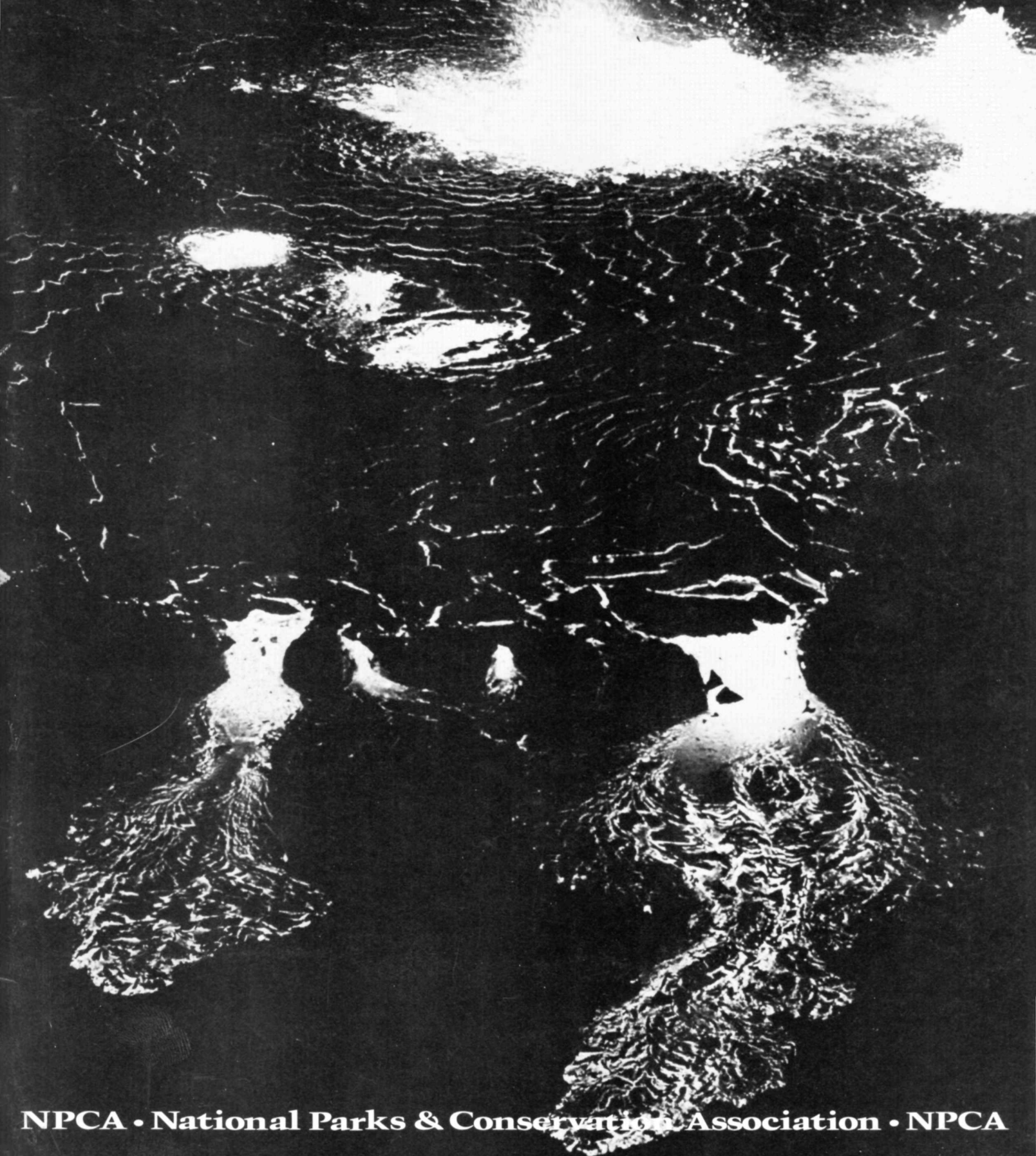


National Parks & Conservation Magazine

The Environmental Journal

March 1977



NPCA • National Parks & Conservation Association • NPCA

Unfinished Agenda

WE HAD INTENDED to continue our discussion of the Law of the Sea this month, but were overtaken by a supervening event, the publication of *The Unfinished Agenda*,* a Task Force Report on the survival of life on the planet sponsored by the Rockefeller Brothers Fund.

The Fund is to be congratulated, in the first place, on bringing the Task Force together, composed of Gerald O. Barney of the Fund as Chairman and the executives of twelve of the largest environmental organizations in America, including the President of NPCA.

These persons have spoken as individuals, and the Report does not necessarily reflect the views of their organizations. Moreover, because it presents a consensus, the individuals do not necessarily subscribe to everything it contains. Nonetheless it can fairly be supposed to represent a high level of personal and organizational agreement, and to constitute an authoritative declaration by the environmental movement of the United States.

As such, it is a strong answer to the technomaniacs who foresee the solution of all of our ecological and economic problems with ease, though the population of the world mount to some 15 billion—or even 30 billion—within the next half century, if only we can thrust the abominable pessimists aside.

And it should serve as an antidote also to the antienvironmental Know-nothings who are mouthing such mottoes as Scenery Is Fine, But Jobs Are Better. Scenery is not

the only issue; jobs are not endangered in the long run by programs for human survival.

The Unfinished Agenda is first of all a courageous statement. It begins with the proposition that a root cause of the present economic and ecological difficulties is overpopulation, and calls forthrightly for stabilization. It recommends continuation and increased funding of family planning programs on a global basis, with special emphasis on foreign-aid measures having an indirect negative effect on fertility, such as social security programs.

In respect to our domestic population policy, it recommends that a national goal of stabilization or gradual reduction be announced, with the small family seen as a desirable and socially responsible ideal.

For our part we would have sharpened these recommendations toward the establishment of a universal moral norm of not more than two children per woman. The population question will be decided in terms of individual choices eventually, and responsible people need precise guidance on the best course to follow for both family and societal reasons.

Most people want to do the right thing, in terms of both reason and morality, and they search for standards to guide their conduct. Only when such standards have been firmly established throughout society can sound population policy prevail and endure through all the fluctuations of poverty and prosperity which lie ahead. But this would be merely to carry the excellent recommendations of the Agenda one step farther toward completion.

Of great importance, the Agenda recommends the elimination of the

illegal immigration into the United States, which swells our population by at least 800,000 persons a year and tends to set at naught the meritorious efforts of our younger generations to reduce the birthrate below the replacement rate, and thus achieve stabilization, a slow reduction, and a beneficial relaxation of a multitude of ecological, economic, political, and social pressures.

A concerted attack on illegal immigration by environmental, social service, and labor organizations should be organized in the early days of the new session of Congress, and brought to a successful conclusion this year if possible. *The Unfinished Agenda* provides a strong send-off in that direction.

EQUALLY COURAGEOUS is the stand taken in the Agenda on the energy issue. This nation, and indeed the world, will be locking down in the next few months and years to the question whether the proliferation of nuclear fission plants, with or without fast breeders, and with or without the so-called plutonium economy, will continue to lead us toward ecological, economic, and military disaster, or whether this blind onward rush can be stopped.

The Report makes it clear that the Task Force is convinced that the nation and world must pull back from nuclear fission. It raises serious doubt as to whether research and development should proceed in regard to nuclear fusion, and recommends a slowdown.

These positions are presented responsibly, seriously, and with very thorough documentation. Let those who attack the Report present equally solid positions if they can, and a rational discussion of the subject can thus be joined. The survival of life on this planet depends on getting the precisely correct answers.

The Report is not negative on energy. It recommends a sharp in-

Continued on page 31

**The Unfinished Agenda: The Citizen's Guide to Environmental Issues.* Gerald O. Barney, editor. New York: Thomas Y. Crowell Company, 1977. (\$7.95 hardbound; \$3.95 paperbound)

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weathered american chestnut trunk
jack jeffers photograph

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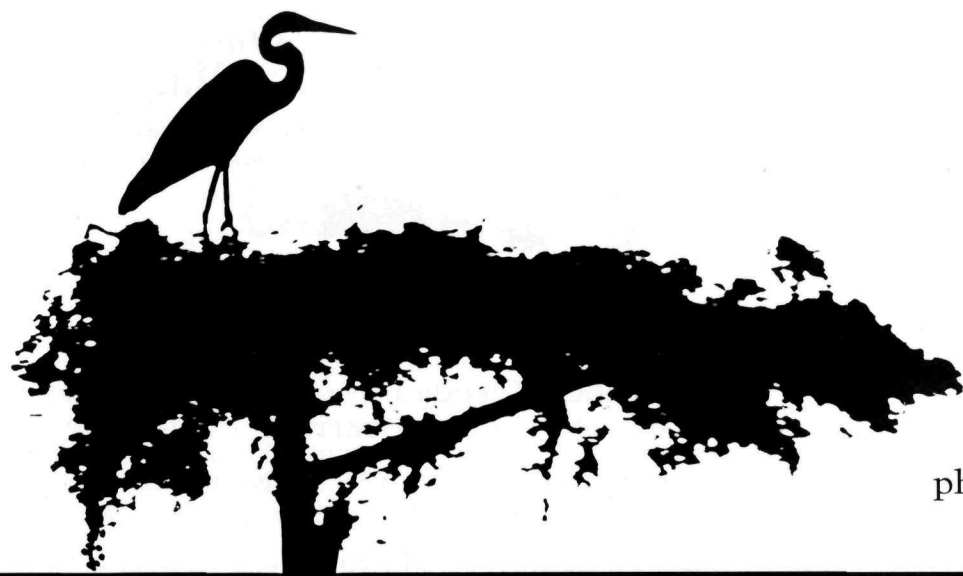
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FRONT COVER Eruption of Halemaumau, by Park Service

BACK COVER Kilauea Iki Devastation Area, by Keith Gunnar
If you are lucky, you may observe land-building in action at Hawaii Volcanoes National Park on Hawaii Island, for this park is the only place in the world where people run toward a volcanic eruption instead of away from it. But in addition to awesome evidence of past volcanic action, the park preserves lush tropical rain forests where orchids and tree ferns flourish. (See page 10.)

Eugenia Horstman Connally, *Editor*
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Putting the

by MICHAEL F. TONER
photos by PETER B. KAPLAN

BIG CYPRESS together again

More than one-third of the Big Cypress National Preserve has been acquired, but its major management problems have yet to be resolved

MONTHS AFTER the end of South Florida's rainy season, when the mild, dry months of winter have settled over the peninsula, shallow pools of tannin-stained water still stand in the sloughs and strands of the Big Cypress Swamp, one of the more recent additions to the National Park System.

A half-mile off the dusty, potholed thoroughfare that hunters and hermits know as the Loop Road, Roberts Lake Strand lies hidden beneath a canopy of cypress trees—their branches bare except for the swaying gray beards of Spanish moss.

The cool, dark water is still knee-deep, but people who take the trouble to wade from the road to the series of elongated ponds that make up the strand—and pause there for a few minutes—will soon discern two important facts about this subtle subtropical wilderness.

An alligator, startled by the noisy approach of two-legged visitors, resurfaces slowly at the far side of the pond. The scattered chorus of bullfrogs resumes, and overhead a red-shouldered hawk alights silently on an outstretched cypress limb.

Fact One: This pond and hundreds of others like it that dot the southwest Florida swamp hold the region's precious fresh water for months after the rains have ceased;

and until the rains come again and the water spreads out in sheets over the open prairies of the Big Cypress, they will be the crucibles of life for many of the swamp's creatures.

The surface of the coffee-colored water is smooth but not quite still. Bits of bark and forest litter drift slowly toward the southwest.

Fact Two: These muck-filled natural reservoirs of water not only sustain the cypress swamp through the dry months, but slowly release their water into the neighboring areas of Everglades National Park, which receives more than half its flow of surface water from the Big Cypress watershed. This watershed is also an important potential source of domestic fresh water for southwestern Florida coastal cities.

Large areas of the Big Cypress, in fact, are what many people expect the Everglades to be; but the dark, damp recesses of its cypress sloughs are interspersed with open marshlands, shaded oak hammocks, and "islands" of pine forest and palmetto scrub.

Thanks to the mild temperatures that prevail throughout the winter and the extended wet season that the terrain of the Big Cypress creates, wild orchids, bromeliads, and ferns thrive here in a profusion found nowhere else outside the tropics.

For nearly half the year the

trunks of trees in the swamp are ablaze with color—the red and yellow flower stalks of epiphytic bromeliads in the spring and the more subdued yellows, purples, and whites of the summer's flowering orchids.

At least nine endangered species including the Florida panther and the Cape Sable sparrow, which are both precariously close to extinction, either live in the swamp or depend on it for part of the year.

The wetlands of the Big Cypress also provide an important feeding, nesting, and wintering ground for birds migrating to and from Central and South America.

BOTH TO PRESERVE the area's remarkable natural resources and to protect one of the major watersheds of the Everglades, Congress drew a line around a 570,000-acre portion of the swamp in 1974 and called it the Big Cypress National Preserve.

A similar boundary had been drawn once before. When the creation of Everglades National Park was first proposed, its boundaries encompassed most of the area that is now designated as the Big Cypress preserve. Later revision of the boundaries to make the park project more politically and financially acceptable eventually left the Big Cypress unprotected. Not until the late 1960s—with the

threat of construction of the Everglades jetport, the diversion of water from the park, and the piecemeal development of the Big Cypress—did the full implications of that omission become apparent.

Conservationists waged an intense campaign for three years before Congress and the state of Florida finally authorized \$156 million in late 1974 to remedy the situation. In adding the Big Cypress and the Big Thicket in Texas to the National Park System in that year, Congress created a new type of NPS unit—the national preserve. To neutralize opposition to the Big Cypress, compromises were made to allow in the new preserve activities that are prohibited in virtually all natural areas of the National Park System, including oil and gas development and hunting.

Acquisition of the 522,000 acres of privately owned lands that form the heart of the preserve has since proved to be one of the National Park Service's most ambitious undertakings.

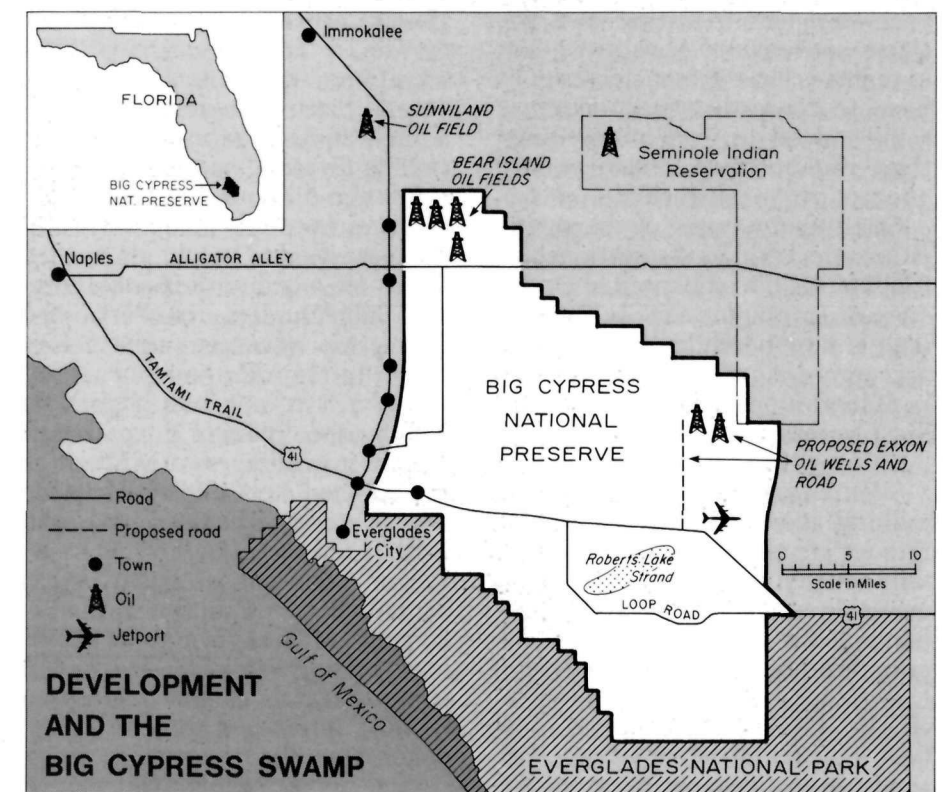
UNLIKE MANY UNITS of the National Park System, the Big Cypress is not being assembled from large tracts of land that are already in public ownership. It is being assembled painstakingly piece by piece.

For years the Big Cypress was the favorite target of Florida's swamp

peddlers—speculators in land who capitalized on the little man's urge to get in on the Florida land boom—by selling small tracts of land to anyone who could afford to put ten dollars down for the first installment. As a result, ownership of the Big Cypress has now been almost hopelessly fragmented. One-, two-, and five-acre tracts have been sold off throughout the

world—the pieces of a jigsaw puzzle that the Park Service is now trying to put back together. No one is even sure how many pieces there are. The number of individual tracts within the preserve is currently estimated at about 60,000.

A staff of a hundred appraisers and land acquisition officers has been working on the project since July 1975 from the Park Service's



local headquarters in Naples, Florida. In the tradition of "boiler room" operations of the old land sales firms, they often work well into the night, using long-distance WATS lines to close deals with landowners in the western time zones. So far, a total of \$58 million in state and federal funds has been committed, and more than 200,000 acres of the Big Cypress has either been purchased or optioned.

The achievement is impressive but somewhat misleading. The real work remains to be done. Most of the land acquired so far has been in large tracts—including one unit of more than 70,000 acres. Nearly 90 percent of the total number of parcels still remains in a scattered checkerboard of private ownership. And many Big Cypress landowners—shocked to find that government appraisals show their land to be worth only a fraction of the speculative prices they paid for it years ago—are resisting a negotiated settlement. Authorities say as many as ten thousand cases may have to be settled in condemnation, a flood of legal proceedings that could crowd federal court dockets for years to come.

Continued funding of the acquisition effort is always questionable. The \$40 million contributed by the state of Florida for the purchase of land is now nearly exhausted, and appropriations of the \$116 million in federal funds authorized for the Big Cypress never quite seem to keep up with the spending.

"We're satisfied that we are making good progress, but at the rate we are closing on property, we will probably exhaust this year's available funds by June 1977," explains James Sewell, chief land acquisition officer for the preserve.

OWNSHIP, however, is only a part of the larger problem the Park Service faces in extending



its control over the Big Cypress Swamp. The careful balancing act that will be required to manage competing interests in the swamp and the minuscule size of the new preserve's staff make the task doubly difficult.

In creating the preserve, Congress clearly established its intent to "assure the preservation, conservation, and protection of the natural, scenic, hydrologic, floral, faunal, and recreational values of the Big Cypress watershed."

But the National Park Service's attitude toward the management of the preserve was succinctly spelled out in 1974 before the Senate Interior Subcommittee on Parks and Recreation by Assistant Secretary of the Interior Nathaniel P. Reed. "The area is not like a park in which a great deal of the park will remain in wilderness or wilderness type of use," Reed explained. "This area is going to be used, and used hard."

Hard use—and hard abuse—has actually been a tradition in the Big Cypress. Most of its cypress stands have been cut over at least once since the turn of the century—a fact that prompted some early opponents of the preserve to insist that it had been deceptively named

because there were, after all, no "big cypress" trees left.

Grazing and farming have been practiced for decades on the outer edges of the swamp. Drainage of western portions of the watershed began as early as 1926 and accelerated in the 1960s when the Gulf American Corporation completed a network of drainage canals for its 100,000-acre Golden Gate Estates.

Drainage—in concert with several years of below normal rainfall and the increased human presence in the swamp when it is dry—has greatly increased the destruction wrought by fire in recent years. In 1974 alone, more than 160,000 acres of the swamp, including some of its most magnificent cypress stands, were badly burned.

And although the construction of the commercial phase of the Everglades jetport was halted in 1970, the \$13 million training and transition airport that was to be its nucleus still remains. At times it is heavily used. Overnights at a popular backcountry campsite are often jarred from their sleep by the screaming, low-level approach of a plane practicing night landings. The training airport will remain until a new location for the regional jetport can be found.

IN SPITE OF its tradition of hard use, however, the Park Service is being forced to juggle some new elements. A sudden spurt in interest in oil exploration may prove to be one of the most pressing problems.

Oil development is no newcomer to the swamp. The first producing well in Florida came in at Sunniland, near Immokalee, in 1943; and several modest fields have been discovered in the area since then. The compromise legislation that established the preserve allows exploration and extraction and specifies that the Park Service cannot acquire oil and gas rights in the preserve without consent of the owner unless the Secretary of the Interior determines that the property is threatened with uses detrimental to the area. The NPS has been so busy trying to acquire the lands that it has made no effort to acquire oil and gas rights.

One of the newest fields, known as Bear Island, actually underlies the northwestern corner of the preserve—and the general trend of oil-bearing formations seems to extend along a thirty-mile arc through the entire northern half of the preserve. Recent growth in the size of the Bear Island field has



Thousands of small tracts in the Big Cypress remain to be acquired, but many owners are resisting sale. Half-tracks (above) and other off-road vehicles pose a regulatory problem for the National Park Service.

triggered a multimillion-dollar leasing and exploratory venture in the region, and for the first time oil companies have penetrated the heart of the Big Cypress.

The full extent of oil company holdings in the preserve is uncertain; but the largest interest, which belongs to Exxon USA, covers 298,000 acres. In the past year alone, Exxon has run more than 130 miles of seismic and survey lines through the swamp. And in spite of protests by conservation groups over the swaths of trees leveled by some of the company's operations, the Florida State Cabinet has authorized several wells and the construction of an 11-mile access road to two well sites in one of the most remote areas of the preserve.

Although some conservation groups and the president of the powerful Florida Audubon Society have approved the route of the road, anti-oil feelings among hunters have been so high that some of them have shot at survey crews and have vandalized equipment left in the swamp overnight. Their opposition, however, has been based less on the damage the road itself will do than on the fact that it will permit increased access to

some of the distant areas of the swamp that so far have been used chiefly by hunters.

BUT THE HUNTERS and other sportsmen rely heavily on off-road vehicles to reach those distant areas, and the growing number of swamp buggies, half-tracks, and airboats that operate in the swamp may soon pose another sticky management problem.

The Big Cypress preserve has been designated a natural area—a classification that generally prohibits both hunting and the use of motor vehicles outside of established roads and parking areas. Authorities, however, have repeatedly pledged to allow "traditional uses" of off-road vehicles to continue, except in highly sensitive portions of the preserve.

Swamp buggies, to be sure, have been a traditional mode of travel in the Big Cypress for decades; but the rapid growth in their numbers in recent years is becoming increasingly noticeable in the backcountry of the Big Cypress. In some areas the balloon-tired machines have smashed trees, torn up ground vegetation, and left deeply rutted "buggy trails" that become flowing streams during the wet season.

"Regulation of airboats and glades buggies will be a terrific problem," explains Frank Craighead, Sr., botanist, author, and veteran Everglades conservationist. "In many places the erosion from these machines has carried off all the soil—two to four feet in places—and the extent of this damage is enormous."

Specific regulations for off-road vehicles have yet to be prepared, but those now being contemplated by the Park Service would allow wide latitude for their continued use. Only about 45,000 acres in the southern part of the preserve—an area that includes Roberts Lake

Strand—would be placed off limits to motorized traffic. Use of off-road vehicles would be limited to existing trails in a 60,000-acre area along the western boundary of the preserve. Park Service officials have also promised to allow continued access by vehicle for people with existing homes or hunting camps anywhere in the preserve.

Hunting itself—whether on foot or by swamp buggy—may present the Park Service with yet another early dilemma. Growing numbers of hunters from the urban Florida east coast look to the Big Cypress as their principal hunting ground. On the opening day of hunting season in fall 1976 more than five thousand hunters fanned out into the preserve in search of deer and wild turkey.

The Florida Game and Fresh Water Fish Commission, which by agreement with the National Park Service manages all hunting and fishing in the preserve, limits the number of hunters only in a small portion of it.

Some signs indicate that there are simply too many hunters. In recent years game agents stocked the swamp with turkeys captured in other parts of Florida, sometimes within days of the opening of the hunting season. The game commission also stocks the Big Cypress with wild hogs, a nonnative species that hunters like, but which the Park Service says is "not entirely compatible" with the purposes of the preserve. Conservationists, too, oppose the stocking.

Other disputes are on the horizon as well. Grazing—to the dismay of some conservationists—is being allowed to continue, even on lands acquired by the government. Construction of new vacation homes and hunting camps—to the dismay of the Park Service—continues on privately owned lands, and the agency is powerless to stop it. Drainage of the western portion of the watershed continues to

Below, bromeliads growing on cypress trees; at right, a curious fox squirrel.





lower water levels in the preserve itself, and the rapid growth of cities in southwest Florida is expected to increase demands for more drainage. But if developing regulations to address all those problems promises to be difficult, enforcing them may be even tougher.

THE BIG CYPRESS encompasses some of the wildest, least populated country remaining in Florida. Most of it is remote and roadless—and to establish the Park Service presence in the 200,000 acres that the federal government already owns, the Big Cypress preserve has a staff of only three people.

"To manage the area to the same degree that we manage Everglades National Park will eventually take a force of thirty or forty people," explains Jack Stark, former Everglades superintendent and now

North Atlantic regional director for the Park Service. "But a force like that is still many years in the future."

NPCA has pointed out that the Big Cypress is but another example of the effect of underfunding of the national parks.

In the meantime, protection of the Big Cypress may depend on its very remoteness and resiliency. After all, it has retained much of its wilderness character in spite of logging, farming, oil development, fires, and the training airstrip. The swamp may simply have to take care of itself for another few years while the National Park Service tries to assemble the pieces of the giant jigsaw puzzle. ■

Michael F. Toner, the environment writer for *The Miami Herald*, has covered environmental issues in South Florida for the past five years.

Editor's Note

Get Involved: Help Protect the Big Cypress National Preserve

During March and April, the House and Senate appropriations committees will be holding hearings on the Fiscal Year 1978 budget for the National Park Service, including the NPS share of the Land and Water Conservation Fund for land acquisition. By the time of the hearing, NPS will probably have nearly run out of this year's funds for land acquisition in the Big Cypress and will consequently need a supplemental appropriation for Fiscal Year 1977, which could be used immediately, as well as the regular Fiscal Year 1978 appropriation, which would not be available until October 1, 1977. Members should write the committees urging these appropriations.

Honorable Robert Byrd, Chairman
Senate Appropriations Committee
1116 Dirksen Senate Office Building
Washington, D.C. 20510

and
Honorable Sidney Yates, Chairman
Subcommittee on Interior
House Appropriations Committee
B-308 Rayburn House Office Building
Washington, D.C. 20515

Although the Big Cypress Act permits the Park Service to limit and control the use of motorized vehicles anywhere in the preserve, apparently it will be very difficult to convince local ORV users who have traditionally driven their vehicles in the Big Cypress swamp to stop or even to reduce current use levels. Nevertheless, greater control is essential. Tracks and scars in the muck and peat soil from continual ORV use take years to recover, if recovery is at all possible. These scars may affect the sheet water flow by creating unnatural channels, causing abnormal drainage patterns and consequent subtle ecological alterations. The Park Service will propose regulations governing ORV use in the Big Cypress and will need the support of NPCA members if effective controls are to be established. Write the superintendent to tell him you support strict regulation of off-road vehicles.

Superintendent John Good
Everglades National Park
P.O. Box 279
Homestead, FL 33030

A smell of sulphur . . . a sound of crackling as if the surface of the earth were being torn apart . . . the sight of fire ebbing and exploding in the dark night . . . above me the snow-covered tip of the most massive single mountain in the world . . . around me the density of a tropical jungle with exotic trees and lovely flowers. . . . That was my introduction to Hawaii Volcanoes National Park. . . .
—James A. Michener

A HALF-HOUR'S DRIVE from Hilo, Hawaii, one can find a stark and desolate area where few living things can grow—a barren, cratered landscape that reminds one of the moon. The area is Hawaii Volcanoes National Park, which covers 344 square miles and begins at the edge of the Pacific and rises to the lofty heights of Mauna Loa—13,680 feet above sea level. Not all of the park has such an aura of other-worldliness, though, for much of it is lush tropical rain-forest where orchids grow and tree ferns flourish. The park even includes a coastline of black lava cliffs pounded by crashing waves.

For all that there is to see in Hawaii Volcanoes National Park, however, the volcanoes are the

main attraction. Since the days when the first Polynesian settlers made sacrifices to Pele, goddess of volcanoes, man has been fascinated by these awe-inspiring expressions of nature's violent force and beauty. It has been said that this park is the only place in the world where people run toward an erupting volcano instead of away from it. Because explosions are rare, it is possible to watch these volcanoes in comparative safety. Geologists consider them quiet and docile, for Hawaiian lava flows are rich in ferromagnesians, which produce quiet flows, as opposed to silica flows, which tend to be more explosive and dangerous. When the volcanoes are putting on a show at Hawaii Volcanoes National Park, it

is possible to walk right up to the edge of the crater where the volcanic activity is taking place.

Even when no volcanic action is going on, a trip to this park is very exciting. From Hilo the road winds up to the four-thousand-foot level past fields of sugarcane and forests of fragrant ginger, gardenia, and red lehua flowers. The weather changes with the altitude and is cool even in the midst of summer. In addition, rainfall is frequent, averaging about one hundred inches a year. At the four-thousand-foot level one arrives at the caldera of Kilauea volcano. Rising up behind it is the massive volcano of Mauna Loa.

The world's largest volcano, Mauna Loa is six hundred kilome-

ters around the base. It is a shield volcano and represents the accumulation from volcanic eruptions that have occurred for the last million years. The very hot, fluid flows produced by Mauna Loa often travel twenty or thirty miles before congealing, thus creating the inverted saucer shape of this broad, massive volcano.

At the summit of Mauna Loa is a caldera, a large basin-shaped depression, called Mokuaweoweo. The caldera, which is three miles by one and a half miles across and six hundred feet deep, was formed when the magma, or underlying molten rock, subsided underground, thus causing the sides of the crater to collapse for lack of support. Numerous spectacular

eruptions have occurred in the caldera and along the rift zones. In 1926 a flow from the southwest rift destroyed the village of Hoopuloa, and lava from the northeast rift flowed within twelve miles of the city of Hilo in 1942. During the blackouts of World War II, the volcanoes of Hawaii were not very cooperative and often lit up the inky-black skies.

Mauna Loa erupted in 1950 and produced one of the largest flows of historic times. On the southwest rift during the night of June 1, 1950, the flows of molten lava began sweeping to the sea. Moving at an average speed of 5.8 miles an hour, the lava reached the sea in less than three hours, and a post office, a gas station, and numerous

houses disappeared under the molten mass. It was an unbelievable eruption that produced about six hundred million cubic yards of lava—enough to pave a four-lane highway four and a half times around the earth.

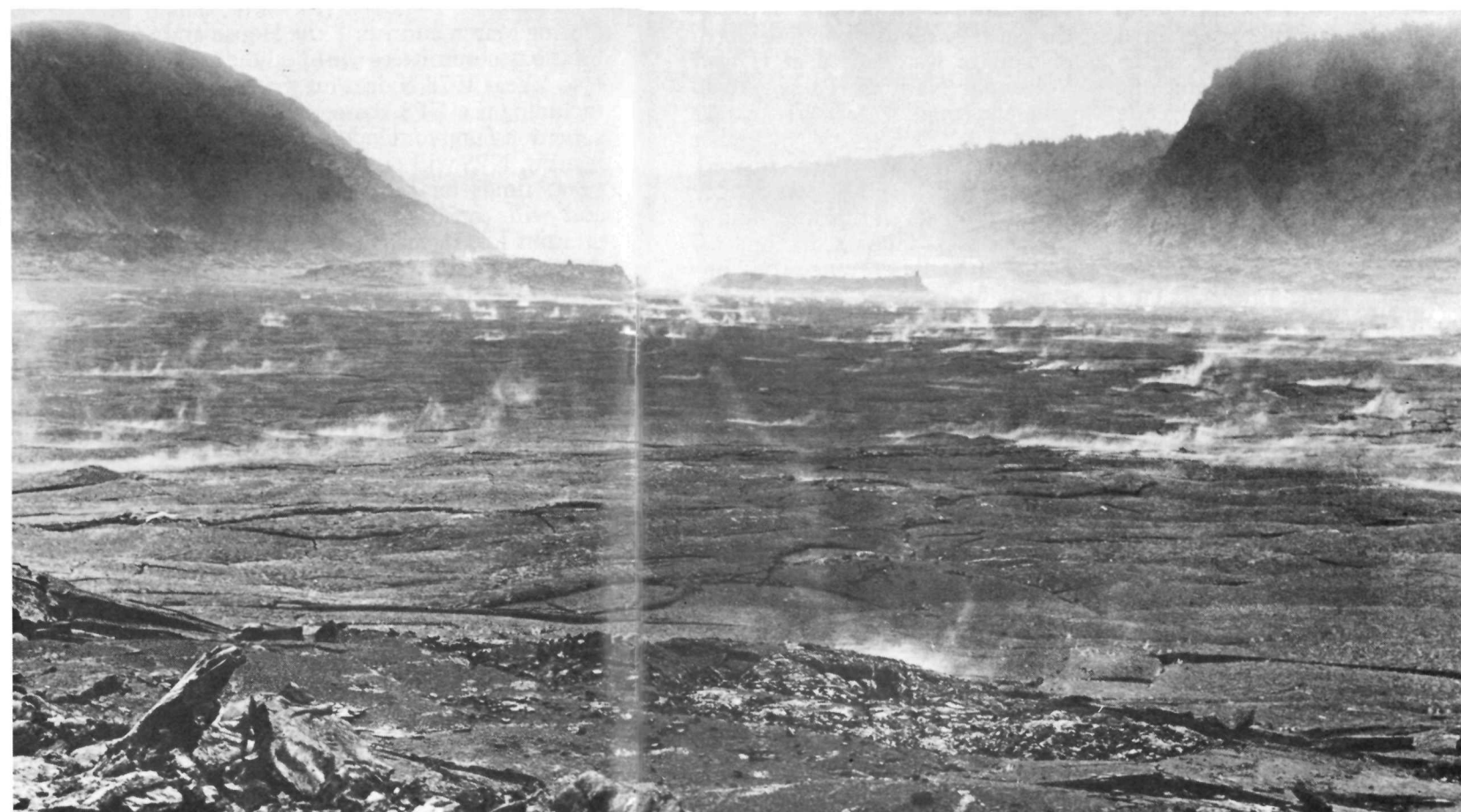
Today, Mauna Loa offers a challenge for the adventurous hiker. A narrow, paved road leads up to the 6,600-foot level, and a trail continues the rest of the way to the summit. The eighteen-mile hike is arduous, for the altitude makes not only exertion but even breathing difficult. Two overnight resthouses are available—one at the ten-thousand-foot level and the other at the summit. Arrangements must be made at the park headquarters before starting up the trail, and the

The Volcanoes of Hawaii

by DOREEN BUSH



PHOTOGRAPHS BY KEITH GUNNAR



Hawaii Volcanoes National Park features lush tropical vegetation as well as stark volcanic landscapes. Here, steam vents in Kilauea Iki crater remind visitors of nature's powerful forces even when no more spectacular volcanic action is occurring.



Snow-capped Mauna Loa

J. D. GRIGGS

Park Service recommends that three or four days be allowed for the hike.

Kilauea volcano, a much smaller edition of Mauna Loa, is the volcano most frequently seen by visitors to the national park. It, too, is a shield volcano, but its summit is only 4,090 feet above sea level. Kilauea's most spectacular eruption occurred in 1959 when lava fountains developed in a rift along the side of Kilauea Iki crater. One fountain leaped an unbelievable 1,900 feet high. This was the highest fountain ever seen in Hawaii and possibly the highest ever witnessed in the world. One of the recent lava flows of Kilauea—in 1971—covered up portions of the Chain of Craters Road in the national park, and the road is still unusable today.

THE Thomas A. Jaggar Memorial Museum at Kilauea is usually the first stop for a visitor to the park. There, the visitor can check on the latest volcanic activity and also ascertain which roads and trails are open. In addition, an excellent exhibit at the museum tells the story of the park in relief models and paintings, and a color film of recent eruptions is also shown.

Crater Rim Drive, an eleven-mile paved road, encircles the Kilauea caldera. As you drive along the road, one of the first sights encountered is Kilauea Iki, where the lava fountains erupted in 1959. Today, although the surface is still steaming in places from a still very hot interior, it is cool enough to walk on. A four-mile trail leads down into the crater and across the

floor, providing an excellent chance to study the lava rock.

Thurston Lava Tube, just a short way past Kilauea Iki on Crater Rim Drive, is another example of the volcanic forces at work. A lava tube is formed when the surface of a lava flow is cooled by the air, hardens, and forms a crust over the lava flow. The flow remains molten, however, and continues to flow as long as there is volcanic activity. When the lava stops, the tube through the rock remains. Thurston Lava Tube is more than four hundred feet long, and the roof is as much as twenty feet high in some places.

The fire pit of Halemaumau (the House of Everlasting Fire) is next on the swing around the caldera. The pit is more than a half-mile in diameter and about 350 feet deep. Here, so close to the hidden main activity of the volcano, the smell of sulphur is almost overwhelming. Even when no volcanic activity is going on, it is an eerie experience to be so close to an active volcano.

After passing Halemaumau, a cutoff to the left on Mauna Loa Strip Road leads to Kipuka Puaulu (Bird Park). Here, in the shadow of Mauna Loa, a one-mile trail cuts through a *kipuka*, a Hawaiian word for an area that was surrounded but not covered by lava. One hundred acres of open forest filled with rare native plants, trees, and birds flourish here, in dramatic contrast to the stark landscape of the lava flows.

More than 85 percent of the flora is endemic to the Hawaiian Islands, and rare birds such as the Hawaiian honeycreeper and Ha-

waiian nene are found in the national park. If you fail to catch a glimpse of any of these birds, however, you are certain to see the omnipresent mongoose, which man introduced on the islands in an effort to control rats but unfortunately has proven to be a relentless destroyer of native birds, their eggs, and their young.

Another of the main hiking trails at Hawaii Volcanoes National Park is Mauna Iki. This trail, commonly called the Footprints Trail, begins at a point nine miles south of the visitors center and covers the area where long ago part of a native army was overwhelmed and killed by an explosion of Kilauea. The prints of many bare feet were left in the layer of ash that settled down over the area and can still be seen today.

Nature is still causing havoc at the park. Millions of dollars worth of damage was caused at Hawaii Volcanoes National Park by two severe earthquakes that struck the island of Hawaii in November 1975. Several trails were damaged, Crater Rim Drive was badly cracked in several places, and a rock slide deposited tons of boulders at the entrance to Thurston Lava Tube. This damage has been repaired, so visitors may still witness one of nature's most terrible and yet magnificent forces at work in the volcanoes of Hawaii and see how these beautiful islands themselves were created. ■

Doreen Bush has written articles for a variety of national magazines including *Writer's Digest*, *Country Gentleman*, *American History Illustrated*, and numerous juvenile magazines.

The Glen Canyon Dam and current river-running practices
are adversely affecting the Colorado River ecosystem

Man's impact on the **Colorado River** in the Grand Canyon

by R. ROY JOHNSON, STEVEN W. CAROTHERS,
ROBERT DOLAN, BRUCE P. HAYDEN & ALAN HOWARD

IN THE OCTOBER 1976 issue of *National Parks & Conservation Magazine*, the article "Dilemma in Grand Canyon," by Steve Martin, discussed some of the controversy over the presence of motorboats on the Colorado River in Grand Canyon National Park. The article also touched on some of the other problems facing the National Park Service in managing this area in the most ecologically sound manner.

In the early 1970s National Park Service resource managers, responding to increasing river use, postulated that the carrying capacity of the Colorado River zone had been or would soon be reached. It

was feared that environmental degradation due to overuse coupled with the impact of Glen Canyon Dam—completed in 1963—in altering the river regime might exceed the ecosystem's capacity to adjust.

Therefore, in 1973 the Park Service initiated a comprehensive Colorado River Research Program consisting of thirty individual investigations conducted under contract by educational institutions and a professional research firm to provide answers to these questions: How rapidly are the physical and biological resources of the riparian (streamside) zone adjusting to the new river regime? How

is the increased visitation affecting the riparian and aquatic resources? And what are the sociological effects of different visitor use levels and patterns on the nature and quality of the river running experience?

The results of these investigations are now being studied by National Park Service resource management personnel; so this article does not represent official Park Service policy. It merely summarizes the findings and recommendations of the studies. The individual research reports did not suggest ways of implementing the broad recommendations.

Changed River Regime



BUREAU OF RECLAMATION

Although Hoover Dam extended Lake Mead into the lower reaches of the Grand Canyon in the 1930s, the upper reaches of the canyon remained in a natural state until Glen Canyon Dam was completed at Page, Arizona, in 1963. Since then the dam has completely altered the flow of the Colorado River. Rather than a river charged with sediment "too thick to drink and too thin to plow," it is now a clear, cold "tidal" flow completely dependent upon the release of water from the Glen Canyon reservoir; and the resulting environmental responses have been rapid and significant.

Nearly all the former sediment load of the Colorado River is now being trapped behind the dam, and the peak water flow is nearly half its former volume. Consequently

the river below the dam is not experiencing its natural deposition and scouring regime. Therefore, in the absence of new sedimentation, former flood-stage terraces are being eroded without being replaced; and in the absence of former peak flows, sediment and debris deposited in the Colorado by floods of side canyons are not being scoured away but are growing larger. Consequently, in time the rapids on the Colorado River will become much more severe and more dangerous and potentially even impassable to boat traffic.

Before construction of Glen Canyon Dam, management of the Colorado River and the riparian ecosystem was not a major problem for the National Park Service; the area approached a true wilderness. It is also fair to say that the

environmental changes occurring along the river today might be of little interest if man's limited use of the river were to continue as it was before construction of Glen Canyon Dam, but the number of people floating the Colorado River has increased dramatically in recent years. The two-hundredth person to navigate the river did so in the early 1950s. By 1967 the number of river runners had reached 2,100 per year, and river

running was becoming a thriving business on the Colorado Plateau.

By 1973 more than twenty-one commercial boating companies and private outfitters carried more than fifteen thousand people annually down the river, an increase of almost 700 percent in six years. Estimates of demand suggest that up to twice that number might occur were it not for present National Park Service restrictions.

Organic Waste

Recreational use along the Colorado River in the Grand Canyon is concentrated on the relict stream deposits colloquially called "beaches." With the new river regime these deposits are now positioned well above the present



ROBERT DOLAN

high-water stage, so they are not replenished by periodic floods as they were before construction of the dam. The dominant natural processes are now sand transport by winds, movement of rocks and soil down toward the river due to gravity, and systematic erosion associated with daily high-low cycles in water levels.

Not only has the presence of Glen Canyon Dam resulted in a dramatically changed river regime, but irreversible physical and biological changes are occurring as a result of current use levels and patterns. Some of these changes are more a function of visitor use patterns and activities than of visitor numbers.

Float-trip passengers use the river beaches for camping, hiking, and lunch stops.

Approximately four hundred camping beaches are located along the Colorado River, but the majority of visitors use fewer than a hundred of them. At the more desirable sites thirty to forty people camp on the beaches each night during a five- to six-month season. Human impact includes incorporation of charcoal, human debris, and human waste into the sedimentary deposits used for campsites. For this reason, the most heavily used campsites are approaching a "sandbox" condition in that artifacts of human use are being incorporated into the deposits at rates that exceed the river's natural purging capacities.

Increased riparian zone vegetation in response to the new dam-

caused river regime as well as improper disposal of organic garbage and intentional feeding of animals have resulted in striking changes in some animal population densities and behavior. Heavily used campsites have higher densities of harvester ants than lightly and moderately used campsites. Because of their painful and toxic sting this species presents a source of great discomfort and a potential health hazard. The flesh fly and blow fly populations show corresponding population increases at heavily used camping areas. Not only a source of discomfort and annoyance, these species could also become a source of fly-vectored disease.

Increases in these insect populations have also resulted in increases in certain vertebrates, such as some species of lizards that congregate near dirty campgrounds. One of the more interesting consequences of human use of the wilderness beaches of the Grand Canyon is that at one of the most heavily used beaches house sparrows have taken up residence. This species does not normally occur outside of urban areas, as it seems to need the presence of man as part of its habitat requirements.

Two species of native mammals—spotted skunk and ringtail cat—and one species of bird, the raven, either have experienced increases in densities or have demonstrated significant shifts in their behavioral patterns as a result of being purposely fed by river runners or hikers.

Fire, Charcoal, Ash



JOHN RUNNING

Regardless of National Park Service regulations prohibiting open fires, charcoal and ash are accumulating in the beach deposits at rates that exceed the purging capacities of natural processes. Charcoal leaks out of the required firepans into the campsite deposits, and some campers and hikers ignore regulations and build open fires. The approved practice of tossing used charcoal into the river does little to correct the problem, because much of the charcoal simply floats down the river to the next sedimentary deposit, where it is incorporated in the active beach deposit or is transported via winds onto the campsites. In addition, the rate of natural replenishment of driftwood—an important component of the ecosystem—is less than the rate of human consumption.

Although fire is an important feature in most natural terrestrial ecosystems, man-caused blazes are generally detrimental in the Grand Canyon. Effects may range from small sand-scarred fire rings to entire stands of riverbank vegetation being consumed. At least ten man-caused blazes along the Colorado River have been documented in the past three years. Virtually all these fires were caused by the careless incineration of toilet tissue. The short-term effects of fires include elimination of actual or potential wildlife nesting, foraging, and display sites. Large burns may kill or force movement of certain animals and may result in the invasion of nonnative pioneer species of plants.

Trampling of Vegetation



STEVEN W. CAROTHERS

Trampling of vegetation and unstable sedimentary deposits also cause direct stress on the habitat. Most of the foot traffic on camping beaches is concentrated within one hundred meters or so of the boat mooring sites; it decreases rapidly inland from the main camping site. Use, however, is commonly channeled by the topography and vegetation, being concentrated along pathways that cross or bypass obstacles. Destruction of the fragile soils is almost total at many campsites, and footpaths have resulted in cuts of as much as 1.25 meters in depth at some sites, with cuts of 0.75 meter being quite common.

In many areas multiple trails, all with the same ending and beginning place, are maintained by large numbers of people trampling the vegetation in ever more pathways. This condition invites accelerated soil erosion and dramatically changes the plant growth of these areas. Much of the native stream-bank growth in the larger tributaries, such as Clear Creek, Hermit Creek, Tapeats Creek, and Havasu Canyon, also shows heavy damage because of foot traffic. This problem has resulted from the lack of any organized trail system designed to accommodate the number of park visitors to these areas.

Motors vs. Oars



ROBERT DOLAN

Finally, the program investigations indicate that motor-powered boats are not safer than nonmotorized boats, that noise from motors is inconsistent with established health and safety standards, that oar-powered trips are as economical to operate as motor-powered trips, and that passengers who experienced both kinds of trips prefer oar-powered trips.

Further, the use of motorboats is clearly inconsistent with the

guidelines provided for the management of the Colorado River as outlined in the Grand Canyon Preliminary Wilderness Proposal and the Grand Canyon National Park Master Plan, which states, "The goals for management of the Colorado River in Grand Canyon will be to perpetuate the wilderness river-running experience, and to attempt to mitigate the influences of man's manipulation of the river."

Recommendations



JOHN RUNNING

As a result of the research findings of the Grand Canyon Colorado River Research Program, the following recommendations were made.

- The incorporation of human wastes in the campsites should be eliminated. These wastes include food particles, liquid waste, porta-potty dumps, and trash. In addition, measures should be taken to provide for the proper disposal of human wastes and urine at lunch stops and attraction sites.

- Open fires and some types of pan fires, including the burning of driftwood, should be eliminated.

- Feeding of wild animals should be stopped.

- Traffic patterns and trails should be controlled.

- Visitors should be dispersed more evenly among the campsites instead of concentrating at the popular campsites.

- Finally, use of motorized vehicles, including motorboats, below the rim of the Grand Canyon should be prohibited.

The evidence presented in the

reports by the investigators of the Grand Canyon Colorado River Research Program suggests that current use patterns along the Colorado River in the Grand Canyon are causing significant environmental degradation. However, what this means to resource management cannot be determined in equally definite terms. The Colorado River riparian zone downriver from Glen Canyon Dam is clearly undergoing rapid changes; so what is happening to the beach deposits because of visitor use may *in the long run* be of questionable significance relative to the large-scale changes resulting from the dam. ■

The National Park Service Research Study Team was composed of Dr. Roy Johnson (head of team), National Park Service, Grand Canyon National Park; Dr. Steven W. Carothers, Museum of Northern Arizona, Flagstaff; and Dr. Robert Dolan, Dr. Bruce P. Hayden, and Dr. Alan Howard, University of Virginia. This article is Contribution No. 27 in the Grand Canyon National Park Colorado River Research Services.

Editor's Note

WHAT NOW? How You Can Get Involved . . .

In spite of the scientific findings by the Grand Canyon Colorado River Research Program of adverse effects on the river ecosystem, the National Park Service recently proposed to extend concession contracts for river tour operators for an additional three years. Because of the damage to water quality and to the riverbanks caused by thousands of river runners annually, NPCA had recommended that the concession contracts be extended for no longer than one year, or until the River Management Plan is completed. In addition, NPCA has been urging prohibition of motor-powered boat trips down the river and inclusion of the river itself within the boundaries of the proposed wilderness designation in Grand Canyon National Park.

The National Park Service is now studying the find-

ings of the Grand Canyon Colorado River Research Program and is completing its River Management Plan. The draft plan and Environmental Impact Statement (EIS) will be available for review about mid-April. After comments are received and considered, public meetings will be held in May to discuss the draft plan and the EIS. If you wish to receive a copy of the plan and the EIS for possible written comment and to be notified of hearings, write to the superintendent to place your name on the mailing list.

Mr. Merle Stitt, Superintendent
Grand Canyon National Park
P.O. Box 129
Grand Canyon, AZ 86023



In the face of the conflicting needs of wildlife and humanity, the government of India is trying to ensure that the protection of wildlife is included in its plans for development

by ZAFAR FUTEHALLY

prospects for INDIA'S WILDLIFE

THE STATUS of a country's wildlife depends primarily on the government's national policy. Fortunately our government has decided that India will be much the poorer both spiritually and materially if its wildlife is allowed to collapse. So although there is no denying that there is conflict in several areas between the immediate interests of humanity and wild animals, the administration is trying its best to contain it, in the hope that in the long run this policy will be wholly beneficial for the people. The Indian Board for Wildlife, the National Committee on Environmental Planning and Coordination, and the Steering Committee on Project Tiger are all trying to ensure that the interests of wildlife are not disregarded in our development plans.

Let us see how this conflict arises. The larger animals of India, the elephant, the Indian bison, the sambar, and the tiger, to name a few, are essentially dwellers of forests. As a result of human pressure the plains' forests have almost disappeared from our country, and the 20 percent of the land surface which is now under forest cover is mainly in the mountains. In many cases the mountains have within them the catchment areas of rivers which form part of hydroelectric or irrigation projects. These mountains are also well wooded areas and with advance planning and imagination could be retained as

wildlife sanctuaries and nature reserves. Because the catchments of these projects must remain well covered with vegetation to prevent soil erosion and siltation of dams lower down, such projects are excellent testing grounds for the principle that conservation and development can proceed hand-in-hand. The areas actually coming under development are not very large in most cases, but the problem has been that once a pristine forest is made accessible by roads and the project staff and laborers are settled in the locality, the fate of animals is sealed unless vigorous protection measures are enforced.

HYDROELECTRIC PROJECTS are by their nature sited in forested areas in mountains, and new giant projects are on the anvil. The Kudremukh Iron Ore Company, Limited, financed by Iran, will be the largest open cast mining company in Asia. It is sited in the Western Ghats, and the mining area is surrounded by evergreen forests rich in wildlife. The Western Ghats is a range of mountains extending a thousand miles north to south along the western coast of India. These mountains arrest the movement of rain-laden clouds which travel eastward over the Arabian Sea and are responsible for the country's principal rainfall. Because of the new awareness of the need to protect the environment, the project authorities have

decided to take firm steps to ensure that the neighboring forests and their denizens are fully protected.

In the Idukki project in Kerala, an area of seventy square miles has been designated as a wildlife sanctuary and in course of time is likely to become a spectacular reserve. The reservoir created by inundation of the valleys is buttressed by lush evergreen forests, and during a recent visit we saw several herds of elephants grazing peacefully in this secure habitat. We also found cormorants and darters nesting in some of the islands within the magnificent waterspread which covers an area of twenty-three square miles; and if proper ecological steps are taken, this sanctuary can demonstrate that with imaginative planning wildlife can be encouraged to prosper even under somewhat artificial conditions.

Though many of the smaller mammals and almost all bird life exist outside our sanctuaries, the case of the larger herbivores and carnivores is quite different. They need protected localities and natural habitats if they are to survive. With the plains almost wholly under agriculture and human use and the mountains being increasingly opened up, wildlife will be secure only in sanctuaries. More than 150 sanctuaries exist today covering a modest 0.5 percent of the land area, and several more are being contemplated. Although essentially meant for wild animals,



Indian elephants



Bonnet macaques

sanctuaries in India are continuing to be exploited for silvicultural purposes.

There has been considerable discussion about the effects of forestry operations in wildlife habitats. According to some, these operations are very deleterious, for disturbance by humans seriously affects the lifecycle of wild animals. Others take the opposite view and point to the fact that in the tourism zone of some of our sanctuaries there is more wildlife to be seen than in the truly wilderness zones. Some naturalists feel that, provided there is adequate territory, nature can be left to find its own balance. Others are more in favor of managing the habitat, recognizing that the best policy is to have well-wooded regions interspersed with open meadows. The edges of such habitats seem to hold a great attraction for wild creatures, apart from the fact that open areas with more sunlight produce a lot more forage for herbivores than comparable areas under tree cover.

OF THE 500 mammal species and 1,200 bird species of India, the most endangered ones are those whose habitat requirements are very special and whose demands for territory are rather large. The elephant, for example,

requires almost 250 kilograms of browse and grass per day, so that extensive wild country is necessary to provide it with food and shelter. A recent survey carried out by a team of ecologists of the Indian Institute of Science, Bangalore, led by Professor M.D. Gadgil, estimates the total elephant population of south India (the best habitat in the country for this animal) at 4,000. They say that "more than direct poaching the most serious threat to this population of elephant is the alarmingly rapid and continuing fragmentation of its habitat due to a variety of reasons ranging from deforestation, extension of plantations, agriculture, dams, and other construction activities." The best hope for the elephant rests on the fact that the forests of the Western Ghats are intended to be preserved for their ecological functions; and with the saving of the habitat, this intelligent pachiderm, so closely associated with India's cultural history, is also likely to survive.

Like the elephant, the future of the Indian bison (*Bos gaurus*), in many ways one of the most striking of wild herbivores, is also connected with the preservation of its forest habitat. But these animals are unfortunately very susceptible to diseases, particularly rinderpest, communicated through domestic

cattle; and in 1968 one of the finest herds in the sanctuaries of Bandipur and Mudumalai was almost wiped out. Since then domestic cattle passing through these sanctuaries are inoculated against this disease; and although the menace has been checked, recent deaths in the Periyar Sanctuary indicate that constant vigilance is necessary.

Of the other herbivores some like the Kashmir stag (*Cervus elaphus hanglu*) and the hardground barasingha (*Cervus duvauceli branderi*) are slowly building up their numbers under stringent protection and with the aid of management plans for their habitats. The Kashmir stag is a close relation of the European red deer, and because of its dwindling numbers the World Wildlife Fund in association with the State Government of Kashmir has formulated a project for saving this animal in the Dachigam Sanctuary near Srinagar. Although the population of this deer was estimated at around 550 in Dachigam in 1957-1958, it is feared today that the number is nearer 200. This decline has been largely due to poaching which has now been arrested. Some like the Manipur brow-antlered deer (*Cervus eldi*) with only fourteen individuals left seem almost beyond redemption. In this case protection has not been enough; it



Indian bison



Indian tiger

is the loss of the very specialized habitat which is the main factor in their decline. The Indian rhinoceros (*Rhinoceros unicornus*) appears to be doing well in the sanctuaries of Kaziranga (Assam) and Jaldapara (West Bengal). The World Wildlife Fund and other international bodies have played a sterling role in saving this animal by providing arms and walkie-talkies to the sanctuary staff to deal with poachers who were the biggest threat to this animal, because of the allegedly aphrodisiac qualities of its horn.

THE CARNIVORES, critically placed at the top of the food chain, suffer the most when wildlife populations decrease; so the tiger was seriously endangered until very recently. Being the magnificent animal that it is, its predicament caused worldwide concern, and it was clear that unless some extraordinary steps were taken the population of 2,000 as against the estimated 40,000 in the earlier years of the century would not be able to survive. The World Wildlife Fund and the International Union for the Conservation of Nature and Natural Resources must take great credit for having stimulated the government of India to formulate Project Tiger, which got under way in April 1973,

principally because of the interest of the Prime Minister Mrs. Indira Gandhi. Nine tiger reserves comprising the best tiger habitats in the country have been established, and the annual reports of the project indicate that the population has increased. This project will cost approximately 6 million U.S. dollars during its five-year period, and it is rightly acclaimed as the largest conservation effort in the cause of any single species ever undertaken in any country. The added advantage is that large stretches of India's magnificent forests and several other species inhabiting these areas will also be rehabilitated in the course of this undertaking. Under the chairmanship of a cabinet minister, Dr. Karan Singh, the Directorate of Project Tiger has made commendable progress. Every attempt is also being made to involve international expertise in this enterprise. Recently Paul Leyhausen, Chairman of the Cat Group of the Survival Service Commission of the IUCN, was invited to visit the reserves and offer his comments. His report is now before the Steering Committee, and many of his suggestions are being implemented. A course in tranquilizing animals has also been given to selected forest officers and others, and the expertise acquired will be valuable in

translocating animals from denuded areas to more promising habitats to ensure their survival. An international symposium on the tiger will be held in New Delhi in April 1977, and this will be a good opportunity for the pooling of all scientific knowledge available about this elusive creature characterized as the "phantom of the forests."

One of the problems of Indian wildlife is that well-trained ecologists are not available for manning the sanctuaries. To remedy this shortcoming it is proposed to introduce university courses in wildlife management at the Ph.D. level. After these students emerge as qualified wildlife ecologists, our sanctuaries will hopefully be managed not by foresters whose principal interests are connected with silviculture, but by people who understand the significance of maintaining wilderness for wild animals. Then will India's wildlife truly come into its own. ■

A member of India's National Committee on Environmental Planning and Coordination as well as numerous other Indian and international environmental groups, Zafar Futehally has long been associated with efforts to protect his country's vanishing wildlife. His particular interest is in environmental planning.

THE UNFINISHED AGENDA

The Citizen's Policy Guide to Environmental Issues

A provocative blueprint for U.S. action on pressing environmental matters was unveiled by a task force of leading environmentalists at a February 2 symposium in Washington, D.C. *The Unfinished Agenda: The Citizen's Policy Guide to Environmental Issues*, which is described on page 2, will appear in book form this month.

Approximately 250 persons in key decisionmaking roles in and out of government assembled for the symposium, at which the chief executives of the country's twelve largest direct-membership environmental organizations alerted the public, the new Carter administration, and the 95th Congress to "what environmentalists really want."

NPCA President A.W. Smith, who, along with eleven other leaders, serves on the task force as an individual, participated on one of four panels that presented the task force's recommendations at the recent conference. The task force was assembled and

chaired by Gerald O. Barney of the Rockefeller Brothers Fund. NPCA staff members were among the 250 invitees to the symposium.

To produce the landmark book, the task force first asked twenty-five recognized environmental authorities what they consider to be key environmental problems and to suggest explicit steps toward solutions. This request resulted in an initial list of 140 ideas that were then submitted to sixty-three environmental experts for discussion and comment. The task force chose the most significant ideas for intensive study, commissioning short papers on those they agreed were most important.

The Unfinished Agenda examines such issues as the stress of world population on food supply and agriculture; the consequences of extracting and using nonrenewable natural resources; energy consumption and conservation; and implications of the new-found ability to create new forms of life.

In addition to his role as one of the leaders producing the 191-page book, at the recent symposium Mr. Smith served on a panel exploring "Global Implications." The task force has recommended that the United States accept a strong leadership role in protecting the global environment.

"Significantly higher" funding for the Park Service—long advocated by this Association—was just one of seventy-five major recommendations in *The Unfinished Agenda*.

Many NPCA members will be interested in this landmark book, which should serve as a starting point for a needed serious national discourse about environmental issues. *The Unfinished Agenda: The Citizen's Policy Guide to Environmental Issues* will be published by Thomas Y. Crowell, Inc. of New York at \$3.95 per paperback copy and \$7.95 for a hardcover copy. NPCA is investigating the possibility of making a book available to members at a discount price. ■

JIMMY & THE PARKS

"Our Park System Will Be Restored and Protected"

"I am saddened at the increasing deterioration and mismanagement of our national parks," President Jimmy Carter told conservationists during the 1976 campaign, and promised to increase funding and personnel for the National Park Service. Accordingly, weeks before the start of the new Administration, NPCA provided the Carter transition team with a recommended program for the parks.

In consulting with NPCA, the transition team learned more about this Association's 1976 survey of park resources. The far-reaching survey had revealed extensive degradation of natural resources, historic structures, and facilities in unit after unit of the underfunded and understaffed National Park System.

President Carter, who as Georgia governor supported expansion of the state's park system and pushed through a park acquisition program, made these promises about the national parks during the campaign:

Under a Carter Administration, our park system will be restored and protected. The Park Service will be allowed to tell the President, the Congress, and the people what it needs to keep the parks in good repair and not be silenced by an unsympathetic bureaucratic superstructure. The people who enjoy our park areas, not just those who make money from them, will have a voice in deciding how they are run and where new parks should be developed. The tangle of government agencies which now cannot hope to manage the parks fairly or efficiently will be unraveled. I will ensure the full funding of the Land and Water Conservation Fund to permit parallel development of state and local park and recreation areas. Urban parks must be developed through an extensive review by the Secretary of Interior of urban recreational needs, followed by action on these proposals which the Ford Administration has ignored.

NPCA is cheered by President Carter's demonstration of concern for our national parks. In order to fulfill his campaign promises, this Association has urged Carter to consider these actions as his Administration's highest priorities in regard to the National Park System:

Budget

The Park Service urgently needs

supplemental appropriations for Fiscal Year (FY) 1977 and a substantial increase in appropriations for FY 1978 and subsequent years. NPCA recommended Administration support of FY 1977 supplemental appropriations of \$141 million for land acquisition, \$500 million for rehabilitation and maintenance, and \$200 million for additional permanent personnel as well as public service jobs. For FY 1978, NPCA recommended that the Administration request congressional appropriation of \$346 million for operation of the National Park System, which has had to accommodate so many visitors that the annual number of visits is now approaching the 300-million mark. In addition, NPCA urged Administration support for FY 1978 NPS appropriations of \$107 million for planning and construction (cautioning against undertaking new construction without securing public evaluation), \$60 million for historic preservation, and \$40 million for other purposes. The Land

and Water Conservation Fund appropriations, from which the Park Service receives funds for land acquisition, should be \$600 million.

Legislation

- **Management:** Legislative action is needed to protect Redwood National Park, California, from further damage resulting from timber harvesting on private lands upstream; to acquire, through a legislative declaration-in-taking, 35,000 acres of private inholdings (worth \$72 million) in various National Park System units; to substantially revise the Concessions Policy Act of 1965; to designate wilderness in at least 17 NPS units; and to provide for study and implementation of alternative transportation systems in parks.

- **New Areas:** In addition to supporting legislation to add Alaska D-2 lands to the National Park System, the Administration should consider legislation needed to add a number of other new areas to the National Park System, as follows: Chattahoochee River National Recreation Area, Ga.; Kern Plateau addition to Sequoia National

Park, Calif.; Santa Monica Mountains area, Calif.; New River Gorge, W. Va.; Tallgrass Prairie National Park, Kans.; expansion of Channel Islands National Monument, Calif., and redesignation as Channel Islands National Park; expansion of Manassas National Battlefield Park, Va.; Santa Margarita Mountains National Recreation Area, Calif.; Sawtooth Mountains National Park, Idaho; Potomac River, Md., Va., W. Va.; expansion of Death Valley National Monument, Calif., and redesignation as a national park; Nantucket Sound Islands, Mass.; expansion of Rocky Mountain National Park, Colo.; Alexandria Waterfront National Historical Park, Va.; Mount Mitchell National Park, N.C.

- **Expanded Programs:** Legislation is also needed to define the National Park Service role in relation to urban parks; to protect areas designated as "natural landmarks" (such designation currently provides no protection); and to consolidate historic preservation efforts under one agency and begin to provide adequate funding in this area of great need. ■

A coyote bounds through Kansas tallgrass. NPCA has urged Administration backing of the creation of a Tallgrass Prairie National Park. A preliminary NPS study narrows possible sites for the park down to three areas in Kansas and Oklahoma. Legislation is needed to add a number of other areas around the nation to the Park System as well.



RON KLANKE

CROSS-FLORIDA CANAL Boondoggle Busted?

In mid-December the governor and cabinet of the state of Florida voted down completion of the Cross-Florida Barge Canal, a multimillion-dollar boondoggle long opposed by NPCA.

The cabinet action followed a hearing in Tallahassee at which overflow crowds and the governor and cabinet weighed the arguments of both environmentalists and the proponents of constructing a waterway across northern Florida to connect the Atlantic Ocean and the Gulf of Mexico.

The officials listened attentively—even as the hearing wore on into the night—as NPCA Florida Representative Walter Boardman and others briefed them on the necessity for rejecting the project on environmental, economic, and social grounds. Boardman reports that it was a "tribute to good government."

Although the cabinet vote does not completely rule out the barge canal, it most likely will squelch the project because Congress rarely authorizes or appropriates money for projects opposed by state officials.

The Corps of Engineers and Florida businessmen have been trying to resurrect plans to complete the canal, on which construction began in 1964 but later was halted pending preparation of an environmental impact statement. Completion would promote land speculation along the canal route.

Dredging, channelization, and other activities associated with the project could have drastic effects on the Ocklawaha River and its valley. The area is noted for diverse types of plant communities including hardwood swamp forests and hammocks, flatwoods, scrub, marshes, and prairies. These communities shelter wood ducks, woodpeckers, graceful wading birds, alligators, bear, wild turkeys, and even endangered Florida panthers.

In addition to the potential for environmental disaster from the Cross-Florida Barge Canal, NPCA representative Boardman emphasized that, contrary to the claims of the Corps, the project would be uneconomical. A benefit-cost analysis shows that bene-

fits outweigh costs only when the ratio is computed using the now impossible interest rate of 2½ percent. Although this may have been the legal rate at the time the canal originally was authorized, the rate is now more than 6 percent. Use of an unrealistic figure to squeak out a favorable ratio makes all other data suspect, NPCA contended.

Boardman pointed out that the recreational benefits of the project have been even more weighted to support the claims of canal proponents.

He maintained that more jobs could be created by using the money proposed for canal construction for public works projects that are needed and clearly beneficial to the people. With the conservative approach to governmental operations evident in the recent past, NPCA representative Boardman observed, "anything that savors of the old Works Project Administration is viewed with abhorrence. Yet the same people seem to be pushing this canal as a means of creating jobs. Work opportunities are needed, but let us consider that there is an urgent need for new, modern, wastewater treat-

ment facilities and a major problem in solid waste disposal. . . ."

NPCA criticized the Corps draft environmental impact statement (DEIS) for sidestepping an Interior Department recommendation that the Corps deal with eutrophication problems in depth before publishing the document.

This Association also noted that the Corps has not provided for adequate protection against toxic spills. By avoiding the question of the cost of safeguards in the DEIS, the Corps facilitated a cost-benefit ratio more favorable to the canal project.

The DEIS also does not adequately consider the effects of competition for water under drought conditions, especially the fact that demand could be greater than supply in the state. Boardman commented that the Corps' attitude boils down to "dig the canal now and then worry later about what we have done."

Get Involved: NPCA members are urged to ask their senators or representatives to vote for deauthorization of the Cross-Florida Barge Canal when it comes before Congress. ■

COASTAL MAINE

NPCA Opposes Oil Refinery

NPCA opposes a proposed refinery at Eastport, Maine, because it could result in oil spills and air pollution endangering coastal resources, wildlife refuges, and parks.

Located in northeastern Maine, Eastport is a small, economically depressed town. Most of its population have supported the oil refinery and marine terminal since the Pittston Company of New York proposed the facilities in April 1973. Refinery facilities would include the processing plant, storage tanks, and berthing piers for large tankers weighing 150,000 deadweight tons.

NPCA noted in comments on a draft environmental impact statement (DEIS) on the project that the possibility of spills was increased by the question of whether Maine's restrictions on tankers and their movements could be superseded by less strict federal regulations. Another major question is the relation of the refinery to a proposed power project. The Passamaquoddy Tidal Power Project, sus-

CAT/CARNIVORE CONFERENCE

Felids Forever

The Fourth International Conference on the World's Cats and Sociobiology of Carnivores will be held on March 17-19, 1977, in Seattle, Washington. The conference is sponsored by NPCA, the Institute for the Study and Conservation of Endangered Species, Woodland Park Zoo, and the University of Washington's Department of Psychology and College of Forest Resources. The program will include presentations by scientists on such topics as the artificial breeding of felids and reproduction, growth, and behavior of various species of cats; an overview of the evolution of the domestic cat; and management of felids in various parts of the world. Lectures will also be given on the sociobiology of various carnivores. NPCA will sponsor a followup conference on felids, the grizzly, black bear, and wolf at our Washington headquarters on March 22. This conference will be attended by scientists, conservationists, and congressional and governmental representatives. ■



pended indefinitely while the Army Corps of Engineers is reassessing costs, conceivably could become prohibitively expensive if significant adaptations were necessary to permit continued refinery operations. Lost with the Passamaquoddy project would be the opportunity for timely development of a renewable energy resource.

The DEIS was prepared by the New England Regional Office of the Environmental Protection Agency, which will issue a final EIS sometime this spring and decide whether to issue a conditional permit to Pittston. Under the Federal Water Pollution Control Act, the state of Maine would then have to certify the oil refinery project at Eastport.

Complicating the entire matter is the Canadian government's opposition to use of an international strait by large tankers on their way to Eastport. Since 1973 Canada has opposed the movement of large tankers through Head Harbor Passage because, understandably, Canadians fear the effects of an oil spill on their multimillion dollar fishing industry. The U.S. State Department is presently attempting to resolve the conflict. EPA must base its decision solely on environmental factors and must therefore ignore the Canadian position. NPCA has recom-

mended that the dispute be settled before a final EIS is published.

NPCA urged EPA to examine in its final EIS the possibility that oil from the mid-Atlantic and North Atlantic outer continental shelf (OCS) leasing regions might be processed at the Eastport refinery. If planned oil development proceeds in those areas, there would be increased tanker traffic offshore, and thus a greater probability of collisions and spills.

The final EIS should also deal with the possible effects of increased air pollution on nearby parks and wildlife refuges. Although federal air pollution standards would not be exceeded by the project, pollutant levels would be significantly affected. Within a few miles of Eastport are St. Croix National Monument, Moosehorn National Wildlife Refuge, and Cobscook and Quoddy Head state parks. Down the coast is Acadia National Park. Legislation under consideration would allow no deterioration of air quality in national parks and wildernesses.

Get Involved: NPCA members can write, call, or send a public opinion telegram to the Administrator, Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460. (202-765-2673.) NPCA urges EPA to deny the permit. ■

OIL TANKER STANDARDS

You Say "There Ought To Be a Law . . .?"

"There ought to be a law . . ." is a frequent, incredulous response to the recent spate of close to a dozen oil tanker disasters and near-disasters. For several years NPCA, along with other organizations, has been saying that there *is* a law—the Ports and Waterways Safety Act of 1972—but that the Coast Guard has been lax in enforcing it. Through litigation and other actions, the organizations have been trying to obtain adequate design, construction, and operation standards for all vessels trading along our coasts.

In fact, the latest disasters do not represent new or isolated phenomena. Oil spills are all too common. On the average, some 200,000 tons of oil per year are spilled into the oceans as a result of tanker accidents. Accidents of commercial vessels of all types in U.S. navigable waters have almost doubled

in the past ten years. The year 1976 was a disastrous year for spills: the Tanker Advisory Center in New York reports that in the first nine months of 1976 alone, before this winter's calamities, 198,277 tons were spilled. Furthermore, the amounts of oil from accidental spills represent only a small percentage of the millions of tons of oil discharged each year in routine operations.

Large though it was, the *Argo Merchant* spill was only tenth in volume on the all-time world list of spills. But for many Americans that December catastrophe literally brought home the seriousness of the threat from lax tanker regulations. Here were 7.5 million gallons of heavy industrial oil fanning into the rich Georges Bank fishing grounds—source of one-sixth of the world's supply of fish. The tanker

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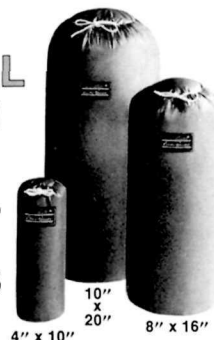
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grounded off Nantucket Island, Massachusetts, less than fifty miles from Cape Cod National Seashore. The twenty-foot waves and fierce winds battering the vessel emphasized the dangers of proposed oil and gas development in the stormy Atlantic. (See February 1977 Magazine.)

Scientists worried about the immediate effects on marine mammals and spawning finfish and possibly devastating and long-lasting effects on the marine food chain.

Spurred by the recent incidents, the Senate Commerce Committee held hearings on the matter in January. Represented by Eldon V. C. Greenberg of the Center for Law and Social Policy, NPCA and other organizations pointed out that the oil spill risk is sure to increase as the volume of tanker traffic along our coasts increases. Furthermore, the *Argo Merchant* was a small ship compared to the average "super-tanker."

When Congress enacted the Ports and Waterways Safety Act in 1972, it

charged the Coast Guard with developing adequate standards on a priority basis for all tankers, U.S. and foreign flag, which enter U.S. waters. However, implementation of the Act by the Coast Guard has been marked by persistent delay and weak standards, NPCA has charged.

For example, Mr. Greenberg's testimony pointed out that the Coast Guard has the power to exclude any vessel from U.S. ports for failure to comply with regulations, regardless of whether violations occur in U.S. territorial waters. Yet, the Coast Guard's rules for construction and equipment of tankers in foreign trade reflect exclusive reliance on the 1973 International Convention for the Prevention of Pollution from Ships. Three years after its negotiation, that convention has never even been sent to the U.S. Senate and indeed may never come into force.

The Coast Guard rules contain no provision for enforcing violations of discharge standards outside U.S. terri-

torial waters. (The *Argo Merchant* went aground outside the traditional limits.)

Likewise, navigation safety regulations proposed by the Coast Guard merely codify existing industry practice. Thus, equipment that might have prevented the *Argo Merchant* accident would not be required.

One specific standard that would assist in preventing oil spills after groundings would be a requirement for double hulls. If the *Olympic Games* had had a double bottom, it would not have spilled 134,000 gallons of crude oil into the Delaware River in late December.

The 1973 convention and both existing and proposed Coast Guard rules require double bottoms on only new vessels—thus exempting most tankers. The Coast Guard also exempts all vessels under 70,000 tons.

Pointing to the Coast Guard's deficient implementation of the Ports and Waterways Safety Act, NPCA testified in detail on new legislation that is

Getting Involved

Dear Member,

Ours is a world in the throes of change. The once-familiar human landscape has taken on a strangeness. The guideposts men moved by but a few short years ago are down, and the destinations toward which they traveled have turned into mirages. Nothing holds. Nothing stays. We are in transit.

The way ahead is assuredly difficult, but, for us at NPCA, it is clear. There are no doubts as to where we want to go or how we want to get there; we have a dream—a vision of the future. A North Star of the spirit, you might call it. From it, we take our bearings. It is a vision which all men, in time, must come to share if they are to survive—a vision of humanity living in harmony with nature. We are optimistic about this dream. Giant steps have already been taken toward its realization.

Most heartening are the changes in people themselves. No longer are they



content to live as they did, tolerating the conditions inherited from the past. They have moved beyond the values, thoughts, and attitudes that claimed and motivated them then. The environmental crisis has brought an awareness of their true interests to the fore, plus something of an understanding of the basic natural realities from which their spiritual and material cul-

ture derives. The power that directed the human stream through the old channels of corporate interest returns to its source. The source is the individual.

As in past crises, the individual is again establishing his claim to himself. He is coming to realize that the issues of our times must be decided, first and foremost, at his level.

It is what happens to him as a person—inside—that provides the nexus. Outward circumstances take their form from inward conditions. We cannot, in any meaningful and lasting way, clean up our environment, protect our parks, halt the ravaging of prime agricultural land, or stay the destruction of habitat and wanton killing that are driving the last wild creatures toward extinction, unless we stimulate and nurture the inner promptings that will make their realization possible. Laws, regulations, mandates are ineffectual in the long run, unless the forces of personal commitment are behind them.

Each individual is a source of power

needed to safeguard our nation against even greater disasters than the ones we recently witnessed.

Among other things, legislation should: require that all standards be based on the "best available pollution control technology"; clarify that the law is not preemptive of state law; mandate specific design, construction, and equipment standards; provide authority to establish radar-controlled traffic systems extending beyond U.S. waters; transfer authority for regulating vessel source pollution to an environmental agency or establish greater civilian control over the Coast Guard; exclude from U.S. waters substandard tankers and those persistently violating pollution control standards; and establish a comprehensive scheme for liability for polluters and compensation for those suffering damage.

Mr. Greenberg also was the lead-off witness at recent House Government Operations Committee hearings on tanker problems. He provided data on spill cleanup contingency plans. ■

in the vast complex of public will and energy. But singly and alone he can accomplish little. Only by joining his strength to that of others can he achieve sufficient impact to overcome those who would despoil this miracle of time, the earth. It takes people to do this—people operating from the base of their own personal convictions, people who will take on the problems of the environment as their own, *lots* of people.

That is why I am asking you to introduce someone you know to NPCA. Get him involved! Involvement is the measure of a person's concern, and the hope he has in people. Get him rolling by enrolling him. Give him a membership.

As a token of our appreciation, we will send you nine superb examples of the nature photographers' art to grace the walls of your den or library. They appeared on the covers of *National Parks & Conservation Magazine*.

Yours,
Gilbert F. Stucker
Chairman, Board of Trustees

BIG CYPRESS, EVERGLADES

35 Percent of South Florida Down the Drain?

After 1900, people came in increasing numbers to south Florida and began extensive modification of its vast wilderness of swamps, forests, marshes, prairies, and bays. The ecosystems of the region had evolved over thousands of years. However, as of 1976 about 35 percent of the natural habitat in south Florida had been destroyed by agriculture and urbanization, according to a report recently published by the U.S. Geological Survey (USGS), Department of the Interior.

The remaining natural habitat, the report observes, is now threatened by exotic plants and animals, altered water levels and flows, severe fires, pollution, loss of animal and plant populations, and by further growth and development.

Man's most dramatic and long-term effects on ecosystems have resulted from drainage, the report emphasizes. Wetlands originally occupied 75 percent of south Florida, but much of this land has been drained. In southeast Florida drainage has lowered water tables as much as 6 feet below 1900 levels and has disrupted natural systems in multiple ways. Dredge and fill operations are major threats to estuaries and marine fisheries.

The eighty-page, colorfully illustrated USGS report summarizes fifty-one federal studies of south Florida. It concludes Phase I of the South Florida Environmental Study, which stemmed from opposition to a 1968 proposal by the Dade County Port Authority to build an international jetport in the Big Cypress Swamp west of Miami. A preliminary federal study indicated that the jetport, planned as the world's largest airport complex, would adversely affect Everglades National Park and other natural resources in south Florida. A coalition of conservation organizations brought together at NPCA headquarters moved to block the jetport in the Big Cypress and got an agreement between the federal government and Dade County and the state of Florida to move the jetport, including an already-constructed training strip, to a more acceptable site.

(That agreement was renewed in 1975, but the training strip remains in

the Big Cypress area that is now part of the National Park System, pending a decision on whether to build the jetport elsewhere. Planners are beginning to realize there may be no need for the jetport. However, Dade County has not made a firm commitment on when it will move the training strip.)

In 1970 the federal government, through the Federal Aviation Administration, made a pact with the county and state whereby the Interior Department

U.N. WATER CONFERENCE

Water, Water Everywhere?

"Something like 40 percent of the human race does not have access to safe water. Waterborne diseases are estimated to kill more than 25,000 people daily," former Environmental Protection Agency Administrator Russell Train stated recently. This widespread degradation of the world's most essential resource—water—will be one topic under consideration at the United Nations Water Conference in Argentina this month (March 14–25).

The pressure of an ever-increasing world population on the globe's finite water supply could result in a world water crisis within a few decades. Planners and policymakers from the United States and other U.N. member nations will meet to discuss ways in which water can best be managed to meet the present and future needs of people and nations. Representatives of environmental organizations, government, and industry will address what is rapidly becoming a major international problem: The threat to world health as well as to economic and social development posed by a growing demand for water resources accompanied by continuing degradation of water quality. The attendant increase in conflicts among nations competing for access to a limited water supply is a growing concern.

Other related subjects to be considered include: energy development; food production; conservation of water; flood plain and river basin management; boundary waters; weather modification; management, research, and education; and recreation. ■

ment agreed to provide background ecological information to aid in finding and purchasing an acceptable site for the jetport.

That ecological study produced fifty-one separate reports on the environment of south Florida by five present and two former Interior Department agencies.

In summarizing those reports, the recent USGS report is also intended for use by federal, state, and local land and resources managers responsible for many land and water-use decisions in the state. The USGS says the report is "aimed at helping to protect south Florida's environment while promoting economic development."

Former Interior Secretary Thomas Kleppe makes the following recommendations in the report:

- "Determine, through local and state governments, human population carrying capacity for the region that is compatible with the goal of no further environmental degradation and with resources and energy constraints.

- "Adopt, through local and state governments, a land use plan based on this determination. . . .

- "Pass state and local legislation that supports the land use plan and creates enforcement machinery for its implementation.

- "Monitor the essential natural resource, economic, sociological, and energy factors to ensure that the regional policy and land use plan are

being followed. Centralize, standardize, and publish this information on a regular basis."

Copies of the report, *The Environment of South Florida, A Summary Report*, published as USGS Professional Paper 1011, are available from the Branch of Distribution, USGS, 1200 South Eads St., Arlington, Va. 22202, prepaid to the U.S. Geological Survey for \$3.65 per copy. ■

BWCA

North Country Forests Get Six-Month Reprieve

At the eleventh hour before winter logging was scheduled to begin on virgin tracts in the Boundary Waters Canoe Area of Minnesota, logging companies agreed to a six-month moratorium on cutting.

In the January 1977 issue of this magazine, Dean Rebuffoni, a reporter for the *Minneapolis Tribune*, explained how developments including a court battle that went all the way to the Supreme Court have reopened the BWCA to logging even though it is a unit of the National Wilderness Preservation System.

Several thousand acres of virgin forest, part of the last large and relatively complete example of the northern conifer system in this nation, were on the chopping block at the end of 1976. Then Rep. James Oberstar (D-Minn.) announced that at his request four logging companies had agreed to postpone cutting to give Congress a chance to act on pending legislation relating to the BWCA. The companies are Boise Cascade Corporation, Potlatch Corporation, and Kainz Logging Company of Minnesota and Abitibi Paper Corporation of Ontario.

The moratorium is a voluntary one, and for a while it seemed that one of the companies would back out. In addition, the moratorium by no means removes the threat to BWCA forests; besides the six sales covered by the moratorium, the Forest Service could legally allow cutting on more than 150,000 additional acres of virgin forest after July 1977.

However, conservationists are grateful to the logging companies, which now seem to have made a firm commitment, for their cooperation. Miron Heinselman, chairman of the Friends

of the Boundary Waters Wilderness, explains that "The moratorium, in effect, gives us until the 1977 fall cutting season to obtain protective legislation for the BWCA."

Located within Superior National Forest, the BWCA includes the biggest contiguous blocks of virgin forest remaining in the eastern half of the United States—a total of 425,000 acres. The threatened acres represent only about 1 percent of the commercial forest in Minnesota.

At press time Rep. Oberstar was expected to propose legislation that would enlarge the million-acre BWCA by 123,000 acres but divide it into two zones—a wilderness area and a 528,000-acre recreational section within which logging would be allowed.

Rep. Donald R. Fraser (D-Minn.) has introduced HR 2820, a bill that would add 40,000 acres to the BWCA and ban logging, use of motorized vehicles, and mining in the entire area and give it full wilderness status.

In other BWCA developments, a U.S. District court judge upheld a current ban on snowmobiling there. However, in the January ruling he indicated that the Forest Service has discretion on whether to allow use of the vehicles or not, thus refuting the contention of ski groups that the Wilderness Act prohibits snowmobiles in the Boundary Waters Canoe Area.

Get Involved: Your help is needed in supporting a complete ban on logging in the BWCA and on other adverse activities that threaten our nation's only lakeland wilderness area. Hearings on the bills probably will be held soon. NPCA members are urged to ask their representatives to support Rep. Fraser's bill, HR 2820. ■



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Member Deplores NPS Fire Policy

To many of us who are interested in the preservation of our National Park System it is appalling to discover that the Park Service has adopted a policy of ignoring or leaving unchecked any forest fire of natural origin.

While cyclic burning may be of advantage in preserving the sequoias against a gradual but dangerous build-up of forest undergrowth, little justification exists for allowing a forest fire to rage unchecked in any climax forest of our parks throughout the Rockies or the Pacific Northwest. Where climax forests exist in these parks the rate of growth of one or more species of tree equals the corresponding rate of decay. Certain purists suggest that a climax forest, if left to its own devices, will



CHARLES J. OTT

A forest burn would impair the view at St. Marys Lake in Glacier park.

NPS Resource Specialist Responds

Gordon M. Schoepfle raises a basic question about the purpose of national parks. Only a few parks have been set aside as the result of concern for a single species such as the redwoods or giants sequoias. Most represent a composite of the geographical features of that region. The legislation establishing the National Park Service in 1916 stated the objective to "conserve the scenery and natural and historic objects and the wildlife therein. . . ."

The report of the Leopold Committee, which reviewed the management of park resources in 1963, emphasized the need to consider the whole park as a system. The Management Policies (1975) retain that concept of perpetuation of a total natural environment.

The Service in its Administrative Policies (1968) acknowledged that lightning fires are a natural influence on some ecosystems, and this premise is retained in the 1975 version. No-

rot away. This is pernicious nonsense. In a climax state where Engelmann spruce is dominant, continued replacement does not result in the appearance of stunted younger trees. Rather, young trees appear as slim and tall, ready to take over the role of the heavier giants who are about to fall. Potential fuel in the form of fallen timber has reached a maximum in the sense that overall rate of fall equals rate of decay. Hence any devastation resulting from fire will be no greater three hundred years from now than it will be at present. In the absence of fire these impressively beautiful stands of forest will remain unchanged for centuries.

However, an argument of esthetics appears at variance with the philosophy that only natural forces should prevail. It is admittedly an arbitrary value judgment to exclude fire and disease from the list of natural forces. It is equally arbitrary to hold as an article of faith that one should interfere with no natural process of any sort. It is our contention then that climax forests of our National Park System exist as unique entities in settings of incomparable beauty. Few substitutions can be found elsewhere. Lightning bolts in these forests or in areas adjacent to

where does the National Park Service condone allowing "any forest fire" of natural origin to burn, as Mr. Schoepfle stated. Some have attributed this idea to us, but it is a gross oversimplification of the complex topic of fire.

Within the parks only those fires which meet certain *predetermined* criteria may be allowed to burn, and then only if they continue to stay within the "prescription." The criteria and prescriptions for that particular park define the limits of acceptable fire behavior. The consideration of "climax species" is a part of the planning process leading to the prescription, as is the protection of the public.

We recognize the uniqueness of climax forests and will endeavor to assure their retention and replacement within the natural system. To limit the objectives of the Service to only their perpetuation, however, would be just as wrong or "unnatural" as burning it all. We intend to do neither, but to ensure

such climax stands may then initiate a catastrophic devastation insofar as esthetic considerations are concerned.

Also, it is most doubtful that any one species of either plant or animal kingdom will vanish into extinction as a result of continued fire prevention in the National Park System.

The proponents of fire prevention contend that national parks, however large, are still too small and too uniquely specialized to serve as mere demonstration laboratories in field biology. The enchantment of the forest primeval should preclude its sacrifice to natural destruction by fire.

The argument relating to fire serves as a divisive and demoralizing wedge between two groups devoted to wilderness preservation. Most of us have long since lauded the decisive resistance of the Park Service to potential inroads by lumbermen, miners, stockmen, and promoters of various sorts. We also applaud the decision to encourage the balance between predator and prey.

It seems then that the recent high-handed decisions relating to fire control may lead to a decidedly negative reaction on the part of the public. . . .

*Gordon M. Schoepfle
Birmingham, Alabama*

as natural a blend of climax and lesser stages of succession as our modern technology can provide.

We agree that parks should not become laboratories or experiment stations. We readily perceive the parks as isolated islands being rapidly surrounded by man-dominated change. Those changes may be developments or land resource uses based upon other



NATIONAL PARK SERVICE

Prescribed burning will help perpetuate the total natural ecosystem.

objectives such as materials for our homes. These are further reasons why as much as possible of the full spectrum of a region's natural resources should be characterized in the parks, to be perpetuated by a sensitive application of management.

The esthetics of fire are as varied as the backgrounds of the perceivers and the behavior of the fire itself. John Muir watched wildfire "creep" through the Sierra forest with "lapping" flame. That obviously was a fire burning in light fuel under low to moderate fire danger. Some of the beautiful stands of white pine or aspen owe their existence to more extreme fire behavior that killed the competing spruces, shrubs, and firs. Significant wildflowers and wildlife food sources such as berries and chokecherries owe their origin to fire disturbance of some sort.

The development of a fire plan for a park involves an evaluation of past fire occurrence, consideration of unique fire-free plants, as well as the consideration for fire control. If the park proposes action other than full fire control, officials must write an environmental assessment covering all factors. Only after approval of the plan and assessment can the park adopt a modified fire management program.

These new fire management plans for parks call for as much, if not more intensive, fire control than before. Fires caused by careless visitors are controlled as rapidly as possible; they still pose a major threat to the forests, as their distribution and timing are rarely if ever the same as fires of natural origin. We will continue to foster strong fire prevention and control programs complementary to our adjacent state and land management agencies.

The Fire Management Task Force recently reviewed the entire fire management program and is recommending continued refinement of the program including safeguards. The climax forests will not be lost from the parks; they will continue to be represented along with the other beautiful, unique, and varied components that make the national parks significant.

*David B. Butts
Division of Natural Resource
Management
National Park Service*

NATIONAL PARKS SAMPLER

Fort Union, New Mexico

GETTING THERE: From Las Vegas, NM, 48 kilometers (30 miles) northeast to monument headquarters via Interstate 25 and State Route 477. No public transportation.

GETTING IN: Nominal fee, summer months.

WHERE TO STAY: Food, lodging, and car rental available in Las Vegas. Camping at Storrie Lake State Park, 9 kilometers (6 miles) north of Las Vegas and at national forests (see below). No food or camping facilities at monument. Cold drinks and picnic tables available.

WHAT TO DO: Picnic and explore the ruins of Fort Union; follow the wagon tracks of the Santa Fe Trail. Ask for safety information. Fort Union is 81 kilometers (50 miles) from Santa Fe and Carson national forests and 121 kilometers (75 miles) from Pecos National Monument.

MORE TIPS: Superintendent, Fort Union National Monument, Watrous, NM 87753.

Crumbling adobe walls and lonely brick chimneys are all that now remain of Fort Union, but your imagination and the dramatic audio programs prepared by the Park Service can recreate for you the shouting and bustle of what was once the largest military post guarding the southwestern frontier of the United States. Here you will see outlined by their foundations the living quarters, storehouses, workshops, and stables that housed and supplied the men and horses of this frontier outpost. For forty years the lonely garrisons who served here guarded the wagons that lumbered along the Santa Fe Trail carrying trade

goods and emigrants to Santa Fe and California and supplies for the military posts of the southern plains. Fort Union was built where two branches of this fabled trail met and turned south for Santa Fe. Just beyond the fort you can follow on foot their wagon tracks, still visible across the empty grassland, and hear again in imagination the creak of wagons and the shouting of mule drivers. Here, too, you can relive a more somber chapter in American history by riding out with Kit Carson and the U.S. cavalry to skirmish with the Indian tribes—Comanche, Apache, Navajo—who were fighting to save their homes and hunting grounds from the encroachment of the white man. Troops based at Fort Union were largely responsible for subduing the southwestern tribes whose resistance finally ended after the Red River War in 1874. Last of all, across the plains you will hear, if you listen closely, the whistle of a Santa Fe Railroad engine. When its fellows arrived in New Mexico in 1878, Fort Union's last remaining function—as a supply depot for the Southwest—was ended. By 1891, its bulging storehouses were empty, its buglers were silent, and the last of its troops had marched away, never to return. Your visit will help to revive one of the most colorful and dramatic eras in our history—that of the opening of the West.

NATIONAL PARK SERVICE

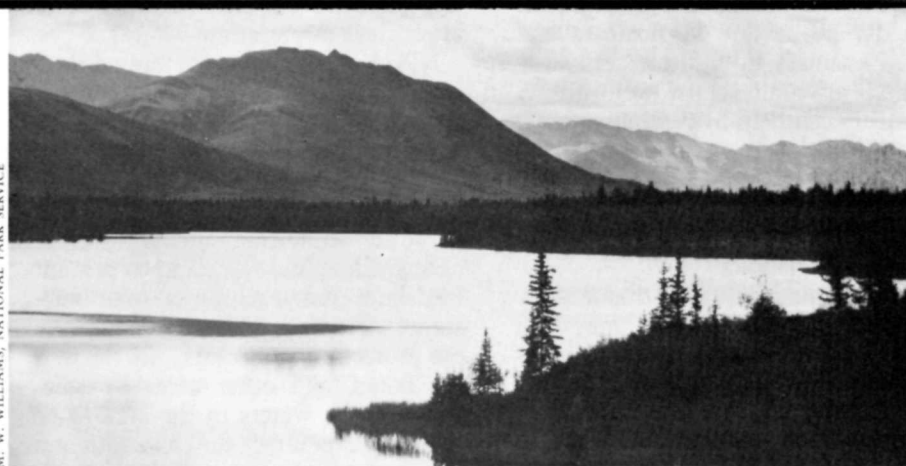


conservation docket

Many environmental bills that did not clear the 94th Congress will be brought up again in the new Congress.

Alaska D-2: Congress has until December 1978 to decide how to designate millions of acres of undeveloped federal land in Alaska in some combination of national parks, national wildlife refuges, national forests, national wild and scenic rivers, or Bureau of Land Management lands. Rep. Morris Udall (D-Ariz.) has introduced HR 39, a bill that would put about 116 million acres in the national park, forest, refuge, and wild and scenic rivers systems and leave about 39 million acres open for development. Sen. Henry Jackson (D-Wash.) has introduced essentially the same measure in the Senate (S 500) by request and also introduced a bill (S 499) that would set aside only 83.5 million acres, leaving the rest of the land open for exploitation. Rep. Don Young (R-Alaska) and Sen. Ted Stevens (R-Alaska) are expected to reintroduce legislation that would protect even less land. Under congressional reorganization, the jurisdiction for Alaska D-2 land matters in the House now rests with the Subcommittee on General Oversight and Alaska Lands of the Interior Committee. John Seiberling (D-Ohio) is chairman of the subcommittee.

Redwood National Park: This park will be the center of attention for the Subcommittee on Parks and Recreation of the House Interior Committee and for the Subcommittee on Conservation, Energy, and Natural Resources of the House Government Operations Committee. Both subcommittees will move rapidly to investigate the logging threatening the world-famous tall trees in the narrow corridor that forms the southern end of the California park. Rep. Phillip Burton (D-Calif.), Chairman of the Interior parks subcommittee, and Rep. Leo Ryan (D-Calif.), Chairman of the Government Operations conservation subcommittee, have both committed themselves to rapid action on this legislation. The Senate is expected to be slower acting. Therefore, NPCA members should write to their senators and to Sen. J. Bennett Johnston (D-La.), Chairman of the Interior Subcommittee on Parks and Recreation, to urge swift action.



M. W. WILLIAMS, NATIONAL PARK SERVICE

Help Protect Our Last Great Wilderness Frontier

These tranquil lakes and spruce forests leading to the "Gates of the Arctic" represent just a small part of the acreage in Alaska that needs protection. NPCA members are urged to put a high priority on asking their representatives and senators to support the Alaska National Interest Lands Act of 1977 (HR 39 and S 500). Congress must act soon!

Clean Air Act: This 1970 law was reviewed during the 94th Congress, but amendments were killed on the last day of that Congress. Auto emissions will receive immediate attention in the House, and the Senate will probably bow to pressure to act quickly as well. The deadlines for compliance with standards probably will be extended because American manufacturers say they cannot meet them. NPCA members should urge their congressmen and senators to support limited extensions of deadlines and penalties for any further extensions of the schedule. Rep. Paul Rogers (D-Fla.) will reintroduce the bill that was killed at the end of the past Congress by the auto industry lobbyists, and Rep. John Dingell (D-Mich.) and Rep. James Broyhill (R-N.C.) will introduce a bill to further delay requirements for meeting auto emission controls.

Action on the significant deterioration provisions of the Act could be delayed until the House and Senate public works committees complete work on the Water Pollution Control Act amendments.

Amendments will be offered to the Act to clarify the sections dealing with significant deterioration of air in areas in which air quality is better than national standards. These amendments would place all national parks and monuments over 5,000 acres in the Class I category, which would permit no deterioration in air quality.

Deep Seabed Mining: This issue will be discussed again in this Congress. The bills introduced during the past Congress would have opened the way for U.S. companies to mine hard minerals on the floor of the ocean, but they lacked effective mechanisms for protection of the environment. Those principally concerned with this legislation in Congress are: Rep. John Breaux (D-La.), Chairman of the Merchant Marine Committee's Subcommittee on Oceanography; Rep. Morris Udall, Chairman of the House Interior Committee; and Sen. Warren Magnusen (D-Wash.), Chairman of the Senate Commerce Committee. NPCA members should urge their congressmen and senators to oppose any action on this issue until the U.N. Law of the Sea Conference can reach an agreement on international controls. If action is taken anyway, every effort must be made to protect the environment.

Land Use: With House Interior Committee Chairman Rep. Morris Udall leading the battle, congressmen will push land use legislation again this year. The legislation would provide grants for planning and management programs. It also probably would require states to inventory their lands and designate areas suitable for various uses.

In the Senate, the fortunes of the legislation rest on the outcome of the committee reorganization. If the Interior Committee retains jurisdiction, it

is likely to move the legislation quickly. If the new Agriculture and Small Business Committee gets jurisdiction, it could be slower. NPCA members can help by reminding their senators and congressmen about the need for federal support for sound land use practices in the states and by urging them to support or lead efforts to pass such legislation.

Strip Mining: HR 2, introduced by Rep. Morris Udall (D-Ariz.), may well be the first major environmental legislation to pass Congress this year. Both Udall and Sen. Lee Metcalf (D-Mont.) have made this bill their number one priority and promised to lead the effort

to pass the legislation. Hearings were in progress at presstime.

NPCA members should remind their senators and representatives to support provisions to give the federal government stronger control over strip mining standards and to require reclamation of *all* mined land to the original, or better, condition, including mandating filling and regrading to prevent landslides and leaching of toxic substances. Provisions should also ensure the protection of streams, alluvial valley floors, and other areas by safeguarding the waters in the area to be mined and requiring the treatment and proper disposal of any toxic or acid-

forming substances. Legislative action is expected this spring.

Water Pollution: The Federal Water Pollution Control Act of 1972 will be reviewed by Congress this year. It is anticipated that attempts will be made to weaken the law both by giving state agencies unqualified to carry out federal programs control over federal funds for clean water and by stripping the Corps of Engineers of their mandate to protect wetlands as contained in Section 404 of the Act. Rep. Harold Johnson (D-Calif.) and Sen. Jennings Randolph (D-W.Va.) chair the House and Senate public works committees, which will review the legislation.

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Continued from page 2

crease in research and development looking toward steady-state energy systems, solar, wind, and geothermal among them. One can question the seeming limitation of solar energy to space heating; more attention should be given to high-technology and high-capital solar energy systems in desert regions including part-time production of hydrogen by electrolysis for use during interruptions of sunlight as a clean-burning fuel without adding to the carbon-dioxide content of the atmosphere. Similar systems, we would argue, should be investigated vigorously for wind-power. But these arguments merely strengthen the basic position of the Report, that a heavy shift from nuclear to sun, wind, and geothermal power is imperative.

THE AGENDA also undertakes to break open the issue of research in recombinant DNA. The American public will be learning in due course during the next few months and the rest of the year, and the rest of the world likewise in time, about this new power which has arisen among us. The genes of one species, or portions of genes, can now be combined in the laboratory with genes of another species, and a new form of life can thus be created. There is a distinct possibility that some of the new forms could be carcinogenic; the principal host species being put to such use at present is *E. coli*, a common bacterium of the nose and intestines of man. If a new cancer-producing organism should be developed and escape from the laboratories, it might well spread around the planet going undetected for a time but eventually bringing agonizing death to multitudes of living creatures, including man. If not cancer, other grave diseases might be disseminated in similar

manner with destructive effects on food plants, on livestock, or on man.

And yet scientists there are, overflowing with a dangerous confidence in science and technology, who scoff at the possibility of such danger. In so doing, they undermine the moral position of their professions in human society, and they may well bring down upon themselves and their work a wrath which could have been avoided had they taken a socially responsible position.

The Report does not recommend cessation of work in these fields. It proposes the establishment of severe guidelines against the more dangerous projects and the more obviously unnecessary risks. This can be only a beginning; many serious people will ask the question whether mankind is ready as yet to open this new Pandora's Box, and whether it would not be better, despite the possible benefits of certain investigations, to defer such work until a higher civilization has been achieved.

DESPITE all the best efforts of conservationists, environmentalists, survivalists, both in private organizations and in government, for the past decade and more, it has not yet been possible to establish an adequate public understanding that environmental issues comprise not merely the amenities, but questions of survival. The impending destruction of the oceanic fisheries presents the issue of basic food supplies for starving peoples. The impairment of the atmospheric envelope of the planet by uncontrolled additions to its carbon-dioxide content, leading to overheating, or in the alternative, by loading it with industrial and agricultural dust, reducing its transparency, with a cooling effect, and pointing us toward a new ice

age, or by the disruption of the ozone layers by aerosols and, as now seems probable, the excessive use of nitrogen fertilizers: all these are questions of survival, not niceties of lifestyles, nor of mere esthetics.

The impending grave imbalances between food supplies and population, dealt with in an excellent chapter of the Agenda, are another aspect of the same problem. The environmental issues, in short, are top priority issues, as the Report says, on a level with defense, employment, health, education, and commerce—and one might add military security.

AGainst this background, the Report wisely proposes that national planning institutions be established in the federal government, with long-range responsibilities and tenure, to recommend national programs addressed to the major ecological and economic issues. The hope would be that such institutions would be relatively free from the pressures and interruptions with which a short-tenure Executive and Congress must necessarily be faced. Perhaps it could do better work than has been done in the past in addressing human reason and morality in these matters. The time has long since passed to make the effort; the hour is late, very late.

Again, the Fund is to be congratulated for having gotten the Task Force together. One of the grave deficiencies of the environmental movement thus far is its failure to articulate effective agencies of cooperation. We hope that the Task Force will stay together, now that it has produced this excellent plan of action, to see whether it may be possible to translate the program from words into deeds.

—Anthony Wayne Smith



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