in the parks, and our lawyers are pursuing litigation at Grand Canyon National Park, Yellowstone National Park, and Joshua Tree National Park.

—Editors

FACING THE FACTS

I was born in Virginia, grew up in Maryland, and have visited Assateague Island. As a child, I was crazy about horses, and I still love them, but that doesn't mean I'm happy to let them eat one of our treasured local habitats into oblivion ["Misty's Legacy," Fall 2008]. The Chesapeake has lost too much vital marshland already—let's not allow a face even as pretty as Misty's to cloud our good judgment. Good luck with reducing the herd, and thank goodness that now means birth control—not hunting—though I had no idea how expensive it is! I'll do what I can to help in the future, and hope others will too.

KIM CROSSLEY
Glen Burnie, MD

A NEW PERSPECTIVE

I just finished reading your outstanding Fall 2008 issue cover-to-cover, and while I found every article worthwhile and enlightening, I particularly wanted to praise Laura Hershey's article ["Along Asphalt Trails"]. I don't face the same physical challenges that Ms. Hershey does, but her words painted a scene that made me feel like I was right alongside her in the Grand Canyon and Yosemite. Her writing led me to "see" things from a wholly unique perspective.

DANIEL J. CUMMINGS
Overland Park, KS

As a handicapped park enthusiast, I was especially pleased to read Laura Hershey's essay. I suspect that for those of us who cannot get around as easily as others, our focus turns away from physical accomplishments and is redirected toward our place in the world. Hershey's beautiful observations seem to come in part because she has taken the time to stop and look at where she is, rather than constantly moving on to the next sign post along the trail. We need people who write about what they think, as well as people who write about what they do.

PRESTON FILBERT
Cedar Rapids, IA

CORRECTIONS: "Beneath the Surface" [Fall 2008] placed Isle Royale National Park in Wisconsin; the park is in Michigan. Also, nuclear testing on Bikini Atoll took place for 13 years immediately after World War II, not during the war, as noted in the article. We failed to credit Aurora for the photograph of a burro on page 34. Several readers informed us that the cover illustration of Theodore Roosevelt showed Yellowstone, not Yosemite, as identified in the caption. The artist did work from a historic photograph of Roosevelt in Yosemite, but the final product bears more resemblance to Yellowstone.

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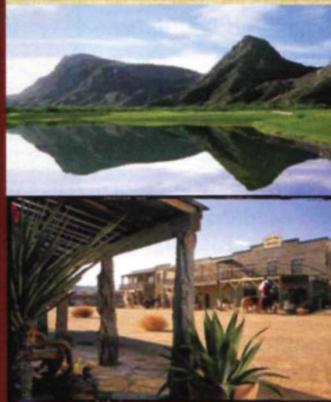
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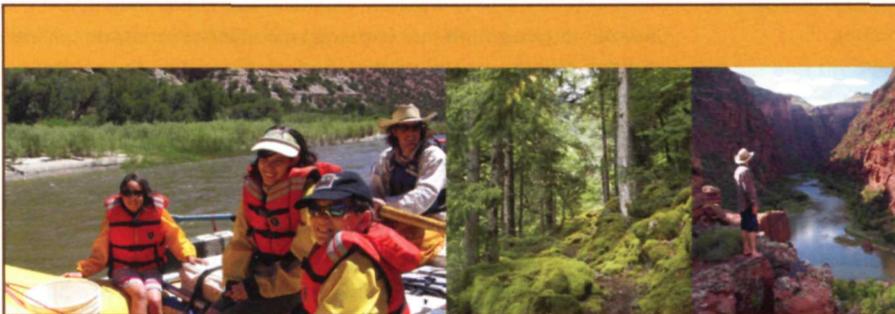
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PHOTOS (CLOCKWISE FROM LEFT): RAFTING IN DINOSAUR NATIONAL MONUMENT, COLORADO (D.O.A.R.S.), CASCADE MOUNTAIN TRAIL LINED WITH MOSS (COMMONLY FOUND THROUGHOUT THE PACIFIC NORTHWEST), WASHINGTON (PALL FLEMMING/GETTY IMAGES), ORCA WHALES (COMMONLY SEEN JUST OFF SAN JUAN ISLAND), WASHINGTON (SANDY BUCKLEY/ISTOCKPHOTO)



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A MOUNTAIN OF CONTROVERSY

New coal mining regulations could harm the Big South Fork

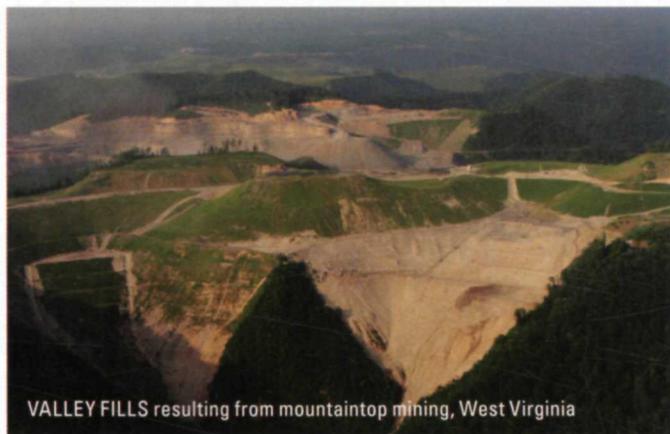
It's the easiest way to get at a seam of coal, and it's often the cheapest. It's called mountaintop removal, and it's exactly what it sounds like.

For ages, the most common way to get at coal was to dig a hole in the ground and send miners in to bring it back out. But in the 1970s, mining companies discovered it was often easier to simply rip off the top of the mountain, like scraping icing off a birthday cake. The method can be especially efficient in Tennessee, where seams of coal might be only two or three feet thick, making traditional deep mines a less profitable option.

What do you do with a leftover mountaintop? In Appalachia, the answer often involves filling adjacent valleys and burying any streams by literally leveling the landscape—and that's about to become a more common practice. A 1983 federal regulation created a 100-foot buffer zone around all streams to prevent the most damaging impacts of such "valley fills." But in April 2007, the Office of Surface Mining (OSM) began reevaluating the rule's interpretation, and in December, the agency effectively removed its teeth. Barring direct intervention from Congress or the Obama Administration, the state of Tennessee will soon be the only thing standing between mining companies and the health of the Big South Fork National River, home to 12 endangered species, including mussels found nowhere else on the planet.

But can a little dirt really do that much damage? "You're not just putting dirt in a stream," says Bart Melton, program analyst in NPCA's Southeast regional office. "You're essentially burying the stream and altering the way the watershed functions, and that could increase the likelihood of landslides, pour more sediment in the rivers, destroy wildlife habitat, and threaten drinking water downstream. A 100-foot buffer may not seem like much, but even if the coal around it is mined, the buffer provides a necessary and essential element for protecting a stream's health."

Fortunately, the governor of Tennessee and officials with the



VALLEY FILLS resulting from mountaintop mining, West Virginia

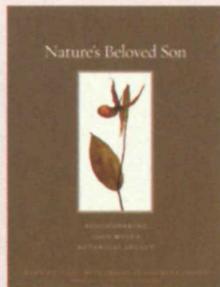
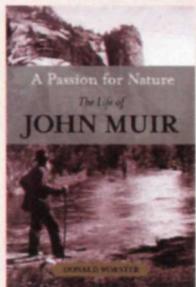
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state's environmental agency agree. NPCA is working with a broad spectrum of allies, including hunting and fishing groups and Christian conservation organizations, to turn local sentiment into a state law that would replace the now-defunct federal regulation.

"We're fortunate that the Big South Fork was set aside for protection 35 years ago," says Dawn Coppock, legislative director of the Lundquist Environmental Appalachian Fellowship (LEAF), a Christian organization that focuses on conservation issues. "With its steep slopes, crystal waters, and scenic vistas, the region really has a wildness about it and a remoteness that is hard to find in Eastern Tennessee, even in the Smokies. And to allow its waters to be fouled by a shortsighted, unnecessary type of mining that could harm Tennessee's tourism industry just isn't sound policy."

"Nothing about protecting streams, endangered species, and the drinking water supply is anti-coal," says Melton. "We have a long fight on our hands, but policymakers in Tennessee have an opportunity to ensure that the unique resources of the park will be here for generations to come."
—Scott Kirkwood

EYE-OPENERS



THIS FALL, TWO NEW BOOKS focused attention on John Muir's legacy, and it should come as no surprise that both titles include the word "nature." In *A Passion for Nature: The Life of John Muir*, author Donald Worster tells the story of the conservation icon, from his birth in the city of Dunbar, Scotland, where "the first sound of nature the child likely heard was a maritime cry of a sea gull flying overhead," to his failed battle to preserve California's Hetch Hetchy Valley (Oxford University Press, 512 pp., \$34.95). *Nature's Beloved Son* by Bonnie J. Gisel explores Muir's botanical legacy, focusing on his discoveries in Yosemite, Sequoia, and other natural areas. Stephen J. Joseph's beautiful photographs of plant species (such as wood rose, right) are complemented by pages from Muir's original journals and sketches of specimens in the wild (Heyday Books, 256 pp., \$45).



PHOTO © STEPHEN J. JOSEPH

A HAZY SHADE OF WINTER

Snowmobiles trump science in Yellowstone National Park.



A political blizzard has descended on Yellowstone National Park.

After more than a year of legal wrangling, the park has decided to allow up to 720 snowmobiles into Yellowstone each day this winter, a move that startled park advocates. In 2007, a decade's worth of Park Service research concluded that so many snowmo-

biles are incompatible with the preservation of Yellowstone's natural resources.

"This decision was based on something other than science, law, and the views of the American public," says Tim Stevens, NPCA's Yellowstone program manager. "The Park Service has lost its way in this process."

Last year in Washington, D.C., NPCA and other advocacy groups sued the Park Service in response to the Bush Administration's proposal to allow 540 snowmobiles in Yellowstone each day—nearly twice the daily average of the past five years. The rule would have degraded air quality, tripled the area where visitors hear noisy engines, and increased stress on wildlife struggling to survive harsh conditions.

The judge ruled against the Administration, upholding the Organic Act and the Park Service's own management policies, and ordered the Park Service to come up with a new plan. But the snowmobile industry filed a separate lawsuit in Wyoming, where a judge ruled that Yellowstone should stick to its daily allowance of 720 snowmobiles until it can draft a more suitable temporary plan. There was hope that the park might cap its daily limit at 318 snowmobiles this winter, but Yellowstone's superintendent chose not to pursue a temporary plan at all, and defaulted instead to the upper limit of 720, a number that flies in the face of its own science.

For ten years now, more than half-a-million Americans have submitted comments about winter access in Yellowstone, and four out of five favor snowcoaches over snowmobiles. NPCA is considering further legal action, including an appeal to a higher district court.

—Amy Leinbach Marquis

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THE NUMBER OF DEVILS HOLE PUPFISH, an ancient species that has occupied a deep, watery hole in Death Valley National Park (CA) for at least 10,000 years. The tally, taken last fall, might not seem like much, but it's a promising sign for a species that dwindled to a mere 38 individuals six months prior—a devastating drop from about 500 in the mid-1990s. No one knows what prompted the species' decline, but theories point to a shortage of nutrients. So biologists manufactured nutrient-rich food and began feeding the fish—an unusual step for wildlife conservation, but one that is proving successful in bringing the Devils Hole pupfish back from the brink of extinction.

ECHOES



This important designation cannot be tossed aside every time there's local pressure to book hotel rooms.

LYNN MCCLURE, director of NPCA's Midwest regional office, quoted in an Associated Press article, commenting on the historic landmark status of the Gateway Arch (above), which had been threatened by a proposal to construct a private museum and cultural center on the grounds of the Jefferson National Expansion Memorial in St. Louis.

They are called the Presidio Trust, but they're going to... lose the public trust by... compromising good will.

NEAL DESAI, senior program manager for NPCA's Pacific Region, quoted by The Los Angeles Times, on the agency's plan to construct a 100,000-square-foot museum and 95,000-square-foot hotel on the grounds of the Presidio, part of Golden Gate National Recreation Area in San Francisco.

You can have all the rangers in the world, but if they're interpreting a townhouse development, it doesn't do much good.

RON TIPTON, NPCA senior vice president, quoted in the Philadelphia Inquirer, on development pressures threatening parks such as the New River Gorge (WV), Valley Forge (PA), and Zion (UT), where the Park Service lacks the funds to purchase private land within park boundaries.



© CHARLES DHARAPAK/AP

EXIT STRATEGY

As his presidency comes to an end, George W. Bush takes a few parting shots.

George W. Bush isn't the first president to do it. Carter did it. Clinton did it. And Bush's own father did it, too. In fact, last-minute rules offered up by a parting president are so common, the term "midnight regulations" has been floating around since the 1980s. The nation's chief executive might insist eight years simply wasn't enough time to complete all of his serious work, but many would argue that departing presidents generally wait until their final days in office to tackle measures that would have proven too controversial, too cumbersome, or required too much political capital. As this issue of *National Parks* went to press, the following proposals were the most troubling to park advocates.

Guns in Parks. Following months of political pressure, the Bush Administration was expected to finalize new regulations that would allow visitors to carry loaded, concealed firearms in national parks where

state law permits it (parks in Illinois, Washington, D.C., and Wisconsin would be the only exceptions). NPCA had opposed the move due to concerns over public safety, increased opportunities for wildlife poaching, and recognition that the longstanding regulation allowing unloaded weapons had been working just fine. Seven former Park Service directors informed Interior Secretary Dirk Kempthorne of their opposition in April, and NPCA's members and activists generated thousands of comments against the move. In spite of the widespread opposition, the Interior Department was expected to finalize the new regulations as early as December.

Endangered Species. In August, the Bush Administration proposed a dramatic change to the Endangered Species Act, which is administered by biologists within the U.S. Fish & Wildlife Service (FWS) and the National Marine Fisheries Service. Under the new regulation, expected

PRESIDENT GEORGE W. BUSH has introduced many controversial regulations in the waning days of his presidency.

to be finalized as this issue went to press, agencies would no longer be required to consult with those expert biologists concerning moves with a potential impact on listed species or their critical habitat. The new rule puts decisionmaking in the hands of the federal agency managing the land in question, ostensibly for the sake of simplifying the process and minimizing the workload. As a result, the Bureau of Land Management (BLM) might determine oil and gas leases are perfectly compatible within fragile habitat for a threatened species, and move forward with a new proposal without consulting with an outside agency, likely to be more knowledgeable and more objective. The national parks themselves are refuges for wildlife, of course, but park species that have access to adjacent land could lose serious protections. Although it might be hyperbole to equate the move to the fox guarding the henhouse, at the very best, it's leaving the hens to fend for themselves. In September, NPCA and 100 other conservation groups delivered a letter to the Department of the Interior opposing the rule change.

Air Pollution. As reported in the Summer 2008 issue of *National Parks*, the Bush Administration has directed the Environmental Protection Agency (EPA) to initiate a rule-change that would make it easier to build new coal-fired power plants near national parks. Rather than measure the impact of the plants' exhaust over the course of hours, pollution would be averaged over a year, completely ignoring spikes that could have a dramatic impact on park plants, park wildlife, and scenic vistas. Given the well-documented impacts of coal-fired power plants on Shenandoah, the Great Smokies, and many parks in the southwest, Park Service employees opposed the move, as did nearly every EPA regional office. Last year, more than 23,000 NPCA members and supporters wrote to the EPA opposing the move, but the agency was expected to go forward with the rule in December, easing the way for the construction of dozens of coal-fired utili-

ties within 186 miles of 10 national parks.

Mining in the Southwest. In response to the threat of new uranium leases within two miles of the Grand Canyon, the House Natural Resources Committee passed a resolution to withdraw more than one million acres of federal lands from mineral entry this summer, but the Interior Department refused to comply, leaving the door open for mining likely to contaminate the Colorado River watershed. The BLM is also planning to award new oil and gas leases on sites adjacent to Arches, Canyonlands, Capitol Reef and Dinosaur National Monument.

Meanwhile, the Bush Administration is still working to remove Northern Rockies wolves from the endangered species list, and is tinkering with regulations that would exacerbate the impacts of mountaintop mining (see page 8) and snowmobile use in Yellowstone (see page 9).

"Every president tries to finish up as much business as they can before the end of their term," says Craig Obey, NPCA's senior vice president for Government Affairs. "But we're seeing a flurry of proposals that could do serious harm to the national parks, and in each of these cases, the Bush Administration is choosing industry over the public interest."

Conservation groups including NPCA are expected to challenge several of the new regulations in court. And Congress and the incoming President may be able to delay or reverse other regulations, depending on the date they are expected to take effect or the price tag associated with their impact.

"Obama's transition team appears very ambitious and they're asking all the right questions, so I'm optimistic about their desire to make positive change," says Obey. "But they will confront practical realities in terms of budget constraints and legal processes, so it's not as if there's any panacea—there's plenty of hard work to be done."

To make your voice heard on these issues and other critical matters, visit www.npc.org/takeaction.

—Scott Kirkwood

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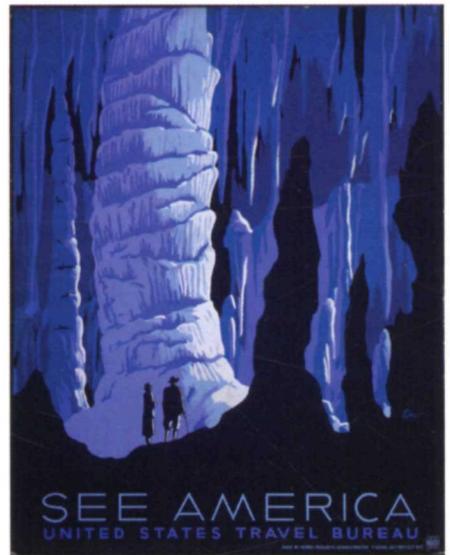
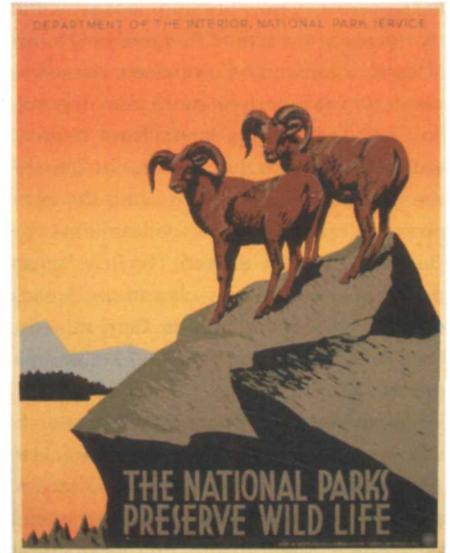
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A HANDFUL OF POSTERS produced by the Works Projects Administration.



LIFE IMITATES ART

Collection of “New Deal” posters documents American history

A stock crash, soaring unemployment rates, a growing awareness of environmental issues, and a focus on the need for energy independence. Sound familiar? Seventy-five years after Franklin Roosevelt was elected president on the “New Deal” platform, politics and

economics are conspiring to present another new president with some of the same challenges that faced our nation so many years ago.

Back in the 1930s, a big part of FDR’s ambitious plan focused on parks and conservation. Members of the newly formed

Civilian Conservation Corp were put to work building bridges and roads, planting trees, and blazing trails in parks like Grand Canyon National Park (AZ), Scottsbluff National Monument (NE), and Shenandoah National Park (VA). That work was bolstered by a broad-ranging propaganda effort that encouraged Americans to discover the wonders their country had to offer, including the national parks and other natural areas. Widely-distributed posters also brought attention to public health, workplace safety, exploring the arts, and,

eventually, support for homefront efforts related to World War II.

Now, all of those themes are captured in a new book entitled *Posters for the People: Art of the WPA*, edited by Ennis Carter, a graphic designer who stumbled on the art form and soon learned that only a fraction of these historic images had been collected for posterity. Although the Works Projects Administration's Poster Division produced more than 35,000 designs and printed more than 2 million posters, the Library of Congress has only 900 images in its collection. Carter and other researchers were able to track down another 1,800 images and her organization, Design for Social Impact, is now engaging the public to collect even more online (see www.postersforthepeople.com to join the effort).

Given the small budget set aside for the work, WPA designers were forced to use few colors and rely on simple, bold lines that could be reproduced with inexpensive screen-printing methods. As the New Deal successfully lifted the nation out of its economic woes and the Great Depression became a distant memory, federal work programs drew criticism, and funding trickled to a stop; art projects were among the first to go. The WPA ended its run in 1943, but the artists' contribution to graphic design had a lasting impact.

"As artifacts, these images provide a snapshot of a moment in our nation's social, cultural, and art history," Carter says. "Their creation played a key role in advancing American design and printing techniques while promoting the hopes and aspirations of our nation's government. Years later, they still serve as timeless reminders of Americans' collective past and a commitment to a bright future."

To see hundreds of posters produced by the Works Projects Administration, visit <http://memory.loc.gov/ammem/wpaposters/wpahome.html>. To purchase posters and postcards with WPA imagery and modern interpretations of the classic style, visit www.postersforthepeople.com or www.rangerdoug.com.

—Scott Kirkwood

298

WEIGHT, IN TONS, of Alexander Hamilton's 206-year-old home, which was moved from New York City's Convent Avenue to St. Nicholas Park last June. Workers

lifted the house 40 feet off its foundation before setting it on dollies and wheeling it around the block. It's all part of an \$8.4-million restoration project that includes adding porches, a staircase, and a grand, federal-style entrance that were part of the original house. The national memorial, called Hamilton Grange, is expected to reopen in late 2009. To learn more, visit www.nps.gov/hagr.

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KEWEENAW MINERS POSE
during a lunch break in 1905.

COURTESY OF KEWEENAW NATIONAL HISTORICAL PARK ARCHIVES

FIGHTING GRAVITY

Saving what remains of Michigan's
19th-century copper industry

Buried under the rolling, wooded hills of Northern Michigan's Keweenaw Peninsula are the remains of a copper deposit that drove the region's economy for more than a century. Although the resource has lain dormant since the copper industry began its long decline in the 1910s, memories of a thriving community are evident in 19 heritage sites, including mines, an opera house, a Civil War fort, and museums. And, of course, there's Keweenaw National Historical Park—a park unit that was created in a fiscally conservative time on the premise that the government would own just a fraction of the property within its boundaries, sharing the burden of management with state and local government, a nonprofit friends group, and the private sector.

But despite such teamwork, historians

have struggled to tell the whole story; doing so takes millions of dollars that the groups don't have. And now, the Quincy Smelter—perhaps the last of its kind in the world—is falling down around itself.

"We're in a poor, de-industrialized area, so we don't have any big donors that can step up and pay for this," says Kim Hoagland, chair of a local nonprofit group called Copper Country Preservation. "So in a way, we're hurt by the very loss of the industry we're trying to celebrate, and it's getting to the point where some buildings could collapse without additional stabilization work."

The Quincy Mining Company produced nearly 500,000 tons of copper in a region that provided as much as 75 percent of the vital resource after the Civil War. Wherever there was a need for brass bullets, copper

wire, shipping hulls, and, of course, pennies, Michigan delivered. The electrical industry never would have taken off had it not been for copper.

But residents aren't ready to see this piece of history vanish. So NPCA helped the Copper Country Preservation launch a campaign to raise \$500,000 in private donations to be matched by Congress. Sen. Carl Levin (D-MI) advocated for \$300,000 in federal appropriations, but that bill has stalled in the Senate. More funding won't change the fact that the Park Service doesn't own the smelter, but the agency could begin working with Franklin Township to stabilize the complex and open it up to the public.

"Keweenaw National Historical Park tells a powerful story of hope and opportunity as well as struggle and decline," Levin says. "Most of all, it offers us an appreciation for our past and an inspiration for our future. Through collaborative efforts with the local community and organizations like NPCA, I look forward to the day when people can visit the smelter and understand its significance in the copper-mining history of this nation."

The complex is made up of 28 buildings and covers about 25 acres. It's where workers melted dull copper ore into beautiful, brassy, 46-pound ingots to be exported all over the country. For nearly a century, the Quincy smelter and surrounding communities buzzed with thousands of immigrant workers who had flocked to the region from as far away as Finland, Italy, and Slovenia. But after copper prices fell, nearly half of the region's population moved away. Quincy found ways to get more copper out of the sand created when the metal was separated from rock, buying the company 25 more years. But in 1971, new environmental restrictions forced the smelter to shut down.

As the Environmental Protection Agency finishes clean-up efforts around Quincy Smelter, local residents are excited about what a revitalized complex could offer. There's talk of renovations and interpretive tours, which would help remove years of tarnish from a place where history unfolded.

—Amy Leinbach Marquis

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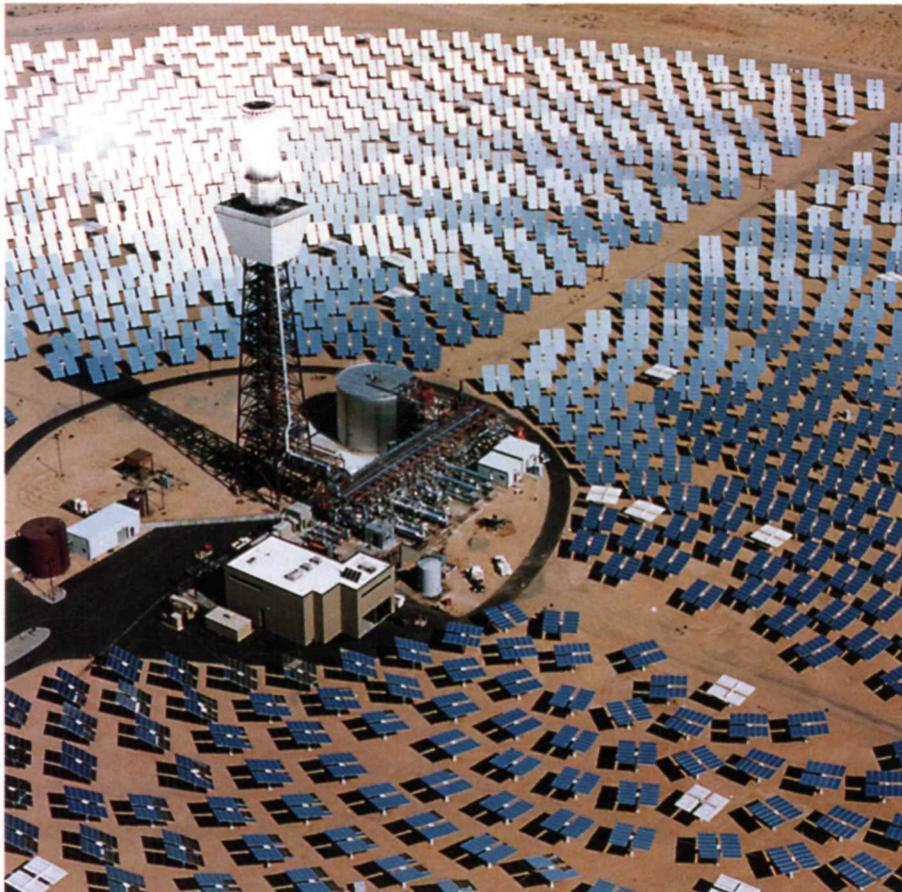
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WINTER 09



COURTESY OF AP PHOTO

A THERMAL SOLAR PLANT in California's Mojave Desert.

wildlife advocates fear: That by applying a quick-fix to some environmental problems, you end up creating others.

The Mojave Desert is one of the last, relatively intact desert ecosystems in America—and the land up for grabs has long provided critical corridors for wildlife, connecting parks like Mojave National Preserve, Joshua Tree National Park, Death Valley National Park, and Lake Mead National Recreation Area. Air quality, historic park views, natural soundscapes, and wildlife would suffer—and even though they may be hard to see, there is wildlife out there (see “Forged in Flames,” pg. 20).

What people may not realize is deserts like the Mojave absorb just as much carbon dioxide—the molecule largely responsible for global warming—as a temperate forest of the same size. In fact globally, desert ecosystems suck up as much as 5.2 billion tons of carbon, or half of the amount emitted by burning fossil fuels. Scientists aren't sure how this happens, or if such measurements are even the norm—but until they know for sure, bulldozing such a resource could cancel out the benefits of solar.

“Is it better than continuing to mine and burn coal?” Cipra says. “Absolutely. But solar is difficult and nuanced, and it takes time to get it right. We should have addressed these questions 50 years ago, but suddenly they all have to be addressed right now.”

These desert projects would use several technologies, but one in particular is problematic: solar thermal. Rows of mirrors direct sunlight to a central tower filled with liquid, which then stores the energy. But in extreme temperatures that tower can quickly overheat—and the cheapest way to cool it down is by using large quantities of water.

“Where will that water come from?” Cipra says. “Will you draw it out of the ground? Will you pipe it in from Lake Mead? Will you draw it away from the springs that our wildlife depend on to survive? Not enough people are asking these questions, but the answers are important for our parks and preserves.”

(contd.)

SOLAR RUSH

California's solar boom threatens the very places it's meant to protect

The Mojave Desert is on fire. Private land worth \$500 an acre five years ago is now selling for as much as 20 times that amount, with Fortune 500 companies scrambling to place their bids. A steady flow of entrepreneurs from individuals to industry leaders are swamping the Bureau of Land Management (BLM) with permit applications that would affect almost a million acres of federal land.

Why all the fuss? California's going solar.

“It's like a gold rush,” says Michael Cipra, NPCA's California Desert program manager. “And that raises a very important question: Should our collective energy future be about striking it rich, or should it be about finding the proper balance between

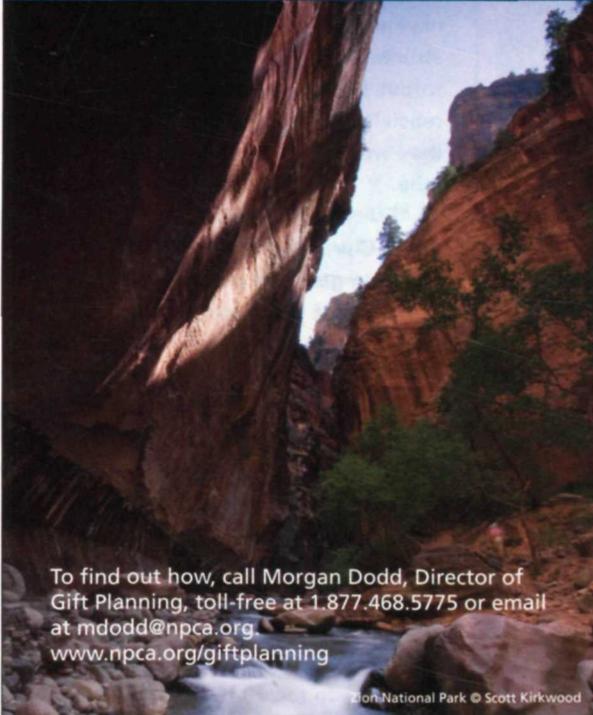
development and our environment?”

The solar boom started in 2002, when California Governor Arnold Schwarzenegger passed legislation that would force the state to switch 20 percent of its energy to renewable resources by 2010. Few would argue the wisdom and foresight of that decision. But in the rush to meet that deadline, critical questions aren't being asked—like whether or not the Mojave Desert is really the best place for a solar boom.

“There's an old mindset that land out here is 'just desert,'" says John Slaughter, Joshua Tree National Park's chief of maintenance. “But it's not. It's a complex ecological system, and what you do to it has an impact.”

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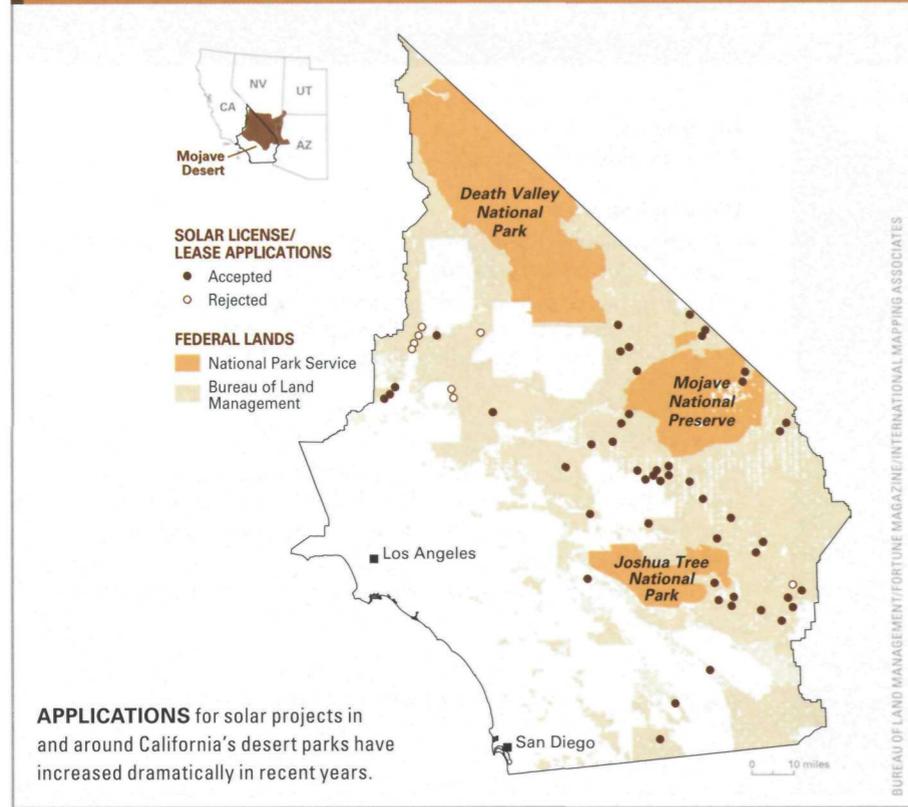
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WHERE THE SUN SHINES



Next, you've got to get the energy to the people, and since many of the proposed solar plants are in the middle of nowhere, new transmission lines need to be constructed. Not only would the lines threaten to cut through critical wildlife habitat to reach Los Angeles and other cities—but they would lose energy with every added mile.

"Efficiency has to be part of any energy plan," Cipra says, "and it's simply more efficient to generate power where you need it instead of hundreds of miles away. We should be developing solar closer to cities and in areas that are already impacted—like landfills, the edges of airports, or as shade structures over parking lots."

But it's just so easy to buy leases on BLM land. If you found gold, for example, you could stake a claim, pay a small permitting fee, and start mining. You don't even have to be an American citizen.

The problem, Cipra says, is that most laws regarding the use of public lands date back to the 19th Century. "We're still caught up in this idea that we can do what-

ever we want to the land and not have to pay the consequences. There should be a more thoughtful process for evaluating which uses are appropriate, and which aren't—and we should carefully consider the effects of bulldozing land that absorbs so much carbon and provides habitat for plants are literally thousands of years old."

As of July, more than a hundred BLM land claims for solar applications hung in the balance—and while the amount of energy generated from all those plants could power California twice over, building them could devastate a unique desert habitat and the wildlife that depends on it. Several applications in particular would mar a large plot of pristine land that not only serves as lambing grounds for desert big-horn sheep, but should, in many opinions, become part of Mojave National Preserve. If development threatens that plan, NPCA will step in, turning discussion back to the value, leadership, and ingenuity of California's desert parks.

— Amy Leinbach Marquis

TAKING THE LEAD



JOSHUA TREE National Park

Think national parks are standing in the way of solar? Think again. Photovoltaic solar (think solar panels on rooftops) is the fastest growing technology in the world, and few are riding that wave like Joshua Tree National Park. Almost 40 percent of the park's energy comes from locally-generated solar: A 64-kilowatt system powers much of the headquarters area in the park, and a 14.5-kilowatt

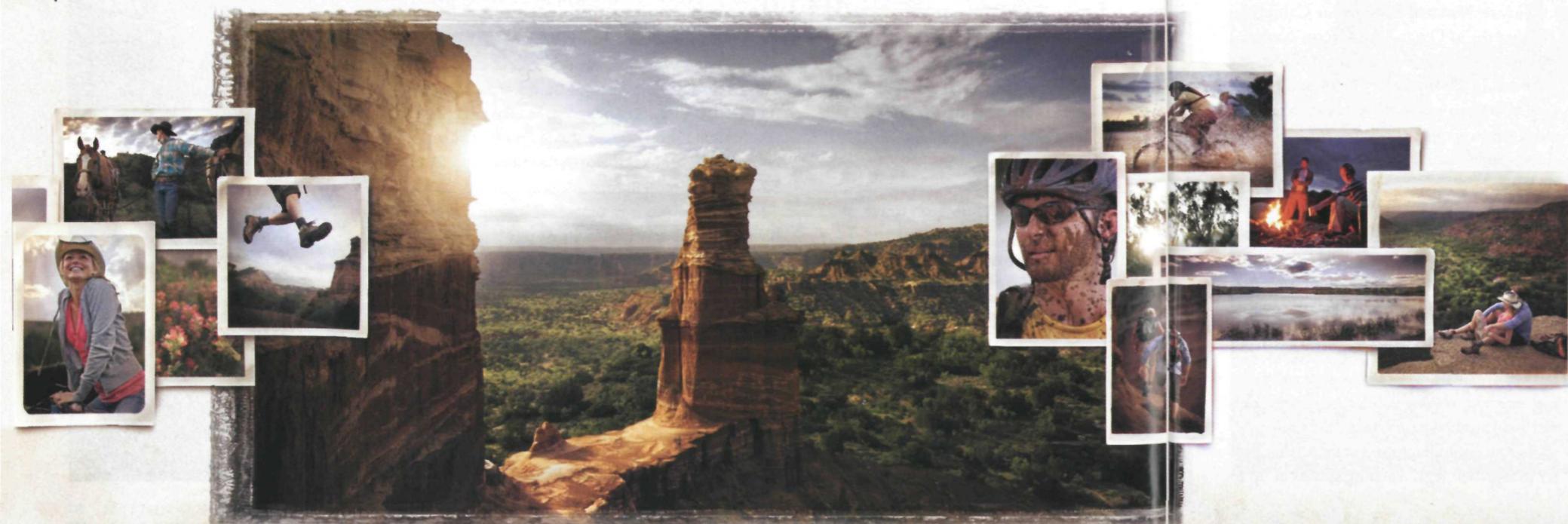
solar system being installed on a new building will increase Joshua Tree's carbon offset even more. (To give some perspective, an average-sized single-family home could operate on a 2.5-kilowatt system.) Headquarters operations alone save roughly \$14,000 a year. The panels themselves are easy to maintain, and since they're mounted on rooftops and around existing structures, the Park Service didn't have to bulldoze any land to make them work.

Eventually, Slaughter hopes to interpret more of this technology on park tours. "When people come to Joshua Tree, they'll see solar in action," he says, "and they'll see that it doesn't require a lot of oversight or technical knowledge. The two greatest impacts we have on the environment are the energy we use at home and carbon emissions from our vehicles. This is one way to significantly reduce that impact."

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It's like a whole other country.



ROAD RUNNERS have evolved to survive extreme desert heat.

Forged in Flames

With summer temperatures hitting triple digits, you might expect desert parks to be lifeless landscapes. But look again.

It's hot. Even that simple recognition rises slowly across the seared plains of your brain. Thoughts tangle like heat waves. You're surprised how difficult it is to breathe, your pulse hammering in your head, the claws of cramps tightening in your calves every time you stop—so you don't

stop. There's no shade anyway. Then you come across footprints weaving in the sand as if from a drunk person. You'd laugh out loud, but your throat feels like sandpaper. It will be another hour before you come across the tracks again and realize they are yours.

We humans are not creatures built for

heat. A rise of just a few degrees in our core body temperature can trigger severe complications, even death. Against that reality, temperatures like 112 degrees Fahrenheit in Mojave National Preserve in California, 117 degrees in Organ Pipe Cactus National Monument in Arizona, or the 134 degrees recorded in Death Valley National Park in California can make these places seem like alien landscapes, lifeless and trackless. But some species actually thrive here. The question is, how?

There are essentially three methods for living in scorching desert heat: Get tough, get out, or be very, very patient. Many desert species are nomadic, swooping in during cooler weather or after rains to take advantage of short-lived resources before getting out. Soaring birds like golden eagles and red-tailed hawks carve the summer sky, rising into the cooler air of higher altitudes. But road runners don't have that ability. Although they can fly short distances, they prefer to use their legs, reaching speeds of up to

18 miles an hour. But even they can't outrun the heat. Roadrunners slow down during the heat of the day, staying still for long periods to conserve energy and stay cool. They get most of the water they need by eating snakes and reptiles, and excreting salt through nasal glands to preserve water. When things eventually cool down, they're off again, racing the desert wind.

Equally impressive despite its size (picture a handful of sand) is the kangaroo rat. It's nocturnal, spending most of the day in a covered burrow to avoid the pounding fists of the sun. When a kangaroo rat does have to venture out, its ears and tail give off heat like radiators. Large hind feet keep it from sinking deep into the sand and expending unnecessary energy, while its hopping gait lifts it up and off the sun-baked ground. Roomy pouches in its cheeks allow it to gather and store food quickly, minimizing exposure to heat and predators.

The kangaroo rat is also an expert at minimizing its water needs. It may go an en-

tire lifetime without a drop of free-flowing liquid. Instead, it metabolizes fluids from seeds and makes the most of every drop with kidneys that can concentrate its urine up to five times higher than humans. The tiny rodent seals the entrance to its den with cool dirt to retain moisture and even uses special membranes in its nasal passages to condense water vapor from its breath, re-circulating moisture in its system and hoarding precious fluids against the hot, dry world above.

The desert tortoise too has been sculpted by its environment. Thanks to patience, a long memory, and a fondness for the underground, desert tortoises can survive for 80 to 100 years in places where ground temperatures exceed 140 degrees. In spring and fall, they gorge themselves on succulent wildflowers and cactus. Immediately before a storm—which they can sense with a change in barometric pressure—they scratch out small catch basins in the dry soil and plot the locations on some internal map, then return when showers turn the holes into sip-

ping pools. In the meantime, adult desert tortoises can go as long as a year between drinks, thanks to a large bladder that acts like an internal water bottle.

As the summer heat bears down, the tortoises seek shade in burrows or rock shelters to help slow water loss. When temperatures become unbearable, they use clawed front feet to dig burrows and eventually enter a state known as estivation, their metabolism slowed and systems all but shut down.

It's a tough place, the desert, and not for the foolish or faint of heart. Survival here takes the wisdom of a roadrunner and the body of a kangaroo rat. It takes the patience of the desert tortoise, resting in a burrow beneath the surface—cool, quiet, and perfectly at home, barely aware of the distant echo of footsteps from a human wandering the dunes above, walking circles in the mid-day heat. **NP**

Jeff Rennie teaches literature at Conserve School in Wisconsin's North Woods.



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CLIMATE CHANGE is causing the alpine chipmunk's habitat to shrink.



© MARK CHAPPELL

Running Out of Room

Climate change is chasing Yosemite's alpine chipmunk to higher altitudes.

There was a time, not long ago, when visitors to Yosemite National Park might come across a diminutive critter called the alpine chipmunk at 7,800 feet above sea level. Not anymore. Nowadays, possibly in an attempt to stay cool, the little guy hasn't been found below 9,600 feet. That's a major loss of geographic range.

According to Jim Patton, a retired University of California Berkeley zoology professor, the tiny gray mammal's movement represents the greatest upward "retraction"

of any high major-elevation species, which include the golden-mantled ground squirrel, the Belding ground squirrel, the water shrew, the bushy-tailed woodrat and the American pika. Among low major-elevation species that have *expanded* upwards (that is, broadened territory instead of leaving part of it behind) are the big-eared woodrat, the pinyon mouse and several others. All of this mountain climbing is potentially emblematic of a larger problem that has an ominously familiar ring to it: climate change.

"If you believe that there have been warming trends, say, in Yosemite National Park, then you'd expect ranges to shift accordingly," says Patton, who last fall cowrote an article for *Science* on his most recent research findings. "Although there's no direct evidence that temperature increases are affecting certain species," he adds, "the patterns of shifts that we're seeing are certainly consistent with that prediction."

Patton also says there may come a time in the next century or two when the chipmunk—which is largely diurnal and endemic to the Central and Southern Sierra Nevadas—will get "pushed off the top of the mountain" and be gone for good. Although there's no definitive information about the chipmunk's chief predators (possibly larger mammals such as weasels and foxes), the chipmunk subsists largely on seeds from grasses and other vegetation. Theoretically, the species' loss could have a damaging effect on the overall ecosystem, but no such studies have been done, so nothing is certain.

"We can't make that kind of prediction," Patton says. "But we know that in [simple] communities that have been studied in detail—bacteria communities, microorganism communities and so forth—different kinds of organisms live in a web of interactions. And very often when you pull out one of those organisms, the web collapses, so the ecosystem collapses as a result—they're all interconnected."

"We think of the national parks as some of the best reserves of native biodiversity that continue to exist in North America because they're completely protected, but when the climate changes and those habitats basically move out of the parks, or disappear entirely, the parks lose that protective function," says David Graber, chief scientist of the Pacific West region of the National Park Service, which includes Yosemite.

Moreover, Graber says, it's wrong-headed to assume that because national parks like Yosemite are so coddled, their flora and fauna are somehow immune to the problem of

climate change.

"The parks have some things going for them," he allows, noting that the larger Western parks represent big chunks of contiguous habitat. "In the Sierra Nevada or Rocky Mountain National Park or Glacier or the Cascades, there's room to move up the mountain to a very limited extent."

But there's only so far a species can go.

As for solutions, Graber says they're still merely "explorations" that scientists have only just begun to discuss. Still, there are "potential ways to ameliorate the effect, make it less drastic than it is now." Reducing the park's carbon footprint by driving smaller vehicles and installing potable water tanks on building rooftops is a start. There's also the theoretical—and inherently hopeful—concept of "resilience," whereby an ecosystem naturally snaps back to its original state following a serious stress like drought or fire. But any measures designed to reverse these impacts must be global, not local. "The national parks are not immune to

the other kinds of changes that are occurring elsewhere in the world," says Graber.

Fortunately leaders in Congress and President-Elect Obama recognize that ecosystem resilience can be stretched to the breaking point by a rapidly warming climate. The federal government is considering major new investments to help wildlife better withstand the onslaught of climate change. These investments would be paid for by the climate polluters themselves, as part of a "cap and trade" system that reduces greenhouse gas emissions by selling a diminishing amount of pollution permits to the biggest emitters.

"I don't know whether people even think about those issues," says Patton, "but if they do, they probably think, 'The national park is preserving nature as it really is, so my kids will be able to see the same things I'm seeing today.' And that's simply not the case." NP

Mike Thomas has written for *Esquire*, *Salon.com*, and *Smithsonian*.

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A WATERCOLOR by biologist Rolf Peterson, long-time leader of Isle Royale's wolf-moose study.

Wolves, Moose, Researchers, and Me

The author of best-selling mysteries set in the national parks visits Isle Royale in the dead of winter.

Nevada Barr has written 14 mysteries that unravel in the national parks—a career that owes much to her years working as a seasonal ranger in sites such as Isle Royale in Michigan, Guadalupe Mountains in Texas, and Mesa Verde in Colorado. Two years ago, she visited Isle Roy-

ale again, in the middle of winter, to research her latest book focusing on the exploits of park ranger Anna Pigeon—*Winter Study*—which was published in April 2008.

Isle Royale is closed in the winter, and nature often shores up the Park Service decree

by ringing the island with ice. No boats or sea planes are allowed to land. The bays are frozen, the trails deep in snow, and the island is given over to the animals for half of the year. The animals and the scientists, that is. And, in January of 2007, me.

I don't know how others think of research scientists, but when I was growing up Jane Goodall and Margaret Mead were rock stars every bit as much as Jimi Hendrix and Jerry Garcia. We followed their exploits in *National Geographic* and discussed their adventures in our classrooms. To me these were the glamorous lives. I pictured myself in baggy khakis and rugged shoes observing mice with Farley Mowat, diving with Jacques Cousteau.

Imagine my delight when I managed to weasel my way into just such a situation—and not sorting caddis fly larvae in Kentucky—no, this was the wolf-moose winter study on Michigan's Isle Royale—the Madison Square Garden, the Hollywood Bowl of wilderness research expeditions.

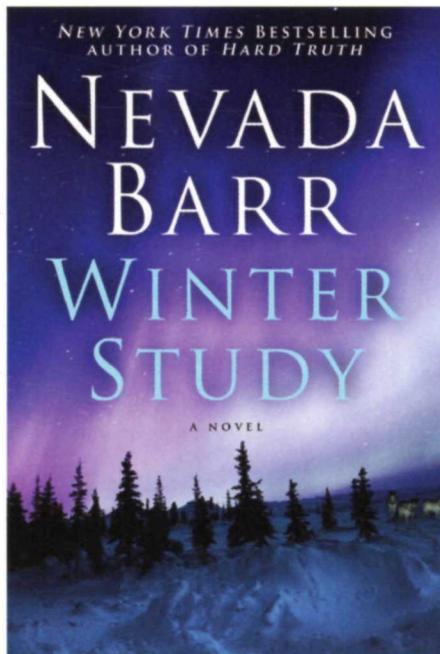
Years before, I'd spent a summer working on Isle Royale as a seasonal ranger. There I'd met a man named Rolf Peterson, the lead researcher in the island's long-running wolf-moose study (now 51 years and counting). I also heard tales of Winter Study, the weeks in January and February when the scientists came to live in the icy reaches of northern Midwest to better observe the interactions of these species.

Because of Jane and Margaret and Jacques and Farley, and because what transpired on "ISRO" in the dead of winter was mysterious and exclusive, for 20 years I've wanted to set an Anna Pigeon book at Winter Study. Not only did I crave the experience but, being a lover of the classics, how could I resist setting a mystery in this most magnificent of all Victorian closed-house settings? No one can get in, no one can get out, and people are being murdered. Ah. It doesn't get any better than that for a writer.

Through the kind auspices of Rolf and Phyllis Green, Isle Royale's superintendent, I was allowed to spend a week in the park with the study team.

Assistant Researcher Beth Kolb and I boarded a Forest Service plane that flies out of Ely, Minnesota, every eight days to bring supplies to the island. An hour later, we were deposited on the ice of Windigo Harbor along with cheese, wine, pasta and fresh vegetables. Ice rimed my eyelashes, crusted the snow, made each step treacherous and honed the wind sharp as a razor.

I always thought of ice as dead water, a substance as devoid of intrinsic interest as a concrete sidewalk but as the researchers unloaded the plane I could hear it singing, a song like that of whales. Where the snow had blown away, I saw it was marbled with black lines. Iridescent pastels, so faint they seemed only a trick of the light, combined with sudden and sporadic clarity to hint at the depth of the water underfoot. Evergreens, black in weak winter sunlight through thin pearlescent clouds, ringed the harbor. Deciduous trees, stripped of their summer leaves, scratched the pewter sky with skinny clawed branches. The air was so cold it glittered.



Months later, writing in the warm lushness of a Louisiana autumn, I can wax poetic about this stark lunar beauty, staggering silences, songs of the ice and divine cruelty of temperature. There on the wind-scoured ice of Windigo Harbor, the cold cutting through the cumbersome layers of coat and hood and gloves and scarves that bound and blinded me, my greatest awe was reserved for the scientists.

The silly buggers were completely at home. They reveled in biting wind and scudding waves of pulverized snow. Rolf, Beth, John Vucetich, and Don Glaser did not simply put up with the hardships of isolation, subfreezing temperatures, minimal electricity, and no running water—they *embraced* them. They embraced winter. Beth told me it was her favorite season. Rolf, John, and Don savored the crunch of the snow and the bite of the wind, measured it, discussed it, compared it to previous falls and crunches and blows. Had they been wolves they would have laid down and rolled in winter for the sheer fun of it.

The whole of these scientists' energies was focused on the study. I was as a woman without a country, without a religion and, sometimes, without a common language.

Mornings, if weather permitted, Rolf, the lead researcher, or John, his heir apparent, took to the air for four hours as Don flew low and slow so the wolves could be seen and filmed or photographed. If the weather held, another four-hour flight was taken in the afternoon. Evenings were given over to revisiting the film, rehashing the sights, comparing them to wolf-moose activities in years past.

Beth spent the days hiking miles cross country through frozen swamps and woods collecting samples of wolf scat and moose urine and studying tracks left by the animals. Dinner conversation was centered on where the wolves had been, where they'd traveled in previous years, where they might be headed in the near future, which pack they were running with, who was alpha, who wanted to be alpha—all the juiciest gossip of a lupine Peyton Place.

After spending eight days immersed in this dedicated culture, dining with scat and urine samples scattered about, and realizing that a toilet seat warming behind the woodstove was our greatest luxury, I doubt that I will ever recapture the sense of glamour researchers once held for me. I no longer consider them rock stars, but they have joined that elite group where lunacy and genius come together to form a new order.

This ability to focus on a single subject with an almost religious fervor put me in mind of the old adage that says an expert is someone who learns more and more about less and less till he knows everything about nothing at all. This is, of course, untrue, but to the nonscientific eye the narrowness of these researchers' obsession was wondrous to behold. Winter Study has yet to discover all that can be learned from the wolf-moose relationships, but I have faith it will one day be revealed.

Then, in celebration and camaraderie, I shall lean my head back and howl. **NP**

Nevada Barr lives in New Orleans, Louisiana. She is working on her fifteenth mystery, set in Big Bend National Park in Texas, entitled *Borderline*. *Winter Study* will be released in paperback in April 2009.

RESCUE

+ UNDER A MIDNIGHT SUN +

A week on North America's highest mountain with Denali's search-and-rescue team.

TEXT AND PHOTOS BY IAN SHIVE



SEARCH-AND-RESCUE crew member Brandon Stuemke, a sergeant with the U.S. Air Force Paramilitary Rescue, hauls gear off the plane. Below, Mt. McKinley as seen from 7,200 feet. Previous pages, a climber approaches medical base camp at 14,200 feet.



TALKEETNA, ALASKA

is a stunningly rugged frontier town that serves as the jumping-off point for anyone planning to climb Mt. McKinley, the towering jewel of Denali National Park & Preserve. Walls of the local bars are covered in old photos of climbers flying their country's flag while standing on the summit. Some of the actual flags are even tacked to the wall as well. Climbers fresh off the mountain hobble through the dirt streets, easily identifiable by their suntans and raccoon eyes in the shape of polarized goggles. The energy here is high, the anticipation of the mountain overflowing like the Susitna River that runs at the edge of town.

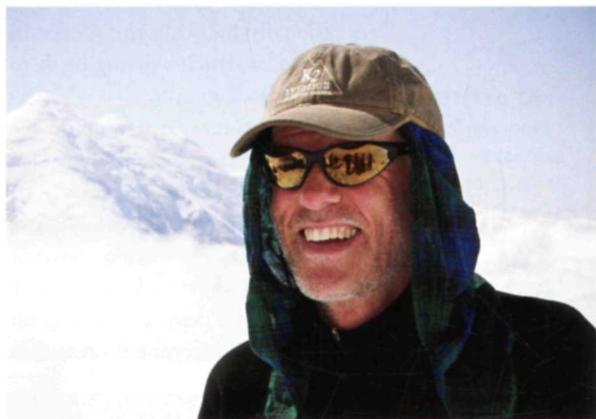
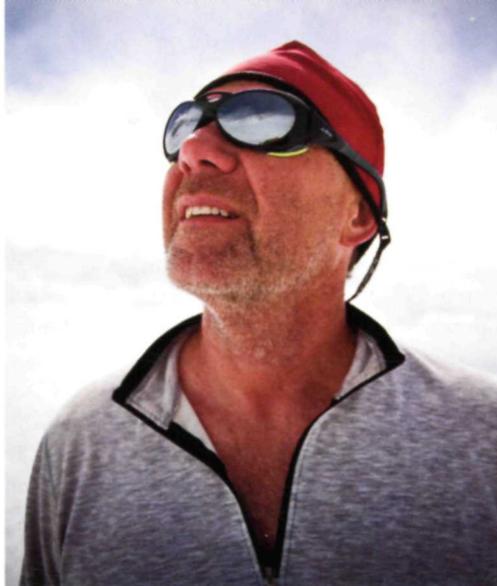
Talkeetna is also home to the national park headquarters that is responsible for coordinating climbers' trips to Mt. McKinley, and it serves as the base of operations for Denali's search-and-rescue team. I had the fortune to find myself here in early June, in the middle of climbing season, accepting an invitation to become one of the first photojournalists embedded on the mountain in a

patrol. As I walk into the briefing room though, the gravity of my own climb comes into sharp focus. There, a "situation board" reveals the details of a historic rescue only days before my arrival: "Climber calls in from satellite phone. Panicked, foreign, garbled and virtually unintelligible. Climber's self-diagnosis is his own expiration in approx. 2 hours. Bleeding and can't see out of one eye."

These are the first details concerning the fall of solo climber Claude Ratte, a French-Canadian who was hoisted nearly 2,000 feet in what became the highest lift ever recorded on Denali. Ratte didn't expire—his life was saved in a massive, well-coordinated, and seamless rescue at 17,000 feet.

Mt. McKinley is the highest mountain in North America and the centerpiece of Denali National Park. Some members of the mountaineering community consider it more difficult than Mt. Everest. Its rise and bulk are greater than Everest, and in Denali there are no sherpas to carry your gear. You're responsible for carrying every piece of equipment, which can weigh as much as 100 pounds per person. And compared with McKinley, Everest is downright tropical. The icon of Denali National Park sits at 63 degrees latitude, just beyond the edge of the Arctic Circle, sandwiched between the Bering Sea and Pacific Ocean, a location that gives the diamond-shaped mountain a deathly moist, maritime climate. The greatly reduced barometric pressure has a direct impact on the percentage of breathable oxygen in the atmosphere; 14,000 feet on McKinley feels like a burning, gasping 18,000 on Everest. Gusting winds at the summit have been known to blow people right off the edge, never to be heard from again. Sudden shifts of cold weather can approach -100 degrees Fahrenheit. At least one climber is known to have been flash-frozen, like a mythological creature that made the mistake of looking Medusa in the eyes.

I've joined a search-and-rescue dream team consisting of Lead Climbing Ranger John Leonard, three United States Air Force Paramilitary Rescue men—Master Sergeant Paul Nelson, Tech Sergeant Brandon Stuemke, and Staff Sergeant Rocco Pergola—and a cardio-thoracic surgeon specializing in wilderness medicine, Dr. Skeet Glatterer. The paramilitary triad, called PJs (for para-jumpers),



CLOCKWISE FROM TOP LEFT: Dr. Skeet Glatterer, search-and-rescue volunteer; Ralph Tingey, former park employee who now volunteers on Denali; Peter Hillary, son of Sir Edmund Hillary, the first person to summit Mt. Everest; and Buck Tilton, writer and wilderness medicine specialist.

have run many rescue missions in Iraq and Afghanistan, as well as recovery efforts after Hurricane Katrina and the Pakistan earthquake disasters. They've dangled out of helicopters to pluck people from freezing Alaskan oceans and come under fire while saving comrades on the battlefield. This trip up the mountain is their "downtime" between deployments. With such an elite force, I can only hope that I won't be "that guy" on the mountain—the one who slows them all down. With the exception of Leonard, everyone on the team is a "Volunteer in the Park" or VIP. Their only pay is a small food stipend; they are driven by the desire to sharpen their skills and extend a hand when it's needed. Without the manpower of these volunteers, says Leonard, no such patrol effort could exist.

Assembling our gear is an adventure in itself. We have layer upon layer of "pro" gear: capilene shirts, snow pants, down parkas, boots that go over our boots, which have yet another layer of insulating boots inside them. Even the water bottles have insulating layers to keep from freezing on the mountain. If you're a first-time climber, a trip to the local mountaineering outfitter will make you a popular new customer with a nearly \$4,000 tab.

After two days of checking and testing the gear that will be our life support on the mountain, each of us finally hauls 100 pounds of technical gear—including layers of silk and nylon, backpacks, jackets, gloves, and, of course, skis—to be loaded into two sardine-can, fixed-wing aircraft with skis mounted to the front. As we sit

packed inside the cabin, shoulder to shoulder, with gear jutting out from all ends, there is an undeniable feeling of excitement and anxiety when we make our final descent onto the Kahiltna Glacier base camp, where our journey begins.

In just 50 minutes, our plane's skis touch down—my first time ever landing on a block of ice. I step out of the plane to see a stunning view of mountains still in their geological infancy. Like an embryonic capsule, thick blankets of snow wrap the peaks and blanket the valleys, occasionally breaking the silence in a massive avalanche, giving birth to newly exposed granite.

The 7,200-foot base camp on the Kahiltna Glacier isn't your typical national park campground. For starters, the glacier itself is moving a foot per day, like a slow-motion conveyor belt made of snow and ice. Because of the fantastic designs of European climbing gear, everyone is dressed in

the brightest colors, as if outfitted for a Las Vegas show. It's a sight to see: teams of the toughest weathered men standing in skin-tight nylon with oversized boots. Camp is a village crowded with anywhere from 50 to 150 climbers. And despite the bright colors, not everyone's mood is upbeat.

Buck Tilton, founder of the Wilderness Medicine Institute, which is now part of the National Outdoor Leadership School park concessionaire guide-team on McKinley, describes it simply as "a complicated place." As a long-time Park Service volunteer, Tilton knows this mountain well. "People arrive here full of anticipation," he says. "Others are just returning from their climb—some have summited and some have not. This camp is full of emotions."

The camp—and mountain in general—is a celebrity scene for the outdoor community. "I love coming here. I've been coming for 30 years and wouldn't miss an opportunity

to come," says Ralph Tingey, who has held senior posts in Denali and the Park Service's regional office in Alaska, and now volunteers at base camp in his retirement. "Base camp is an international mélange of who's who in the climbing community," he says, and it starts to show. Word on the mountain is that Peter Hillary, son of the legendary climber Sir Edmund Hillary, just left base camp to begin his journey to the top of North America.

Daryl Miller, the patriarch of McKinley and the lead climbing ranger only weeks from retirement, is also in camp. His demeanor speaks of years of experience that have helped him guide his successor, John Leonard. Deciding who works at a Park Service outpost is not an easy task. The best rangers are climbers long before they don the gray and green uniform, which means they've got to bridge the gap between the renegade culture of mountain

AT ALTITUDE, every step can be exhausting. Below, Glatterer takes a rest inside the tent, as his socks hang out to dry. Opposite, a mountaineer braves a snowstorm at medical base camp.

IT'S LIKE BEING INSIDE A PING-PONG BALL: no horizon line in front of you, no color in the sky above you, and no texture below you.



climbers and the regimented culture of the Park Service.

After a couple days of getting to know the team better and acclimatizing, I prepare myself for a 4 a.m. departure. Traveling in the coldest part of the day—while unpleasant—is the safest approach. Snow bridges that cover the deep crevasses on the glacier will be frozen solid, making them safer to cross than they would be under the mid-day sun. The glacier we are traveling on is a mile deep—so deep that when something falls in a crack, we don't hear it hit bottom. As an extra precaution, we slap on skis instead of attaching crampons to our boots; this helps disperse our weight and make a fall less likely. In addition, we are all roped together in teams of three. I am in the middle—a human yo-yo with two strings pulling me



in opposite directions. For the next five hours we'll cover more than five miles like this, with a gradual gain of 800 feet. As the rising sun begins its ascent, we soon realize that we're shrouded in clouds. It's like being inside a ping-pong ball: no horizon line in front of you, no color in the sky above you, and no texture below you. Everything is blinding white, even through the lenses of your polarized sunglasses. The only thing that provides any perspective is the person in front of you. Within an hour, I'm lulled into the zen-like rhythm of our movement, and it's all I need to keep going.

We make camp by noon, the hottest part of the day. The sun begins to break through the clouds and quickly turns the white glacier into a gigantic solar panel. The heat from the snow is unrelenting and unavoidable. Even standing still, I break a sweat. Above 13,000 feet, the ultraviolet index will be nearly 300 percent higher than at sea level due to the reduced atmo-

sphere. One foreign climber passing through said it best: "I never thought the coldest place in the world could also be the hottest."

The next five days all blend into one another, with moments of blinding snow and varying degrees of coldness that give way to sweltering heat. Our climbs become more difficult as our elevation gains increase to 3,000 feet per day, a pace we will maintain until we hit the 14,200-foot medical base camp. The weight of my pack and sled seem to be conspiring against my success with every step I take.

In the evenings, I listen to stories of yet another world foreign to me. Stories from the PJs, of rescue missions in the Alaskan back country and daily life in Iraq. In the abundant downtime, Pergola and Stuemke read books about the military. Our unusually sunny afternoons are spent dodging the heat under tents. It seems a contradiction to avoid the sun while we

Mt. McKinley: The Numbers

HEIGHT: 20,320 feet

COLDEST RECORDED TEMPERATURE: -100 degrees F

REGISTERED CLIMBERS IN 2008: 1272

SUCCESSFUL SUMMITS IN 2008: 755 (59%)

DEATHS IN 2008: 4 (102 in total)

SUMMIT ATTEMPTS, 1903-2007: 32,419

SUCCESSFUL SUMMITS, 1903-2007: 15,646

MAXIMUM NUMBER OF PARK SERVICE CLIMBING PERMITS AVAILABLE ANNUALLY: 1500

PERCENTAGE OF FOREIGN CLIMBERS: 60%

PERCENTAGE OF GUIDED CLIMBERS: 40%

take turns melting snow to make drinking water.

During this time, I also get to know Lead Climbing Ranger John Leonard better. Even in a blinding snow, his green Park Service hat and jacket form a silhouette that is unmistakably that of a park ranger. As we pass climbers coming down the hill, many pay Leonard compliments for the cleanliness of the mountain. It is, in fact, spotless. Even the errant

Power Bar wrapper gets scooped up as Leonard skis uphill. To him, keeping the mountain clean is priority one. “We manage Mt. McKinley first as a national park,” says Leonard, “and that means resource protection is the first priority.”

Picking up the trash may not seem like a massive challenge compared with the daunting effort to climb



it’s not the cold you fear most, but the lack of breathable air. The altitude wreaks havoc on the human system. Above 10,000 feet your body loses fluids faster, you struggle to get enough oxygen, and your sleep is disturbed (in a sugar-plum fairy sort of way). Above 16,500 you deteriorate faster physically, mentally, and emotionally.

At the lower levels, the thin atmosphere is responsible for a variety of aches and pains ranging from a splitting headache and lightheadedness (acute mountain sickness) to pulmonary edema and cerebral edema—in layman’s terms, your lungs begin to fill with fluid and your brain swells inside your skull. The only cure is immediate descent, though some medications can help stabilize a patient until descent is possible. The other result of oxygen deprivation is an impaired ability to make decisions. Best friends can turn on each other and decisions that would seem

his bottom lip, his years of experience in rescue operations and managing a team are obvious. Even under stress, Nelson guides all of us with knowledge and ease. Despite his demeanor, he regards the job as “boredom with moments of sheer terror.”

When we arrive in 14K camp, I meet Phil Ershler, a record-setting climber turned mountain guide for Alaska Mountaineer School/International Mountain Guides. Ershler and his wife were the first couple to stand on all seven summits, later retold in their popular book *Together on Top of the World*.

Ershler had two differing thoughts about the strong Park Service presence on McKinley. “They do an incredible job of education, protecting resources, and saving life and limb of mountain climbers.” But, he adds, “the flip side is climbers tend to be less self-sufficient.”

It’s a concern that Lead Climbing Ranger Leonard recognizes. In the

ON THIS MOUNTAIN, as on any other mountain worth climbing, it’s not the cold you fear most, but the lack of breathable air.

EVEN THE BEST GEAR and preparation can’t protect everyone on Mt. McKinley, and in time, intense conditions take their toll. Above, a climber from Denmark is treated for frostbite.

up McKinley, but other mountains, such as Everest, are a step away from being classified as the world’s highest landfills. The globe’s most impressive mountains are littered with empty oxygen containers, waste bags, meal packs, and anything else people can ditch to cut weight on their climb. From base to summit, McKinley is covered only in footprints.

After five days of climbing, we finally make our approach to an area known as “windy corner,” the homestretch on our journey to medical base camp. At 13,500 feet, it’s hard to grasp just how high we are, but Tech Sergeant Brandon Stuemke put it in perspective when he told us the planes he parachutes out of are capped at 13,000 feet. We’re walking around in the snow much higher than that.

On this mountain, as on any other mountain worth climbing,

catastrophic at sea level start to look like good ideas at elevation.

The worst part of these O₂ afflictions is it’s impossible to determine who is most susceptible. It’s the Russian roulette of the climbing world—the most unlikely climber could ascend to the summit with no problems while a world-class athlete could require an emergency evacuation. There are no tests you can take to predetermine your vulnerability and no training you can do to prevent it. The one true test is the mountain itself.

And that test is a big part of the draw for the members of my patrol team. Nelson had returned from Afghanistan only two weeks before heading to McKinley. Although Leonard is undoubtedly our patrol’s leader, Nelson is clearly second-in-command. When he isn’t enjoying a good laugh or a plug of tobacco in

hope of creating more self-sufficient climbers, the Park Service won’t treat blisters or minor injuries that climbers can and should treat themselves. It’s also a well-known fact that the Park Service manages the mountain first and climbers second. Even in the event of life-threatening emergencies, the patrol team’s response is measured. “Someone else’s emergency is not our emergency,” says Leonard. “Our safety is the first priority—we won’t put our own lives at risk to rescue those in danger.”

Climbing on Denali, as on all big mountains, has increased exponentially. In 1968, only 40 people attempted the summit and ten made it. Each year since, those numbers have nearly doubled. By 1988, the figure had jumped to 916 climbers, with 551 reaching the top. In 2008, I was one of 1,240 people on

the mountain. Leonard refers to it as a “big game” type of experience, for people who have a lot of money and want the proverbial trophy on their wall. At 14K camp we caught up with Peter Hillary who explained another possible reason for mountain climbing’s rise in popularity. “There was a time when flying across an ocean was a major achievement. It was difficult—you might get lost and not come back,” he says. “Today, we fly across the oceans daily—it looks easy. With climbing, it’s the same. People read about or see the hundreds of climbers attempting peaks and they think it’s easy because so many before them have done it.”

The medical camp had an easy go at first with a few complaints of gastrointestinal distress and lightheadedness. After nearly a week and the first few cases of frostbite, the first serious emergency came up. It was 9:30 p.m., when the voice of an English speaking man with a Russian accent came across the Park Service radio frequency. A team of Russian climbers at the top of the fixed lines at 16,500 feet had come across a sick



climber unable to descend to 14K camp on his own. They offered to help lower him on their own while the Park Service patrol team immediately mobilized into rescue mode. This was the real thing.

With crampons on their boots and climbing and rescue gear harnessed up, the team began ascending to meet the sick climber. No ascent is fast at this elevation—even after acclimation, you still gasp for air with every

step. As we neared the patient, his skin looked waxy and he wasn’t moving.

The team confirms that the climber is still breathing, and indicates that he’s not in serious danger, but he requires extensive treatment and evaluation. The team lowers the man to the heated medical tent and immediately tap an IV to begin rehydration while he’s administered bottled oxygen and warmed in a sleeping bag. After a few hours, he

THERE ARE NO SHERPAS on Mt. McKinley—each climber must carry about 100 pounds of technical gear.



A SMOKE FLARE creates a target for the “Denali Lama,” the park’s high-altitude helicopter, which arrives at medical base camp to take an injured climber back to Talkeetna, along with the author.

comes around, and even smiles. He spends the night in the medical tent under the watch of Dr. Glatterer.

But the next morning, the patient is taken off oxygen and his blood-oxygen saturation immediately drops to abnormally low levels—a dangerous sign of a more serious problem that can’t be fully diagnosed at this facility. The patient will be unable to hike off the mountain and will require evacuation by helicopter.

For the next two days, the patient stays on oxygen and waits for the weather to clear so that the high-altitude helicopter—the Denali Lama—can evacuate him to Talkeetna for

transfer to a hospital. Although I’d planned to hike down to basecamp with the team, it makes more sense to hitch a ride on the Lama and take a once-in-a-lifetime flight above Denali’s snowcapped peaks. At the end of the third day, the river of clouds below us begins to dissipate, finally allowing the helicopter to land.

With rotors at full blaze, the oversized dragonfly lands on a makeshift pad, red smoke from signal flares mixing with snow and ice. The search-and-rescue team moves with the efficiency of a NASCAR pit crew, loading the patient and gear into the helicopter, as I step onto the Lama myself. In less than 60 seconds, the door is closed and I’m looking through the window and waving goodbye to the team below, huddled together for protection.

Fifty minutes later, we’re back in Talkeetna. A medical team meets the

patient and escorts him to a regional aircraft for transfer to a hospital, and that is the last I hear of him. I’m left standing in a parking lot in 80-degree weather dressed in a down parka, climbing boots and harness, sweating and more than a little disoriented. For some reason, the first thought that hits me is what Sergeant Master Paul Nelson said before we left for the mountain: “What doesn’t make sense down here, starts to make sense up there.” Of course, he was referring to the way extreme altitudes can affect a climber’s reasoning, but as I stood there watching a midnight sunset, I realized he was right in more ways than one. **NP**

Ian Shive is a California-based conservation photographer and writer. His last piece for *National Parks* focused on the Park Service’s Submerged Resources Center.

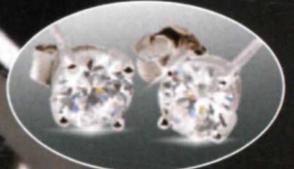
ON THE WEB

View a brief “photofilm” with more images from Ian Shive’s time on Denali at www.npsca.org/ magazine. (Requires free Quicktime download.)



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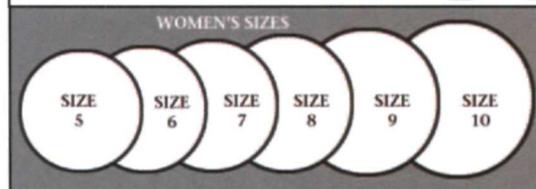
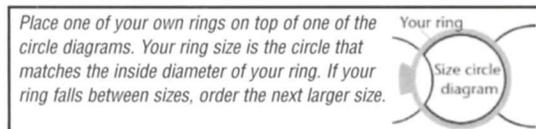
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A CLUSTER OF FIREWEED, one of the most prolific blooming plants in northern Alaska, adds color to a rocky landscape in Gates of the Arctic National Park.

*Celebrating wildflowers means
slowing down, looking closely, and
having just a little bit of luck.*

And Heaven in a Wild
 Flower

They have wreathed the locks of royalty, fragrancd the privies of the Middle Ages, and been prescribed as cures for everything from snake bites to the pangs of unrequited love. To scientists they speak of soil types and photoperiods and offer hints about global climate change. To poets like William Blake, who saw “a world in a grain of sand / and heaven in a wild flower,” they offer a very different vision.

Flowering plants are the most widespread plant types on the landmass of our planet, with more than a quarter of a million species known and new species still being discovered. Still, when it comes to wildflowers in our national parks, most of us just drive right on by never knowing what we may be missing.

“When you take the time to look at a flower,” says Donald Davidson, a renowned botanical illustrator who runs workshops in the national parks, “you are not just looking at beauty but at natural history, human history, art, poetry—all of it.”

To do that, however, you must slow down. “The speedsters miss so much,” he says, referring to the car-bound visitors who rush from scenic overlook to scenic overlook seeking out postcard views. “Get out of the car, look closely. There is so much to see and learn from wildflowers. It may take a little patience, but the genius is in the details.”

And maybe heaven really is in a wildflower, if only we would slow down and look.





THE SMOKY MOUNTAINS COME ALIVE in springtime, blooming with trillium, bloodroot (below), and spotted jewelweed (bottom)

© BILL LEA

GREAT SMOKY MOUNTAINS NATIONAL PARK • North Carolina and Tennessee

Call it Wildflower National Park. “The diversity of plants in the Smokies is dazzling,” says Peter White, author of *Wildflowers of the Smokies*. “Some 1,660 kinds of flowering plants are found in Great Smoky Mountains National Park—more than in any other North American national park, even though a number of other parks are considerably larger.” With a temperate climate, hidden grottos and waterfalls, and elevations ranging from 875 feet to 6,643 feet, something is almost always in bloom in the Smokies.

Spring ephemerals emerge in the valleys and along the creek sides as early as February. Look for trillium, hepaticas, fire pink, lady slippers, and bleeding heart, even as the high peaks are still blanketed in snow. Along the Porters Creek Trail, the sound of rushing water provides the background for a setting dominated by dwarf iris, bloodroot, Robin’s plantain, rue anemone, and whole trailsides dusted with drifts of spring beauty.

By early summer, blossoms rise like scented mist up the hillsides. The climbing Kanati Fork Trail or Chestnut Top Trail can lead you to displays of Dutchman’s britches, fire pink,

jewel weed, and larkspur. Higher up and deeper into the summer, look for trout lily, flame azalea, bee balm, wood sorrel, and painted trillium. By July the hillsides seem aflame with Catawba rhododendron. As summer wanes you can still find the starbursts of asters, shrouds of monkshood, and if you are not too distracted by the fall foliage, yellow flowers of witch-hazel that bloom into early winter.

Beyond their beauty, wildflowers are also closely studied for the effects of lowered air quality (there is concern that high levels of air pollution hamper a flower’s ability to attract pollinators by scent), global warming, and the influx of more than 380 invasive species already identified in the park. Learn the science in the annual Spring Wildflower Pilgrimage (www.springwildflowerpilgrimage.org, 865.436.7318), a week-long event that attracts more than 1,200 flower lovers to lectures, programs, and guided hikes among a park in bloom.



© BILL LEA



© ANN FROSCHAUER

GATES OF THE ARCTIC NATIONAL PARK • Alaska

Long-time Alaskan Ray Bane, a former ranger at Gates of the Arctic, has called summer “a lie” in the Arctic. “Winter is the truth about Alaska,” he says. But if summer is a lie, what a spectacular lie it is. Sit on a ridge in Gates of the Arctic on a warm July day and the tundra surrounding you almost buzzes with life: mountain avens nodding “yes and yes and yes” in the soft breeze, puffs of cotton grass like tufts of summer clouds, white dryad and the yellow pinwheels of arnica, the fragile petals of forget-me-nots as blue as the clear Arctic sky.

Summer is a sky-rocket season this far north—short but spectacular. In the 24-hour summer sunlight, plants can photosynthesize almost constantly, fueling an unparalleled burst of life. Still, the cold, windy conditions that dominate most of the year are never far away. You can see the fingerprints of Alaska’s “truth” in



A FROZEN ALASKAN LANDSCAPE gives way to periwinkle forget-me-nots in springtime and Alaskan cotton grass in summer.

the plants themselves. Moss campion clings like a clenched fist of purple flowers to the tundra floor to avoid the wind. The Arctic poppy is heliotropic, tracing the sun’s path with its flower head to maximize the solar rays and covering its stem in dark hairs to absorb heat. Everything that

grows in the Arctic must be tough. In 1967, seeds from a 10,000-year-old tundra lupine discovered frozen in permafrost actually germinated within 48 hours of being planted.

Without a single maintained trail, the 7.2 million acres of wilderness set above the Arctic Circle are not the kind of place to expect interpretive signs to guide you to wildflowers. Many visitors drive up the rugged Dalton Highway, which skirts the eastern edge of the park, and hike in through fields of yellow oxytrope, bluebells, and Arctic daisies. Paddling the upper reaches of the Noatak River can lead you beneath hillsides dancing with saxifrage and daubed with Indian paintbrush. In July, hiking into the popular rock-climbing routes of the Arrigetch Peaks can land you hip-deep in fireweed.

Soak it in the way the plants and animals store up energy for winter. The “truth about Alaska” is never far away.

Leave No Trace

As fragile as they are beautiful, wildflowers face a host of environmental pressures from pollution to poachers. Don’t become yet another danger. Follow these Do’s and Don’ts for flower-friendly viewing.

DO know before you go. Consult guidebooks and local experts for prime blooming seasons and locations.

DON’T pry open blossoms, spray with mist bottles to simulate dew, jostle stems to simulate wind, or in any other way manipulate plants for photographic purposes.

DO carry a magnifying glass or a macro camera lens to look closely at the beauty of flowers.

DON’T remove surrounding vegetation, rocks, or

logs for a better view. The flower may be dependent on the exact, tiny microclimates created by such things to survive.

DO carry a guidebook for field identification or photograph and identify later.

DON’T pick or remove flowers in national parks—it’s illegal.

DO stay on trails or tread lightly if you must step off-trail.

DON’T trample flowers with boots or stake your tent on top of them.



DEATH VALLEY NATIONAL PARK • California & Nevada

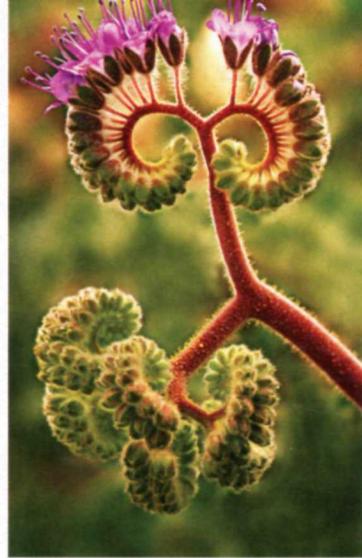
Park Ranger Charlie Callagan has learned to be careful with superlatives when it comes to the wildflower displays of Death Valley National Park. “In 1998 we had great wildflowers, and I was telling people that this was the bloom of the century,” he says. “Then in 2005, we had an even better year. People were kidding me saying, ‘Well, that was a pretty quick century!’”

At first glance, Death Valley can seem like an unlikely place for wildflowers, or much else in the way of life. With an annual average of just 1.9 inches of rain and summer temperatures as high as 134 degrees, it is one of the hottest and driest spots on the continent. Still, looks can be deceiving. There are 1,032 species of plants in this 3.3-million acre park, and under the right conditions—sufficient warmth, a lack of

moisture-robbing winds, and above-average rainfall from well-spaced storms in winter and early spring—the show can be spectacular.

In good years, the displays begin as early as mid-February at the lower elevations. Look on the valley floor and along the base of alluvial fans in the southern section of the park for desert gold, blazing star, poppies, and an array of cactus species. By April, the show has moved up the slopes of the Amargosa and Panamint Mountains where you’ll find Panamint daisies, paintbrush, desert rue, and lupine. In the final flourish in early June, the highest reaches of the park such as Dante’s View and the shoulders of Telescope Mountain are fringed with wildrose, mariposa lilies, and colorful wands of lupine.

“Even in an average year the wildflowers of Death Valley can be

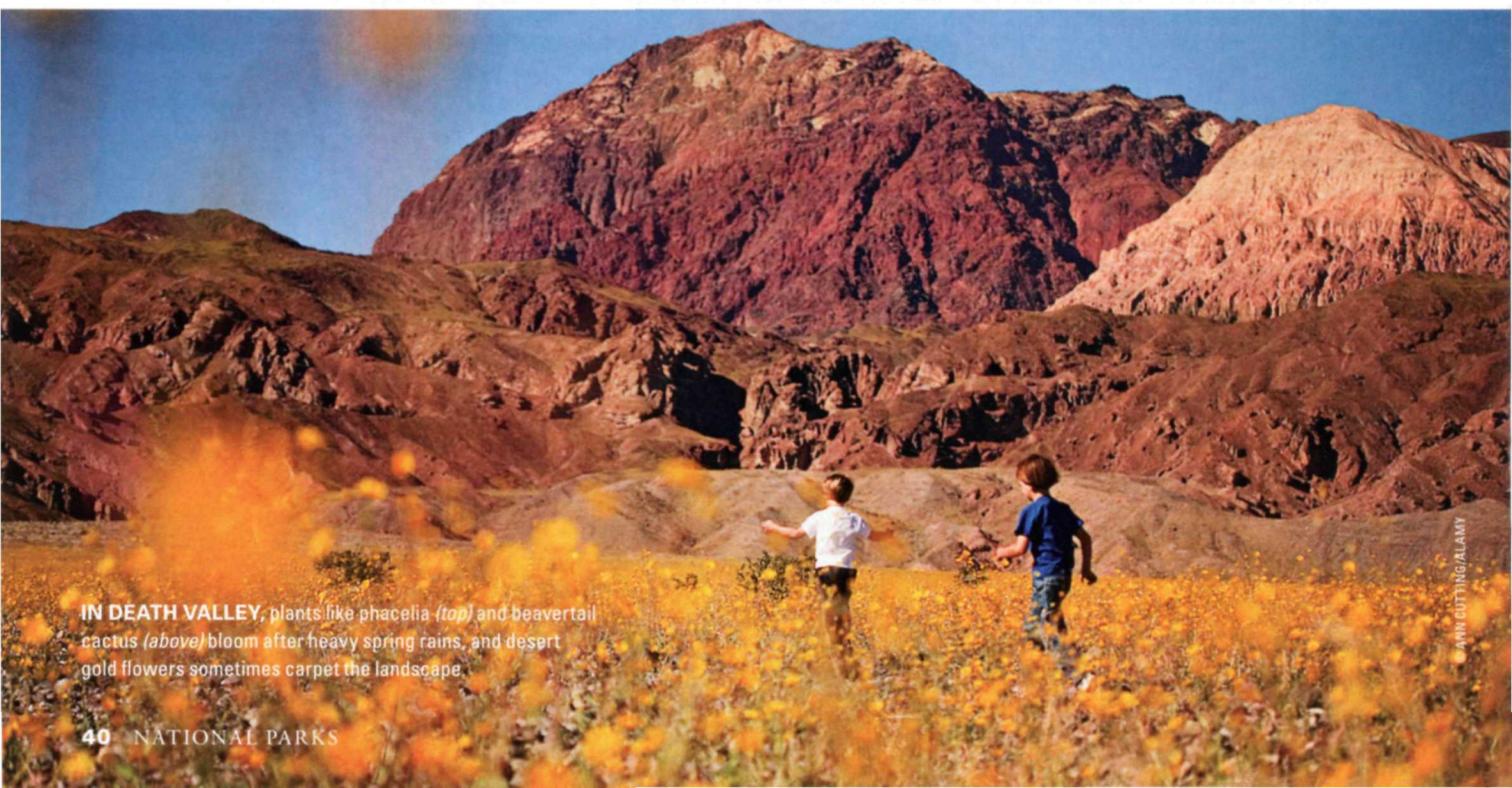


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© JOHN DITTLI

incredibly beautiful if you know where to look,” says Callagan. And just knowing that the big blooms do happen, he says, “opens our eyes to the possibilities of the desert, makes us realize that there are millions and billions of seeds out there lying dormant, just waiting for the next time the perfect storm of conditions comes along again.”



© ANN CUTTING/ALAMY

IN DEATH VALLEY, plants like phacelia (top) and beavertail cactus (above) bloom after heavy spring rains, and desert gold flowers sometimes carpet the landscape.



BLUE COLUMBINE blankets alpine meadows in the Rocky Mountains.

© ROLF NUSSBAUM/ISTOCK/AMY

ROCKY MOUNTAIN NATIONAL PARK • Colorado

A “highway to the sky” and the “highest paved road in the world,” Rocky Mountain National Park’s Trail Ridge Road has been called many things. Add one more: Wildflower Way. “There are dozens of great places to see wildflowers all over the park,” says naturalist Jared Gricoskie, who leads tours for the Rocky Mountain Nature Association and his own company Yellow Wood Guiding. “But if all you did was to drive the 48 miles of Trail Ridge, stopping at every pull out, you’d get a wonderful cross-section of the park’s flowers.”

Rocky Mountain stands more than a mile tall, stretching from 7,840 feet at the Beaver Meadows entrance to the 14,259-foot summit of Longs Peak and reaching through three major ecosystems, each with its own constellations of wildflowers. Below 9,000 feet, the wooded trails of Sprague Lake and the Gem Lake Trail shimmer with fairy slippers, western wallflower, daisies, larkspur, and buttercups blooming as early as April. A bit higher in the sub-alpine areas, columbine, silver lupine, and shooting star fringe the popular hike stringing together Nymph,

Dream, and Emerald Lakes. But the star of the show is the alpine tundra, a “world by itself in the sky,” as early conservationist Enos Mills called it. Trail Ridge Road is the pathway to that world.

Mid-July is peak season on the tundra. “At the height,” says Gricoskie, “you can’t walk ten steps without seeing a dozen different species.” There are alpine forget-me-nots, fairy primrose, phlox, blue harebell, iris, alpine sunflower. There are snow buttercups, golden draba, alp lily, and sky pilot. More than 200 varieties in all, and each one a survivor in this land above the trees where winds can top 170 miles an hour and snow can fall any month of the year. Ranger-led hikes run every day at 10 a.m. during the summer from the Alpine Visitor Center—or try self-guided hikes at the Medicine Bow, Rock Cut, or Lake Irene pull-outs areas.

It’s a short season—just six to eight weeks by the calendar—but Gricoskie uses a different measure: the Arctic gentian. “It is one of the last alpine flowers to bloom and, for me, a symbol of the season winding down,” he says. **NP**

Get Some Flower Power

Guidebooks:

General guides such as *Wildflowers of North America* by Frank D. Venning can be a good starting point; also visit the park bookstore for local guidebooks.

Websites:

Get up-to-date wildflower information for individual parks at www.nps.gov. The National Park Service also maintains the “Celebrating Wildflowers” website at www.nps.gov/plants/cw.

Wildflower Tours:

Most national parks offer ranger-led wildflower walks during peak bloom seasons. For a list of tour times and locations, contact the park’s main visitor center.



© TOMAS ZUCCARENO/AURORA

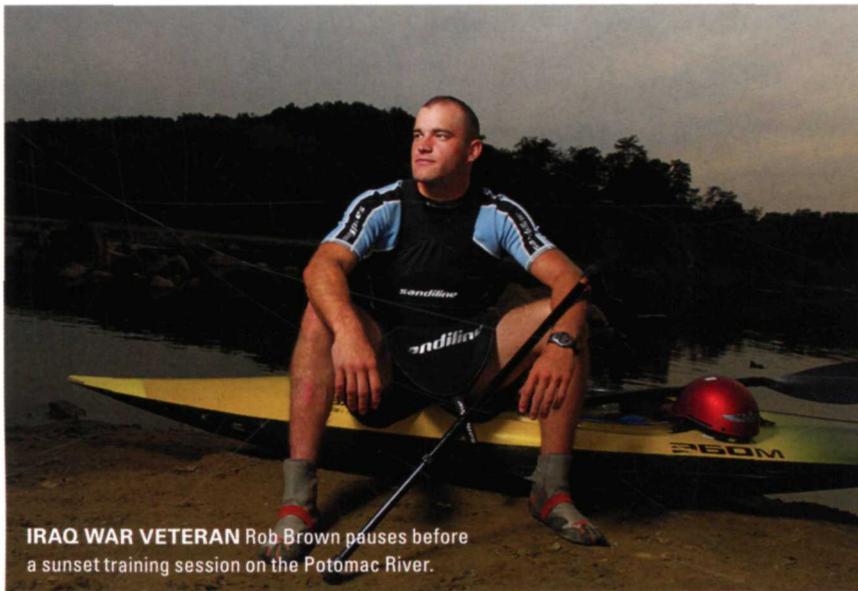
Jeff Rennicke has stopped to enjoy the wildflowers in more than 40 of our national parks.

Injured soldiers
turn to Great
Falls Park in
Maryland to
renew their
bodies, minds,
and spirits, one
paddle stroke
at a time.

HEALING WATERS



A GROUP OF KAYAKERS with Team River Runners
glides across the C&O Canal at Great Falls Park.



IRAQ WAR VETERAN Rob Brown pauses before a sunset training session on the Potomac River.

When you watch Rob Brown disappear around the river bend with the grace and speed of an Olympian, leaving every kayaker on the Potomac River in his wake, you wouldn't know that a gunshot wound in the Iraq War left his leg permanently immobile. When Troy Crawford surfs a wave like an old pro in his compact yellow kayak, you might be surprised to learn that he spent a week in March 2006 in a coma after a bomb exploded behind him in Mahmudiyah, Iraq. And if you'd seen Brandon Huff paddle technical runs on a recent trip through Grand Canyon

“When we’re
in the boat,
we’re just like
everyone else.”

—ROB BROWN

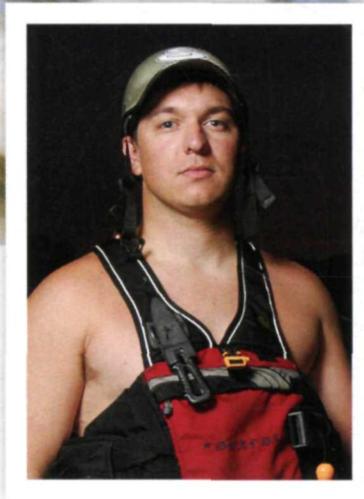
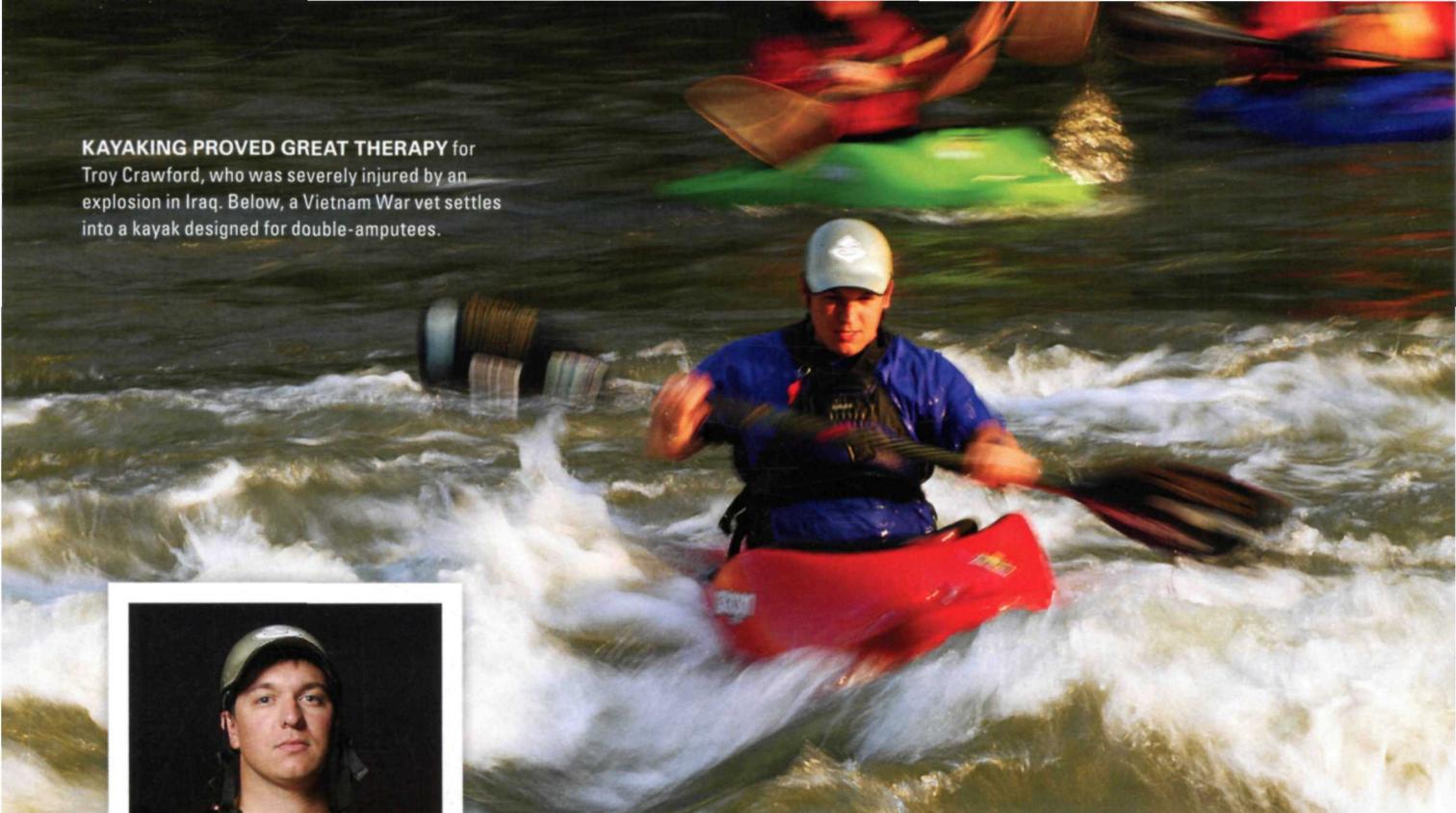
National Park in Arizona, you never would have guessed that he lost a leg in Iraq during his tour of duty.

“When we’re in the boat, we’re just like everyone else,” Brown says.

But they’re not, exactly. Because you have to be a little braver than the average person to push your body to such extremes after it’s been through such trauma. And until these three were injured, they had never paddled a kayak before in their lives.

Every day at the Walter Reed Army Medical Center just outside Washington, D.C., wounded soldiers who served in Iraq and

KAYAKING PROVED GREAT THERAPY for Troy Crawford, who was severely injured by an explosion in Iraq. Below, a Vietnam War vet settles into a kayak designed for double-amputees.



“Kayaking is a natural high. Whether you’ve run the rapid once or twenty times, you don’t know what’s gonna happen. Every time you run it, it’s different”

—TROY CRAWFORD

Afghanistan ease into physical therapy to recover from their injuries. It’s meant to be healing time—but the down time in between sessions can drive a person mad.

“When you’re in Iraq, you don’t know what’s going to happen day-to-day,” Crawford says. “Your life is on the line, and things are happening so fast. Then you get home, and you’re just lying in a hospital bed. That rush isn’t there anymore.”

In 2004, Joe Mornini and Mike McCormick—two lifelong kayakers—decided to change that. Why not share their love of kayaking with veterans? Get them in the water and teach them how to balance, paddle, and “roll” (a skill required to get upright if your kayak flips over). Rebuild their confidence. Help them reconnect with wilderness. Give them the adrenaline rush they live for. After all, you don’t need legs to paddle a boat—or even both arms, for that matter.

So Mornini and McCormick went to work collecting loaner boats and retrofitting paddles and bulkheads to be compatible with a variety of disabilities. They posted signs around the hospital and uploaded YouTube videos to the Web encouraging soldiers to get out of their beds and into the water. Walter Reed’s indoor pool came alive on Tuesday nights, with veterans practicing rolls under the careful watch of upbeat instructors, ready to duct-tape a pros-

thetic arm to a paddle if necessary. Eventually, the group got enough donations to purchase a van that could accommodate small group outings in Great Falls Park, part of the Chesapeake & Ohio Canal National Historic Park that runs through Maryland, West Virginia, and the District of Columbia. They called the program Team River Runner, and their kayaking family soon grew exponentially.

“I’m always surprised at how gung-ho these guys are,” says Mornini, the program’s director. “They just have no hesitation about trying adventurous things. They’re fearless, they do what we tell them to do, and they get very good, very fast. It’s remarkable to see someone as injured as some of these guys are jump in and start kayaking at a very high levels in a very short period of time.”

Perhaps no one matches that description more than Brown. He’s still dealing with the



“I admire their determination, but it doesn't surprise me. What surprises me is the fact that they're down and out, just like I was, and they pick themselves back up and find that one thing that gets them motivated again.”

—TROY CRAWFORD

aftermath of a bullet that ripped through his hip and sciatic nerve—permanently robbing his right leg of any sensation or mobility, and forcing doctors to amputate it last fall. “But it doesn't matter,” he says, “I'm still fast.” And it's no wonder why: Brown kayaked almost daily from November 2007 through October 2008, pausing only to enjoy Thanksgiving. His goal is to race in the Olympics in 2012.

But the progress isn't just physical—an evolution of character often takes place, too. Last July, in what Mornini calls the high point of his Team River Runner experience, he spent three weeks paddling through the Grand Canyon with Brown, Crawford, and Huff. “These guys did what they had to do to get down the canyon and help with camping—and it's hard to move around with a prosthetic leg or a cane, but they never complained. They just did everything every-

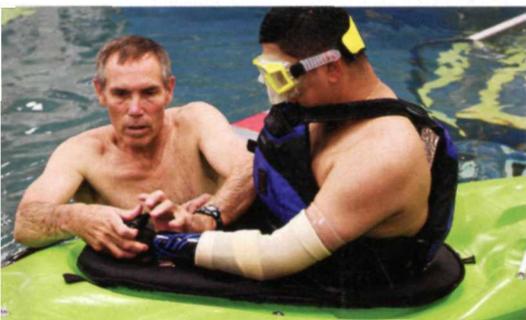
body else did. It was a wonderful experience to see that.”

When they reached Lava Falls, the longest whitewater run in the Grand Canyon, they paused to drop an object over the edge, just as so many kayakers had done before them to mark an important life shift. Mornini scattered a friend's ashes. Brown, the Olympic hopeful, tossed in his last pack of cigarettes. Crawford, the coma patient, released his Purple Heart, marking the end of one chapter of his life and the beginning of a new one. **NP**

Amy Leinbach Marquis is associate editor for *National Parks* magazine.



ROB BROWN, whose right leg was amputated several months after this picture was taken, is training for the 2012 Olympics.



TRAINING BEGINS IN THE POOL, where instructors tweak boats and paddles to accommodate various disabilities.

BY SCOTT KIRKWOOD

If you were asked to consider some of the most challenging environments facing national park managers, you might be tempted to rattle off a few extremes, like the highest point in North America or the lowest point on the continent—Denali and Death Valley, respectively—each of which is highlighted elsewhere in this issue. You might not be so quick to identify the harsh realities that exist in a place like southern Florida, where visitors go to escape their troubles, not to test their own limits. But parks surrounded by water face serious challenges unlike those that are landlocked—and those problems unfold in several of Florida's parks in simple ways you wouldn't expect, and in complicated ways that have no simple solutions.

Water Changes Everything

In 1845, when the U.S. military was completing plans for the construction of Fort Jefferson on an island 70 miles west of the Florida Keys, engineers designed a clever system to collect rainwater from the structure's roof, channel it through iron pipes, and store it in huge cisterns underground. Decades later, the staff at Dry Tortugas National Park still rely on some of those cisterns to store fresh drinking water, now generated by desalinization machines.

Unfortunately, in the intervening years, the weight of the fort's 16 million bricks has caused the structure to slowly sink into the sand, cracking most of the cisterns and allowing ocean water to seep in, rendering them useless. Meanwhile, its iron pipes have expanded and they're now destroying the fort's walls from the inside, brick by brick. Shutter hinges damaged by saltwater are destroying the mortar from the outside and pulling the walls into the moat. To save the fort, the Park Service

Managing a national park is
tough enough, but when
you add water to the equation,
the challenges multiply.

JUST
ADD

THE MOAT SURROUNDING Fort Jefferson was built to minimize the impact of waves crashing against its walls, but hurricanes and salt water still take their toll on the structure, a part of Dry Tortugas National Park in Florida.

© SCOTT KIRKWOOD/NPCA

JUST ADD WATER

has pursued \$5.5 million worth of restoration work, which is expected to continue into 2010.

Even if those clever military engineers had somehow considered how time and salt water might have ravaged the structure itself, they never could have accounted for more modern-day challenges. An air conditioner in staff housing lasts no more than three or four years, which means one more new appliance to bring in and one more piece of trash to haul out from this remote island. Small armadas of asylum seekers also find their way to this little piece of paradise—Cuban refugees fleeing their homeland, who often arrive on the island in make-

shift boats called “chugs.” When the Coast Guard can’t ferry the new immigrants to the mainland and dispose of the vessels, the Park Service is forced to do the work itself, though the costs aren’t included in its operating budget.

There are, of course, modern solutions to these challenges. While most tourists make day trips to Dry Tortugas on pricey sea planes or speedy tour boats, the Park Service relies on the services of the *MV Fort Jefferson*, a \$2.5-million, 110-foot aluminum vessel with a crew of three. The annual cost of running the boat exceeds \$300,000, or about \$6,000 per 140-mile round trip. There had been talk of selling

it off and simply hiring out other vessels as needed, but when Captain Clay “Blue” Douglass took the helm in the summer of 2006, he cut costs substantially by consolidating trips and running the engine at slower speeds. (“Cargo isn’t in any hurry,” as he’s fond of saying.) With input from NPCA’s management consulting wing, the Center for Park Man-

agement (CPM), the Park Service has worked to hire out the vessel to government agencies for broader conservation work, for which they gladly pay. Eight bunks have been made available for researchers, staff, and guests, alleviating the need to house visitors in the park itself and turning the vessel into a worthy research and education platform.

And that made Matt Patterson a very happy man. As the leader of a team of 12 marine ecologists working in the Park Service’s Vital Signs program, Patterson monitors coral reefs and other natural resources for seven parks in South Florida and the Virgin Islands, and he’s found the *Fort Jefferson* invaluable.

“By using the *Fort Jefferson*, a 10-day trip with four or five biologists that used to cost more than \$30,000 now costs about \$12,000, so we can double, if not triple, the work we were able to do for the same amount of money,” says Patterson. “And we’re able to provide funding to upgrade the boat with the understanding that those upgrades will be there to serve us next year and the year after that, so we can make investments that will provide a return for years.”

A Game of Inches

Miles of open sea present obstacles for park employees in Dry Tortugas, but at the southern tip of the Everglades, Florida Bay’s problems are measured in inches of water.

“Navigating a boat on Florida Bay isn’t like boating on the open ocean or a lake that allows you to go wherever you like,” says Rob Clift, senior marine outreach coordinator for NPCA’s Florida Keys Field Office. “It’s a series of channels and shallow water basins surrounded by mudflats that are inches below the surface. For those unfamiliar with the area, it’s like navigating through a maze with walls that you can’t even see.”



FORT JEFFERSON is part of Dry Tortugas National Park, located about 70 miles west of Key West, Florida.





dollars to be towed out, either, but it's not an easy problem to fix. Many visitors spend only a few days in Florida Bay, and few even realize they're in a national park. Signage and markers in Florida Bay are often lacking or inconsistent at best. Some channels have six-foot poles on either side to indicate the correct route; others are marked with single buoys, so newcomers are often left puzzled at every turn.

But there are plans to fix those problems. Clift is conducting educational outreach to provide boaters with printed materials that should help them navigate the distinct maze of Florida Bay while protecting the natural resources that make



© SCOTT KIRKWOOD/NPCA (2)

Local guides with specialized skiffs (shallow-water boats) have developed the skills to successfully navigate the Bay, but as word of the fishing mecca has spread, thousands of anglers have come to Florida Bay with no working knowledge of its sensitive waterways. “Fifty years ago, you would have found a handful of anglers on the bay,” says Clift. “But with advent of new boats with larger engines, many people have the false sense of confidence to go to shallow parts of the bay where they really shouldn't be.”

As a result, hundreds of propeller blades have destroyed sea grass and scarred the sea bottom. It's just as devastating as taking a chainsaw to the park's mangrove trees, only this damage is all underwater.

“Sea grass is a flowering plant that acts as a natural filter, removing pollutants and making the water clean and crystal clear,” says Clift. “It also stabilizes the sediment, keeping Florida Bay from eroding away. Sea grass is an essential part of Florida Bay's complex web of life. It provides essential habitat for juvenile fish like gray snapper and invertebrates like shrimp, lobster, and stone crabs—all of which wading birds like the roseate spoonbill rely on for survival.” Sea grass is also crucial to manatees, sea turtles, and other animals that eat it or consume algae growing on the plant's surfaces.

Wayward boaters aren't too happy about getting trapped in beds of sea grass or paying hundreds of

WHEN MAKESHIFT BOATS, or “chugs,” carrying Cuban migrants arrive at Dry Tortugas, the Coast Guard is the first responder, but park employees are sometimes left to deal with the consequences. Fortunately, Captain Clay “Blue” Douglass (above) has been able to focus more on park conservation and education efforts in recent months.

it unique. You might expect boater education to be about as popular as a driver's ed course, but visitors want to make the most of every minute in the bay, and locals want to preserve the resources in their own backyard.

To that end, the Park Service is exploring the idea of a mandatory boater-education component in its the next generation of management plans. NPCA supports those efforts, and they can't come soon enough. Most anglers are thirsty for education, so Clift has given talks at local outdoor retailers and attended



© JERRY GINSBERG



© TOM STACK

NPCA'S ROB CLIFT demonstrates poling in Florida Bay, a part of Everglades National Park.

boat shows and other events, all in an effort to help boaters in Florida Bay learn how to read navigational charts, understand channel markers, “trim” their engines (raise the propeller to avoid scarring the sea bottom), and use a pole to propel their boats through very shallow areas. Believe it or not, thousands of anglers visit Florida Bay with the sole intention of not taking a single fish, but just because a fish is released doesn't mean it survives. So Clift is working to teach proper catch-and-release skills for those going after fish in Florida Bay, including highly prized species like bonefish and tarpon, which can involve a lengthy struggle.

As Everglades' managers begin crafting a general-management plan to shape the park's future, these issues and others will be put on the table. Fortunately, solutions are already emerging. “It's been a long time coming,” says Clift, “but we're on the verge of getting some real protections for Florida Bay.”

The Other Bay

Farther north, other challenges have been unfolding for a century, and they continue to evolve. In 1908, the first major canal in southern Florida was completed, connecting Lake Okeechobee to the ocean and effectively removing a stopper from a drainpipe. Since then, the so-called

River of Grass has been drained as water has been redirected to serve agriculture and developing communities in southern Florida. Wetlands have dried up, bird species have disappeared, and invasive species now run rampant. Although the impacts on Everglades National Park are well documented, fewer people are aware of the impact on the fragile ecosystem of Biscayne National Park.

Biscayne Bay, which spans 15 miles along Florida's southeastern coast, protects part of the third-largest coral reef system in the world and one of the longest stretches of mangrove forest on the Atlantic, providing habitat and nursery grounds for fish, shellfish, and crustaceans. The park is home to at least 16 threatened or endangered species, including the West Indian manatee and the American crocodile.

Snorkelers and SCUBA divers come from all over the globe to see the park's colorful reefs and species like endangered staghorn coral. But climate change is wreaking havoc on water temperatures, bleaching coral and destroying key habitats. And dozens of sunken ships, which are also a huge tourist draw, present a challenge to the park's curators. With only one person to manage millions of artifacts for the four South Florida National Parks units (including Big Cypress National Preserve)

it's impossible to catalog, retrieve, or interpret the thousands of treasures that lie beneath its waters. Park managers also face challenges brought about by the park's popularity. Although it's the largest marine park in the country, Biscayne deals with the same challenge faced by Florida Bay: Boaters often don't realize that they're in a national park. With new residents coming to Florida from all over the world, park managers have to inform a constantly growing population of visitors, so that everyone who enters park waters understands the rules and the reasons they're put in place. Boats running aground on coral reefs or in sea grass beds can do serious damage and can easily kill or injure manatees and sea turtles. Overfishing led most commercial operations to abandon the area, but fish populations remain so fragile that individual anglers can do serious damage if they're not familiar with regulations governing how many fish they can take or which juvenile fish must be released. These broader problems generally amount to funding cash-strapped outreach and enforcement, which are the focus of NPCA's Washington offices.

Some of the most significant threats to the park cataloged by NPCA's Center for the State of the Parks emerge from local communi-

ties—and so do the solutions. The questions often boil down to a state agency's decisions about who gets the water. Too often, the winners are housing developers and the agriculture industry.

“With development along Biscayne's shoreline and further inland, many of the area's wetlands have vanished,” says Kahlil Kettering, Biscayne Restoration program analyst for NPCA. “For centuries, those adjacent wetlands have held freshwater, which then slowly drained into Biscayne Bay, which was an estuary—a mixture of saltwater from the ocean and freshwater from the Everglades, making it a productive place for marine wildlife. But as the water has been channeled into canals to serve agricultural needs, the bay has become a saltwater lagoon.” To counter that, the water-management district occasionally pumps freshwater into the bay, but that unnatural cycle can make conditions even worse. The results take a toll on habitat that was once ideal for lobster, pink shrimp, red drum, and a number of other juvenile fish species, such as gray snapper and great barracuda.

NPCA and several other conservation groups have asked the state's water-management agency to reconsider draining farmland and dumping water into the bay so that tractors

can negotiate otherwise waterlogged fields. Years ago, 50,000 acres of farmland were irrigated with water from these canals, but that number has dropped to 1,000 acres, so the agency has agreed to review the environmental impacts of freshwater surges and weigh them against the needs of the agricultural community.

Like most every other national park in the system, Biscayne has been affected by our nation's growing energy consumption. A nuclear power plant that skirts the park uses thousands of gallons of water each day in its cooling towers, then dumps that heated water into the bay. There are plans to double the plant's capacity, but public engagement could change that.

As people continue to flock to Florida's coasts, developers are constantly announcing new plans for condominiums, and NPCA's representatives do all they can to stave off new construction that would affect the bay. Huge swaths of privately held land between Everglades and Biscayne would provide an ideal buffer for both ecosystems, so NPCA is working to find the funds to purchase those lands for conservation purposes.

Kettering is also helping engage local residents to recognize they have a stake in these decisions, too. At

a recent community event, NPCA invited a leader from a local homeowners organization to discuss how she'd formed a coalition with neighbors that stopped a developer's efforts to build condominiums on the last piece of public park land in their neighborhood. “With gatherings like that one, we're helping make people aware of the strategies they can pursue—writing their commissioners, working with the zoning board, getting a meeting with the mayor,” says Kettering. “It's not easy to compete with developers that have a lot of money, but every voice counts. When you have hundreds of people sitting in a county chamber, telling their leaders, ‘We want to change this,’ it can be quite a formidable force.” NP

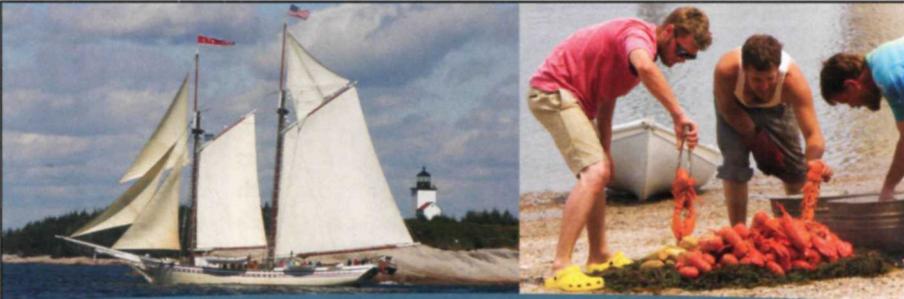
Scott Kirkwood is editor-in-chief of *National Parks* magazine.



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VISITORS TO BISCAYNE National Park (above) come for some of the country's best snorkeling and SCUBA diving, but water-management issues are putting some of that scenery in jeopardy.



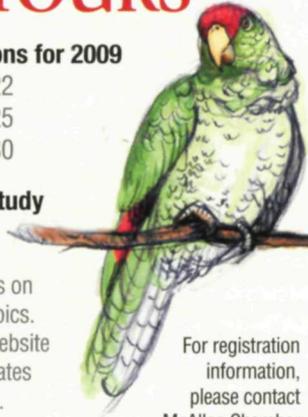
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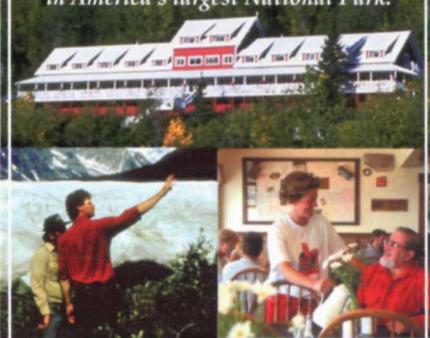
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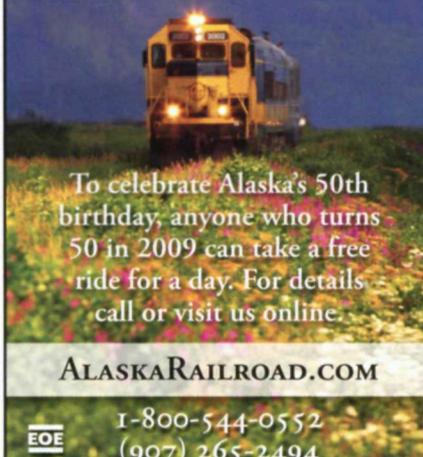
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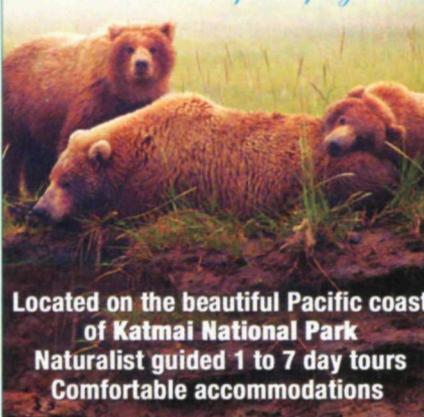
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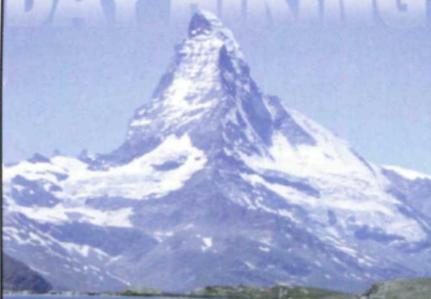
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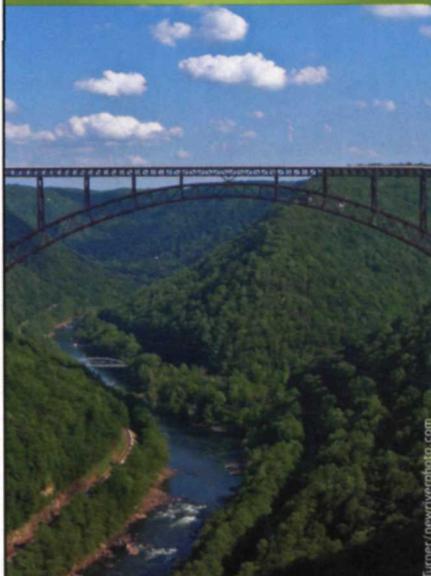
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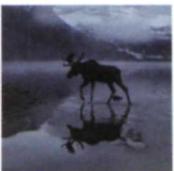
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A FLOCK OF SHEEP tended to the White House lawn during World War I.

An American Home

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—President Dwight D. Eisenhower

In 1861, when a Union militia was called in to protect the White House as tensions rose around the nation's capital, soldiers spilled from one elegant room into another, begging for food in the kitchen. In a starkly different landscape almost a century later, King George VI and Queen Elizabeth chatted privately with the Roosevelts in a

well-dressed reception room—marking the royal family's first visit since 1860. And on a summer day in 1964, the American quest for equality hit a powerful new stride when Lyndon B. Johnson sat down in the East Room to sign the Civil Rights Act.

But ordinary things happen in the White House, too. Despite the constant glare of media, the daily influx of visitors, and the stress that typically clings to those in charge of running a nation, the White House is also a refuge, a place where presidents can reconnect to the things that make them ordinary and human. Ulysses S. Grant ended each day feeding treats to his horses in the stables.

Richard Nixon spoke to the portraits of past presidents in a quiet attempt to channel their wisdom. John F. Kennedy discovered a new interest in roses.

The White House, home to America's finest leaders and stage for its most critical moments, has evolved dramatically since its construction began in 1792. When John Adams moved into the new building in November, 1800, there was no running water, and the telephone hadn't yet been invented. The East Room was a mere unfinished shell, where Abigail Adams hung laundry from clotheslines. Small dirt roads connected the sprawling mansion to a city center dominated by open, rolling terrain, with views that cascaded toward the Potomac River, interrupted only by trees and grazing livestock.

But that serene landscape changed dramatically two years into the War of 1812, when the British set fire to several government buildings—including the White House. The only object saved, thanks to Dolley Madison, was an immense portrait of George Washington hanging in the State Dining Room. (It's the oldest item in

the White House today.) Three years later, James Monroe moved back in. By 1830, the North and South Porticos had been constructed, and a century later the East Wing was created. The West Wing was rebuilt and expanded in 1934.

But changes go beyond architectural, as the character of the White House is constantly evolving from one president to the next. John Adams planted a magnolia tree, now 200 years old, with branches that fill tall windows on the dining room's south side. Franklin D. Roosevelt converted a long cloakroom into a small movie theater. Brand new bowling lanes were all the rage during Harry Truman's administration. Dwight D. Eisenhower added a putting green outside the Oval Office. And President Clinton made good use of a new jogging track encircling the South grounds' driveway.

President Woodrow Wilson's addition—a flock of sheep on the White House lawn—reflected a more austere era. It was World War I, a time of scrimping and saving

to support troops overseas, and the sheep replaced costly lawn equipment. The flock also produced enough wool to bring in \$53,000 at an auction benefitting the Red Cross.

The imprint of each great leader still hangs in the air. It's a powerful sensation, one that Jacqueline Kennedy reveled in. "I love the Lincoln Room the most," she said. "When you see that great bed, it looks like a cathedral. To touch something I know he had touched was a real link with him."

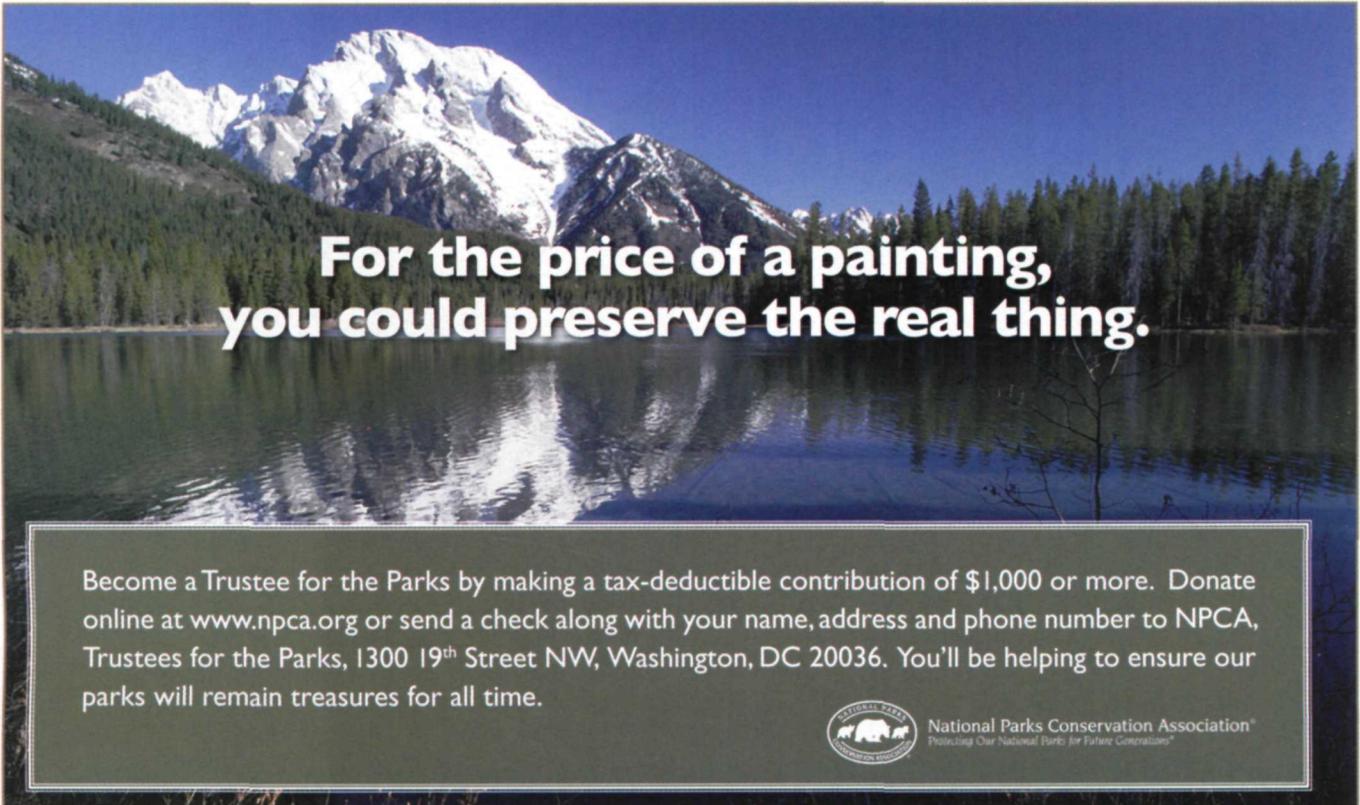
Decades later, a young, new senator named Barack Obama had a similar experience: "As I stood in the foyer and let my eyes wander down the corridors," he later wrote, "it was impossible to forget the history that had been made there—John and Bobby Kennedy huddling over the Cuban missile crisis... Lincoln alone, pacing the halls and shouldering the weight of a nation."

Today, the public can enjoy similar experiences on self-guided tours scheduled up to six months in advance through their Congressional representative's office. The

White House and the surrounding President's Park, which features Lafayette Park, Sherman Park, and the Ellipse, are all part of the National Park System. Although rangers don't offer interpretive tours inside the building, Park Service staff care for the grounds, and twice a year, you can tour the gardens for free. The Park Service also offers in-depth interpretation at the White House Visitor Center, where visitors can view a video, explore exhibits, and glimpse a collection of more than 30,000 objects, including antiques and original artwork.

As President Obama and his family move into the White House this January, they will choose items from the collection to decorate their new home, gently shaping each room to their liking as they settle into traditions that began more than two centuries ago. It's just one small way they'll make this historic house their own. NP

Amy Leinbach Marquis is associate editor of *National Parks* magazine.

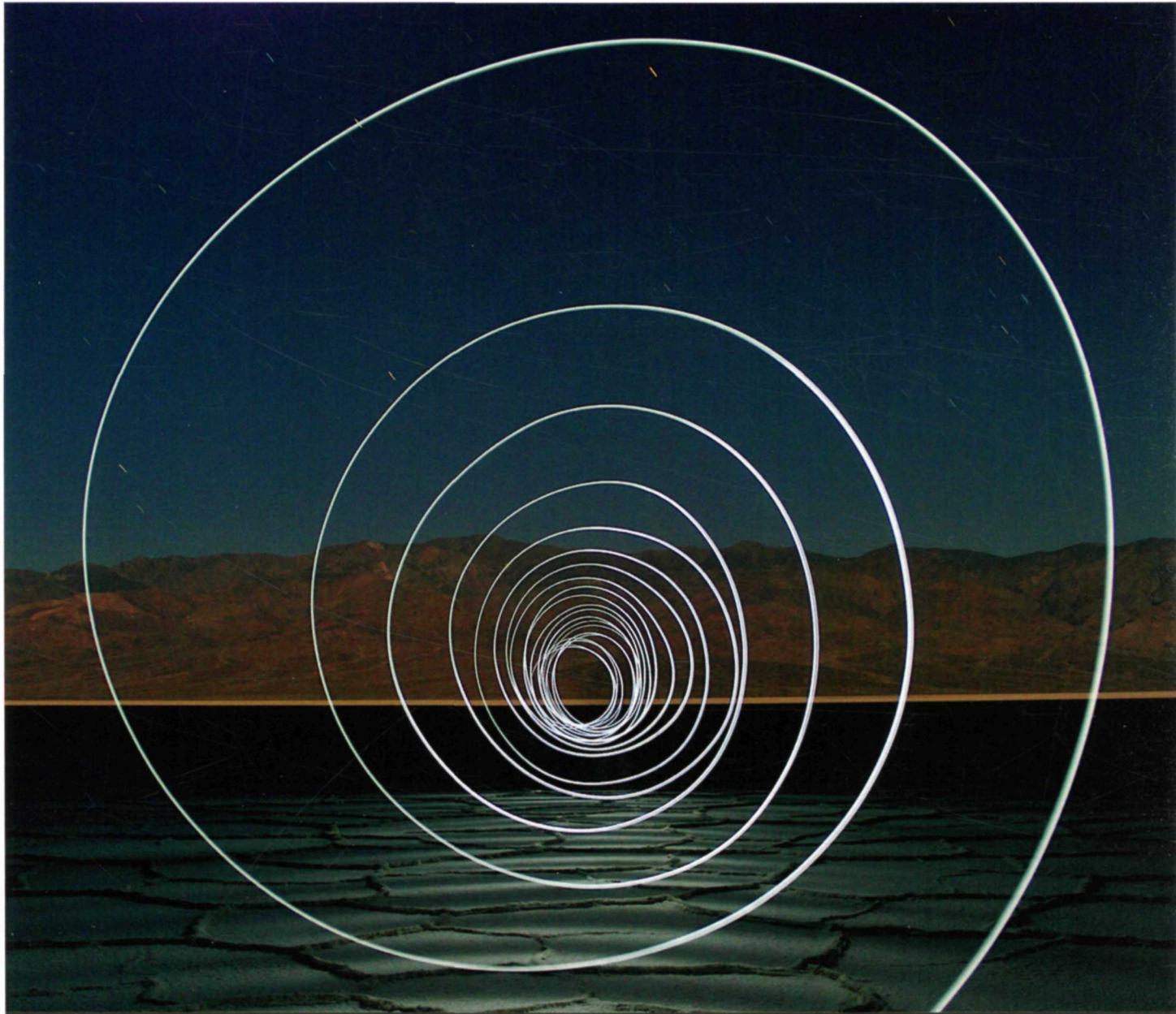


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As Germans who have traveled all over the world, we've found that some of the most impressive landscapes exist in America's national parks—and California's Death Valley National Park is one of them. It attracts so many visitors, but at night it's completely deserted. We made this photograph when we were alone and the moon was rising, its light sweeping over the salty crust and flooding the whole valley. It's an experience we'll never forget.

This spiral of light was "painted" in the air with a flashlight attached to a tent pole—one of us is actually in the frame moving it, but by wearing black clothing and exposing the photo for five minutes, we effectively disappear from view. Images like this require a lot of preparation, including searching for the right settings during the day and estimating the effects of moonlight and other sources of light. Sometimes we had to shoot until dawn to get the picture just right... but there are certainly worse ways to spend an evening.

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