

# NATIONAL PARKS



*Conservation  
Magazine*

**The Environmental Journal**

**January 1973**



# Crisis in the Parks

LIKE THE LONG ARM of a cyclone descending on a prairie town, disaster threatens the National Parks of America.

Only the President of the United States, in our opinion, can save the situation.

Impending are sweeping proposals for the reorganization of the land management agencies of the government, and specifically the National Park System. The public should have a chance to comment.

The recreation areas of the System may be "sent back to the states." The parkways may be turned over to the tender mercies of the Federal Highway Administration. The historical parks may be relegated to custodial care in an institution with other major tasks.

THE Office of Management and Budget, from which the plans are said to stem, is not the agency which should be making these decisions. The problem is how best to protect the ecological, environmental, recreational, scenic, and cultural resources of the National Park System for the benefit of the people of America. The values are intangible and cannot be translated narrowly into dollars, or statistics on visitation, nor calculated by computers.

Insofar as the Department of Interior is concerned, the recommendations of the Advisory Board to the Secretary of Interior on National Parks, Historic Sites, Buildings, and Monuments would seem to be indispensable, and enough time should be taken to obtain them.

But basically the strong hand of the President is needed to confirm the existing structure of the National Park System in its essential outlines.

This action could be taken by explicit instructions to the Secretary of Interior and the Director of the National Park Service, and would have the wholehearted support of most of the national conservation and environmental organizations.

AS WE WRITE, the appointment of Mr. Ronald H. Walker, Special Assistant to the President, on the White House staff, as the incoming Director of the National Park Service has just been announced. The resignation of Mr. George B. Hartzog, Jr., was accepted a week before, effective as of the end of the year.

We shall do everything we can to assist the new

Director in what may well be onerous responsibilities. We supported the outgoing Director, regarded him as an able public official, and regret his departure. We trust that the continuity of administration within the Service will be preserved as fully as possible by the retention of present administrative personnel.

THERE SEEMS to be general agreement that the major national parks, and all the other units within the so-called natural area category, must remain the responsibility of the Service.

The National Park Service Act of 1916 establishes a priority for the preservation of natural conditions within these parks; utilization, including recreation, must be compatible with the protection of natural conditions.

The main problem is the automobile traffic, not people. In fact, the protection of the parks can be viewed as a project for the protection of people against the traffic. This problem can be solved readily by the use of public transportation like that initiated already at Yosemite and elsewhere, and planned for access into such parks as Yellowstone.

Abundant outdoor recreational facilities, including both pedestrian and vehicular campgrounds, can be provided easily in the other public lands which surround most of the major national parks. Yellowstone is a good example, with perhaps four times as much land in the National Forests around the park as within the park itself.

The Forest Service needs to harvest the timber in these forests in such manner as to preserve their recreational potentials. This can also be done easily by applying good silvicultural practices.

What is needed is the will to utilize all the public lands, and indeed the private lands beyond them, and the development of competent interdepartmental techniques and institutions.

One rumor has the Forest Service being transferred to Interior. We think the Forest Service should stay in Agriculture; at least one-third of the timberlands of the nation are in farm woodlots and comparable small woodlands. They produce a timber crop.

THE UNITS within the so-called recreational category are by no means identical in purpose and quality. Master planning within this category can focus on, say, canoeing, and therefore on the protection of wilderness, where such uses would be fundamental.

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**NATIONAL PARKS** & *Conservation Magazine*

**The Environmental Journal**

**January 1973**

**NPCA • National Parks & Conservation Association • NPCA**

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The spectacular beauty of the tortured land forms in Death Valley National Monument offers a great variety of scenic opportunities for the curious and properly equipped visitor.

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weathered american chestnut trunk  
jack jeffers photograph

# Exploring the Canyons of Death Valley

View from Zabriskie Point in Death Valley National Monument.

ED COOPER



by Chuck Gebhardt

**A**vantage point a mile above the floor of California's Death Valley affords a view into a vast trough of heat, sand, and salt. North and south for almost 100 miles are only barrenness and desolation. This is the Death Valley most people know and talk about. But what about the ringing of the crystals on the salt pinnacles of Devil's Golfcourse, warmed by the morning sun? Or the grotesque formations of rock decorated by a palette of colors? Exploration of the hundreds of canyons and washes of Death Valley reveals a multitude of scenic surprises to belie the valley's name.

Death Valley National Monument encompasses nearly 3,000 square miles, the sixth largest unit in the National Park System. The Valley is shaped like a lopsided rectangle, oriented north-south. The actual valley is a great depression in the center of the rectangle, bordered on the east by the Grapevine, Funeral, and Black mountains and on the west by the Panamint Range. The northern third of the rectangle is between sea level and 3,000 feet elevation. Most of the southern two-thirds lies below sea level, including the lowest point in the continental United States at minus 282 feet. At the southernmost end the land rises to a few hundred feet elevation.

Geologically, the Valley lays bare a topsy-turvy world in which earth strata have been so mauled and broken that their history has never been entirely unraveled. The Valley contains twenty-one endemic plants and some unique fishes. Historically, Death Valley's gold mines and miners, prospectors, pioneers, and Indian legends epitomize the popularized Western locale. Gravesites, inactive mines, and ghostly remnants of boomtowns are scattered throughout the Valley.

The most rewarding way of travel in this desert is on foot. Graded roads lead to some of the more popular and visually dramatic canyons. Many others, equally lovely, are relatively unknown and inaccessible by automobile. Properly prepared with adequate footwear and a generous supply of water, the hiker can slip away from the tainted aroma of the blacktop world and enter the tempting coolness of these untouched canyons.

Visitors to Death Valley should plan their trips according to the seasonal changes. The depths of Death Valley are inhospitable during hot summer months (May through Oc-

tober), although the heights of the Panamint Range are comfortable. Springtime in the desert means blooming time as anywhere else, given winter rain, but the season arrives much earlier than in a temperate climate. Beavertail cactus blooms in northern Death Valley from the latter part of February to the latter part of March. Scrambling over rocks in and out of canyons to view exposed minerals is best done in southeastern Death Valley in October or November.

My walk down the length of Death Valley in the early part of 1971 was a lucky choice of time and direction. Excepting occasional heavy winds, no barriers prevented me from absorbing the profuse wildflower display, and from clear skies the sun brightened the colors of mineral-rich rock. I managed to explore a dozen or more canyons; some by accident and some by design. My excitement at my finds led me to return with a photographer to capture on film some of the exhilaration I felt in the subdued light of those canyon depths.

Anson Beman, my photographer-companion, questioned whether the clefts we explored in the mountains are really canyons, as some are very broad and shallow. Dictionaries and encyclopedias fairly closely agree that a canyon is “. . . a deep valley with precipitous sides usually with a stream at the bottom” and that a wash is “. . . the dry bed of an intermittent stream.” Anson and I found this information confusing, for less than half the “canyons” we explored have precipitous sides, and none has a stream at the bottom. On the other hand, many of our favorite canyons bear evidence of an intermittent stream path; this, then, would allow us to conclude that our canyon is just a wash. We eventually decided to leave technical definitions to the American Geological Institute and explore canyons as they were identified on our set of topographic maps.

**T**he majority of canyons in Death Valley are open-ended: they can be hiked completely through from end to end. But our more interesting explorations were into box canyons. Many of the clefts we investigated in the southern end of the Valley end suddenly at a sheer wall. In one such canyon slightly north of Badwater (scene of the point of lowest elevation) days could be spent hiking down the score of branch canyons amid the colorful displays of red and brown rock strewn about the floor. Each of the fingers of the main canyon terminates in a wall of rubble. Some of the branch clefts are so sheer that we could not see the top, while others are broad and shallow. All of these passages are difficult to maneuver because of loose rock on the floor and, in some instances, high risk of avalanche.

Of the more well-known canyons, Twenty Mule Team Canyon is a speleologist's delight. In almost every direction the surrounding hills are riddled with caves at varying elevations. We were particularly delighted with one of the caves that promised to provide excellent shelter against cold and windy nights. The entrance height is six feet, but just inside the ceiling drops to five feet. Although the cave is thirty feet deep, two persons and their gear can comfortably be accommodated in a small alcove inside the entrance. On an adjoining hillside we found another cave located higher up the mountain. This cave has quite an intricate network of passageways. The main corridor cuts into the mountain for fifty feet and then ends as abruptly as it began. On either side of the back wall, two more

corridors open into the blackness. As we explored, again and again the end of one passageway led to the beginning of several others, and soon the idea of keeping tally became ludicrous. All of the passageways were smoothly cut and strangely symmetrical, and at no time did we discover an “amphitheatre” or large room. The floors of all the caves were mysteriously level and clear of rubble. The diffused daylight from the cave opening reflected with surprising brilliance on the quartz- and mica-studded walls. Later we learned from William Clark, Death Valley Monument's park naturalist, that the caves actually are tunnels bored by prospectors in search of borax. That explained the lack of “rooms,” the level floors, and the symmetry of the passageways.

Our visit to Desolation Canyon was the most disappointing of our trip. The entrance road climbs a slight incline, turns a corner, continues on in a broad, low canyon for about a quarter of a mile, and abruptly ends. From the road surface, composed of sand several inches thick, stifling clouds of dust enveloped our vehicle when it stopped. The sides of the canyon appear as gently sloping piles of dark sand, but closer observation shows them to

*One of the better known canyons in Death Valley National Monument is Twenty Mule Team Canyon. Below is a path through one of its many side canyons, and at right is a view from the road through the canyon.*



ANSON BEMAN

be hard sandstone. Many side gullies and hillocks display the impacts of too many motorcycles and dunebuggies. I hiked a distance through a small cleft and was soon stopped by a wall of crumbling sandstone.

Farther north, we hiked to the canyon I had used as a rest area during the hot daylight hours when I had walked the Valley earlier in the year. This is a box canyon containing magnificent multicolored rock specimens that had broken off the heights above and splintered on impact. The small canyon is one of many greater and lesser canyons nestled in a huge mountain wall that is part of the Black Mountains. The larger portion of fallen, broken rock seemed to be basalt with tracings of iron and manganese minerals. At midday, when the sun is high, the canyon takes on a rainbowlike hue along its shadowed walls.

Not far distant from Desolation Canyon a rough spur road winds its way up a steep slope to a small plateau and a parking lot. From this site one may walk a short but interesting 500 yards to Natural Bridge. Natural Bridge is an arch eroded by winds and rain and sandwiched between high canyon walls. Between the parking area and the formation, the hiker, crunching along a gravel floor,

is surrounded by walls of grotesque rock formations. With slight imagination, one can visualize the configurations as a monument to all sorts of masked devils of the past. The contortions appearing in the rock strata above look much like a gallery of gargoyles.

While visiting the Keane Wonder Mine site in the high foothills of the Funeral Mountains (at which for four years in the 1900s a twenty-stamp mill processed 1,800 tons of gold ore), we came upon several small canyons of more than passing interest. A few hundred feet below the mill and beyond the aeration structure, a tiny canyon opens onto the desert. On portions of the floor and sides are masses of exposed limestone colored by algae, evidence that mineral springs once spilled over the rocks. A half mile south of the mill is a very narrow, winding canyon containing contorted rock shapes similar to those in the Natural Bridge Canyon.

Many Death Valley canyons are of greater historic than scenic significance. Surprise Canyon, in the western Panamint Range, is an outstanding example. At the end of the canyon in the high reaches of the Panamints,

ED COOPER





Panamint City rose quickly upon the discovery of silver there in 1873. A typical western boomtown, Panamint City could boast fifty murders and scores of successful robberies during its brief four years of existence. For a time, local highwaymen reigned supreme. Panamint City mine owners recognized the risk they took by shipping their ore in open freight wagons—the only conveyances available. A shortage of manpower for “shotgun riders” added to their dilemma. After many discussions a plan was developed whereby they might be able to transport the silver safely to the railhead. The silver was cast in quarter-ton balls and loaded on the wagons at the mine. Trip after trip was made through Surprise Canyon with this odd cargo, and not a theft was reported.

In my opinion Titus Canyon is by far the most beautiful canyon in Death Valley. But even within its captivating confines lies a story of a boomtown fiasco typical of the old west. The tale is set in 1925, when mining operations in Death Valley had ceased to exist except for small gleanings of talc and borax. An infamous promoter selected a site in an open, meadowlike area in central Titus Canyon, named it Leadfield, and began blasting out tunnels. He salted the tailings with lead ore and widely advertised his “find.” Illustrated handbills displayed steamships cruising up the Amargosa River to load ore at Leadfield. Investors

jumped at the bait and, without hesitation or investigation, began hauling construction materials across the Amargosa Desert from Shoshone and Beatty for buildings at Leadfield. In the meantime, the promoter became difficult to locate.

Even in those days, anyone with a passing knowledge of the area should have been aware of some basic facts concerning the Amargosa River; namely, that it is dry most of the time; that when the river is “running,” even an unloaded rowboat would have difficulty traveling any distance; that the river runs south in Nevada and north in Death Valley, while Titus Canyon runs east and west, and twenty-five miles is the closest the river comes to Leadfield.

Some of the investors’ investments still remain in Leadfield. Sturdy buildings line the hillsides, standing straight and strong as a monument to human gullibility.

Titus Canyon is entered via a one-way road from the Nevada side of the monument. Crossing twelve miles of the high Amargosa Desert, the gutted and dusty road winds uphill through narrow Red Pass on the eastern side of the Grapevine Mountains. The view from the pass is spectacular. In early morning the mountains to the north reflect the sunlight in a spectrum of brilliant colors. Splashes of red, green, yellow, and white appear upon the slopes as on an artist’s palette. Farther into the canyon and past infamous Leadfield is Klare Spring, site of a collection of petroglyphs. The fresh water spring is not unlike an oasis amid the surrounding barrenness. A short climb above the spring are excellent views of the intricately carved petroglyphs. To the south and west of the spring the wall of the canyon becomes a slope of loose, broken rock that threatens to slide onto the road at any moment. The last few very narrow miles of the canyon typify the geology of the area. Anticlines and overturned anticlines attest to the warping up and the actual lateral movement of huge segments of the earth’s surface. The forces of water are also apparent in the polished mosaic of the canyon walls. Leaving the tight mouth of the canyon, we burst upon a view of northern Death Valley and the Cottonwood Mountains to the west.

Anson Beman and I have not explored all the canyons in Death Valley. We have seen, but we have not discussed, the myriad petroglyphs in Arrastre Canyon, the endemic Panamint daisy high in Wildrose Canyon, or the polished marble and breccia of Mosaic Canyon. There still are stories to be heard about vegetable farming in Johnson Canyon, the castle of Grapevine Canyon, and the scenic grandeur of Trail Canyon. But Death Valley is a national monument, protected by law from human attempts to destroy it. For this reason its canyons and the tales of its history will change little in our lifetimes and will be there whenever time permits us to return. ■

Chuck Gebhardt has been an avid camper, hiker, and backpacker for over twenty-five years. He logged an average of 300 miles during each of the past four years backpacking in the Cascade, Sierra, and Santa Lucia mountains. In early 1971 he became the first backpacker to walk the length of Death Valley unaided. His first book, *Inside Death Valley* (soon to be published), is an outgrowth of that trek.

*Sand dunes and patterns of salt evaporation are familiar sights on the floor of Death Valley National Monument. The photograph below was taken from Dante’s View. Successive waves of prospectors came to Death Valley in search of valuable minerals, but none of the ore strikes, including borax, the “white gold of the desert.” was substantial enough to support a permanent community. Below left, an abandoned railroad line.*

PHOTOGRAPHS BY ED COOPER



# INTO MAMMOTH CAVE — THE HARD WAY

by Patricia P. Crowther



Pat Crowther has a degree in physics from Massachusetts Institute of Technology and is a computer programmer taking time out to rear two children. She is a member of the Cave Research Foundation, heads its publication mailing office, and with her husband Will is codirector of its cartographic program. Before she became active in Cave Research Foundation activities in the spring of 1969, she had tackled several of the harder climbs in eastern rock-climbing areas. She assisted in the exploration of Skull and McFails caves in New York, among the most difficult in the northeast.

“I’ll never do anything like this again,” I muttered through chattering teeth. I was lying on my back on the sloping mud floor digging, trying to make a cave passage bigger to let me through. We were searching for an underground route to connect the eighty-six-mile-long Flint Ridge Cave System with Mammoth Cave, nearly sixty miles long. I pushed forward and slid down the mud, my shoulder jammed in a tight spot. I tried to move back, but it was too cramped to use my arms. Claustrophobia had never bothered me before, or I would not have been exploring these caves. But panic was setting in. STOP. Calm down. Relax. I was panting, dizzy with hyperventilation. Mammoth Cave might be just beyond my dig, but I didn’t care—I wanted out.

When breathing returned to normal, I squirmed back by wiggling all of my body. I crawled out of the hole in the ceiling and sat for a long time on the mud bank with my feet in the stream, shaking with adrenaline reaction.

It was May 1972, and I was on an exploration trip deep inside the Flint Ridge Cave System in Kentucky’s Mammoth Cave National Park. We had entered the cave through the Austin Entrance, about two miles to the northeast on a beeline, but four miles and eight hours away through the maze of wild cave passageways. Ours was one of six survey parties fielded by the Cave Research Foundation that weekend. We were surveying and checking passages that would go on the map to make this baffling cave more understandable. And we hoped we would find a lead to Mammoth Cave.

Foot after foot of passage had been surveyed by hundreds of teams like ours over an eighteen-year period. Each new segment of map produced new insight into the cave’s pattern and processes. Then a new team would discover an overlooked hole or a side passage and add to our knowledge. Because you can’t see a cave from the surface of the land, the map is basic to all scientific studies—and surveying is the only way to get a map. The Cave Research Foundation (CRF) had been surveying and supporting science projects in cooperation with the National Park Service since 1959.

My husband Will and I had gone on outings together in my undergraduate days at M.I.T. He patiently taught me to rock-climb vertical walls in the Shawangunk Mountains in New York and to ski New Hampshire slopes in winter. Even on our honeymoon we explored Breathing Cave in Virginia, a long, confusing labyrinth. When a couple of our friends recruited us to join the field trips of CRF in Mammoth Cave National Park in 1969, we eagerly locked up our house and headed southwest. They promised us the cave trip of a lifetime, but we weren’t prepared for what we found.

The Foundation rents some old buildings inside the national park, from which they conduct a field program.



We met archaeologists from St. Louis, a laser scientist from New Mexico, and an advertising man from Ohio. Some brought their children along. These joint venturers, as they are called, came from all over the country to take part in scheduled field trips. Mostly these men and women mapped the cave passages, but some of them helped with scientific investigations—tracing underground streams or counting cave crickets. That morning everybody had pitched in like homefolks to cook scrambled eggs and sausage for thirty people. The expedition leader assigned party leaders, who checked over our food and gear. We were off to the underground for eighteen hours.

A long, bewildering succession of big walking passages, low crawlways, deep canyons, and streams—more changes of direction than I could remember—brought us to our destination. We used a folding compass with a mirror sight and a steel measuring tape to survey from point to point. The leader taught me to mark the bearings and distances in the notebook, along with detailed sketches of passage cross sections and features such as gypsum flowers that look like white crystal orchids. The vastness and intricacy of the maze numbed my brain, yet both Will and I could feel our curiosity grow. We weren't prepared to be so perplexed, nor were we prepared for the total commitment we would develop to help unscramble this puzzle. Where did all these passages go? Could we ever understand them? And was it possible that we could ever find the needle in the haystack, the one passage in thousands that might connect the Flint Ridge and Mammoth Cave systems together?

Both the friendships we made and the cave itself brought us back repeatedly to Flint Ridge over the next three years. Will and I involved ourselves heavily in the CRF cartographic program. Our home literally became a map factory—the dining room table was stacked high with survey books, maps, and computer printouts. A new drafting table blocked the kitchen door, and the cave and topographic maps wallpapered the bedroom. One corner of the living room held a computer terminal, part of Will's work as a computer scientist and mine as a programmer. It is exciting to watch the cave "grow" before your eyes as you feed in punched-up data and see the computer plotter draw the map.

Now we were returning from the passage where I nearly got stuck. Dr. John Wilcox, a rawboned mechanical engineer from Columbus, Ohio, set a blistering pace on the way out. Good thing he did, for my resolve that this would be my last trip melted as I hurried to keep up. No time for self-pity. We had been to a survey station named Q-87, the point of farthest penetration from Flint Ridge toward Mammoth Cave. Stories John told of being only three hundred feet from a surveyed passage in Mammoth Cave made me itch to return to look for a connecting passage myself.

In July 1972 we went back to the park with Sandy and Laura, our two children. Will had written off Q-87 as a hopeless cause—we would never get through the mountain of sandstone breakdown that plugged the passage. But I went on the trip there anyway. An extra wool shirt kept me warmer in the 54° F cave, but it ripped on sharp rocks in the tight places.

After a few anxious moments in a tight virgin crawlway

I found a pretty, symmetrical dome, ten feet across and fifteen feet high, with a circular pool. Dripping water fell from a three-inch hole high on the wall. I had entered by the drain. There were no leads, but it was the first place I had been able to stand up in for a long time. I get a lot of pleasure from squeezing into a tiny hole where nobody has been before and finding something beautiful, or something that goes.

Near the beginning of the Q survey I checked out a low squeeze down to the left. It went—100 feet of new bellycrawl, practically dry—to a little pit with loud rushing water noises coming out of a small canyon in the floor. I followed the canyon, up on my side to get past an awkward tight spot, down into a pool at a crossroads with water pouring in from the left and running out at the right. I shifted down to the right and poked my head out into space. I was at the top of a waterfall, eight feet above the floor of a room, which looked huge compared to some of the places we had seen this trip. Climbing down seemed slightly tricky—not a good thing to try when nobody knew exactly where I was. My pocket compass said the drain was heading west. Wow! A real live, going lead. The trip was worth it after all.

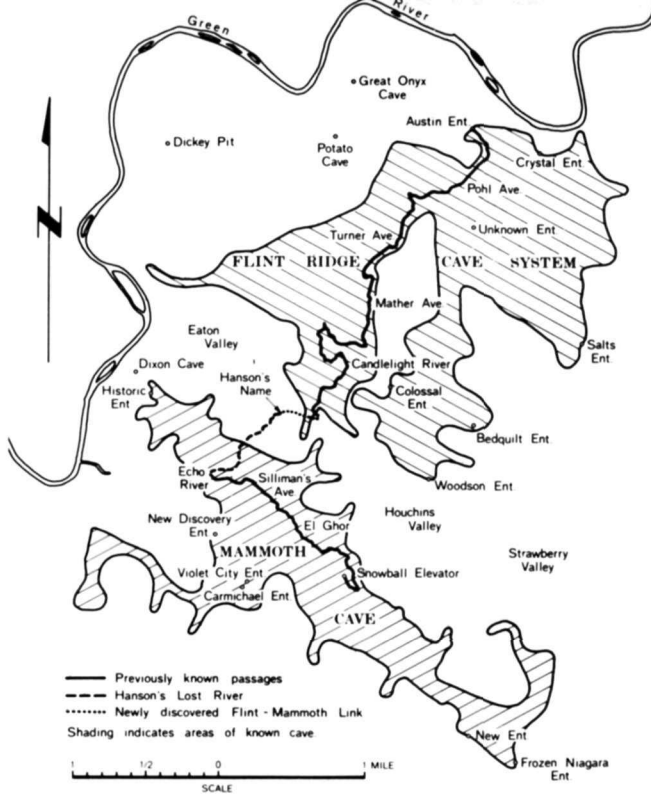
Making known these giant cave systems is a kind of relay race. The baton passes from one team to the next—trip reports, survey notes, and personal accounts pass on the accumulated knowledge to each following team.

A month later an exploration team went straight to my little drain lead heading west. They surveyed to where I had stopped, then Tom Brucker explored the drain lead while Richard Zopf coiled up the measuring tape, preparing to head back. Tom is a six-foot curly-haired nineteen-year-old who first went into caves in Mammoth Cave National Park at age three months. He is one of the most capable trip leaders in CRF and has virtually committed to memory the Mammoth Cave map. On this trip the drain led him to a river. He followed it for 1,200 feet, crawling first and eventually walking in a ten-foot-wide by eight-foot-high passage with cave blindfish and cave crayfish in the water. It was a major discovery. Tom admitted being embarrassed because he had left the compass with Zopf and did not know the direction in which the river ran.

On August 30 I was in Mammoth Cave National Park again, this time without Will. We were excited by the prospects of Tom's new river and wondered who would be chosen to go there. Expedition leader Wilcox said, "By the way, Pat, you're leading this party." I was tickled!

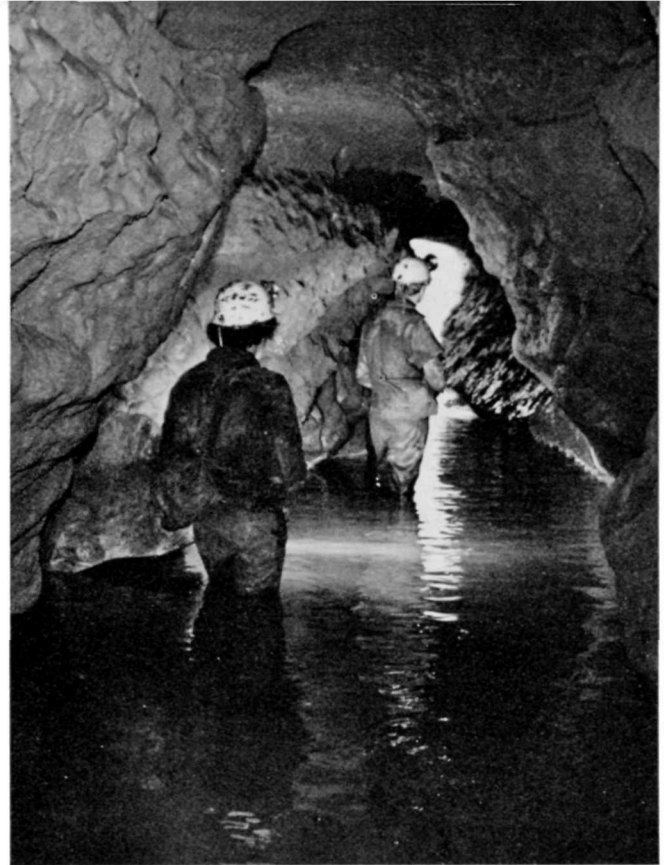
In CRF caving the party leader's word is law. So I outranked John Wilcox, who was on my party, along with Tom Brucker and Richard Zopf. This policy makes decisions perfectly clear, passes around the fun of leadership, and thus has been one reason why joint venturers return. It is highly satisfying to me to lead, to know that I am responsible for the choices I make.

We were in high spirits, singing the "Tight Tube Blues" and "Bretz River Shuffle" in a particularly echo-y canyon section of Candlelight River. (I'm glad that Richard Zopf, a young carpenter and craftsman with a bushy black beard, is a better caver than singer.) We started our survey through the drain Tom had explored and turned right at the river. We went west downstream, stoop-walking through pools with gravel sandbars. On and on. As leader I watched the



CAVE RESEARCH FOUNDATION in cooperation with the NATIONAL PARK SERVICE, 1972

*Route of the first trip connecting the Flint Ridge Cave System and Mammoth Cave, September 9-10, 1972. The surveyors started the trip from the Austin Entrance at Floyd Collins' Crystal Cave and left Mammoth Cave via the Snowball elevator.*



PHOTOS BY CAVE RESEARCH FOUNDATION EXCEPT AS NOTED

*Surveyors waded down the river connecting the Flint Ridge Cave System with Mammoth Cave.*

time, for I must turn the party around to keep to our schedule so those on the surface wouldn't start the emergency rescue procedure.

At the survey's end point we decided to look ahead for fifteen minutes and head back at 10 p.m. Tom Brucker's initials in the mudbank marked his farthest penetration, and we moved on through virgin cave. Slosh, slosh on hands and knees in shallow water, getting wetter by the minute. Ahead Tom and Richard were yelling. What for?

I reached the little room where they were pointing at a mudbank—at curious markings. There was an arrow scribed in the mud by a finger long ago, now revealed in the yellow glow of the carbide lamp. It pointed downstream, the way we were headed. And on another wall we saw scratched faint letters—PETE H. We had seen arrows like this one in Mammoth Cave! They belonged to Pete Hanson, a Mammoth Cave guide and a leader on the trip that found the New Discovery section of Mammoth Cave in 1938. We whooped for joy, for we knew we had connected with Mammoth Cave. No doubt this was Pete's farthest penetration. But where were we in Mammoth Cave?

I set a one-hour time limit to stay within our four-hour overstay grace period. We followed the stream at a brisk pace. It grew big and turned south, driving right under passages in Mammoth Cave. We walked bent over in thigh-deep water until our backs ached, and we kept walking. After a mile we could stand up briefly. The passage continued, but we were absolutely out of time. Our energy reserves were drained low. We left our initials on a wall, then shifted our minds into automatic for the five-mile return trip.

Tom said the cave was spinning around him. John's elbows were rubbed raw. Richard, the rascal, was in fine shape. I had a sore knee and hip. We left the cave as the bats were flying in for the day, and outside the golden sunrise lighted our faces.

It is an indescribable feeling, being part of the first party to enter Mammoth Cave from Flint Ridge. Something like having a baby. You have to keep reminding yourself that it's real, this new creature you have brought into the world that wasn't here yesterday. Everything else seemed new, too. After I woke up that afternoon, I listened to a Gordon Lightfoot record. The music was so beautiful it made me cry.

We were frantic to find *where* we had connected in Mammoth Cave; but, shot in mind and body, I stayed out. Wilcox led a trip in, but one of the party couldn't make it through a narrow canyon, so they returned. On the last day of this expedition I was assigned to a wet-suited trip into Mammoth's Cave's Roaring River, one of Pete Hanson's old haunts in the late 1930s, to tackle the job from the other direction. We probed and pushed. My thin, sleeveless wet suit gave little protection from the painful cold of the water. Hands wouldn't work—someone had to open my carbide lamp for me to add water. I shivered violently but pressed on. Our good crew checked every lead—there just was no connection. Frustration.

On September 9 I returned to Flint Ridge. My children were beginning to miss me, but Will jumped to the rescue; he understood how important this connection was to me and was willing to cope with the preschool chores. At the



*Cleve Pinnix and Steve Wells decipher PETE H. scratched on the wall, while Richard Zopf views Pete Hanson's arrow, both of which told them they had connected to Mammoth Cave.*





*Steve Wells views the steel pipe railing in Cascade Hall. Although tours no longer use this route, millions of Mammoth Cave visitors have passed by the little hole into Cascade Hall that leads from Flint Ridge.*

cave Wilcox had summoned a friendly bunch of strong, thin cavers: Steve Wells, who is working on his master's degree in geology; Dr. Gary Eller, a research chemist and CRF manager for Mammoth Cave operations; Cleve Pinnix, Park Service ranger and supercaver; and Richard Zopf.

John took no chances. We had four compasses and two survey tapes. He set up a leapfrog survey from the last station near PETE H. and the arrow. Three of us surveyed thirty stations, then passed the other party and resumed the next survey. All went smoothly, hour after hour. At the end of our last survey jump, we came upon the other party six-hundred feet from where we had left our initials on the previous trip. They had completed the hardest part of the survey and were ready to quit for the day. We waded on to the initials, then ahead in unfamiliar cave. After 450 feet, the mud-covered ceiling dipped to within a foot of the water. Wilcox was in front.

"The ceiling is rising. I see a tourist trail!" says Wilcox. We are yelling now. Zopf sticks on a projection. We push him hard and shove him through. We sink chest-deep in water, lay our ears next to the water, and float out into a black vault that looks like outdoors on a moonless, starless night. On the far shore we see the linear outlines of a steel pipe railing atop a manmade rock walkway. I feel weirdly disoriented seeing this artificial construction in the far reaches of the wild Flint Ridge Cave System. Where are we? Intellect screams *Mammoth Cave!* Instinct shouts *not possible!* The wading is easy, but I slip on an

underwater rock and sit in the water up to my neck, soaking the third compass. Finally we all recognize where we are—Cascade Hall near Echo River, where the boat landing used to be. Although tours no longer go this way, millions of Mammoth Cave visitors have passed by the little hole we came through.

We plunge back into the water and bring our survey on to tie it into another survey CRF had made earlier in Mammoth Cave's Cascade Hall. We joke about "driving the golden spike."

Soberly we contemplated the tough return trip; but with a grin Ranger Pinnix fished into his pack and dangled the key to the locked entrance of Mammoth Cave. We left Mammoth Cave early in the morning of September 10 by way of the elevator, thus completing the first portal-to-portal trip into Flint Ridge and out of Mammoth Cave. None of us could stop smiling, for we had just "climbed the Everest" of speleology. We posed for a souvenir photo and later relived the sixteen-hour trip in the Pinnix living room over a bottle of long-saved champagne.

When I got home later that day, it was good to be with Will again, for there was much to tell. We talked nonstop; but at midnight he went to bed, and I sat down at the teletype to tell the computer about our surveys. The plotter drew the map for me—*then* I could sleep, knowing that the new Flint Ridge-Mammoth Cave System is the most extensive in the world, with more than 144.4 miles of surveyed passages. We proved it—the hard way. ■

*Souvenir photo of the victorious party immediately after the connection trip: Back row, left to right, John Wilcox, Richard Zopf, Steve Wells, Cleve Pinnix. Front row, left to right, Gary Eller, Patricia Crowther.*



JOHN HESS

# MAN and OSPREY



# Strategies for Survival



PAUL STOUTENBERGH

**T**he osprey, that stately chocolate and white fish-hunting raptor, has become the object of some new conservation strategies aimed at relieving today's major threat to many species of birds: reproductive failure due to chlorinated hydrocarbon pesticides such as DDT and its metabolite DDE, dieldrin, and chemically related industrial compounds like the polychlorinated biphenyls (PCBs). The Environmental Protection Agency recently has banned almost all uses of DDT in the United States, and the menace of PCBs is under active investigation. There still remains, however, a vast reservoir of chlorinated hydrocarbon chemicals in American soils and waters that will be present for many years to come under the most optimistic circumstances; thus, conservation techniques may be needed for some time.

The strategies being used in the case of the osprey, *Pandion haliaetus*, and some other birds represent a departure from past conservation approaches. They entail human intervention in the reproductive processes of endangered populations of wild birds, focusing on the most threatened yet most easily manipulated stage of the life cycle: reproduction.

Various osprey colonies have been more or less hard hit by chemically induced reproductive failure and other environmental stresses. But the osprey's continued presence means that it has been less harmed than the peregrine, which now is virtually extinct as a breeding bird in the forty-eight contiguous states (*National Parks & Conservation Magazine: The Environmental Journal*, September 1972). This may be because the osprey, which eats fish, is lower on a poison-concentrating food chain than the peregrine, which tends to eat birds that eat fish.

While no osprey egg from any part of the United States or Canada which recently has been subjected to toxicological analysis has been found wholly free of chemicals, some local populations of the birds are faring far better than others. Thus biologist John Ogden of the National Park Service says that nonmigratory ospreys breeding on small Florida Bay islands off the Everglades have low amounts of poison in their eggs and exhibit a stable population. But north along the Atlantic Coast, around Long Island Sound, the osprey is declining at a precipitous rate. Other local osprey populations fall between these two extremes. Encouragingly, field workers from several areas reported small upturns in reproductive success beginning in the mid-1960s, when use of DDT in this country began to decline.

**David R. Zimmerman**

The only generally recognized standard for measuring a colony's reproductive trend is the average number of young birds fledged per active osprey nest. From a life-table analysis based on recoveries of banded ospreys, research biologist Dr. Charles Henny of the U.S. Migratory Bird Population Station at Laurel, Maryland, has calculated that the osprey must produce about 1.2 fledglings per nest each year if its numbers are to remain comfortably stable. This figure has become a benchmark by which osprey field workers can evaluate a colony's present status and the success or failure of the strategies they have employed to sustain its numbers.

One such strategy suggests, somewhat surprisingly, that manmade nest poles might be employed in certain places to keep ospreys and their eggs as far away from pesticides as possible.

The report in which this suggestion was made came from Leon Rhodes of the U.S. Fish and Wildlife Service, now assistant refuge manager of the Tennessee National Wildlife Refuge, who for several years had worked with ospreys at the Glen L. Martin National Wildlife Refuge, a 4,000-acre marsh on Smith Island in the middle of Chesapeake Bay. This island refuge is separated from coastal Maryland and Virginia by at least ten miles of deep water.

The reproductive success of the osprey around Chesapeake Bay's perimeter ranges from static in some Eastern Shore counties of Maryland to marked decline at the mouth of the Potomac River. But at the Martin Refuge in mid-bay, the situation is wholly different. There are many ospreys, and their reproductive success is extraordinarily high.

This is quite a recent development, and is the outgrowth of steps taken by Rhodes and his colleagues several years ago to see if they could improve osprey breeding conditions on the refuge. Rhodes says that prior to 1968 the virtually treeless marsh attracted few breeding ospreys. Nests were built either on beached crab traps that later might be reclaimed by crabbers, or flat on the ground where they might be washed away by high tides. To compensate for this lack of suitable nest sites, he began early in 1968 to erect manmade platforms atop ten- to fifteen-foot poles at scattered sites in the marsh.

The platforms immediately proved highly popular with the ospreys, apparently attracting not only low-nesting birds from within the refuge itself but ospreys that previously had nested elsewhere around Chesapeake Bay. In the first year, Rhodes says, "success was so astounding that ten of the twelve poles were occupied." The next year he put up more poles. More ospreys came. By 1971 the refuge had osprey pairs nesting on twenty poles, and two pairs that still preferred the ground.

These results might be dismissed as unimportant on the grounds that the sudden osprey upsurge at Smith Island only meant abandonment of other nest sites, except for one key factor: once at Smith Island, the birds' reproductive success was far greater than that of ospreys elsewhere in the bay area. In 1971, for example, the twenty-two pairs produced thirty-six fledglings. This is an average of 1.65 young per active nest—a reproductive rate avian demographer Henny says is "the best I've seen in North America."

While nothing has been proved, the strong implication of these results is that Smith Island ospreys, fishing in

LEON RHODES, BUREAU SPORT FISHERIES & WILDLIFE



relatively clean midbay waters, picked up less pesticides and so laid healthier eggs than ospreys elsewhere. The ten-mile-wide deepwater moat between the island refuge and polluted coastline may well have provided the margin of reproductive success.

Some confirmation of this theory was provided in a report on a comparably isolated osprey nursery on Gardiners Island in Long Island Sound. There a privately owned nature preserve is separated from Long Island Sound by eight miles of deep, tidal water, and there also the ospreys do most of their fishing close to home. The Gardiners Island ospreys have decreased catastrophically in the past several decades—from about 300 breeding pairs in 1948 to thirty-four pairs in 1971. However, the birds that now remain are reproducing measurably better than the essentially barren population on nearby Long Island and Connecticut shores; in 1971, poor even at Gardiners, parent birds fledged .50 young per nest; in 1970, the figure was .65, an average of nearly two-thirds of a fledgling per nest.

The waters around Gardiners Island, it is thought, may be just clean enough to permit the birds to sustain themselves. Their reproductive success has been rising broadly since the mid-60s, when DDT use was sharply curtailed on Long Island and in nearby Connecticut. Because of this improvement, Gardiners may become the last breeding sanctuary for the remnant population of Long Island Sound ospreys.

The birds' relatively stronger showing on Gardiners and Smith islands suggests that other dwindling populations might be preserved if ospreys could be lured by attractive, manmade nest poles to clean-water sanctuaries away from polluted fishing grounds. Asked if there were other federal island refuges in relatively clean water to which ospreys might be lured, Martin Refuge worker Rhodes mentioned two in the Chesapeake area of Virginia: the area around Chincoteague, a nearby island off the Atlantic Coast, and Fisherman Island, at the southern tip of the Delmarva Peninsula.

Beyond their immediate protective value the experimental studies on East Coast ospreys suggest a preliminary



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answer to the key question of where the birds pick up sterilizing doses of pesticides, and foreshadow several new protective strategies based on a tentative answer.

While efforts are being made to curtail the use of chlorinated hydrocarbon pesticides in this country, use of DDT and some other poisons continues unabated in many countries to the south. No one knows exactly where and how much these chemicals are used in Central and South America, but visiting ornithologists have reported heavy spraying in some places. Thus there is concern that attempts to sustain birds that breed in the United States by keeping them alive and cleaning up the environment might be doomed by pesticides picked up on wintering grounds.

Data presented at a recent North American Osprey Research Conference at Williamsburg, Virginia, suggest that for the osprey at least this may not always be so: that the differential dose—the amount that makes the difference between successful reproduction and failure—may be picked up in this country on the bird's breeding grounds. This indication came in part from Rhodes' work at Smith Island. The fact that his ospreys bred successfully, while those nesting on Chesapeake Bay's perimeter did not, strongly suggests that it was the pollution or poisoning of the local environment, not that of distant South America, that made the difference.

Support for this theory has come from Connecticut ornithologist Paul Spitzer, who has analyzed pesticide and PCB levels, egg mortality, and shell thickness for eggs collected at osprey colonies around Long Island Sound. He has found that eggs from particular colonies have distinctive chemical profiles.

In one location osprey eggs may have a relatively higher ratio of DDE to PCB than others. In another area shells may be thicker, while embryonic mortality remains high. Spitzer says the chemical profiles are so distinctive that he often can tell from toxicological data the locality on Long Island Sound a particular egg was laid. Such clear differences from place to place suggest, he says, that

important amounts of the chemicals that kill the birds' eggs are picked up where the eggs are laid.

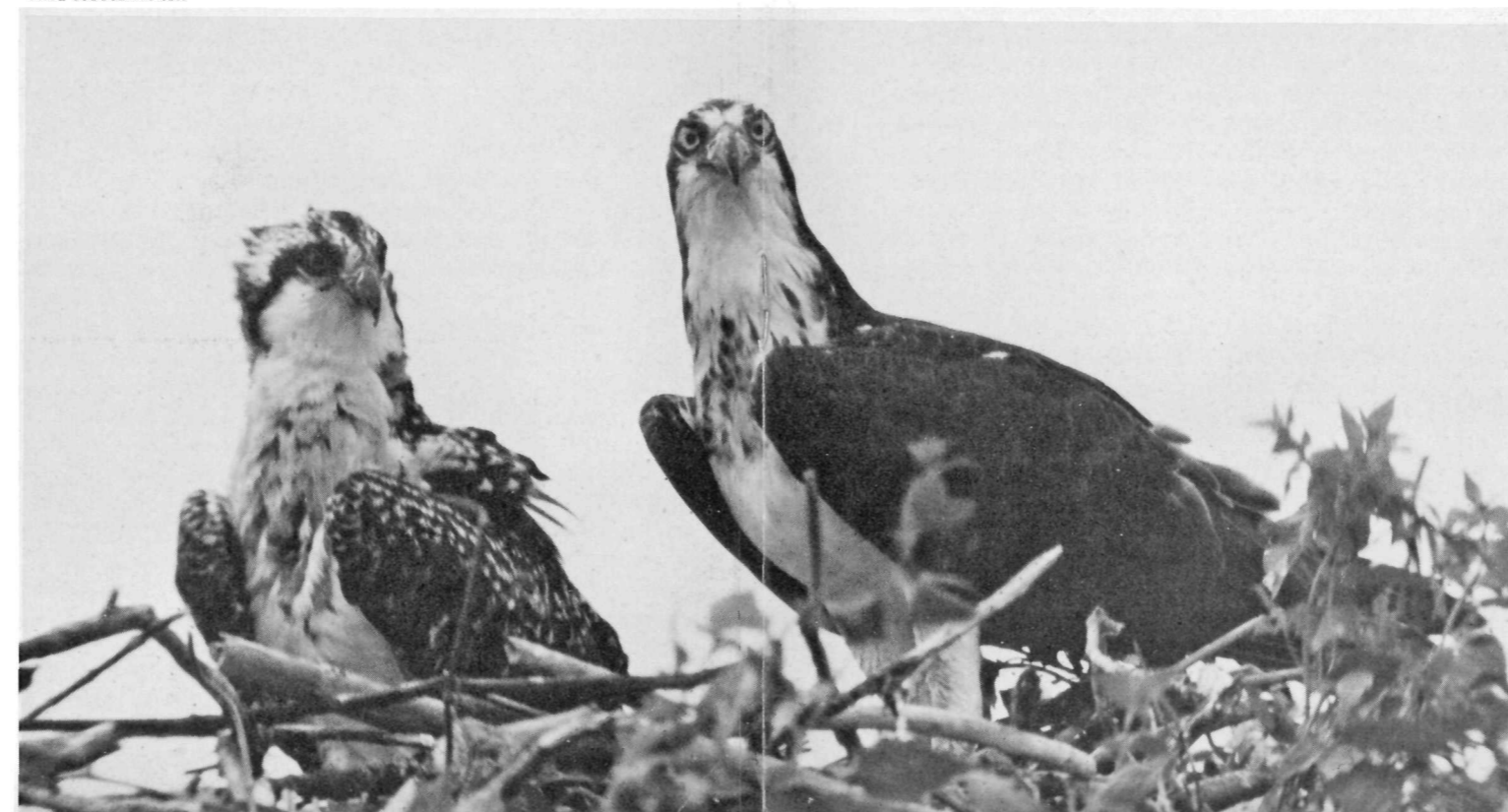
Conceivably birds that breed together might winter together, and thus pick up their distinctive chemical loads together in the south. But data collated by bird population specialist Henny strongly suggest that this is not so.

While thousands of ospreys have been banded through the years in the United States, he says, band recoveries from South America have been sparse, consisting of seventy-eight to date. Even these few findings are, however, instructive. The seventy-eight band recoveries were scattered broadcast across South America, which would tend to show that ospreys that nest close together in North America year after year may spend their winters thousands of miles apart in South America.

The winter pesticide pickup of birds from any particular breeding colony therefore tentatively appears to be nearly random, he says. So, if these birds' eggs have characteristic chemical profiles that differ from those of the eggs of birds nesting in colonies not far away, the differential amounts of chemicals must be picked up in the north, not in the south. The fact that birds that moved recently to Smith Island have healthier eggs than their former neighbors on the mainland shores of Chesapeake Bay further suggests that chemical burdens are picked up when the birds arrive for breeding, not two or three years earlier as nestlings.

Ospreys thus may pick up their egg-killing dose of chemicals between the time the female arrives at her nest site and the time she lays her eggs, a period which Dennis Puleston, of the Environmental Defense Fund, estimates at ten to fourteen days; destruction of eggs has been shown to occur within twenty-four hours after birds ingest pesticides. Whether there may be in these discoveries what Puleston's coworker Spitzer calls a "conservation strategy" that might keep the birds "clean" for these crucial two weeks remains to be seen.

PAUL STOUTENBURGH



One such strategy was suggested to the Williamsburg conference by the late Herbert Mills, who, more than any other speaker at the conference, tended to doubt that pesticides are the principal cause of the osprey's decline. "I have long felt," he said, "that the killoff of fish populations needed to support the birds was a major factor."

Because he felt the ospreys were hungry, Mills conducted an experiment: "We undertook to supply frozen menhaden at a regularly used perch near a particular nest. We began by supplying one fish each day, and it was taken immediately. Increased to two, then three, the birds picked them up as soon as we departed from the perch."

The experiment, showing that some ospreys will take proffered food, was conducted late in a breeding season rather than at its inception. Nevertheless, if newly arrived ospreys could be induced to pick up fresh fish provided by man, and if in fact fish catches during the short two-week period before egg laying provide the margin of pesticide mortality, then Mills' experiment suggests another possible conservation strategy: if relatively pesticide-free fish are put out for ospreys during the week or so before egg laying, their bodies may remain just clean enough to produce viable eggs.

This strategy has not yet been critically evaluated; but other osprey-saving ideas already have been tested and are reaching the operational stage. Thus, an approach being employed by Dr. Mitchell Byrd of the College of William and Mary and his former graduate student Robert Kennedy, now of Louisiana State University, is based on an observation reported long ago by ornithologist Arthur Cleveland Bent—that ospreys that lose their eggs lay a second clutch. The plan is to transform this behavioral observation of the egg-collecting era into what Kennedy says can be an egg-conserving method "for increasing osprey production." He calls the method "double clutching," and needless to say it is a work for the highly skilled professional only.



DAVID R. ZIMMERMAN



LEON RHODES, BUREAU SPORT FISHERIES & WILDLIFE

Briefly, first egg clutches are removed from the osprey's nest and transferred to an incubator for hatching. The parent birds meanwhile lay another clutch, which they are allowed to keep. The first-clutch eggs that hatch in the incubator are put out—as pipping eggs, or as hatchlings—under nesting ospreys whose bodies are too loaded with chemicals to produce live young of their own.

A small double-clutching experiment that Kennedy has conducted dramatically foreshadowed the technique's potential. He took eggs from three pairs of relatively "clean" birds and hatched 1.67 young per pair in the incubator. In their second clutches the parents produced 2 birds per nest for a total of 11 young, or 3.67 per productive pair—about double natural production.

In a sense, the osprey of the eastern United States has been a remarkably cooperative first raptorial patient upon whom environmentalists could work to develop strategies for its survival. Unlike similarly threatened hawks and eagles, its nests are close together and accessible. It tolerates man's presence and a certain amount of interference with its nest. The osprey lives long enough and has been declining slowly enough to allow development and trial of emergency measures before it vanishes.

Identification of the egg as both the most acutely diseased stage of the birds' lives and the manipulatable target for therapeutic intervention by experts has suggested conservation strategies that ornithologists already are exploring for other endangered or potentially endangered species, including the peregrine falcon. Much, if not all, of the desired manipulation can be conducted in cooperation with nature, without the loss of wild traits that would occur were the birds to be propagated in cages. ■

Free-lancer David R. Zimmerman has been a bird watcher for thirty years and a science writer for ten. He writes the column "Medicine Today" for the *Ladies' Home Journal* and is a contributor to the *New York Times* on ornithologic topics.



IN THE PAST FEW YEARS the concept of recycling has grown like an idea whose time has come. City governments regard recycling as a partial solution to waste disposal; lovers of wilderness like recycling because it means fewer scars from logging and mining; conservationists see recycling as a way to help save natural resources. Thousands of recycling centers have been set up and countless volunteers have separated and transported materials otherwise destined for the dump. Yet the postconsumer scrap that is recycled remains a pitifully small fraction of the postconsumer scrap material that does get recycled comes from the manufacturing sector, just as it did a decade ago before the rise of ecological voluntarism. Industry people call the recycling of postconsumer scrap an "eyedropper operation." Although the idea of recycling is doing well, actual recycling is in trouble.

# Talbot Page RECYCLING, TAXES & CONSERVATION

Recycled materials are at a disadvantage, in this country, at least, for the simple reason that their competitors enjoy special benefits. Primary, or virgin, materials—materials entering the economy for the first time—have such powerful advantages that one might wonder whether it is government policy to deplete our resources, spoil our recreation areas, and overflow our dumps as fast as possible. It is no solution to make recycled materials less expensive by voluntary contributions of labor. Secondary (recycled) materials are already so inexpensive that their price is often dominated by freight charges. The answer may be to make primary materials more expensive by eliminating their unwarranted advantages.

THE PERCENTAGE DEPLETION ALLOWANCE is perhaps the best known advantage given extractors of virgin material. The allowance permits a firm to decrease taxable income by an amount equal to a fixed percent of the sales value of the mineral product extracted. The percentage allowed varies with the type of mineral. Decades ago when percentage depletion was introduced, many firms decreased taxable income to zero by using this generous tax provision. To prevent firms from escaping tax free, Congress limited the allowance to no more than half of net taxable income (profits). Even now, if it has large annual sales of mineral products compared to net taxable income, a firm may be able to cut its income tax in half by means of the percentage depletion allowance.

Because it is based on sales value of mineral extracted rather than on costs, the depletion allowance functions like a sales tax—but a very unusual one. Instead of paying the government a fixed percent of sales, extractive firms, in effect, are paid a percentage of sales by the government. The fact that the payment is in the form of a lowered tax bill makes little difference to the extractive firm.

This "negative" sales tax applies to almost all primary minerals, not just oil and gas. Only "inexhaustible" minerals from the sea and such resources as soil, sod, and mosses are excluded. Also excluded, of course, are all secondary, recycled, or reused minerals. The allowance ranges from 22 percent for oil, sulfur, aluminum (bauxite), and many other minerals to 15 percent and 14 percent for many metals and to 5 percent for gravel, peat, and stone. Extraction of potentially toxic metals is also encouraged by the depletion allowance. Mercury and cadmium, for example, both have a 22 percent depletion allowance. Even underground water is sometimes eligible for percentage depletion.

(For several technical reasons, a particular percentage depletion rate is equivalent to a somewhat lower rate of



EPA-DOCUMENTA—GENE DANIELS

## UNCLE SAM HELPS WITH EVERY SALE



DRAWINGS BY THEODORA PAGE

*The depletion allowance operates to the advantage of the extracting industries and to the disadvantage of the recyclers. It operates rather as though the government gave 15¢ to each extracting firm for every dollar's worth of material it sells.*

a negative sales tax. For example, a lead miner would be about as well off with a 15 percent negative sales tax in place of his presently allowed 22 percent depletion allowance. A rule of thumb is that about three-fourths of the rate of percentage depletion is a pure negative sales tax.)

Even if there were no other advantages given to virgin over scrap materials, percentage depletion alone would be a considerable advantage. But percentage depletion is not alone. Several other features in tax law favor primary materials over scrap and insure that we extract too much and recycle too little.

CAPITAL GAINS is a very complicated subject, and many hundreds of pages of tax law are devoted to distinguishing capital gain income from ordinary income. Many economists, William Vickrey for one, believe that the distinctions are complicated because they are artificial and that there is no real basis on which distinctions can be made.

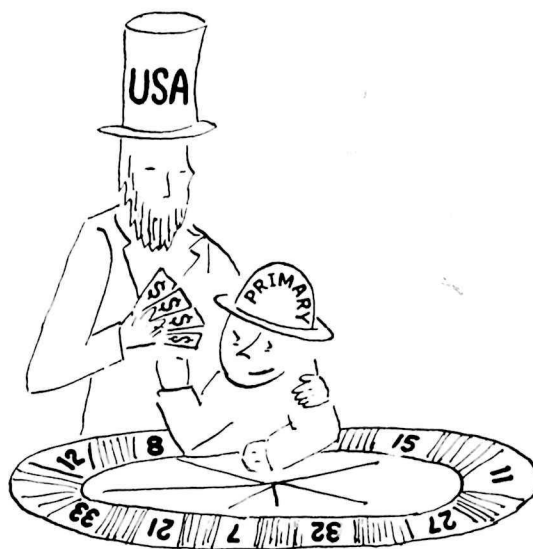
Nevertheless if a corporation is able to get its income classified as capital gains income, a very simple thing happens. Its tax rate drops considerably, often from the 48 percent rate for ordinary income to a 30 percent capital gains rate. The extractive industries benefit much more from capital gains treatment than do recycling industries. The timber industry, which does not qualify for percentage depletion, enjoys low capital gains taxation on nearly all its income. The coal industry is able to supplement its 10 percent depletion allowance with capital gains treatment on some of its income.

Here's how the capital gains provisions help the extractive industries pay lower taxes. Suppose a mining corporation prospected eleven times: the first ten were losses costing \$5 each, whereas the last was successful but also cost \$5. The corporation sells off its successful discovery for \$105, realizing a net gain of \$100 on the successful venture. Total expenses are \$55; total income \$105; net

income \$50. With a 48 percent corporate tax rate the tax would be \$24, right? Wrong because of the capital gains provisions.

With a 30 percent rate on capital gains, we might expect the tax to be  $.30 \times \$50 = \$15$ . But a mineral corporation can often do still better. Instead of calculating its tax on the aggregate total cost of \$55 and the win of \$105, it can often deduct its losses from other income and increase the amount of capital gains taken. Suppose the corporation has \$1000 of other taxable income. By deducting the cost of the ten losses (\$50), the corporation lowers the tax on ordinary income from  $.48 \times \$1,000 = \$480$  to  $.48 \times (\$1,000 - \$50) = \$456$ . With this accounting the capital gain is the win minus the cost of the successful exploration by itself. The capital gains tax on this gain ( $\$105 - \$5 = \$100$ ) is  $.30 \times \$100 = \$30$ . The effects of the eleven ventures on the corporation's tax bill are an increase of \$30 from capital gains and a decrease of  $\$480 - \$456 = \$24$  from loss offsets. The total effect is a modest tax increase of  $\$30 - \$24 = \$6$  on a total profit gain of  $\$105 - \$55 = \$50$ . In other words, the effective tax rate on the package of eleven explorations is  $6/50 = 12$  percent.

Mineral exploration, thus, is a form of gambling. When a mining corporation loses, the government allows the corporation to offset income that would otherwise be taxed at the 48 percent corporate rate. When the corporation wins, the net win is eligible for taxation at lower capital gains rates. The situation is like that of a gambler who shares his wins and losses with a partner. Every time he loses a dollar, the gambler is paid \$.48 by his partner. Every time he wins a dollar, he keeps \$.70 of it and gives only \$.30 to the partner. In the example, the tax effect is the same as if the government (the partner) gave the corporation (the gambler) \$.48 for every dollar of the ten losses ( $.48 \times \$50 = \$24$ ) and took \$.30 for every dollar of the net gain of the single win ( $.30 \times \$100 = \$30$ ).



*Mineral discovery and extraction is a form of gambling. By offering capital gains tax treatment, the government acts like a silent gambling partner who takes 30 percent of an extracting firm's wins while subsidizing 48 percent of its losses. Recycling industries do not receive such generous treatment.*

The total effect is that the "gambler" walks away from the table having given to his partner  $\$30 - \$24 = \$6$  of a net win of  $\$50$ . The government's (partner's) share of the total effort is only 12 percent, far below the rate for ordinary corporate income.

If mineral exploration is done directly through the pocketbook of a wealthy individual in the 70 percent tax bracket, as it sometimes is, the situation is even more favorable. His ten ventures would lower his *total* tax bill, because the government would share 70 percent of the losses ( $.70 \times \$50 = \$35$ ) and only 30 percent of the win ( $.30 \times \$100 = \$30$ ). The tax rate on his ten ventures would be, in effect,  $-5/50 = -10$  percent. Gambling through mineral exploration is very attractive if you are a wealthy taxpayer, though not usually as successful as in this example.

The presence of risk in the mineral industries is one of the standard arguments used to justify the percentage depletion allowance. Risk, however, is clearly an advantage with respect to the capital gains tax. Without risk there would be no unequal sharing of losses and wins by the government. In the case of petroleum exploration, considered one of the most risky industries, investors are attracted by favorable tax treatment (including, but not limited to, the capital gains provisions) to such an extent that the after-tax rate of return for petroleum is driven lower than for most other industries.

ALTHOUGH PERCENTAGE DEPLETION AND CAPITAL GAINS have received most of the attention from tax reformers and environmentalists concerned with recycling, two other provisions may be even more important.

Minerals, especially petroleum but also the other minerals, have advantages in the timing of tax payments. Many expenditures for exploration and development may be deducted from income right away instead of slowly over the life of the mine. The privilege of deducting sooner rather than later may seem at first look to be a small privilege. After all, it means only smaller taxes now and correspondingly larger taxes later. But the postponement of taxes is equivalent to an interest-free loan from the Treasury. We tend to think of the value of money in terms of the interest rate we can get at a bank, about 4 to 6 percent. The rate for a corporation is usually much higher, in the range of 14 percent. With respect to this rate of interest, an interest-free loan from the government looks very good indeed. In fact, at a 14 percent interest rate the postponement of tax for five years is almost equivalent to complete tax avoidance. (The same logic applies to expenditures for pollution control. Postponement of expenditures, even for a few years, is very valuable from a corporation's point of view.)

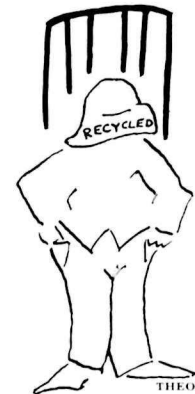
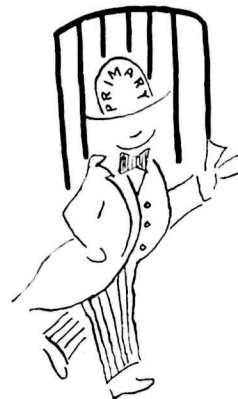
Together, the privileges of the timing of deductions and capital gains in theory can lower the tax rate for timber from 48 percent to an effective rate of 7 percent. No wonder recycled paper fiber has a difficult time competing with virgin paper fiber. Recycled-fiber companies must pay income tax at the regular 48 percent rate. One consequence of this inequity is increased pressure for logging on public lands.

The privilege of timing has escaped scrutiny because it seems innocuous. A set of provisions that receives even

less attention is the treatment of income from foreign sources. The law regarding foreign source income and foreign taxes is sufficiently complicated to dissuade public inspection and interest. This is unfortunate, for here perhaps is the largest advantage of all. Nearly all mineral companies have overseas operations, and the generous provisions concerning foreign tax credits go a long way toward keeping U.S. income taxes very low for mineral industries. Needless to say, recycling companies rarely, if ever, have the advantages of foreign tax credits.

IN ADDITION to these special tax favors, primary materials seem to move at lower rail/freight rates than do competing secondary materials. It is difficult to be certain that the freight rates are inequitable, for the transportation rate structure includes literally billions of rates, nearly all of which are inoperative, and is therefore very complex and confusing. Yet individual rates strongly suggest that scrap is discriminated against with respect to primary materials.

## R. R. TICKETS



THEODORA PAGE

*The rates for shipping many scrap materials by rail are generally higher than—in some cases more than double—the rates for corresponding virgin materials.*

The rail freight rates are controlled by the federal Interstate Commerce Commission. In early 1972 ICC approved a 2½ percent across-the-board rate hike. Some environmentalist organizations criticized ICC, pointing out that because transportation cost is a very large fraction of the total cost of recycled material at the point at which it competes with primary material, any existing discrimination by rates in favor of primary materials would be increased by the rate hike. Under threat of court suit from these organizations, including the National Parks and Conservation Association, ICC reluctantly agreed to write an environmental impact statement, as required by the National Environmental Policy Act, to analyze the conse-

quences for recycling of the rate increase and, by implication, the prevailing rate structure.

ICC's statement, a bare six pages long, was considered inadequate by the President's Council on Environmental Quality as well as by the several concerned environmentalist groups, who took ICC to court on the matter. A three-judge panel of the U.S. District Court ruled July 11 that the statement was indeed inadequate and that ICC should roll back the rate hike for scrap materials until it had prepared a statement that analyzed the effect of the rate structure on recycled materials. ICC appealed this decision of the Supreme Court in October. As of December 15 the Supreme Court had not announced whether it would hear the appeal. Meanwhile ICC has granted another general rate increase, and the environmentalists have asked the District Court to exempt recycled materials from this increase as well until ICC prepares an adequate impact statement. If the Supreme Court allows the original District Court ruling to stand, environmentalists will win a significant victory, for the lower court decision sets the precedent that pricing policy established by regulatory agencies has environmental impacts that must be taken into account.

UNDERSTANDABLY, THE TWO TRADE ASSOCIATIONS of the recycling industries—National Association of Secondary Materials Industries (NASMI) and the Institute of Scrap Iron and Steel (ISIS)—are unhappy about the present situation. Their position is that the best solution—eliminating special privileges for the extractive industries—cannot be accomplished in the present political climate. The percentage depletion allowance has been fought, off and on, for forty years, but the size of the allowance and the list of minerals it covers have increased steadily. The next best approach, according to NASMI and ISIS, is to extend the special benefits to the recycling industries.

This approach follows the traditional wisdom that it is easier to widen a tax loophole than to narrow it or eliminate it. Unfortunately, this solution suffers from the deficiency of trying to offset one evil by creating another evil. The NASMI-ISIS solution would provide incentives to extract resources as well as incentives to reuse them. In combination these incentives would tend to pump more material through the economy, encouraging too much extraction as well as more recycling, relative to an economy with no special advantages to either primary or secondary industries. The NASMI-ISIS approach undoubtedly would benefit the recycling industries, but in some ways it would aggravate our economy's material flow problems.

The conventional approach of the trade associations may sell short the prospects for a tax reform that would eliminate special privileges for primary materials. Times have changed since the First World War, when mineral exploration was believed to be gambling in the public interest. Percentage depletion was the result of efforts to exempt from taxation the gambling wins from mineral exploration. But now the view has changed and people think it is in the public interest to recycle more and extract less.

Two developments are promising for the future of tax reform. First, the government is under pressure and will be under greatly increasing pressure to broaden the tax base in order to raise money. The U.S. Treasury estimates that \$1 billion is lost due to percentage depletion alone,

and this may be a serious underestimate. Second, of course, is the taxpayers' revolt. The various tax shelters that distort the relative price of primary and secondary materials also benefit many wealthy people while the rest of us pay higher taxes. An equitable tax structure requires elimination of special privileges. Percentage depletion and extra low capital gains treatment are high on the list of tax reformers. As time goes on and the pressure for tax reform becomes more critical, the more subtle problems of timing and taxes and foreign-source income will move up the list.

Increasing pressure for tax reform will produce the traditional howls from the presently favored groups. We will hear again that mineral extraction is especially risky and that minerals are "basic" and of strategic importance for defense. However, our present policy has the effect of draining the mineral resources of the United States; and, clearly, having a little domestic oil twenty years from now also has strategic importance. Under examination, some of the arguments for tax sheltering the extractive industries have little substance—for example, the claim that percentage depletion is vital for oil exploration. The one good study that sheds light on this question, by Franklin Fisher of Massachusetts Institute of Technology, indicates that percentage depletion, or the price of crude oil, has only a very small effect on the extent of oil exploration.

Given the dismal past history of tax reform, it may seem ominous for the fate of recycling to be so closely related to the tax structure. Not only is recycling related to tax reform in a technical economic sense, but recycling and tax reform are "motherhood" issues in the sense that no one is "against" recycling any more than he is "against" tax equity. Both issues are sufficiently complicated so that a legislator, for example, can seem to be "for" tax reform when he actually is "against" it. Both issues pit the public, largely uninformed and unorganized, against the special interests, who, understandably, fight to keep their special privileges by waging massive public relations campaigns claiming the tax privileges are in the public interest and that reforms will bring various kinds of disaster.

Ironically, the outlook for recycling seems brighter as the future of mankind on earth becomes grimmer. The "disasters" forecast by the tax-favored special interests pale beside the prospect of an increasingly unlivable planet, strewn with toxic wastes and other undesirable debris. Much of the recent effort to encourage recycling is an effort to prevent just this kind of future. The relationship between recycling and the tax structure is complex, but not so complex that it escapes the attention of newly motivated environmentalists. With their weight added to tax reform pressures from other sources, the prospects for both tax reform and large-scale recycling seem somewhat brighter now than they were a mere decade ago. A more widely informed public can make them considerably brighter. ■

**Talbot Page is a research associate with Resources for the Future, an economics research organization in Washington, D.C. He obtained a PhD degree in economics from Cornell University, where his dissertation topic was pollution and congestion. The drawings were contributed by Theodora Page, married to Talbot Page and employed at Ralph Nader's Center for the Study of Responsive Law.**

**Alan F. Barney**

# **NATIONAL PARKS of COSTA RICA**

*Virgin montane wet forests surround an ancient, water-filled crater at Poas Volcano National Park.*

ALAN F. BARNEY



**M**any nations that lie to the south of the United States have recently taken important steps to secure and protect scenically and scientifically important portions of their national lands. Not least among these nations has been the small republic of Costa Rica which over the past two years has been able to establish, with the assistance of a number of national and international organizations, four national parks and one area specifically designated as a nature reserve. All of these units are oriented primarily toward protection and preservation of native flora and fauna, including species that are or might become rare or endangered. The new units are administered by the Costa Rican National Parks Department, a part of the Ministry of Agriculture and Livestock.

The national act establishing the National Parks Department authorized it to establish and enforce all regulations necessary to preserve natural habitat in the 81,500 acres presently under its jurisdiction. Additional national parks and reserves may be designated by executive decree of the Parks Department and the Forest Service, also in the Ministry of Agriculture. Once established, only an act of legislature can make changes in the areas.

Costa Rica's five natural areas contain plant and animal associations outstanding among the nation's wide spectrum of ecosystems. In cooperation with the Tropical Science Center and other scientific institutions, the department hopes eventually to protect and preserve representative examples of each major biological community in the country and to insure habitat for endangered wildlife. This will be an ambitious undertaking, because the wide differences in elevation, precipitation, temperature, and soil found in Costa Rica produce an enormous number of such communities, all of which are important to professional and layman alike.

The first and most highly developed of the five units also may be the most ecologically diverse. Located on the northwestern Pacific coast, Santa Rosa National Park has several vegetational associations within a tropical dry ecosystem, each association with its characteristic animals. Under a comprehensive plan drawn up by Dr. Kenton Miller of the Food and Agricultural Organization, in collaboration with Landscape Architect Keith R. Von Borstel, a Peace Corps volunteer, the park is zoned to protect its biological integrity. Tourism and associated facilities are permitted only in areas most capable of absorbing human impact.

The mangrove swamps of the park's coastal lowlands are habitat for some of the few remaining large crocodiles of the general region as well as many migratory waterfowl, among which are the blue-winged teal and the roseate spoonbill. Spectacular evergreen gallery forests dominate the terrain behind the lowlands and the terrain along park streams. During a six-month dry season the park's forests are a refuge for animals like the white-faced, spider, and howler monkeys; ocelot, collared anteater, and peccary; and the endangered Baird's tapir and Central American jaguar.

Extensive oak-forest savannas, mixed deciduous forests, and open savannas with scattered trees grow on the higher lands of the park and shelter, to a greater or lesser extent, the same species of animals during the rainy season. Also common in these plant communities are the whitetail deer



and many dry-forest birds, including the scarlet macaw, rufescent tinamou, spot-bellied bobwhite quail, great curassow, and crested guan.

The beaches of Santa Rosa also are significant as one of the world's most important nesting areas for the Pacific Ridley sea turtle, object of a recent major study. Five biologists on Peace Corps assignment are investigating, among other topics, the breeding activities of the East Pacific green and leatherback turtles, which also nest on Santa Rosa beaches. The Parks Department uses the findings of such studies to decide how human activity in the park can be planned with maximum preservation of natural resources first in mind.

Santa Rosa Park also is notable in human history as the site of a successful 1856 battle by Costa Rican peasants against invading forces from Nicaragua.

Biological Reserve Cabo Blanco lies 100 miles south of Santa Rosa Park and also is on the Pacific coast. Although the reserve is formally classed as possessing a tropical moist ecosystem, its animals and vegetation actually may be more characteristic of a tropical dry natural regime similar to that of Santa Rosa. Compared to Santa Rosa's 24,453 acres, Cabo Blanco, with 1,764 acres, might seem small; but because human intrusion is barred completely here, the variety of animal life is nearly as great as that of the larger park. Management guidelines follow recommendations of a study by Ingeniero W. Albertin made for the Organization of American States in 1962; they are supplemented by the ongoing investigations of the reserve's superintendent, Olaf Wessberg.

East of Cabo Blanco is Poas Volcano National Park, most visited unit of Costa Rica's park system. Poas is an active volcano and possesses the world's largest active crater. Its central highlands location, elevation of which exceeds 9,000 feet in places, is characterized by a montane wet vegetation rich in species of oaks. Since the most recent major eruptions of the volcano in 1952 and 1954, an interesting succession of plant species involving various



CAROL ROSS BARNEY

*Offshore breakers at Cahuita National Park indicate the presence of living coral reefs that are among the most biologically diversified in the Caribbean Sea. In the distance is Cahuita Point, clothed by virgin tropical moist forest.*

ferns, mosses, and members of the genus *Vaccinium* has been developing. Attractive because of this vegetation and other unusual plants as well as numerous unusual animals, Poas is a major Costa Rican site for biological field studies. Among its animals are the rare quetzal, again the endangered Baird's tapir and the jaguar, the brocket deer, and the Poas mountain squirrel, unique to the volcano. Noteworthy plants also include many epiphytic orchids and bromeliads.

A dormant crater in the park—higher than the active Poas crater—is filled with water and surrounded by magnificent virgin forest. Both lagoon and forest are being studied by a British ecologist who lives in the park; and here again guidelines for wise land use have been established in a comprehensive plan developed by director of the Costa Rican National Parks Department, Ingeniero Mario Andres Boza.

Costa Rica's other two national parks are located along the Caribbean coast. The first, Tortuguero, is one of the last two well-protected nesting grounds in the Caribbean for the Atlantic green sea turtle, an endangered reptile whose life history and future prospects have been studied and publicized by Dr. Archie Carr of the Caribbean Conservation Corporation and the University of Florida.

Inland, Tortuguero Park preserves in virgin state nearly 46,460 acres of towering forests and miles of freshwater lagoons, representing the tropical wet ecosystem. Park lands are replete with colorful birds like toucans, parrots, and macaws; the same three species of monkey found in Santa Rosa; water turtles, cayman, and many game fishes. Three endangered species of mammalia—the giant anteater, the manatee, and Baird's tapir—also are denizens of this park, as are the jaguar, mountain lion, and ocelot. In addition to the Atlantic green sea turtle, two other endangered marine turtles—the leatherback and the Atlantic hawksbill—nest on Tortuguero's coast.

South of Tortuguero, Cahuita National Park has one of the best examples of living offshore barrier reefs in the Caribbean. Cahuita, much smaller than Tortuguero and with a smaller proportion of virgin land, is less rich in terrestrial species of plants and animals. Its barrier reefs, however, contain a wealth of sea animals and marine vegetation that may be unequaled along the Central American coast. Turtle grasses on its reefs are an important feeding ground for the Atlantic hawksbill. A marine biologist of the Costa Rican Parks Department currently is making an exhaustive study of the park, whose tourist facilities were developed with a view toward maximum protection of biological features.

In coordination with wide-ranging field studies, a Costa Rican Parks Department planning team—consisting of park planner, landscape architect, architect, and visitor analyst—continually revises development plans and initiates new ones to better coincide with park conservation needs. To foster a conservation ethic among the citizens of Costa Rica, the Parks Department conducts an educational program in public schools and in the University of Costa Rica, promotes its cause in the national press, and will soon open two well-planned visitor education centers in Santa Rosa and Poas national parks.

The department also works with investigators at the university and with students engaged in tropical science programs to encourage field research projects within park boundaries, and also an interest, national and international, in the department's biological preservation programs. Its goal of national conservation through research, planning, and public education seems well on its way to success.

**Alan F. Barney was a U.S. Peace Corps volunteer on assignment with the Costa Rican Department of Parks when this article was written. He holds a graduate degree in botany from the University of Illinois.**

# NPCA at work

**Some Conference resolutions** The Second World Conference on National Parks, meeting in September at Grand Teton National Park in Wyoming, passed a number of resolutions on national park matters and the conservation of various types of ecosystems. Three of these, at least, on the management or establishment of parks, seem of particular interest to NPCA members, since they bear both on matters currently of great concern in our own national park system and on the possible establishment of a very large world park.

One of the resolutions recognized the great increase of various kinds of vehicles in park or other categories of protected lands—the private automobile, boats, aircraft, and especially the many kinds of conveyances generally known as off-road or all-terrain vehicles. In this case the recommendation was strict government control to eliminate disturbance and damage to animal communities and other park values.

Another issue concerned exploitation and development in parks and other reservations, including among other things hunting, roadbuilding, and provision of visitor accommodations and recreational facilities. These subjects, too, are much on the minds of environmentalists in America today as our own park system moves into its second century. On these matters the conference urged all governments to respect the integrity of parklands and to move effectively against inappropriate and unnecessary intrusions.

A third resolution addressed itself to the establishment of the first truly world park, to include all of Antarctica “and the surrounding seas,” to be managed under auspices of the United Nations. The conference went on record as recognizing the great scientific and esthetic values of Antarctica’s as yet largely undisturbed ecosystems. It recognized also that the existing Antarctic Treaty provides a considerable measure of protection for these ecosystems. However, the conference felt that the second century of the national park movement would be an appropriate period for a vastly expanded concept of the park idea. It pointed out that Antarctica seems especially well suited to the world park idea, and it recommended that nations signatory to the Antarctic Treaty negotiate toward such a park.

**More on owls** As reported in the November Magazine, NPCA had recent occasion to protest sharply a change in Interior Department policy that not only would allow the taking of a number of species of so-called “nuisance” birds—blackbirds, grackles, crows, and magpies—but also would include horned owls in that category (in spite of the fact that Congress was at the time considering complete protection for hawks and owls). As of early November the Association had received no response from Interior’s Bureau of Sport Fisheries and Wildlife, that initiated the *Federal Register* notice—without, it may be noted, allowing opportunity for public comment on the grounds that the action was obviously in the public interest.

Now a further remarkable action has been accomplished by the Bureau in the *Federal Register*: elimination of all

restrictions on the taking of birds of prey, including owls, that are covered by the U.S.–Mexico Migratory Bird Treaty, excepting only those covered under other laws. One of the more startling features of the proposal apparently would allow the taking of any species of owl for falconry, although it is hardly apparent how the Bureau would police such a purpose even if owls were used in falconry.

NPCA has written the director of the Bureau indicating its feeling that this portion of the publication must have stemmed from editorial error and ought to be corrected. Beyond that, NPCA requested that owls of all species be placed again on the fully protected list and that the entire notice be republished in the *Federal Register* with a ninety-day period for public comment.

**Questionable philosophy** NPCA recently received a handsome brochure from the Southern Region office of the U.S. Forest Service titled *New Forests for Wildlife: How Even-Aged Management Benefits the Sportsman*, with distribution aimed at the southern pine forest region, according to the Service on inquiry by NPCA. An analysis of the publication shows it to be a thinly veiled argument for the Service’s current even-aged forest management philosophy, which in the southeastern pine forest means clearcutting.

NPCA has written the Service indicating that the brochure is filled with inaccurate and misleading statements designed to support the practice of large-block clearcutting. Among other things, said NPCA, the statements do an injustice to the Service’s many competent wildlife management specialists, who are well aware that wildlife is maximized by maximizing forest edge and diversity—a concept spelled out specifically in Leopold’s law of interspersion of cover types.

NPCA’s letter praised the Service for some commendable efforts noted in the brochure—leaving den, nest, and food producing trees and the creation of wildlife openings. It suggested, however, that the need for these practices might be reduced dramatically if the Service substituted a policy of small-patch cutting for large-block clearcutting. In summary, NPCA objected strongly to the brochure’s use of alleged wildlife benefits as an implied justification for continued clearcutting when there exist much better forestry techniques for enhancing wildlife populations.

**River channelization** The Corps of Engineers currently has plans for ditching and channelizing the Cache River Bayou Deview Basin in Arkansas to create new farmlands in the area. NPCA has written the appropriate district engineer for the Corps indicating its concern over the project, first because of its environmental impact—downstream flooding, soil erosion, and loss of fish and wildlife habitat—and in addition over the question of bringing new croplands into production while other governmental agencies encourage retirement of croplands to reduce surpluses.

The Cache River project will be particularly damaging to Arkansas wintering grounds for large concentrations of waterfowl, NPCA noted; it also will cause considerable





"Yoo hoo . . . It's the family we met at the national park this summer."

destruction of forest lands. NPCA requested a copy of the Corps' final environmental impact statement on the project, and in addition any documents or views on the matter that may have been submitted to the Corps by other federal agencies, or by state or local conservation agencies, under the requirements of the national Fish and Wildlife Coordination Act.

**Yellowstone buffalo herd** A serious threat to Yellowstone National Park's buffalo herd, the only naturally controlled, free-ranging herd in the country, is posed by a Department of Agriculture program for the elimination of brucellosis in domestic cattle.

The department proposes as part of its eradication program to corral and test the Yellowstone herd and slaughter those animals found infected with the organism, *Brucella abortus*. NPCA has written Secretary of Agriculture Earl Butz strongly endorsing the goal of brucellosis elimination, but at the same time expressing its deep concern over both the feasibility and legality of the proposed action. The Association's letter made the following points on the matter:

"The program would be of questionable legality, since the relevant legislation effectively prohibits all killing, capturing, or taking of wild animals such as the bison within the park, except for purposes of protecting human life. . . . Any program to kill, capture, or otherwise take bison within the park must therefore be justified

by a finding that the bison constitute a threat to human life. We have significant doubts about the validity of such a finding and the assumed efficacy of the program to eliminate that threat.

"The organism *Brucella abortus* occurs in deer, elk, flies, and fleas, among other creatures. This distribution strongly suggests the existence of a natural reservoir of the organism that could never be eliminated. Therefore, even if the bison within Yellowstone could be 'certified free' of the organism, there would always be the strong possibility of reinfection at some future time. In practical terms, vigorous prosecution of the proposed program could easily lead to complete elimination of the bison in a park that is set aside to protect precisely those values represented by the wild, free-ranging bison.

"Additional doubts concerning the proposed program arise from substantial questions of fact as to whether bison are a vector transmitting [brucellosis] to cattle, and from the possibility that the organism may cause problems only in situations where susceptible animals live in high densities. Research relating to the density of animals necessary to effect spreading of the organism, and the vector transmitting the disease to cattle, coupled with research on a more effective vaccine, might obviate the alleged need for the proposed program in Yellowstone."

NPCA urged the Secretary to exhaust all potential alternatives to the Yellowstone program. It added that, were the Secretary

to proceed as presently planned, NPCA would need a copy of the environmental impact statement that should accompany such a decision.

**Scrap materials rates** We reported in September that the District Court for the District of Columbia had ruled in favor of NPCA and three other concerned organizations (Students Challenging Regulatory Agency Procedures [SCRAP], The Environmental Defense Fund, and the Izaak Walton League) on the matter of rail freight rates for recyclable materials. The court enjoined the Interstate Commerce Commission from permitting the nation's railroads to collect a 2.5 percent surcharge on transportation of such materials until the ICC had produced an adequate environmental impact statement on the subject. The four organizations had asserted that the quality of the environment would suffer if the rate advantage for raw materials was perpetuated. Several things have happened since that report.

The railroads and the ICC have filed a request in U.S. Supreme Court asking a review of the lower court decision.

NPCA and the three other organizations have filed motions in the Supreme Court requesting affirmation of the lower court's decision, or in the alternative a return of the matter to District Court for further proceedings.

The ICC has proceeded to approve a permanent rate increase, to become effective in June 1973.

The environmental groups also have filed additional motions in the lower court for further proceedings to enjoin implementation of that increase until ICC files an impact statement.

**Good news on bats** NPCA has been deeply gratified over the recent response of the Interior Department, by way of the Bureau of Sport Fisheries and Wildlife, on the Association's request for greater protection for a number of species of bats whose populations are either very low or declining in America. NPCA's letter to the Secretary of the Interior on the matter, reported in the September 1972 Magazine, gave as apparent reasons for bat declines the disturbance of roosting sites by untrained bat-banders, lack of public understanding of bats, and lack of adequate laws protecting the small mammals. In essence, NPCA urged Interior to afford bats the same protection accorded waterfowl and other migratory birds. This would mean, among other things, a U.S.-Mexican treaty on the animals.

The Bureau has written NPCA saying that as of early November it had placed a moratorium on issuance of bat bands to new banders, and on new banding projects. "Current supplies of bat bands will be issued to investigators for use in the com-



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**SAWTOOTH  
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pletion of ongoing, pertinent projects that do not involve species of bats with declining populations." Deputy Director F. V. Schmidt of the U.S. Fish and Wildlife Service told NPCA, who indicated also that the Service would soon begin exploring possibilities for developing an international treaty for the protection of American bats.

NPCA members doubtless will feel that the Department has responded to the Association's request in admirable fashion, and that in this matter the Bureau of Sport Fisheries is doing good work. Members who would like to commend Deputy Director Schmidt on the Bureau's actions may write him at the Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

**Some IUCN resolutions** Delegates to the 11th General Assembly of the International Union for the Conservation of Nature and Natural Resources at Banff, Canada, held during the past September, considered and passed many resolutions on various world environmental problems. Many of the resolutions were supported strongly by NPCA. Space limitations forbid the discussion of all of these dealt with by the Assembly; but we briefly summarize here several that either were supported by or actually were introduced by NPCA's two delegates.

One resolution concerned establishment of an International Wildlife Range of nearly twenty million acres on the northern Alaska-Canada border, essentially an expansion into neighboring Canada of the existing Arctic Wildlife Range in Alaska. The resolution noted that the unit would be of sufficient size to constitute a self-contained and stable ecological unit—a "magnificent sample of the Arctic region of great significance not only for North America but for the world." The resolution passed with the request that Canada and the U.S. bring about establishment of the range "at the earliest possible date."

Another resolution in the field of preservation focused on the need for more rapid action by coastal or island governments of the world to establish marine parks—a subject prominent in discussions at the Symposium on Conservation in the South Pacific, held at Noumea, New Caledonia, during the fall of 1971. This resolution welcomed the increasing interest that a number of nations now are taking in island and reef protection, but urged that much more should be done, particularly in the Pacific.

A third resolution addressed itself to the over-exploitation or inadvertent killing of marine mammals in international waters. On this matter NPCA took the lead in securing a strong statement, which in effect did two things: urged all nations to regulate their fishing operations to avoid unnecessary killing of porpoises and other small

cetaceans, and also urged all concerned organizations to examine closely present quotas for whales and seals and to impose a moratorium on the taking of any species for which scientific evidence does not clearly support continued killing. The resolution further suggested caution in the taking of krill (a small coldwater fish) which is favored as a food item by many species of marine mammals, especially the baleen whale. Krill currently are being taken on a large scale by factory ships in Antarctic waters.

Two resolutions submitted by NPCA's delegates passed the Assembly in slightly amended form. The first was aimed at the continuing depletion of threatened species of wildlife by commercial exploitation. It recognized the value of negotiation with industry for voluntary moratoriums and other restrictions on use of threatened species as an interim measure pending mandatory controls by governments, and urged that in negotiating such agreements no concessions detrimental to the survival of endangered species be made.

The second resolution introduced by NPCA recognized that some species or subspecies of animals and plants have become endangered partly through overuse for biological and medical research. The resolution recommended that endangered animals and plants should not be used in biomedical, zoological, or botanical research except in critically needed human health research, and then only after fully effective measures have been taken to insure survival of the species.

## conservation news

**Mrs. Cazenove Lee** NPCA regrets to inform its members of the death, on November 16, of Mrs. Cazenove Lee (Dorothy Vandergrift Lee), for many years a promi-



Mrs. Cazenove Lee



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ment Washington, D.C., environmentalist, historian, and civic leader and from 1962 to 1969 a trustee of the National Parks and Conservation Association.

Mrs. Lee was possessed of a seemingly unlimited interest in environmental and preservation matters, both in this country and abroad. Beyond her trusteeship in NPCA, she was an honorary vice-president of the Audubon Naturalist Society of the Middle Atlantic States; member of the Wilderness Society and the Chesapeake Bay Foundation; and for many years member of the National Trust for Historic Preservation and the Historical Societies of both Delaware and Virginia. She was one of the original directors of the Robert E. Lee Memorial Foundation, which restored the birthplace and ancestral home (Stratford Hall, in Westmoreland County, Virginia) of General Robert E. Lee. Despite these many and varied interests she found time to take an active part in the work of numerous civic organizations in the nation's capital.

Mrs. Lee was a native of Wilmington, Delaware, and a graduate of Wilmington Friends School and Vassar College.

**ENCONA and bison** The Environmental Coalition for North America (ENCONA), Washington-based public service organization, recently has questioned the Department of Agriculture's program for elimination of brucellosis in the United States so far as the program affects the bison herd of Yellowstone National Park. (Brucellosis is a disease of domestic cattle, among other animals, and thus falls within the Department's purview.)

ENCONA has pointed out in a letter to the Secretary of Agriculture, Earl Butz, that apparently there is a natural reservoir of brucellosis in elk, moose, whitetail deer, horses, flies, and fleas, and that the Department's proposed slaughter of up to 80 percent of the Yellowstone bison herd hardly would have much effect on the natural reservoir. "Elimination of free-ranging wild herds of elk, moose, and deer is unthinkable; elimination of flies and fleas is impossible," ENCONA told the Secretary. The Coalition also questioned the Department's assumption that the Yellowstone bison play a part in the infection of domestic cattle.

ENCONA asked the Secretary to reconsider the Department's plans for the Yellowstone herd and urged him to secure the public's interest in its protection. The letter was signed by ENCONA's chairman, A. W. Smith, who also is president of NPCA.

**Pyramid Lake order** The recent decision of a U.S. District Court judge (District of Columbia) not only may benefit the Paiute Indians of Nevada's Pyramid Lake Reservation in their long fight to save the reservation's historic Pyramid Lake from

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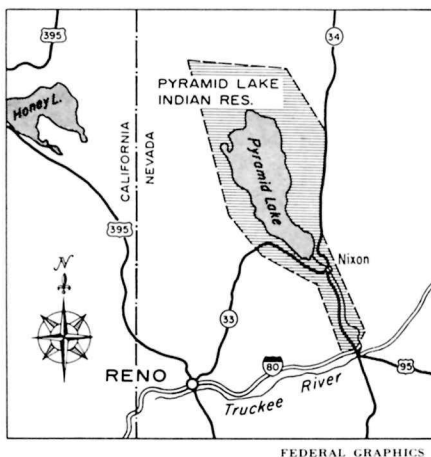
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further drainage, but eventually may prove good news for two endangered American species of fishes, one unique to the lake. The two are the Lahontan cutthroat trout and a species of large sucker, *Chasmistes cujus*, known otherwise only by its Indian name of cui-ui (pronounced quee-wee). The latter is a Pleistocene relict species known only from Pyramid Lake.

Historically the two fishes have been vital in the economy of the Pyramid Lake Paiutes, first as a food staple and later additionally as a source of revenue through sale of fishing licenses to non-Indians. The lake itself is a relict of once much more extensive Pleistocene Lake Lahontan, and is fed by the Truckee River flowing east from the Sierra Nevada. Over the years an Interior reclamation project has diverted so much water from the river for irrigation around Reno that the lake level has dropped by some seventy feet. Now the fishes are unable to make their yearly spawning runs up the Truckee River, and for the past several years have been artificially restocked to prevent extermination in the lake.

The District Court judge has sharply criticized the Interior Department for its past "management" of the Truckee River and has ordered that sufficient water be allowed to enter the lake to at least stabilize its present level. He characterized the department's actions in the matter as arbi-



trary, irrational, and detrimental to the interests of the Paiutes, about two-thirds of whom have had to leave the reservation in recent years because of the depletion of their economic base, the Lahontan trout and cui-ui. In his order the judge also required the department to tell him at an early date whether new regulations hold the lake level steady.

**Interim report, pupfish** Further on the subject of endangered native fishes, we pass on to members some information on the prospects of the Devils Hole pupfish of Death Valley National Monument (Devils Hole being a small detached sec-

tion of the monument in southern Nevada).

There, nature has stepped into the situation with a temporary reprieve by way of good rainfall that has held the water of Devils Hole at about its present level while a Nevada court considers the Interior Department's suit for relief of the situation, as reported in some detail in the October Magazine. As we pointed out in that issue, the legal aspect of the matter is not an easy one; it involves the complexities of underground water law, and at this time no opinion has yet issued from the court. Also, it is not now clear what steps the Interior Department may want to take even in the event of a decision favorable to the government.

This much may be said, however. If the current coalition that is working in behalf of the Devils Hole pupfish—the Interior Department, California and Nevada fish and game people, scientists, and environmentalists all over the country—is finally successful in salvaging a small creature unknown to the vast majority of Americans and without the relatively wide appeal of animals like the whooping crane, the bald eagle, the trumpeter swan, and some of the larger mammals, there is indeed real hope for endangered forms of life in America and elsewhere.

**Convention called** As this issue was being consigned to the printer NPCA

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learned that the international convention on rare and endangered species of plants and animals—originally scheduled for March or April of 1971 and then postponed—will be held in Washington February 12 to March 2. NPCA and other environmental organizations have made a considerable contribution to American thinking in the matter by invitation of the State and Interior departments; NPCA discussed its own views on desirable convention aims several times in these pages during the past year, and we shall keep members informed on further developments in regard to this important international meeting.

**Fossil Butte** With the close of the 92nd Congress the National Park Service came into possession of a fine, if relatively small, natural history unit—Fossil Butte National Monument, of somewhat more than 8,000 acres north of US Highway 30N and a few miles west of the town of Kemmerer, Wyoming.

The new monument closes an important gap in the Service's group of paleontological preserves. Florissant Fossil Beds Monument in Colorado is world-renowned for its fossil insects and plant leaves; Dinosaur Monument in Utah tells the story of long-vanished saurian life; Petrified Forest National Park in Arizona protects the nation's greatest and most colorful treasurehouse of agatized wood; but until recent days the

Service possessed no grand display centered principally on aquatic animals. Thus Fossil Butte has been created primarily to protect and interpret one of the world's outstanding localities for fossil fishes and other water-dwelling vertebrates, and secondarily for its great and as yet not wholly assessed invertebrate animal remains.

Probably first discovered by geologist John Evans in 1856, the Fossil Butte area attracted at one time or another a long list of outstanding geologists and paleontologists of earlier American days. F. V. Hayden, E. D. Cope, O. C. Marsh, A. C. Peale, W. H. Bradley—all of these and others researched the fossil treasures of the Butte; present also were laymen like Craig and Haddenham, suppliers of outstanding specimens to museums the world over.

The Park Service first became interested in acquiring Fossil Butte in 1959, at which time it fielded a team of investigators to report on the area's natural history and educational opportunities. An early proposal for the monument encompassed some 13,000 acres, a figure scaled down over the passing years to the present 8,000-plus, still a most worthy addition to the national park system, and one offering vast interpretive possibilities to the Service in telling the public about its long-extinct animals. "In the knowledge they give of the past," says paleontologist Gilbert F. Stucker of the American Museum of Natural History,

"fossils contribute in many ways, none more important than the enlargement of our view of life, and this in turn to the enlargement and fulfillment of ourselves."

**Triumph at Mammoth** Elsewhere in this issue we bring members a firsthand account of the linkage of the Mammoth and Flint Ridge cave systems, in Mammoth Cave National Park, into the world's longest single cave system. The final sixteen-hour, mud-stained odyssey that connected the two systems culminated at least 2000 years of exploration in the area, for Americans of prehistory already had penetrated the caverns deeply and had left evidence of their explorations in the form of burned torches, rope, and other artifacts.

An early American surveyor mentioned the two caves in 1799. Since then many speleologists and scientists have waded, squirmed, and squeezed through the remote passages of both. The Flint Ridge system in particular was investigated extensively by Floyd Collins in the earlier decades of this century; in fact, a rockfall in Flint Ridge cost him his life in 1925. It was through these passages that the party led by John Wilcox finally linked the two cave systems into one in a speleological feat characterized by Wilcox as "like going through a huge bowl full of spaghetti—except that we went through the tubes in the strands."

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## conservation docket

WITH THE ADJOURNMENT OF THE 92ND Congress in mid-October all proposed legislation that had not reached a floor vote in both House and Senate must, to receive further consideration, be reintroduced as entirely new legislative proposals in the 93rd Congress. Such bills would be referred in the usual manner to an appropriate standing committee of House or Senate, and further referred to a subcommittee of the standing committee, in which hearings would begin anew. If a subcommittee reports a measure to full committee, the latter may also hold new hearings. NPCA members, as citizens, may write committee or subcommittee chairmen asking that they be placed on lists for notification in the event of hearings. In the event that House and Senate pass differing measures on the same subject, it becomes necessary for the measures to be sent to a House-Senate conference, where differences may be adjusted. If the adjusted bill passes both legislative bodies again the measure is sent to the President for signature (or veto).

A number of measures important to environmentalists and preservationists were passed by the 92nd Congress. A number of other measures of interest, however, had failed of sufficient progress by adjournment date, and expired in one stage or another of the legislative process. A number of these bore on important national environmental questions, and might reasonably be expected to reappear as new, although not necessarily identical, proposals in the 93rd Congress. Many environmentalist observers probably would agree that among such measures would be:

**LAND USE AND PUBLIC LAND POLICY:** Whether in one or a number of measures, Congress likely will address itself to the encouragement of the states in more comprehensive land use controls, and also to the establishment of a national policy for administering the public lands, which still constitute at least a third of the nation's total acreage. In regard to the public lands it is possible that consideration may be given to an organic act for the Bureau of Land Management in the Department of the Interior.

**STRIP MINING:** This method of mining very likely will come under close Congressional scrutiny again, and perhaps stricter regulation. Renewed efforts toward compliance with the recommendations of the Appalachian Regional Commission may be made; among other things, this could mean a slope limitation of not more than 14° on fill from strip mining—that is, earth and shattered rock stripped from above a coal

seam could not be deposited on an area with a slope of more than 14°. Standards for restoration of stripped land also might be defined.

**HIGHWAYS:** New efforts may be made to open the Highway Trust Fund for assistance to various kinds of public transportation other than highways.

**FORESTRY:** New efforts may be made to regulate clearcutting in the national forests as well as to provide incentives or regulations improving forestry practices on private lands.

**SUITS & ACTIONS:** Legislation may be considered providing for citizens' suits and class actions in U.S. district courts against persons responsible for creating environmental hazards.

**POWER PLANT SITING:** Competition for Land and Water Conservation Fund money for many projects authorized by a previous Congress well may be severe. More money likely will be sought for the fund, and for the operational budget of the Department of the Interior.

**NEPA:** New efforts to undermine the National Environmental Protection Act may materialize, either through direct amendment or by appending exceptions to the act

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on other bills, perhaps especially those concerning highway or dam construction.

**PESTICIDES:** The terms of the 1972 Pesticides Act (Public Law 92-516) left some Congressmen and many conservationists somewhat unhappy; efforts may be made to secure stronger regulatory practices.

**NATIONAL PARKS:** The slow pace of national park inholdings acquisition may be dealt with through legislation.

**SST:** Administration spokesmen have indicated on several occasions that the question of federal subsidies for an American prototype supersonic transport may be placed before Congress again. The SST program was killed by the first session of the 92nd Congress on votes of 58 to 37 in the Senate and 215 to 204 in the House. During the second session a national noise abatement measure was passed by both House and Senate with an amendment that would have forbidden supersonic transports from other countries—presently meaning the English-French *Concorde* and the Russian *T-144*—from landing at airports in the United States. The SST amendment was deleted from the noise abatement legislation only after it had reached the stage of House-Senate conference.

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*Continued from page 2*

We refer to protection for the benefit of people; this is the true meaning of the notion that the parks are for people; it is people who need and demand protection for the woods, wildlife, and streams which are the heart of the National Park System.

There are notable differences between the national seashores, lake shores, riverways, and wild rivers, on the one hand, and the reservoirs of the Army Engineers and the Bureau of Reclamation. The reservoirs downgrade the System, but the System could upgrade the areas, and to whom should they be entrusted? The Bureau of Outdoor Recreation, in our judgment, should not become a management agency.

The parkways differ in quality. Some of them, like the Baltimore-Washington Parkway, which are really highways, should be turned over to the states. Others, like the Blue Ridge Parkway, should be retained within the National Park System and given a high measure of protection.

**M**UCH of the difficulty in regard to preservation *versus* recreation arises from the neglect of the federal-state recreation structure established with the Land and Water Conservation Fund and the Bureau of Outdoor Recreation.

Great labors of love were expended by the conservation movement beginning a dozen years ago to set up the Fund and the Bureau. Pursuant to this system the states develop recreation plans which must comport with federal standards established by the Bureau. On approval of the plans, which include state and local parks and other recreational facilities, the Bureau makes grants from the Fund to assist the states and localities.

The involvement of the National Park Service in national urban parks and other urban recreational activities results, in our opinion, from the inadequate utilization of the Fund and the Bureau. This is almost entirely a matter of adequate financing and attention.

**W**ITH RESPECT to the historical category of units entrusted to the Service, we see no other governmental agency qualified to manage them. They include various types of preservations, from the C&O Canal National Historical Park to the Edison National Historic Site.

Disposition of these units would require the alienation of federal public lands to the states or localities, or to quasi-public or private institutions.

The Service may have room for improvement in

its administration of the historical units, but it has the best public agency expertise available.

It also manages a variety of external historical preservation activities, such as the National Register of Historic Places. There is no other federal agency available and qualified to do this work.

Most of the battlefield parks are actually parks. They have great rural beauty in most instances and should be kept in the System.

Within the historical category fall the archaeological monuments. These units are often very similar to the smaller national parks, and need to be protected and preserved in the same way.

The new cultural units like Wolf Trap Farm, the Kennedy Center, and the Ford Theatre actually present no problems. Programs, as at present, can be entrusted to separate societies or foundations by cooperative agreement.

**T**HE CURRENT SITUATION suggests that the National Park Service should be professionalized as rapidly as possible. Employment, promotion, and tenure should be determined by professional qualifications. The Director should be given full Civil Service tenure.

The interdepartmental and interbureau coordination which will be needed can be achieved by Executive Order coordinating the activities of the agencies. It does not require any merger or transfer of agencies. It does require a clear-cut national preservation and recreational policy.

The agency functions could best be drawn together through an interdepartmental commission with representation from Interior, Agriculture, Defense, Commerce, and HUD, and with policy decisions enforced by Executive Order of the President.


The present crisis would be the best possible opportunity to put such an integrated management system into effect, and most of the conservation and environmental organizations, in our opinion, would accept such an approach and support it.

—Anthony Wayne Smith

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Please write, wire, or telephone the President at the White House, Washington, D.C., and ask him to protect the integrity of the National Park System at this critical hour. You may wish to consider the views printed here, but express your own opinion. We would appreciate a copy of your statement.





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