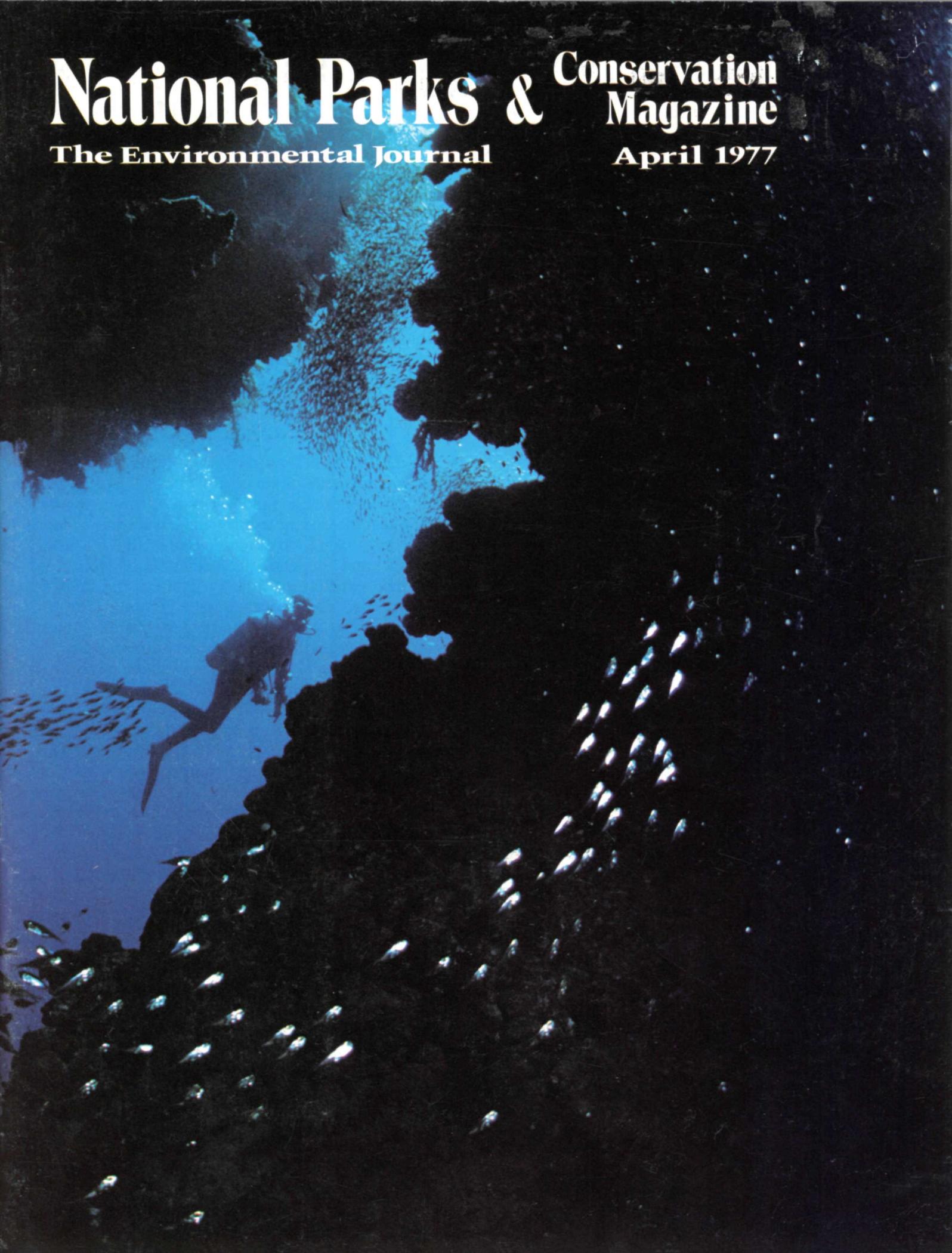


National Parks & Conservation Magazine

The Environmental Journal

April 1977



A Legal Order for the Oceans: II

RESUMING the discussion of the Law of the Sea, which we reopened in February, conservationists have a vital stake in the outcome of the United Nations Conference on that subject which convenes once again in New York in May.

The survival of the oceanic fisheries and marine mammals, the protection of the oceans from deadly pollution, and such issues as freedom of navigation and scientific research are all of them deeply involved.

Environmentalists dare not retreat from these efforts into their specialties, whether parks, forests, wildlife, or whatever, nor behind the boundaries of their native lands, for if they do, they will not hold these fortresses for long.

THE CONFERENCE will have before it the Revised Single Negotiating Text (RSNT) which represents a remarkable measure of consensus among 150 nations on many of the central issues of world law in relation to the oceans.

Conservationists must necessarily be highly dissatisfied with the RSNT in a number of respects, notably as to the living resources of the seas and oceanic pollution. This means mainly, however, that renewed efforts must be made, beginning now, to improve the text, and that the doors must be kept open in the final draft for further progress in other negotiations later on.

It does not mean that environmentalists have license to campaign for unilateral action by the United States in respect to pollution or anything else, nor to threaten opposition to the expected treaty, assuming that the text surrenders no irrevocable ground in respect to the living resources and permits improvement by subsequent treaties.

CONSIDER the oceanic fisheries. They make up a large part of the present and future food supplies of a hungry planet. Catches are declining from overfishing. Management is turned over completely to the coastal nations by the RSNT within the new 200-mile coastal economic zone.

The pressures which will lead to depletion and extinction are just beginning. The name of the problem is famine, resulting from the explosion of populations beyond all possible growth in agricultural or industrial productivity.

The governments of the poor countries will be under ruthless political pressures backed by threat of revolution to over-exploit their resources

now, and let the future take care of itself; thus all hope for the future will be destroyed.

The RSNT should have provided for strong international regulations and enforcement to rescue the oceanic fisheries as vital to the planetary food supply; it does not. The nations should have lashed themselves to the mast of international cooperation; they have not done so. It is not too late to try.

A linkage can still be established in the negotiations between the fisheries and the other issues; the food stocks of the planet must be given higher priority in the bargaining; and all the nations must recognize that they are fighting together for survival.

THE PRESENT writer struggled for years with a measure of success in the Advisory Committee and the Delegation to substitute a population test for a yield test for the harvesting of food fish (e.g. tuna), to provide protection for associated and dependent species (e.g. dolphins) against extinction, and to protect the marine mammals. The language as it emerged in the RSNT is so gravely qualified as to be largely meaningless without machinery for judicial interpretation and enforcement; such machinery has not been created.

The qualifications should be trimmed; interpretation and enforcement should be added. The United States weakened its negotiating position gravely in these matters when it passed the unilateral 200-mile fisheries bill last year. That legislation does not begin to solve our conservation problems, nor can it. There are international tradeoffs, however, which we can offer for a better regime for the oceanic fisheries. And we can save ourselves a great burden of famine relief in the century ahead in the measure of our success in the effort.

The story of the marine mammals is much the same. The priority for their protection in the U.S. delegation has always been low. The present writer labored with the problem for a long time without much help. Eventually the mammals were listed among the so-called highly migratory species for protection by international organizations; but coastal states were given supervening authority to undercut international controls by less exacting regulation; this provision must

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National Parks & Conservation Magazine

NATIONAL PARKS & CONSERVATION ASSOCIATION

The Environmental Journal

Vol. 51, No. 4, April 1977

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COVER Red Sea Reef, by David Doubilet
At the end of a day of diving in the spectacular underwater fantasyland at Ras Muhammad, one of Israel's marine reserves on the Red Sea, Howard Rosenstein, volunteer ranger, decompresses in a cave while thousands of silvery glassy sweepers swarm about him. Although Israel and the Arab countries bordering the Red Sea have acted to protect their coastlines and the Red Sea itself from pollution, much remains to be done in the face of threats from increasing tourism and economic development of the area. (See page 13.)

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PRINCE OF CATS

In a remarkable experiment, a dedicated conservationist successfully reintroduced into the wild a hand-reared pet leopard

by ARJAN SINGH

THE INDIAN JUNGLE, with its myriad animal noises, is a fearsome, hostile place to some people. To me it is home—a familiar place where life's cycles move in perfect rhythm. As I lay half asleep one night outside my house in the terai forest of Uttar Pradesh, in the foothills of the Himalayas, I was jarred awake just before dawn by a large form nuzzling against me. I peered through the mosquito netting and was able to make out the figure of a large cat—a leopard. I lay perfectly still as the animal nosed my arm, walked around my cot several times, then walked away into the jungle.

I got up, dressed quickly, and followed the leopard into the sal forest. Prince had come to pay me a visit. He would be waiting for me.

THE STORY of my relationship with Prince began long before he was born, when I first realized that fewer and fewer wild animals were left in India. Years of uncontrolled slaughter by maharajahs and wealthy foreigners, professional hunting for trophies and fur, poaching, and reduction of natural habitat through increased human population and unrestricted movement of sacred cattle—all had taken their toll.

By 1964 I had made a personal commitment to do whatever I could to help save India's vanishing species of wildlife. I became a member of the wildlife board of

Uttar Pradesh and worked to make the area surrounding my sugarcane farm, Tiger Haven, hospitable to wildlife. I tried to discourage poaching and hunting and to ward off cattle that competed for grazing space with the chital deer and endangered swamp deer.

But I knew that the only truly effective way to protect the animals that roamed the forest would be to have the area officially protected. Finally in 1968 the state forest minister declared 82.2 square miles surrounding Tiger Haven a wildlife sanctuary, later named Dudhwa Sanctuary, and appointed me resident manager. In July 1976 Dudhwa was elevated to the status of a national park—a heartening prospect for the chital deer, swamp deer, hog deer, wild boar, sloth bears, sambars, barking deer, marsh crocodiles, pythons, nilgais, black bucks, elephants, tigers, and leopards that make their home here.

From the beginning of the establishment of Dudhwa Sanctuary I played host to a variety of animals. My guests have included a black buck stag, a python—a grand old rubbery chap who consumed small deer alive—and a tiger cub. Unhappily, the tiger died of pneumonia after a month.

The animals-in-residence in 1971 included two motherless rhesus monkeys, Sister Gupta and Elizabeth Taylor (so named because of a lovely natural blue

coloring above her eyes), who had come to the farm several years before and made their homes in the trees around my hut. They readily accepted handouts from my farmhands and developed a proprietary interest in sanctuary life. In addition, two elephants and a nondescript-looking mongrel bitch named Eelie called Tiger Haven home.

That year I was called on to assist some longtime friends who had raised a leopard cub to the age of five months. The cub had become too big to keep in the house, and the family did not want to see their beloved pet spend his life in a zoo. I enthusiastically offered to take the cub, hoping to slowly introduce it into the wild. The cub was Prince, my predawn caller, and the project I was about to undertake was to prove one of the most challenging and rewarding experiences of my life.

PRINCE ARRIVED at Tiger Haven in October 1971, frightened and disturbed by his long cross-country train journey and the new surroundings. His welcoming committee was less than cordial. Elizabeth Taylor and Sister Gupta stared rudely, and Eelie repeatedly tried to nip the intruder in the rear.

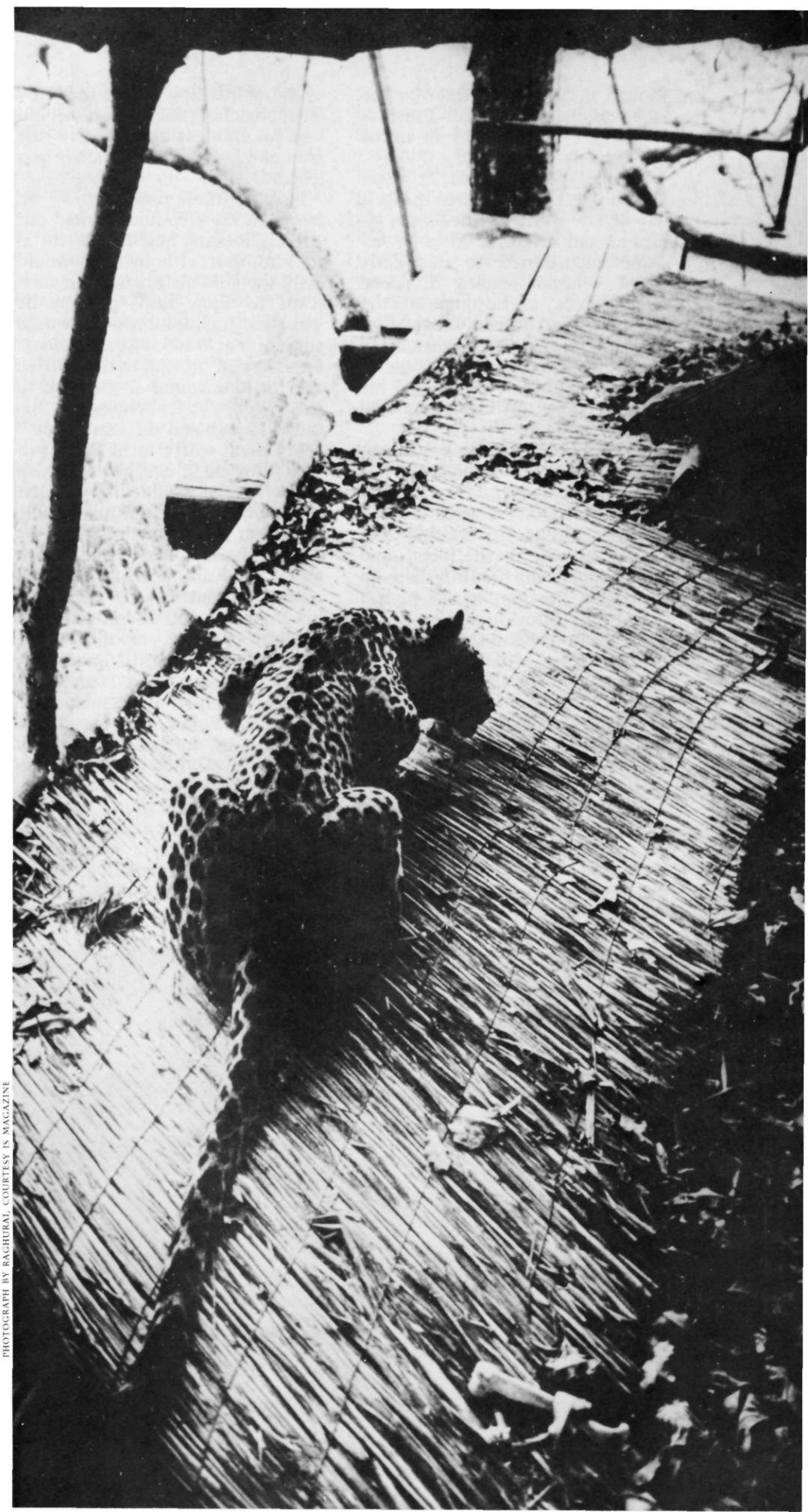
If Prince's first day at Tiger Haven was traumatic, his second one was historic, for this day he made his first visit to the jungle.

He exhibited little curiosity at the sights and sounds around him. Birds started overhead, and a langur monkey coughed in a nearby sal tree at the sight of this "killer." Their alarm was wasted. Prince kept close to his human companions and the forest track.

Although this first day in the jungle did not seem promising for Prince's rehabilitation, I had not expected that it would; I knew that the task before us would not be easy for either leopard or man.

The story of the return of Elsa the lion to the feral state is well known. At the time of Prince's arrival, however, no one to my knowledge had ever attempted to rehabilitate a leopard. In returning Prince to his wild state, I was not only trying to help an individual animal; I was hoping to save an entire species. If Prince's rehabilitation were successful, my techniques might be tried on other leopards and even, perhaps, on tigers.

I began the arduous experiment by taking Prince for long walks each day in the jungle. As he learned to trust me, he also learned to feel at home in the forest. Eelie soon showed a change of heart and became a playful companion for Prince on these jaunts. Even after Prince was full grown, he respected Eelie greatly and allowed her to dominate him. The two animals enjoyed playful tussles with no harm done to either party, al-



PHOTOGRAPH BY RAGHURAJ. COURTESY IS MAGAZINE

though Eelie was by then far too small to be a match for Prince—and dogs often serve as an entrée on leopards' menus.

At first I fed Prince at Tiger Haven. He received three meals a day of raw meat fortified with vitamins and calcium. After he became accustomed to our daily hikes, I began feeding him one meal each day in the jungle and the others at Tiger Haven. Gradually I fed him farther and farther away from Tiger Haven into the sanctuary and then slowly increased his jungle feedings until all meals were served there.

At this point I built a machan, or tree house, for Prince about one hundred yards from my hut at Tiger Haven and started leaving him there overnight. By this time he was at ease in the forest, and soon he made his first kill there—a porcupine. Previous to this he had killed only birds at the farm. Apparently he caught the porcupine by the snout, killed it, and then plucked out the quills with his teeth.

At times I was convinced Prince would never make the transition from tame state to wild. By the time he was a year old he had made a number of small-animal kills but had made no attempt to procure a heartier meal of deer, although deer were drawn in great numbers to the salt licks in the sanctuary. Prince became extremely agitated at the

sound of rustling leaves made by an approaching deer, but he would lose his interest once he saw the animal—a strange reaction for a leopard.

I sometimes took Prince on forays in my jeep and pointed out a likely looking hog deer or chital to him. But although he would stalk the animals I had taken such pains to show him—perhaps he was trying to humor me—he would stop short at attacking distance and either reveal himself to the startled deer or look round at me as if to say, "Well, I've had enough of this game, let's go and see some more."

My main worry at this point in rehabilitating Prince, however, was not where he would find his next meal but whether he would be able to protect himself if threatened by a tiger, the king of the Indian jungle. A wild animal that has been reared domestically has many of his instincts dulled and may not exhibit sufficient caution when confronting his natural enemies.

One evening when Prince was nineteen months old it seemed he might make his first big kill. I watched as he stalked quietly toward the salt licks in the sanctuary. When I called to him, he only turned and gave me a conspiratorial grin and then continued his stalk. The objects of his interest were about a dozen chital stags and one fawn. Prince stalked them hesitantly but expertly, periodi-

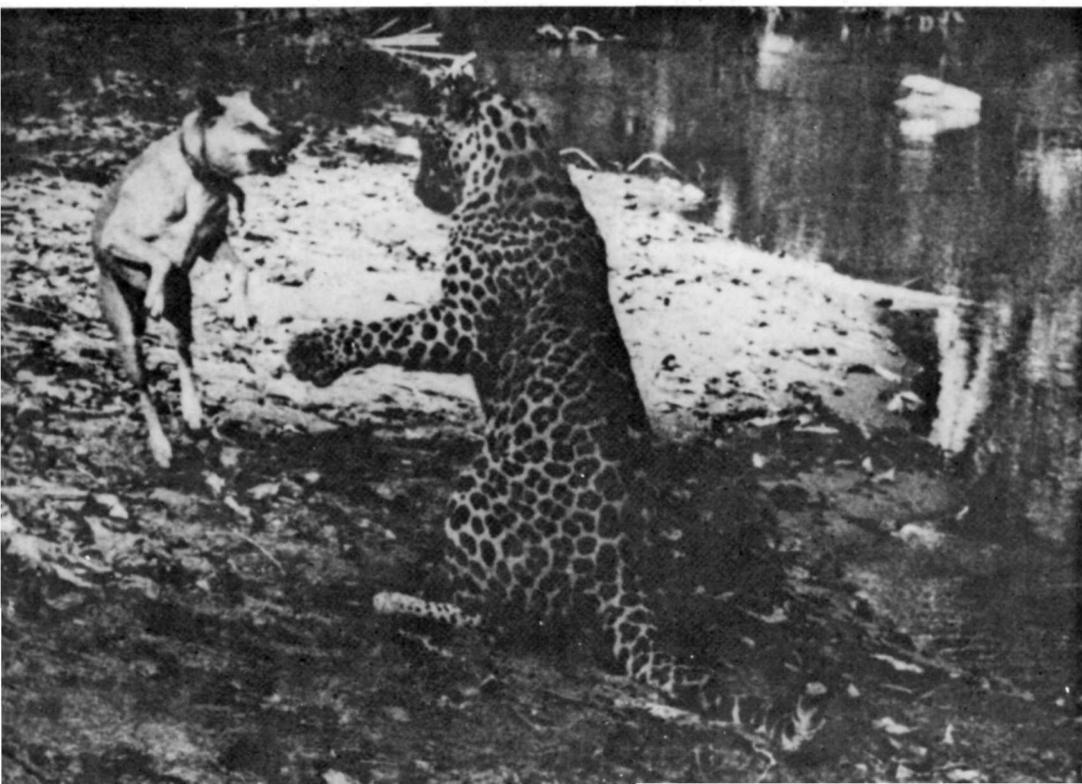
cally looking back at me as if for reassurance. He crept forward when the deer grazed and stayed motionless when they looked up. Suddenly, however, a tiger appeared, on his way to the remnants of a kill. A langur coughed, and swamp deer barked in alarm, so the chital scattered to safety.

After this incident I decided to move Prince's headquarters away from the tigers' regular beat as I felt these larger cats were inhibiting his attempts at independence. The move also took him farther from Tiger Haven—another spur to independence, I hoped—and farther from gawking tourists, who had by now heard of my experiment with the leopard.

My fears for Prince's safety were realized one night when he was mauled by a tiger near his new abode. His instincts were apparently still blunted enough so that he did not escape into the treetops immediately upon encountering the tiger. Fortunately, he managed to escape, and the wounds, which I treated at my house, were superficial.

Gradually I reduced the quantity of meat I fed Prince and the frequency of meals until he was on a once-a-day schedule. He would have to supplement these feedings by his own efforts.

When Prince was about twenty months old, he made his first big kill—an adult chital. I discovered



The mongrel bitch Eelie and Prince often romped playfully together, and even after the leopard was full grown she dominated him although he could have easily killed her. Prince enjoyed watching the rivulets in the river—or perhaps his own handsome reflection—and he liked to play in the shallow water as long as Arjan was nearby. Occasionally Arjan could coax Prince into deeper water with him.

the kill one evening when Prince only reluctantly answered my call. He rubbed against my legs, returned to the bushes, and then came back to me, leaping on me and seizing my arm in his mouth. It was obvious he was trying to tell me something.

I soon discovered a chital carcass in the bushes. The fang marks on the neck indicated Prince had killed the chital. But he was apparently not able to open the carcass. After a flurry of biting, playing with the carcass, and stalking and leaping on me, Prince persuaded me to disembowel the deer, which he later evidently completely consumed.

I was proud of Prince's accomplishment. However, he was still inexperienced. Although he stalked animals more often than before, he usually gave his position away. And Eelie could still drive Prince away from a kill when I was not looking.

PRINCE was like a schoolboy on a romp during our daily walks. A favorite antic was to pounce on me from behind a bush, sometimes knocking me over. I quickly discovered that being the object of affection for an uninhibited, 120-pound leopard who still thought of himself as a kitten could be painful. Once after a walk through the forest, Prince came and sat across my legs, got up and

rubbed himself against my back, and then in a moment of excessive affection, bit a hole in my ear!

Prince had a disconcerting habit of leaping onto the middle of the tea table on the veranda to grab a piece of toast. Almost as bad was his habit of trying to climb into a lap, even when he weighed well over a hundred pounds. He seemed totally unaware of his increasing size. Perhaps worst of all, in the middle of the night he would sometimes leap onto the bed of a sleeping guest.

Prince amused himself for long stretches of time biting, shaking, and worrying an old gunnysack just as a puppy would. He enjoyed playing with turtles he met in the forest, rolling them over and over. He loved to ride in the jeep and would leap in whenever I drove into the forest. He also liked rowboat rides whenever the opportunity offered itself.

Prince enjoyed perching on a log over our shallow river and watching the everchanging rivulets rushing beneath him—or perhaps his own fascinating reflection in still water. And—most unusual for a leopard—he liked to play in the river. I spent enchanted afternoons watching Prince chase floating bits of wood, jump from an overhanging tree into the river, immerse himself to his neck, and then crouch in the water, his eyes bright, and lunge at me.

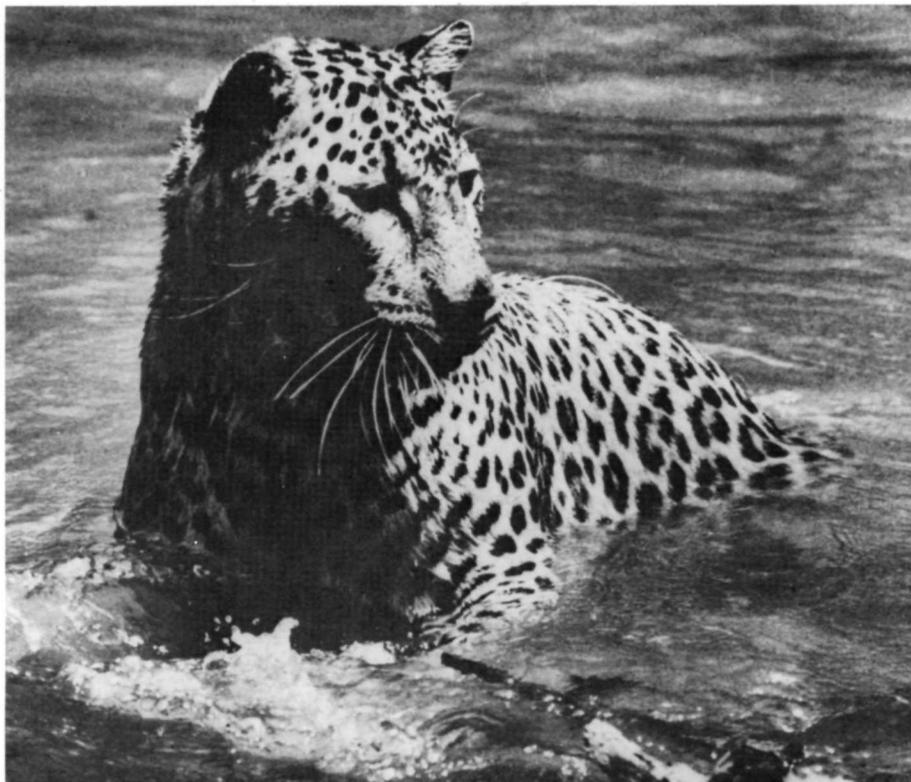
As soon as I started to leave, however, Prince would come out of the water. Apparently my presence gave him a sense of security in that hostile element. Sometimes, after much coaxing, Prince would join me in deeper water for a swim. He did so at first only with great hesitance; but once he made the plunge, he seemed to enjoy these occasional dips.

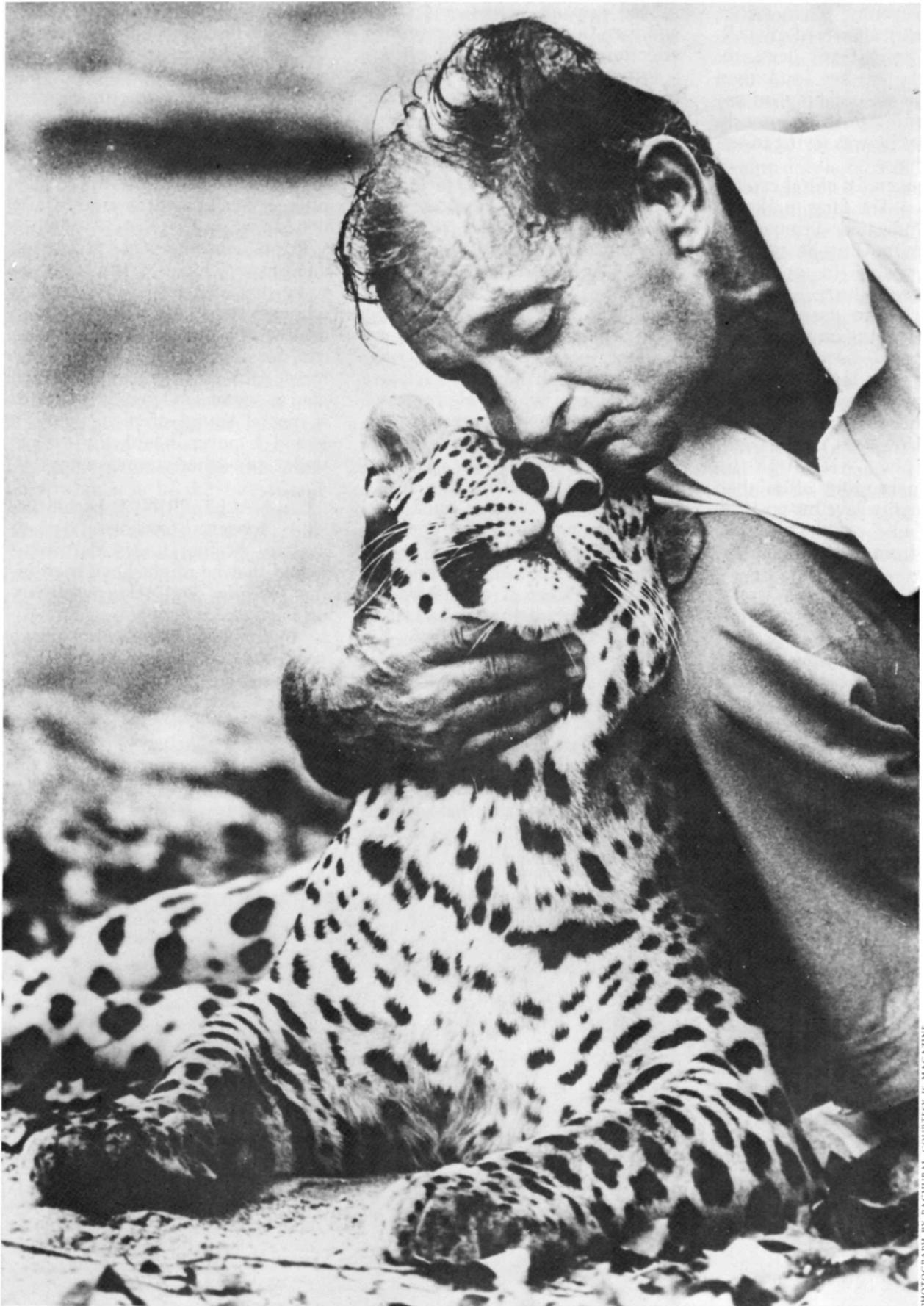
Prince demonstrated a great need and capacity for affection. He loved to be stroked gently as one strokes a housecat, and often he would rub against my legs just as a domestic cat does. When we met in the forest each day, he always seemed glad to see me and greeted me with a special sound of recognition, a sound I never heard him make under any other circumstances.

FINALLY PRINCE began disappearing for several days at a time. At first I was alarmed. I feared that he might have been injured while competing with another male leopard for a female—for by this time he was almost two years old and sexually mature—or that he might have been killed by a tiger. I knew that a tigress had taken up residence in the vicinity of Prince's machan. Prince dealt with her by scent-spraying in the area, apparently to inform her that this was his territory. The only other leopard I spotted near Tiger Haven was a young female, so I was



PHOTOGRAPHS BY RAGHURAJ, COURTESY IS MAGAZINE





PHOTOGRAPH BY RAGHURAJ, COURTESY JS MAGAZINE

Arjan Singh and Prince

fairly certain Prince was safe from others of his kind.

Prince disappeared and reappeared several times, always returning in apparent good health. He ate the meat I gave him at Tiger Haven with decreasing relish but seemed to maintain his weight. My fears turned to hope then, for I realized that he was becoming more independent. I missed our daily meetings, but I was thrilled at the thought that the rehabilitation process might be working.

On May 26, 1973, Prince disappeared into the wild forever. He was two years old at the time. I was fairly certain that Prince had not been killed by humans, as he had been declared state property and his death would have been almost impossible to conceal. I was similarly confident that he had not been killed by a tiger or another leopard. A year in the forest in close proximity to the larger cats had taught him to take care of himself, and confrontations between leopards are rarely fatal.

I also ruled out starvation. When he disappeared, Prince had killed five chital deer, a peacock, a porcupine, rhesus monkeys, and numerous smaller mammals that I knew about and probably other animals as well. Unlike the larger tiger, a leopard can subsist on rodents and birds, aided by his remarkable tree-climbing ability. Such small prey can be entirely eaten before they putrefy, making detection difficult.

One of the peak periods for breeding among carnivores is May and June, the other being November and December. A wild leopardess had been sighted only two miles from Prince's home a month before. In addition, I saw his pugmarks in the vicinity for several days after his disappearance. Considering his devotion and the regularity of our contacts, it was obvious that Prince had a compelling reason for disappearing.

Seven months later Prince returned to the vicinity of Tiger

Haven, as evidenced by familiar pugmarks and sightings by other people. At the same time a female appeared in the area. I tethered a goat in the hopes of catching a glimpse of Prince, but neither leopard killed the animal, possibly because carnivores do not eat while actively mating. The pugmarks of the two leopards eventually joined on a trail—further indication that the two normally solitary animals were mating.

Now, four years later, Prince still roams free, sharing his territory with two wild females. In addition, one of two females I attempted to rehabilitate after my success with Prince had mated with my erstwhile companion. Prince is back on his home range now, a predator in his own right, roaming an area where no leopards had lived for almost ten years.

I AM CONVINCED that rehabilitation is one of the most useful tools available for preserving the world's vanishing wildlife species. I am equally convinced that rehabilitation should be undertaken only by someone who is truly committed to the task and who understands the extent of his or her commitment. Too often relationships between wild animals and humans end in tragedy—usually to the animals—because the humans do not understand the temperament of the species they are working with. To attempt to rehabilitate an animal such as a leopard or tiger through domination would never succeed.

I believe that Prince retained his docility of temperament because no attempt at domination, other than a firm "no" when he indulged in horseplay, was ever made. During my nineteen months of association with Prince he never exhibited any signs of viciousness except on one occasion when he thought he was entrapped in an enclosed and swaying machan. Once released, though, he was as friendly as ever.

The rehabilitation of each species of big cat—as with any species of wild animal—must be approached in a different manner. In rehabilitating the sociable lion, who depends on the social structure of the pride for food, the main problem is the animal's acceptance by other members of the pride. With solitary cats such as the tiger and the leopard, the central issue of survival is indoctrination into killing techniques. For instance, Prince might easily have been disemboweled by the sharp hooves of a large sambar he tried to overpower at the age of fourteen months. Such indoctrination and the slow weaning from proffered food to the animal's own kills require patience and care and a commitment of months or years of one's life.

Ideally, a domestically reared animal will eventually make contact with a wild mate, although this contact may not always be possible. In severely depleted areas such an attempt might lead to adverse competition, especially among males. In such a case, the introduction of a hand-reared pair might be rewarding, although probably more time-consuming.

The final step in rehabilitating a wild animal is to let go, much as a leopard mother must turn her back on her cubs when they have learned their lessons. Who am I, a member of an alien species, to grieve that Prince left one day and never returned? What to me are treasured memories will perhaps be to him only indistinct recollections if we should ever meet again. And that is as it should be. If we do meet, my joy will be in knowing I returned him to the jungle where he rightfully belongs. ■

Arjan Singh, naturalist and ardent conservationist, has devoted himself for many years to helping save India's once abundant wildlife. He described his struggles to establish and protect a wildlife sanctuary in *Tiger Haven*, published in 1973 by Harper & Row.

STRIP MINING *and the environment*

The coal industry must be more stringently regulated if we are to preserve our land and water

by BRANLEY ALLAN BRANSON

THE ECOLOGICAL MOVEMENT in the late 1960s and early 1970s focused public attention on many pressing problems and stimulated the creation of specialized bodies like the Environmental Protection Agency (EPA) and the President's Council on Environmental Quality (CEQ) in an attempt to control environmental degradation. The environmental standards emerging from this flurry of activity were hard-won outcomes of pitched battles against the American industrial complex with its congressional spokesmen and professional lobbyists.

Environmental control, intimated these spokesmen, would throttle American productivity or the economy or both with impossible-to-meet standards or costs that must be passed on to the public. Nowhere was this reaction more evident than in the field of energy exploitation, particularly in the coal industry. No enterprise—even during the height of environmentalists' sometime successes—was so adroit at avoiding federal control as the coal interests, and never was there an industry so badly needing to be controlled.

Then came the energy crisis, abetted by an economy oscillating between recession and ever-mounting inflation, which gave industry retaliatory teeth with which to chew up environmental safeguards. The coal people were par-

ticularly pleased. Not only were they able to step up production in environmentally critical areas, but until this year they were able to do so with assurance of presidential veto of any strip mining control bill passed by Congress. Because of the recession, many states were hesitant to enforce their own regulations: the severance tax money was too important.

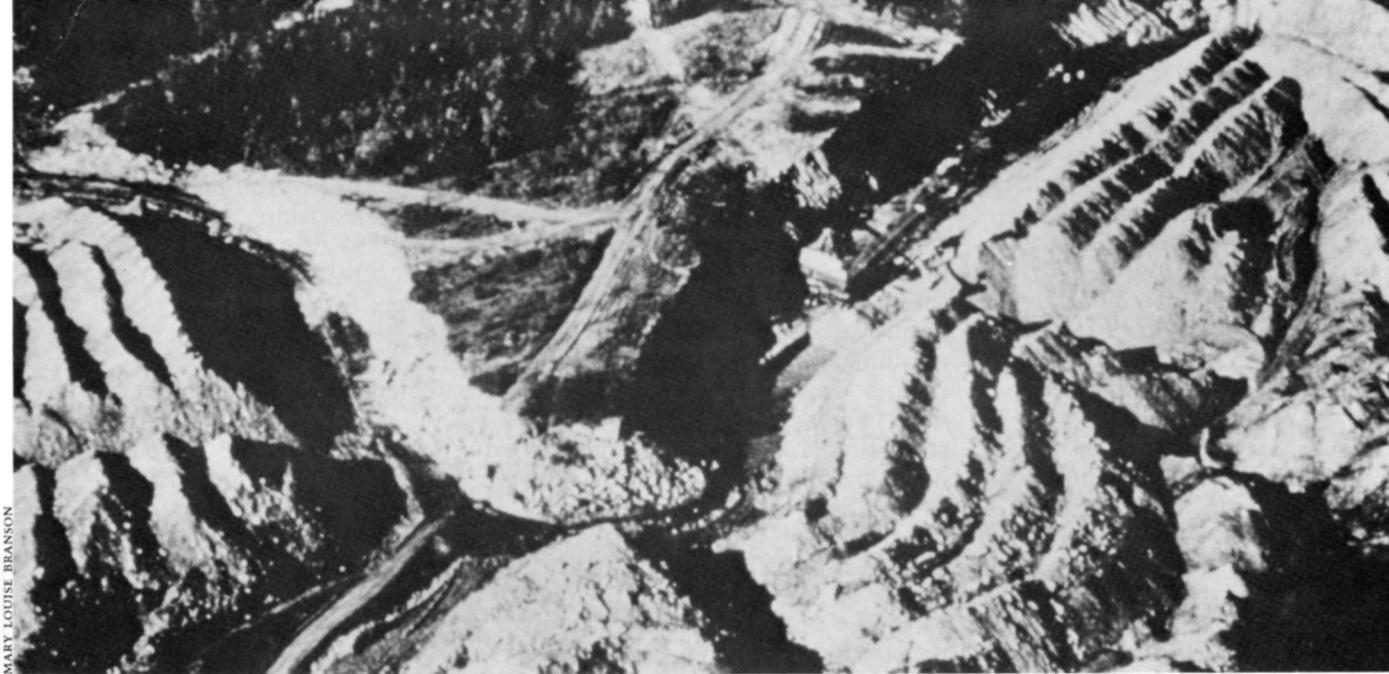
The energy-crunch backlash was just another chapter in our country's illogical approach to regulating the coal industry. Each time it seemed that a strip-mine control bill was about to pass, coal lobbyists and the Ford and Nixon administrations managed to eliminate strong provisions during congressional hearings and finally to kill it entirely, as President Ford did with two subsequent bills. If Congress now passes a strip-mine control bill—which President Carter has promised to sign—some problems will be ameliorated, although efforts will be made to strip the bill of most strong provisions, particularly those dealing with contour restoration.

If strip-mine operators are required to return mined lands to their original contours, says the coal industry, many of them will be forced out of business, thereby drastically reducing national coal production. However, wide-scale closure did not occur in Pennsylvania, where somewhat strict reg-

ulations are already in effect. Furthermore, according to the CEQ and the Federal Energy Commission, if stripping steep slopes were completely forbidden, only 3 to 14 percent of all U.S. coal production would be affected.

Moreover, the high-cost-of-reclamation argument is weak. Whatever the cost, it must be borne, principally by those gleaming the soaring profits, without passing the cost on to consumers, if we want a healthy planet on which to live. Even if coal and power companies were to pass prices on, Representative Morris Udall (D-Ariz.) estimates that the cost of reclamation would amount to no more than approximately fifteen cents per family bill in increased utility costs—a small price to pay, considering that the coal-mining industry is already pushing a hefty increase on consumers in the form of so-called "per kilowatt hour fuel adjustments."

Because the federal government is forging ahead with Project Independence, a plan for achieving "reasonable self-sufficiency by 1985," coal and power companies continue to undermine efforts at regulation. President Carter has said that he prefers coal to nuclear power and that he wants increased but more strictly regulated strip mining. He supports an increase from 602 million tons to 1.962 billion tons in 1985. In order to ac-



MARY LOUISE BRANSON

comply with this feat, many environmental, technical, social, and economic hurdles must be eliminated.

THE TECHNICAL PROBLEMS of increased but better controlled strip mining are mere annoyances for a nation capable of putting men on the moon. The economic problems are mostly imaginary, because the coal industry is hesitant only to divert capital into new hardware. The social problems are mainly in the realm of propaganda, which consists of convincing voters that we should allow the rape of Appalachia and, more recently, portions of the Southwest and Great Plains—without any controls. The rapid increase of surface mining had already inflicted enough environmental damage to incite a massive campaign calling for controls to limit its impact before the conception of "Project Independence." Now concern is magnified. Coal and power companies are solidly opposed to tightened regulations of environmental damage or to rigid enforcement of existing laws, including federal laws.

For example, strip-mine operators who discharge pollutants into streams must apply for a federal National Pollution Discharge Elimination System permit. The deadline for applying was December 31, 1974—set after a two-year waiting period. Despite this

long period, only 170 Kentucky coal miners out of an estimated 1,800 to 2,200 had obtained permits by 1976. Furthermore, the Environmental Protection Agency has been very lax in enforcing federal water pollution laws in the coal fields. Only after the Appalachian Research and Defense Fund threatened to bring suit did the EPA finally send a handful of inspectors into the field.

Another environmental law now under heavy attack by the coal-and-power bloc is the Clean Air Act, principally because Project Independence intends that surface mining shall increase until all near-surface minerals are depleted. Power companies are pushing to be permitted to use higher sulfur content coal without having to install adequate scrubbing devices.

IN THE APPALACHIAN highlands, most resistance to tightening controls centers on the steep-terrain controversy. Coal miners want to strip lands that far exceed twenty degrees in slope, a process that is vastly destructive and environmentally degrading. There the slightest disturbance of slope vegetation results in enormous erosion and pollution, and reclamation is all but impossible.

The principal planning strategy most surface miners follow is the economics of coal removal, regardless of environmental costs. Strip

mining is the cheapest but most destructive method of mineral removal, which accounts for the fact that many mining companies continue to ignore the estimated billion tons of clean-burning, high-energy anthracite coal still in the deep mines of Pennsylvania. Profit is the name of the game, and these days the profit is in surface mining.

Although many near-surface coal deposits can be mined with minimal disturbance and with relatively good possibilities of reclamation, including a return to virtually the same slope that was present before the onset of operations, highlands and arid lands in the West cannot. There reclamation techniques range from poor to absolutely ineffective.

A comment often heard is that coal miners have changed nonproductive mountains into good cow pastures, or that new bass waters exist where only woodlands were before. Such statements grossly misrepresent the facts. Surface mining in mountains creates many complex problems. Essentially, the process consists of building silt-producing haul-roads to the coal deposits, where huge machines and explosives cut many L-shaped grooves around the mountains, creating 30- to 100-foot vertical highwalls, a working bench, and massive spoil banks. The equipment—trucks, drills, explosives, loaders—work directly on

the bench, removing coal from the exposed seams. Until recently all the overburden was simply pushed over the side of the mountains, where it quickly gave rise to enormous erosion and raised the silt in nearby streams from 20 to 100 parts per million to several thousand parts per million—and the steeper the slope, the more profound the problem.

Newly developed techniques, mining engineers tell us, make it possible to strip mountains without pollution, or virtually so. The most promising technique seems to be the Pennsylvania block cut, or truck haul-back, where the overburden is pushed into each preceding small cut and the topsoil is replaced *as mining progresses*, rather than after the whole area has been stripped. Other techniques that are not so successful are overburden segregation, where topsoil is saved for re-covering exposed rocks and subsoil, and head-of-hollow fill; i.e. spoil materials are dumped into depressions high up on the mountains instead of over the side. However, some state laws permit some to all of the overburden to be pushed over the side. Many of these operations occur on slopes of 20 to 30 degrees where massive erosion and concomitant water pollution are nearly impossible to prevent and where returning the land to its original contour without additional disturbance is

impossible. These facts account in part for the intense counterattack against the passage of strip-mine control legislation.

An important factor in attempting to understand these issues is the "haze" factor. The general public seldom has the specialized vocabulary to understand technical reports. For example, coal miners want water-quality standards that state that during an "exceptional hydrological event" (rainstorm) overburdens may deliver turbidity to streams of "1,000 Jackson turbidity units (JTU) multiplied by a factor of 2.2" (translated: 2,200 parts per million, or about seven times more silt than normal). Most of us wouldn't know a JTU from a hard-rock singing group.

The revegetation of strip-mined slopes, as regulations now stand, must produce slopes that are at least 70 percent covered with permanent grasses, legumes, and woody plants before bonds are released. However, most grasses and legumes are usually developmental stages in areas normally covered by forests. On freshly disturbed steep slopes without tree cover, summer ground temperatures are often hot enough to kill many grasses and legumes, and even a 70 percent survival is not enough to prevent massive erosion and earthslides—not to mention the huge amounts of fertilizer required for maintenance of the cover plants.

The problem of acid-mine pollution is particularly critical where coal or the overburden is rich in sulfur. Disturbing the surface in such areas brings these materials into contact with the atmosphere, which allows oxidation and the release of harmful metals and sulfuric acid into the water, often completely eliminating fishes.

MANY PEOPLE seem to consider it economically unsound to insist that the environmental impact of the coal and power-producing industries be stringently controlled while the nation is in the midst of a recession and energy crunch. Such thinking inevitably plays into the hands of the industries. We must not be deluded into accepting the idea that mining companies should be allowed to use "energy production" as an excuse to destroy the land.

When the coal is gone, all that shall remain will be the memory of a once-beautiful land. And that, too, shall fade when this generation gives way to the next. ■

Branley Allan Branson is a frequent contributor to *National Parks & Conservation Magazine*. A professor at Eastern Kentucky University, Richmond, Kentucky, he is the author of many articles reflecting his wide-ranging concern for the environment. He has conducted considerable research on the effects of strip mining on fishes.

Editor's Note

STRIP MINING REGULATION

Both the House Interior Committee and the Senate Energy and Natural Resources Committee have held hearings on their respective strip mining regulation and reclamation bills. Both bills are expected to move quickly and could be on the floor of either house soon. Specific provisions needed to assure environmental protection are:

1. Designation of prime agricultural land as off-limits to strip mining be-

- cause even the best reclamation methods are inadequate to protect this vital resource.

2. Ban on steep slope mining.

3. Ban on mining on alluvial valley floors that are used extensively for and ideally suited to ranching. Only 2 percent of mineable coal is found in these areas, but their lush, naturally subirrigated meadows make them the most inexpensive places to raise cattle.

4. Providing Indian lands with the same protection as federal lands.

The bills as presently drafted will set up funds for reclamation of abandoned mines and will provide grants to states to set up reclamation and regulation programs. If a state program does not meet certain minimum standards, the Secretary of the Interior is instructed to prepare a program for the state.

SYNAGOGUES & SEA FANS

ISRAEL'S NATIONAL PARKS AND NATURE RESERVES

In less than fourteen years Israel has made great strides in protecting her archaeological and natural treasures by establishing a system of national parks and nature reserves—but more needs to be done to preserve the beautiful Red Sea

by EUGENIE CLARK

The Red Sea may be the first sea men and women have studied in detail. Queen Hatshepsut, 3,500 years ago, sponsored an expedition to the Red Sea—the first recorded expedition in history. The impressions of its marine creatures brought back to her by the sea's earliest biological illustrators are still preserved as carvings on the walls of Queen Hatshepsut's tomb.

Since 1950 I have made 21 expeditions to Israel, Ethiopia, Sudan, Egypt, and the Yemen pursuing my studies as an ichthyologist. I have never ceased being amazed at the Red Sea, its myriad inhabitants, and the beautiful desert that surrounds it. In my opinion the Red Sea is the most unusual and magnificent sea in the world. When I first visited the Red Sea, its waters were unspoiled and its shores desolate. But today it is threatened by the encroachment of civilization and the dangers of modern economic development.

Israel and the Arab countries bordering the Red Sea have begun to take strong measures to try to prevent the disasters that have ruined so many other beautiful and unpolluted coastlines. These countries realize the need for conservation measures (especially marine reserves), development of fisheries, and basic oceanographic studies for

the wise exploitation of the last major sea still virtually unpolluted, underexplored, and underexploited.

In 1976 the Arab League Educational, Cultural, and Scientific Organization (ALECSO) met at Jeddah to plan environmental studies of the Red Sea. These plans include reactivation of Egypt's historic marine laboratory at Ghardaqa, where I, like marine biologists from all over the world, became acquainted with the Red Sea and fell in love with it. ALECSO will support marine science stations recently established at Aqaba (Jordan) and Jeddah (Saudi Arabia) and future stations planned for the coasts of North and South Yemen, Ethiopia (at Massawa and Assab), and a Somali station in the nearby Gulf of Aden. Jordan recently established its entire Red Sea coastline as a marine reserve.

Israel's measures to preserve wilderness areas along its Red Sea coast, both on land and underwater, are the most active and have the most effective government backing. Perhaps this is because its precious short Red Sea coastline (the closest tropical coral reef to Europe) is threatened by burgeoning tourism and hotel building at Eilat, now the largest city on the Red Sea. Eilat and neighboring

Aqaba are major ports and focal points for oil pollution. One major oil spill in this area could cause an ecological disaster to the coral reef environment of the Gulf of Aqaba.

The past twenty-eight years since the founding of the State of Israel have brought impressive changes throughout the country. Verdant fields of crops, gleaming fish ponds, and settlements of kibbutzim now thrive in what was once a vast "wasteland," from the human point of view. But at the same time the great Negev desert—occupying nearly half of Israel—and her wild mountain regions, coastal plains, and seas became shrinking wilderness areas. Now Israel is actively seeking to protect these areas as well as the Red Sea.

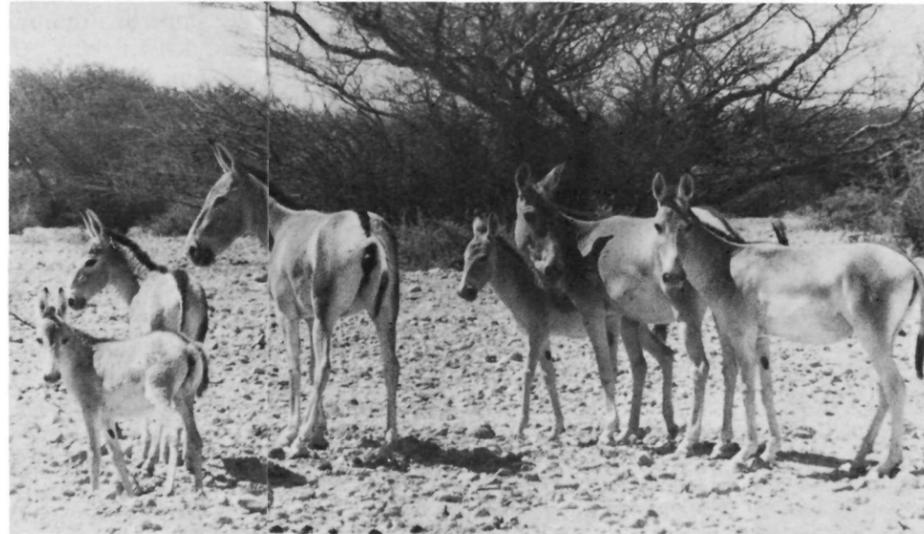
The motivating force behind Israel's conservation movement has been the Society for the Protection of Nature (SPN), a private organization started in 1953. The goal of this group of concerned nature lovers and historians, now numbering 25,000, is to educate the public about conservation. SPN has a chain of eighteen field study centers throughout Israel and the territories it occupies, where tens of thousands of children and adults attend courses of one to six days



Avraham Yoffe, Director of Israel's Nature Reserves Authority, takes a few moments out during the 1967 Six Day War to nurse a baby gazelle found by his troops. Yoffe, retired Major General and tank commander, has been known to interrupt combat to avoid endangering wildlife—once so a rare bird could cross the battlefield in safety. Another time he ordered a military encampment moved to protect a field of wildflowers. On the last day of the war, Yoffe's game wardens went out in the newly captured territory to mark off nature reserves.



MICHA BAR-AM, HOLY LAND CONSERVATION FUND



MICHA BAR-AM, HOLY LAND CONSERVATION FUND

At left young Nubian ibex frolic at Hai-Bar South, one of the wildlife reserves where Biblical animals are being reintroduced to the Holy Land. Symbol of Israel's Nature Reserves Authority, the Nubian ibex is the wild goat so often mentioned in the Bible.

The Persian onager (below left), the fleet and powerful wild ass of Biblical times, has been long regarded as endangered. Although the onager is also protected in Iran, where several large herds exist in the wild, the herd at Hai-Bar South in Israel is the largest in captivity.



HOLY LAND CONSERVATION FUND—MID EAST NEWS AGENCY

learning to appreciate and conserve the environment and its wildlife.

In August 1963 the government passed SPN-initiated legislation to establish a system of national parks and nature reserves in Israel. Since then Israel has established thirty national parks, is planning ten more, and has designated more than one million of its six million acres as nature reserves. The nature reserves are operated by a Nature Reserves Authority (NRA) under the direction of Major General Avraham Yoffe, a retired Israeli tank commander and war hero.

Yoffe has been described as Israel's one-man Environmental Protection Agency. His dream is to see the entire Negev become a nature reserve. At present a million acres of the Negev have been approved for a reserve. "Next we need a million acres for roads and kibbutzim," Yoffe told me last year. "We'll ask for the last million later." The NRA has 160 areas of

150,000 acres now operating as reserves—not including the wide spaces of the Negev and the Sinai peninsula.

One of Yoffe's most exciting projects is returning animals of the Bible to the Holy Land. Hai-Bar (meaning "wildlife" in Hebrew) was set up to organize this project, with Yoffe as its chairman. Hai-Bar is independent of the NRA but works closely with it. The Holy Land Conservation Fund was formed in New York to back up this dream with funds.

At present Hai-Bar has two fenced-in reserves where Biblical animals that are now rare or extinct in Israel are maintained for breeding—in captivity yet in their natural environment. When herds are large enough, their offspring will be released into the wild.

Yoffe took me to see Hai-Bar Carmel, located in the north of Israel near Haifa on Mount Carmel. Here mountain goats and other en-

dangered ungulates such as the gazelle, fallow deer, red sheep, and roe deer will be able to breed in natural surroundings.

The second Hai-Bar reserve, Hai-Bar South, is a 10,000-acre area of the Negev near Kibbutz Yotvata. It shelters Nubian ibex, addax antelope, two species of oryx, two species of gazelle, two species of wild ass, and ostrich. Among the predators being protected in the region are the desert lynx and the Sinai leopard.

A third reserve, Hai-Bar North, is planned for 5,000 acres of mountains and wadis in the Galilee region. When funds are raised, the NRA hopes to establish there the same species of animals now sheltered at Hai-Bar Carmel. It is hoped that a representative number of predators such as the Syrian bear, the leopard, and the Asiatic lion—symbol of the tribe of Judah and house of David and now extinct in Israel—can be established in an associated protected area. The leopard

has already begun to make a comeback in the area.

Hula, once a rich marshland in northern Israel, has taught the Israelis a sad lesson in the importance of wetlands. Hula is in the flyway for migrating waterbirds between Africa and Europe and is the home of the water buffalo, wild boar, and African wildcat. Much of it was drained as a reclamation project in spite of protests from scientists and nature lovers. What is left of these marshlands is now protected.

Two marine reserves have been established along the Mediterranean at Habonim and Kziv. The continental shelf in these areas is open only to the Arab fishermen who make their living catching food fish in nets, not to hook and line or spear fishermen.

The NRA regulates sport fishing and hunting, issues licenses, and penalizes offenders through the courts. It functions, in effect, like the U.S. National Park Service and

The lyre-horned addax antelope (right) is believed to have been used by King Solomon as a meat animal in Biblical times. Until its return to Hai-Bar South, the addax had been extinct in the Holy Land since the early twentieth century. The animal's present natural habitat has been reduced to the Sahel region south of the Sahara; but since the great drought there several years ago, the remaining addax are believed to be approaching endangered status.

Highly adapted to the desert, the swift and graceful scimitar-horned oryx (top) also is a victim of the Sahel drought and is fast becoming endangered.



HOLY LAND CONSERVATION FUND—MID EAST NEWS AGENCY

the U.S. Fish and Wildlife Service combined. Its strict hunting regulations have restored gazelles from fewer than 800 in Israel to more than 5,000 and have built up the Nubian ibex herd to 2,000, the largest herd in the world of this endangered species.

In contrast to the conservation-oriented NRA, Israel's national park system is intended mainly for the enjoyment of visitors. Most national parks in Israel (except Mount Carmel National Park) are small areas centered around human constructions—valuable archaeological and historical sites, with modern landscaping and restorations. The sites include ruins of Biblical cities, ancient synagogues, tombs, Roman amphitheaters, crusaders' palaces, and the famous fortress of Masada—a huge, flat-topped rock rising 1,700 feet above the western shore of the Dead Sea, the site of the last Jewish stand against the Romans. Many parks are away from cities and surrounded by magnificent wilderness areas.

Because Israel is largely a country of desert, it is not surprising that some of its national parks are associated with springs. The cool pool at Aqua Bella is the site of a convent built by the Crusaders. The icy pool at Eyn Avdat, in the hot sandy expanse of the Central Negev, gave refreshment to ancient caravans traveling from the Red Sea to the Mediterranean.

Three national parks border the Mediterranean Sea. North of Haifa the National Parks Authority (NPA) helped restore the Biblical city of Achziv (Joshua 19:29), prepared a beach for swimming, and established a national park. Midway along the Mediterranean coast at Caesarea, originally a Roman port, the NPA carried out a large-scale archaeological excavation, restoration, and landscaping project. Visitors can see a beautifully preserved second-century aqueduct and listen to concerts in a recently excavated Roman theater. Ashqelon, one of the oldest known cities in the



world, has a shoreside national park bounded in part by the ruins of a Byzantine seawall and Roman columns.

The jurisdiction of the NPA over these Mediterranean seaside parks stops at the water's edge. David Levinson, Deputy Director of Israel's national parks, told me there is as yet no problem with pollution and desecration of these parks—a fact I found astonishing. But he agreed that for further protection extending seaside parks into the sea is worth considering.

Because no national parks are located on the Red Sea, Levinson has not had the problems of despoliation that Yoffe encounters. Yoffe's NRA has marine nature reserves extending along the coast of Elat and ten huge coastal areas along most of the eastern and southern edge of the Sinai peninsula. The NRA employs Bedouins as wardens of these reserves. Recently I was collecting eels at a remote Sinai beach when a Bedouin on a camel approached me to check what I was doing. The patch with an ibex head he wore on his sleeve proclaimed him to be an NRA warden. Fortunately I had a permit handy.

Much of my "dry time" in Israel is spent in Jerusalem at the fish collection in Hebrew University's Department of Zoology. But my

field work, the most enjoyable part of my life as a zoologist, has been mainly at Elat and on down the coast of the Sinai peninsula to one of Israel's marine reserves, the most beautiful spot in the world—Ras Muhammad.

From 1964 to 1975 seven of my students from the University of Maryland, students from other universities and schools, and my four children joined me in Elat in a series of summer programs to study the behavior of shy garden eels and other creatures of the sandy bottom near the corals and sea grass beds. Since 1972 these summer programs have been enhanced by the valuable and beautiful photographic documentation of our studies by David Doubilet.

David and I—and every diver I've met who has come to this area—agree that of all the places we have dived Ras Muhammad is the most spectacular and fascinating. Here the narrowest of continental shelves drops down an almost vertical wall to a depth of 6,000 feet into a crack that runs the length of the Red Sea floor. This great crack, with hot brine in its volcanic depths, is slowly separating the Arabian peninsula from the African continent. The dazzling array of rich marine life concen-



At Ras Muhammad, on the very tip of the Sinai peninsula (opposite), the narrow continental shelf drops to a depth of six thousand feet. With its coral gardens and dazzling array of marine life, divers agree that it is the most spectacular and fascinating place in the world.

In the Red Sea near Elat Dr. Clark discovered that the Moses sole (left) produces a powerful poison that repels sharks and other large predators. Photographer David Doubilet has been known to catch the little flatfish from the sand and use it to ward off a hungry barracuda.

More than ten years ago Dr. Clark began studying the behavior of garden eels in the Red Sea. To get close enough to the shy eels to study them, she borrowed a method from ornithologists and set up an underwater "blind" (below). Here, as she hovers over the blind, David peers out a window. The eels spend their lives with their tails tips in the sand, feeding on plankton and withdrawing into their burrows at night and sometimes for a midday "nap."

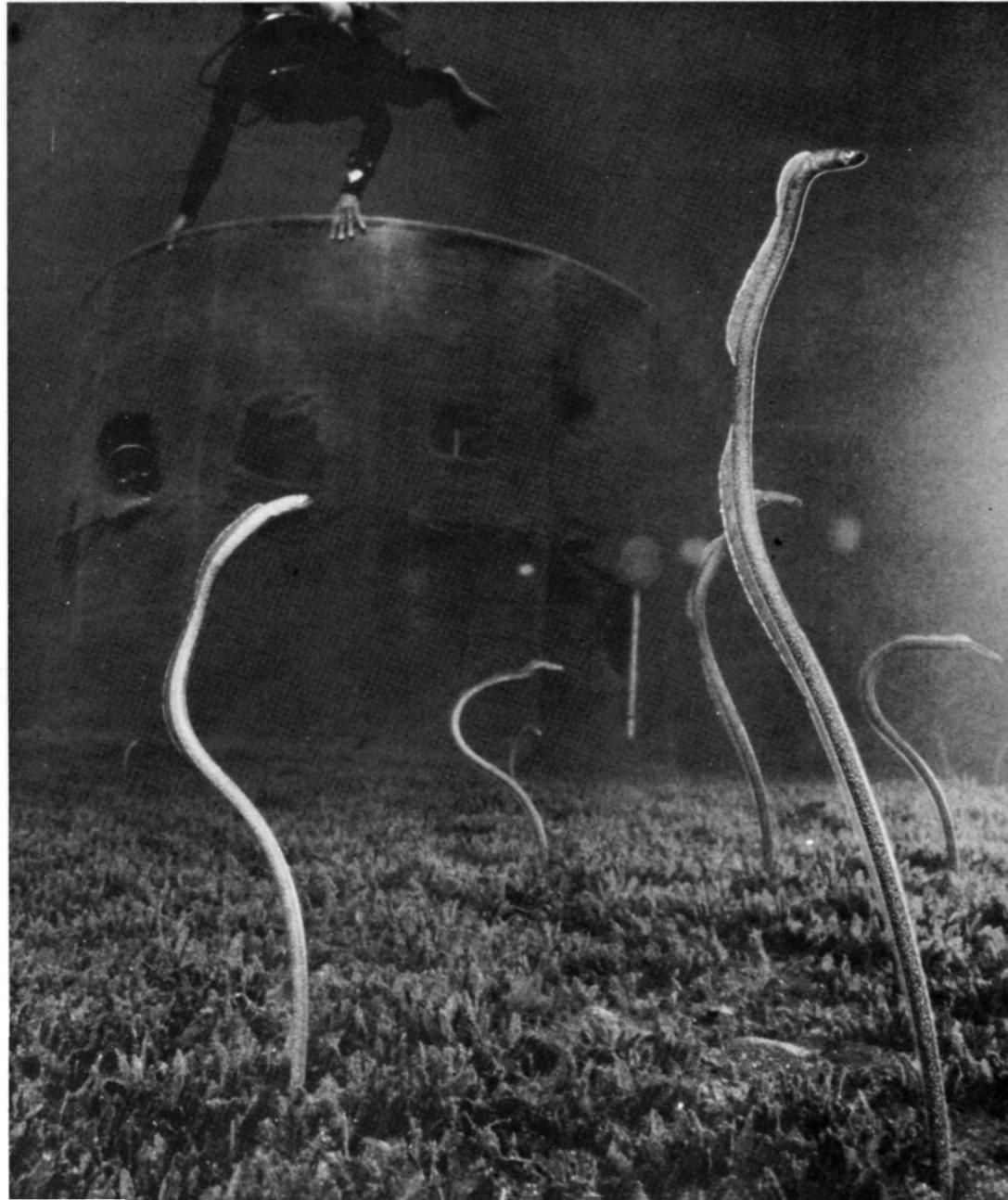
trated in this drop-off area at Ras Muhammad lures us back again and again.

Elia Sides, manager of the South Sinai Nature Reserve, and his small crew of five wardens are charged with protecting more than half the Sinai desert. Elia tells me the conservation problems in the Sinai's desert are not great, but the coral reef coastline worries him. Poachers and spearfishermen take lobsters and beautiful shells from the marine reserves and shoot at everything—even butterfly fishes.

"It's not just the tourists," Elia says. "Our own Israeli soldiers are some of the worst offenders. They fish with depth charges and hand grenades." I can imagine how difficult it would be to punish a soldier, risking his life to defend his country in this wild desert, for using a quick method to obtain food or for taking souvenir shells for his family. But Israeli conservationists feel that the law should apply to the soldiers, too, who should set a good example.

Volunteer rangers aid the NRA, but the enormous Sinai coastline cannot be effectively protected. Elia fears that the area is "too beautiful and too accessible" and that if there is not a change in people's attitudes soon, the treasure and main asset of this region

PHOTOGRAPHS BY DAVID DOUBILET



for divers will be destroyed. Ugly buildings, hastily constructed, mar the desert. A private aquarium company has obtained permission to take tropical fishes from Ras Muhammad to be sold in Europe. An electric power station, a tower on the reef for boats to refuel, and a commercial harbor are proposed to be built.

Howard Rosenstein, owner of the Red Sea Diving Center on Na'ama Bay and volunteer ranger in the South Sinai Nature Reserve, thinks the reefs at Ras Muhammad may be partially protected from oil pollution by the deep water and currents, but he foresees problems from the increasing number of ships on the Red Sea and from the divers in it. The many ships from the ports of Elat and Aqaba are allowed to unload their ballast of oily bilge water once they are outside the Strait of Tiran, creating oil slicks on the beaches and in the mangrove channel of Ras Muhammad. Marine life is damaged or killed, especially at low tides when the tops of coral reefs and the intertidal organisms are exposed.

Professor Francis Por, head of marine biology at Hebrew University, has studied such rare coastal phenomena as the landlocked salt-water pool with blind red shrimp in the Ras Muhammad crack; the Solar Lake south of Elat; and the mangrove forests at Nabq and Ras Muhammad. He feels more cooperation is needed between the NRA and the scientists and that university-level education, especially among graduate students engaged in research projects in marine biology and limnology, must be more closely tied to the work of NRA. He fears that time is rapidly running out in regard to oil pollution of the Mediterranean and Red Sea coasts. Two ships have been wrecked at the Strait of Tiran, fortunately neither an oil tanker. An oil spill at the treacherous reef in this narrow strait could choke this entrance to the Gulf of Aqaba.

Dr. Por has been asked to serve

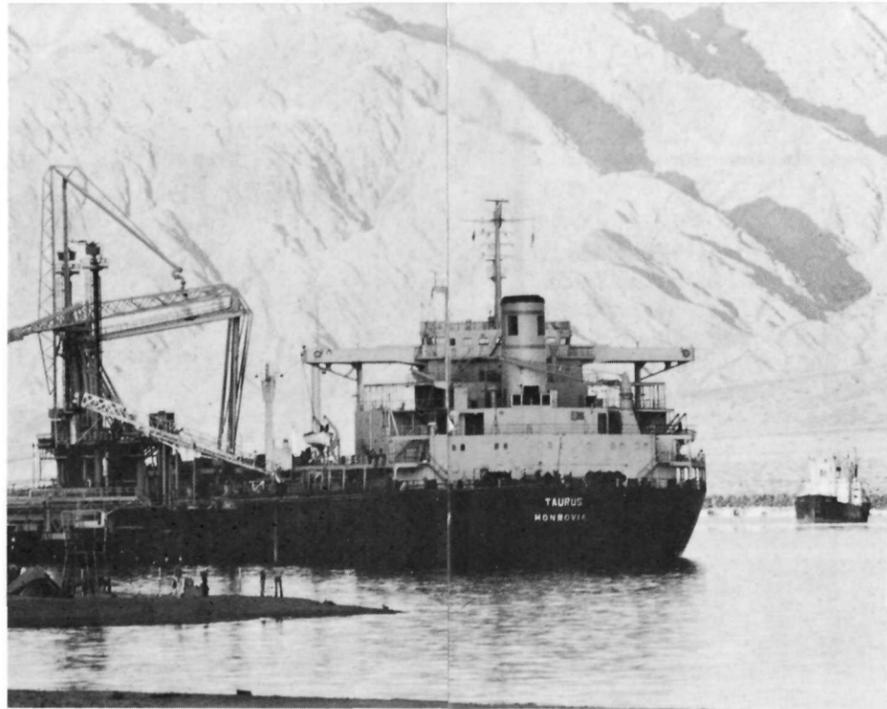
on a committee with conservationists and is impatient for this committee to meet. He feels that a slow but promising beginning has been made to bring the expertise of the scientist into conservation campaigns.

How much longer will the beauty and wildlife at Ras Muhammad remain? What is it like to dive there now, when the reef is still unpolluted? Come along with us and see for yourself!

We wade clumsily across the fringing reef, carrying our heavy gear, and then drop weightless into deep, clear water. A curtain of marine "goldfish" draws into the reef to let us through. We catch a current that carries us to the outermost corals. We glide like birds through a forest of sea fans, using our fins to steer rather than propel us. Howard Rosenstein, our diving guide, leads the way.

A group of fifteen gray sharks (*Carcharhinus sp.*) swims toward us. We hide in crevices and behind sea fans so as not to frighten them away. They start milling around each other. One female leaves the throng and swims upward. A male follows her, bites her repeatedly, tearing the edges of her fins, slashing the sides of her body, and leaving a crescent of tooth marks on her flanks. We watch the courtship in fascination, amazed at the restraint of the love nips contrasted to the bites these sharks can give when feeding. Howard leads the way down twenty-five meters to a small cave. We put our heads in the entrance and see a "sleeping" white-tipped reef shark. We hold our breath to avoid disturbing the shark. Suddenly Howard exhales. His bubbles awaken the shark, and it swims out the entrance as we part to let it through.

As we round the outer edge of the coral wall, the current is more than two knots and impossible to swim against. Unlike a column of barracudas nearby, we can't even hold our place in the open water.



PHOTOGRAPHS BY DAVID DOUBILET

At right a school of white parrot fish passes Dr. Clark and another diver at Ras Muhammad. Having dived in many beautiful areas, Dr. Clark considers the Red Sea the most unusual and most magnificent sea in the

To make headway and reach the outermost underwater tip of Sinai, we must pull ourselves slowly, hand over hand, along the corals. Howard leads us through a tunnel in the reef in which we can rest by simply swimming. Then we are out in the current again. I pull ahead to a projecting ledge and am surprised to find in this remote place an almost invisible nylon fishing line. One end is tangled on the ledge. I hang onto the other end while the current sweeps me out into the open water until the line is taut. Now I can hold my position like the barracudas. Howard's eyes open wide in amazement until he sees the line.

In such a current we give up trying to reach the ultimate dropoff and agree to let go, all together. The current shoots us back to the fringing reef. As the sun sinks, the pinkish desert mountains that rim the Red Sea reflect onto the sea's calm surface and turn it red. Beneath this sheet of crimson satin, the sea is turning a deeper blue. We decompress in a cave where thou-

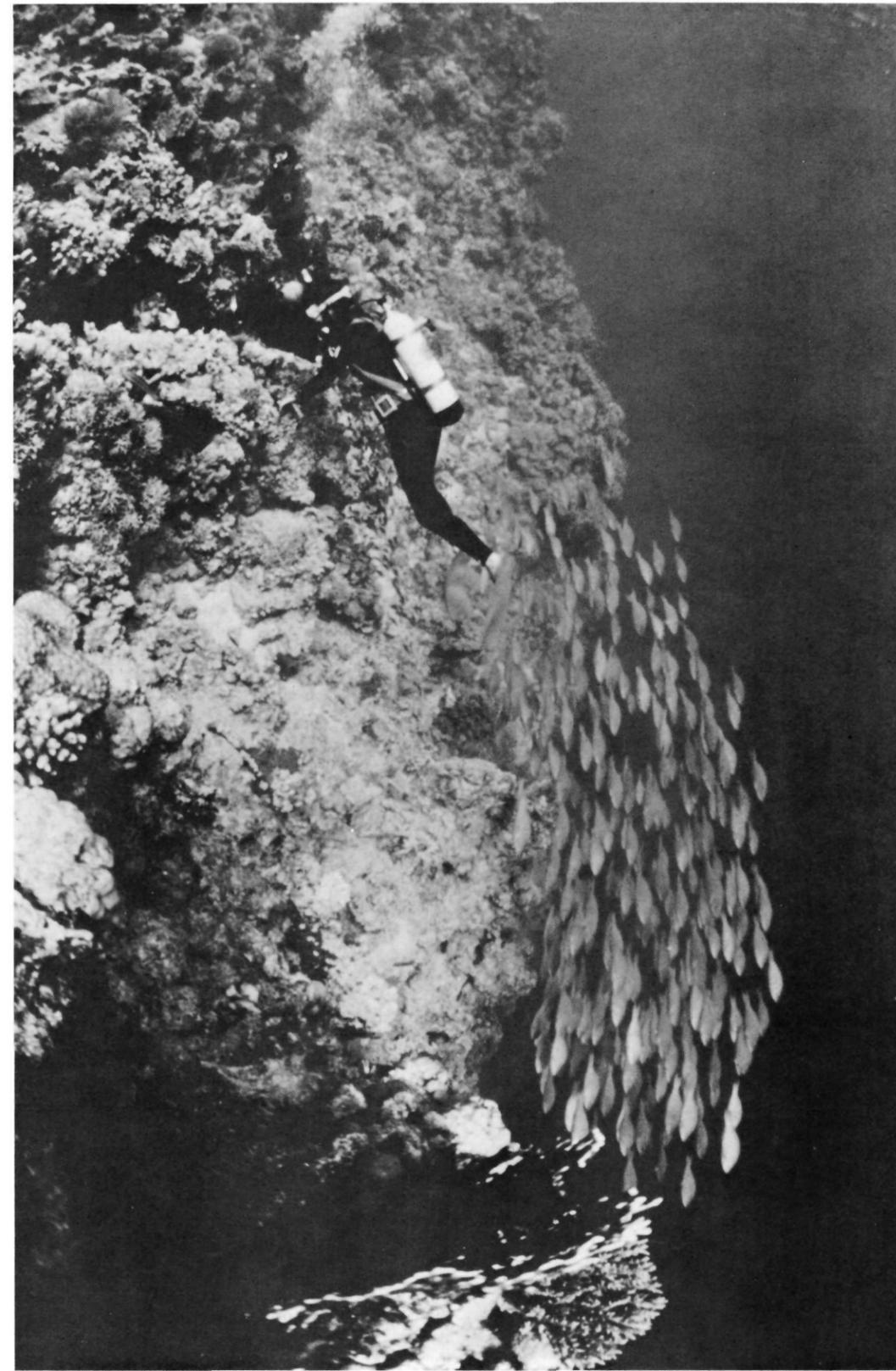
world. But burgeoning development and ship traffic threaten pollution of the Red Sea and destruction of its coral gardens and marine life. One major oil spill in the Gulf of Aqaba could cause an ecological disaster.

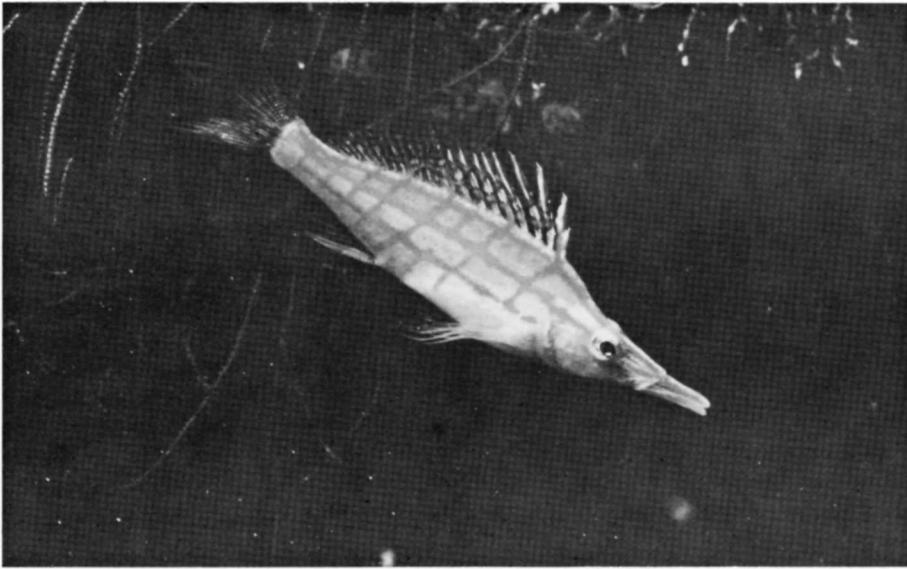
sands of glassy sweepers with luminescent silver bellies swarm around us and long strands of colored colonial tunicates seem to drip from the ceiling.

With our scuba tanks out of air, we snorkle over "anemone city"—a giant flat ledge carpeted with huge anemones protecting a thousand symbiotic orange clown fish and three-spot damsel fish.

In the darkening light, the polyps on the stony coral, soft corals, sea whips, and sea fans start to emerge and spread their petal-like tentacles—the blooming of a million miniature night flowers. Tapestries of surgeon fishes and the moon-eyed *Monotaxis* fish hang away from the reef, while a moving wall of white parrot fish, a hurrying group of black-masked puffer fish, and a unicorn fish with orange daggers on its tail reminiscent of an Hieronymous Bosch painting parade in front of the tapestries.

Sea urchins start to move about, and feather stars climb to the tops of corals and spread and flatten their tentacles into fans for noc-





DAVID DOUBILET

turnal filter-feeding. Groupers, moray eels, and a hundred other kinds of fishes peer curiously at us. As we take a last look before emerging from this underwater fairyland, a sponge with blood-red fingers that sway in the gentle current seems to beckon us to linger.

We will dive again tomorrow—perhaps in a nearby sandy lagoon where David can photograph garden eels or a giant sawfish. Or we may go down to the deep forest of black coral trees and pink sea fans, where the long-nosed hawkfish lives and its gray windowpane plaid pattern turns brilliant red in the flash from David's camera.

We may even return to dive tonight. Then we will see basket stars spreading their giant, billowy fans to feed, each looking like it belongs to a mermaid fan dancer. Moving around these complex starfish will be the fantastic *Photoblepheron*, black fishes that come from their hiding places deep in caves at night, blinking with "eyelids" covering luminescent

under-eye pockets, to become the most conspicuous creature we encounter on a night dive.

David found the "Spanish Dancer" crawling along the corals on a night dive. The velvety red nudibranch, the largest of sea slugs, has white naked gills and camouflages a red symbiotic shrimp in the folds of its mantle. When we picked it up and played with it, the slug unfurled its exquisite skirtlike mantle and performed for us, justifying its Arabic name "Bedia," after the famous Egyptian belly dancer. When we let go, it undulated away into the black night water, the tiny shrimp still riding on its magic carpet.

In the past few decades we have made tremendous strides in our scientific knowledge of Red Sea marine life. Will we, in the next few decades, destroy the home of these beautiful and fascinating creatures? Only our species among all the thousands sharing this unique wilderness can determine the answer. ■

Editor's Note: For further information about Israeli national parks and nature reserves, write to

Holy Land Conservation Fund
150 East 58th Street
New York, NY 10022

Two superb, beautifully illustrated books about the Red Sea can be ordered from the publishers. Send payment with your order.

Schlomo Cohen, *Red Sea Diver's Guide*, 1975, Red Sea Divers Publications, Ltd., El-Al Building, 32 Ben Yehuda Street, Tel Aviv, Israel. (\$13.00)

Dr. David Darom, *The Red Sea*, 1976, Sadan Publishing House, P.O. Box 16096, Tel Aviv, Israel. (\$8.95)

The long-nosed hawkfish was not known to occur in the Red Sea until only recently, when it was discovered to live in the deep water. Below, Dr. Clark holds one of the Red Sea's garden eels she has been studying.



TSUNEO NAKAMURA

National Parks & Conservation Association vice-chairman Eugenie Clark is professor of zoology at the University of Maryland. She has been involved in studies of marine life and underwater conservation in many countries bordering the Atlantic, Indo-Pacific, Mediterranean, and Red Sea. For twelve years she was Director of the Cape Haze Marine Laboratory in Florida, where she studied sharks and their behavior. Currently she is serving on the international committees of NPCA, the Keikyo Aburatsubo Marine Park Aquarium in Japan, and the Heinz Steinitz Marine Biology Laboratory in Israel. Dr. Clark has participated in three international congresses on behalf of marine conservation. Most recently, she represented NPCA at the First International Conference on Marine Parks and Reserves in May 1975 in Tokyo. In 1972 Dr. Clark taught marine biology at Hebrew University in Jerusalem as a visiting professor. She hopes to serve as a volunteer ranger in the South Sinai Marine Reserve this coming summer during her twenty-second trip to the Red Sea.

NPCA at work

PARK SERVICE APPROPRIATIONS

Deteriorating Parks Need Funds, Personnel More Than Ever

The need of the National Park Service for more funds and personnel has never been more acute, NPCA warned in testimony submitted on invitation to the Interior subcommittee of the House Appropriations Committee.

The House subcommittee is focusing on the Bicentennial Land Heritage Program, proposed in 1976 legislation submitted by President Ford, that died when the 94th Congress adjourned. The Ford Administration resubmitted a substantially unaltered program as a fiscal year 1977 supplemental appropriations request. The Carter Administration has supported the bulk of the proposal, but would stretch the funding out over four fiscal years starting in FY 1977.

Both the number of areas administered by the National Park Service and total visitation have increased dramatically in recent years. The 31.1 million acres of the National Park System are spread among 293 diverse park areas in 49 states, with visitation in 1976 to-

taling well over a quarter of a billion visits. In 1975-1976 an extensive NPCA survey of NPS units revealed that many areas throughout the country lack funding and staffing to adequately protect park resources, maintain facilities, provide visitor services, and restore historical properties. The survey led to congressional hearings on the matter, and public awareness of the problem grew. President Ford proposed the Bicentennial program as a ten-year, \$1.5 billion effort to restore the national park and wildlife refuge systems.

In discussing the resubmitted program, NPCA praised its substantive intent and urged appropriation of a substantial amount to supplement the Fiscal Year 1977 budget. However, NPCA stressed that we cannot support a number of individual projects.

The Park Service proposes 780 individual projects totaling \$694.3 million in expenditures. An NPCA analysis of the list of projects reveals that the

single largest category of expenditures (\$247.4 million) in the program is for roads. A number of projects are objectionable because of their potential effects on park resources. For instance paving a dirt road in Badlands National Monument would cost \$3.4 million and open the backcountry to increased use. Other projects have not been approved in the regular planning process and properly reviewed by the public. NPCA advised the subcommittee to consider deleting a total of ninety-six projects costing \$249.8 million. These funds could be best used for land acquisition and increased personnel.

However, NPCA emphasized that the balance of the Bicentennial program is desperately needed by the Park Service if many areas are to be restored up to standards. In fact, if a substantial supplemental appropriation is not provided in FY 1977, both costs of restoration and damage to resources and visitor services will escalate.

NPS needs the funds for 1,000 additional personnel and an appropriation of \$127 million for land acquisition from the backlog of funds in the Land and Water Conservation Fund. The House and Senate will consider these issues at hearings this month. ■

CLEAN AIR

Smog Alert for U.S. Parks

NPCA has urged Secretary of Interior Cecil D. Andrus to break a bureaucratic standstill on protection of air quality in our national parks and has testified on invitation in support of amendments that would strengthen the "significant deterioration" provisions of the Clean Air Act.

The Clean Air Act Amendments passed in 1970 mandated prevention of "significant deterioration" of air quality in areas where the air is now cleaner than required by national secondary standards. Congress intended to protect clean air areas including the national parks, monuments, wildlife refuges, and wildernesses.

Unfortunately, NPCA President A. W. Smith told Secretary Andrus, these areas have been denied protection by

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Interior Department inaction. NPCA said the National Park Service supports giving parks "Class I" status that would prohibit any deterioration in air quality, and attempted to move ahead with studies for designating Class I areas, but former Interior Secretary Thomas Kleppe ordered a halt to the studies. Presently the Park Service plans a case-by-case approach.

However, NPCA stressed that states cannot be relied upon to consistently protect national interest lands, as demonstrated by a recent Utah air quality plan. (See below.) Meanwhile, smog is increasingly becoming a problem in national parks such as Yosemite, Shenandoah, and Sequoia. Construction plans are a threat to Grand

Canyon, Zion, Mesa Verde, Canyonlands, Arches, and other areas. Visibility has measurably decreased in national parks throughout the West.

NPCA urged Andrus to direct department officials to move quickly toward Class I designation for all NPS areas, wilderness areas, and wildlife refuges that are larger than 6,000 acres and outside Standard Metropolitan Statistical Areas. Smaller units should be studied for possible classification as Class I as well.

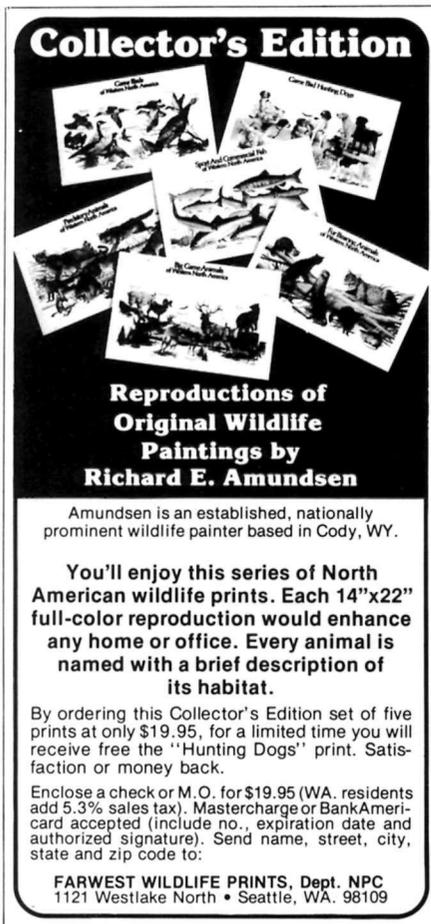
In addition, in recent congressional testimony presented on invitation, NPCA advocated designation of such parks and wildernesses as Class I. All historical areas larger than 21,000 acres and all national recreation areas larger

than 20,000 acres should also be Class I, NPCA testified. States would have the option to apply for reclassification of the latter. Testifying before the Senate Public Works Subcommittee on Environmental Pollution and the House Commerce Subcommittee on Health and the Environment concerning proposed amendments to the Act, NPCA stressed that federal land managers should have power to stop location of polluting sources near protected areas under their jurisdictions.

Get Involved: You can help by urging Class I designation for the previously discussed areas. Write to Hon. Cecil D. Andrus, Secretary of the Interior, Washington, D.C. 20240. ■



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CLEAN AIR & SOUTHWESTERN PARKS Utah Proposes Blueprint for Industrial Development

Utah seems determined to change from a state with a reputation as the heart of national park country to Smog State U.S.A. Under a hastily prepared air quality proposal the state submitted to EPA recently, most of Utah would be open to heavy industrial development.

At January hearings in Salt Lake City, NPCA opposed the plan, explaining how it reflects an inadequate grasp of Clean Air Act regulations and would fail to protect many natural areas in the region of the Colorado Plateau. A concentration of National Park System units in the region comprises one-fifth of the total NPS acreage, and the area includes many other spectacular natural and historical resources as well. Utilities are proposing a number of coal-fired powerplants and developments that would pollute these areas. (See "Smog Alert for our Southwestern Parks," by Marga Raskin, July 1975.)

The recent Utah plan was submitted in conjunction with EPA regulations, but NPCA pointed out that the plan did not meet EPA requirements for public comment and state officials even compounded the resulting confusion by introducing a new proposal on the day of the hearing. EPA issued the regulations in 1975 to implement the Clean Air Act's mandate for prevention of significant deterioration of air quality in areas where the air is now cleaner than required by national sec-

ondary standards. Such areas can be classified as Class I (no deterioration in air quality), Class II (relatively moderate change in air quality permitted), or Class III (maximum deterioration permitted down to national standard). EPA classified all areas of the nation as Class II pending state or federal applications for reclassification.

Under the recent Utah proposal, the first state plan submitted to EPA, 9 percent of the state (including national parklands) would be classified as Class I, 44 percent would remain as Class II, and 42 percent be designated Class III. (About 5 percent of the state is already too polluted to be placed in any of the three categories.) But do not be confused by statistics.

For one thing, Utah wants to rely on "flat-land" modeling in considering pollution emissions when reviewing new powerplant construction. That method works on the premise that land surrounding a site is level and that air pollution will disperse evenly. However, much of the state is, of course, high terrain and valleys where pollutants would concentrate. High terrain areas are subject to pollution from elevated sources such as powerplants. The Utah plan specified that in addition to designating large areas of the state as Class III to permit maximum development, "'flat-land modeling' would constitute a logical alternative to the

Continued on page 26

NPCA Sea Turtle Survey

The giant sea turtles, survivors of a line dating back millions of years, gracefully ride the ocean currents on journeys hundreds of miles from their birthplaces, journeys of which we know little. But they have retained an ancient reptilian characteristic that ties them to land and makes them especially vulnerable to human activities—the necessity of lumbering ashore to lay their eggs. Now bureaucratic bickering is further compounding the problems of three endangered species of these turtles.

NPCA has now received responses to its survey on the status of sea turtles in Atlantic and Gulf Coast national seashores, wildlife refuges, and parks. This survey, which we announced in February's issue, is part of an NPCA effort to halt the decline of sea turtles by having them listed under the Endangered Species Act of 1973.

This magazine already has reported on some of the causes of endangerment. (See "Let's Help the Atlantic Loggerhead," February 1977.) Although different species have been depleted in varying amounts by various human actions, all species have suffered from exploitation for skin, shell, or flesh; from inadvertent killing in fish nets; and from loss of habitat for nesting.

The endangerment of sea turtles has been recognized internationally: Commercial trade in all sea turtles has been prohibited by listing them under the Convention on International Trade in Endangered Species of Wild Fauna and Flora. The United States, however, legally protects only three species by listing them under the Endangered

Species Act of 1973—the hawksbill (*Eretmochelys imbricata*), the leatherback (*Dermochelys coriacea*), and the Atlantic ridley (*Lepidochelys kempii*).

These species so seldom come on land in the United States that management of them normally is limited to control of incidental catches at sea. None of the seventeen parks or refuges covered in our survey reported nesting by any of these species, although Padre Island National Seashore formerly contained an Atlantic ridley rookery.

The loggerhead (*Caretta caretta*), the green (*Chelonia mydas*), and the Pacific ridley (*Lepidochelys olivacea*) sea turtles—also severely depleted—have yet to be protected by federal law. These species were first proposed for listing under the Endangered Species Conservation Act of 1969 and later proposed under the 1973 law.

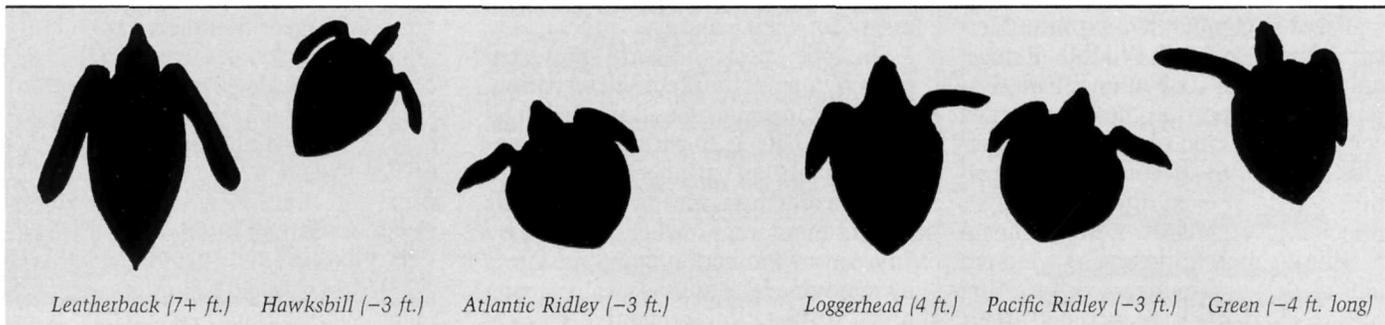
The delay in listing them involves three main areas of contention. Shrimp fishermen and canners fear that listing these turtles will inhibit their industry, because turtles are occasionally caught in their trawling nets. Commercial turtle farmers fear an industry setback because they still take green sea turtle eggs from the wild. Finally, although agencies responsible for administering the Act—the U.S. Fish & Wildlife Service (FWS) in the Department of the Interior and the U.S. National Marine Fisheries Service (NMFS) in the Department of Commerce—signed an agreement to work together on actions involving marine turtles, they continue to work at odds. In fact, this bureaucratic obstinacy has been the major cause of inaction.

NPCA hopes to pressure the agencies into action—if necessary by going to Congress. We have suggested that management be split between the two services, with NMFS managing the turtles at sea—because it has expertise in ocean research and fishing management—and with FWS managing the sea turtles on land—because a large proportion of turtles nest in wildlife refuges and national seashores and thus are already under Interior Department jurisdiction.

Seven national seashores, one national park, and nine wildlife refuges responded to our survey, covering an area of coastline from Assateague National Seashore, Maryland, in the north to the Key West National Wildlife Refuge in the south, and west to Padre Island National Seashore in Texas. Responses were based for the most part on casual observations by the directors or managers of the seashores and refuges. Although some monitoring and tagging has occurred, sea turtle research on these lands is generally limited. The most important information—negative environmental impacts and degree of management—does not require scientific analysis to elucidate the major problems.

Without a doubt, loggerheads are the predominant sea turtles in these areas, nesting in fourteen of the seventeen places surveyed. Other turtles may occasionally come ashore—particularly in the southernmost parks and refuges—but only loggerheads nest on these lands. (The only exception is Cape Canaveral National Seashore/Merritt Island National Wildlife

Leatherback, hawksbill, and Atlantic ridley sea turtles are protected under the Endangered Species Act. The loggerhead, Pacific ridley, and green turtles have not been listed because of bureaucratic bickering. Loggerheads nest in most parks and refuges NPCA surveyed.



Leatherback (7+ ft.) Hawksbill (~3 ft.) Atlantic Ridley (~3 ft.) Loggerhead (4 ft.) Pacific Ridley (~3 ft.) Green (~4 ft. long)

Refuge, where a few green turtles nest.) Any ridleys in these areas are the already-listed Atlantic species; the Pacific ridley is also found in the Atlantic but only south of the United States.

Most respondents commented on the decline or disappearance of sea turtles. The reasons for this decline were repeated over and over: loss of nesting habitat, beach vehicles, animal predation, and nighttime use of beaches by visitors.

Three seashores report trouble from feral animals, but they currently exert no effective control. In Cape Lookout National Seashore, feral ungulates crush nests on Shackleford Banks, an authorized but as yet unpurchased section of the park. Privately owned hogs, cattle, and horses run loose and destroy nests and nesting habitat in Cumberland Island National Seashore. Gulf Islands National Seashore also has some trouble with feral hogs. The refuges report no problems with feral animals.

Direct taking or harassing of animals or nests and taking of eggs are prohibited by regulations, which are generally obeyed. More than half the responses stated that outboard motors and fishing nets, which are generally outside of Interior jurisdiction, are responsible for numerous deaths.

The method of coping with all the various problems varied. However, for the most part, the management of sea turtles is far more conscientious in refuges than in national seashores, where visitor impact on turtles is far more severe. For example, four seashores, compared to one refuge, reported disturbance by beach vehicles.

The National Park Service generally emphasizes recreation, whereas the FWS, which manages the refuges, has instigated more aggressive and specific protective measures. Aside from Canaveral National Seashore, which is managed in conjunction with the Merritt Island National Wildlife Refuge, only one of the six National Park System areas reporting nesting turtles conducts any kind of management effort. None of them conducts propagation activities even though all eight responding apparently have adequate nesting habitat to do so. In contrast, four of the eight refuges with nesting turtles close at least parts of their

beaches to visitors at night; three move or cover nests to protect them from visitors and predators; and six have participated in transfer projects and hatching efforts.

But both the FWS and the NPS fail on one account. They are conducting almost no tagging or research on these turtles in areas responding to the survey. The little that is being done is conducted almost exclusively by private citizens and organizations.

Our survey revealed areas with concentrated problems and also skillfully managed lands. Cape Hatteras National Seashore, established in 1937 as a "primitive wilderness," illustrates the problems that exist at seashores. Its enabling act calls for no visitor-environment conflicts but at the same time guarantees the use of beach vehicles. These vehicles run over turtle nests. In addition, their ruts are obstacles for the young hatchlings, and their lights, moving at night, discourage the prospective mothers from coming ashore to lay. At the Canaveral/Merritt complex, by contrast, beach vehicles are prohibited, and roads to major portions of the beach are closed at night. Turtles are being studied and propagated there under a National Aeronautics and Space Administration grant.

Other responses confirm this wide disparity in sea turtle management. Clearly the turtles cannot be saved by even the most concentrated conservation efforts in one location if their numbers continue to be reduced through mismanagement and neglect in others. Widespread and uniform protection is essential to their survival.

Several steps must be taken to achieve this end. Stopping the decline of the remaining turtles in these protected areas is the first step; eventually, reestablishment of existing species to their former range will be necessary for their recovery.

On land, nests must be protected from human activity and depredation. Although in some cases depredation by other animals is a natural phenomenon, sea turtles have been so depleted through unnatural means that we must protect them from further depletion by any cause. Protection from predators by removing feral animals, transferring nests, or installing protective barriers

over nests may achieve this objective. In addition, hatchery programs are necessary to build the populations.

Killing at sea must stop. Development of modified fishing gear that will not entrap sea turtles will help eliminate this problem. NMFS is currently developing a net that seems to be successful in excluding turtles. In the interim, restrictions on the incidental take of sea turtles are needed, perhaps including limitation of trawling near rookeries during the nesting months.

To protect these turtles effectively, research is necessary to determine where young hatchlings go after leaving their nests, to define habitat needs including tolerance to various types of human activity, and to discover migratory patterns at sea.

But no efforts to prevent the extinction of sea turtles will succeed without the preservation of their nesting habitat. Even under improved management, increased recreational activity on these public lands will further discourage sea turtles from coming ashore to nest. Listing the sea turtles under the Endangered Species Act and designating critical habitat that will be managed for their protection is mandatory. We must act immediately to locate and protect suitable nesting areas all along the turtles' historic coastal range before they, too, are claimed for conflicting human uses.

Listing the turtles would also instigate the development of a recovery plan to restore the sea turtle population. Federal assistance could then be provided to states that have agreements under the Act. Moreover, listing would put the force of the law behind turtle conservation efforts. Without listing, the problem may continue to be ignored. But listing will be possible only if FWS and NMFS act jointly.

Get Involved: Members can help by urging these agencies to cooperate with each other to develop a management plan and to hasten the listing of loggerhead, green, and Pacific ridley sea turtles as endangered. Please indicate your support by writing: Secretary Cecil D. Andrus, Interior Department, Washington, D.C. 20240; and Secretary Juanita Kreps, Commerce Department, Washington, D.C. 20230. ■

Getting Involved

Dear Member:

As Membership Secretary, I have had the chance to work with many of you personally on various occasions. I always enjoy personal contact with NPCA members, since we are all basically interested in and working for the same goals: protection and preservation of our parks and environment.

For various reasons, we all share feelings that our natural treasures should be protected. I have enjoyed trips to some of our greatest national parks and national forests. We are very fortunate to be able to band together to protect them, under the guidance and leadership of NPCA.

I have worked for NPCA for nine years. In the time I've been here, NPCA has been involved in numerous lawsuits, coalitions, and legislative efforts for the protection of the environment. You remember our active involvement in the Law of the Sea Conferences, our congressional testimony on OMB cuts that endangered our national parks, and our participation in coalitions on Alaska and the Florida Everglades.

We are currently waging a campaign to halt massive clearcutting of redwoods in California, and are involved



in yet another coalition on Alaska with other conservation organizations.

We can continue this work as long as we have a strong unified membership. The money from your dues goes far in enabling us to research and develop plans and policies to protect our environment.

It is important that NPCA stay strong and active, and grow even more so. That is why we ask our members to help us by enlisting new members, those who share your love of nature, and are willing to fight for its protection. Our "get a member" campaign is an ongoing effort to ask each of you to enlist one other member.

Gaining new members through massive prospect mailings can be costly and time consuming. When you enlist a new member, you're not only making our job easier; you are also doubling your own effort and concern.

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We hope this portfolio is an incentive for you to "get a member"; we can protect our environment only when we are unified and strong.

This opportunity to act, and to urge others to do so, is vital to the future of our environment. Remember, if you get one new member, you have doubled your active concern; when you give a membership to a school or library, your concern multiplies.

Please enlist a member today, for a better tomorrow. You will receive the portfolio with our heartiest thanks!

My best,
Marcel Bloomquist
Membership Secretary

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Continued from page 22

Class III designation." Under this approach high terrain areas such as the overlooks at Bryce Canyon National Park would be treated as though they were at ground level and, in effect, given Class III protection even though they are Class I areas! NPCA repre-



GORDON ANDERSON

Capitol Reef National Park is threatened by a proposed powerplant. Utah's air quality plan would treat areas such as the park's Navajo Dome (above) as "flat-land."

sentative Marga Raskin stated at the hearing that EPA should reject Utah's plan because of such deficiencies.

Furthermore, Raskin stressed that even the Class II designation presently can accommodate large industrial facilities. The Federal Energy Administration and EPA have agreed that a 3,500-megawatt plant could be built on high terrain. That means a plant the size of the proposed Kaiparowits project—the largest coal-fired powerplant ever planned. The agencies figure that "a well-controlled 1,000-megawatt coal-fired powerplant could locate as close as 6 miles from a Class I area."

The Utah Power and Light Company, NPCA pointed out, has admitted that all existing and proposed powerplants could be accommodated in Class II with installation of the best available control technology. Requirement of such technology, NPCA demonstrated statistically, would increase the electric industry's capital expenditures by a *maximum* of 2.3 to 2.7 per-

cent by 1990. Yet the proposal fails to discuss the necessity for requiring all new sources to employ such technology. NPCA maintained that Class III should be eliminated because the incremental costs of implementing the best technology would be minimal for both industry and the consumer. Otherwise, in this case, vast areas of Utah would be severely degraded.

NPCA said that Utah's plan reveals an inadequate grasp of the meaning of prevention of significant deterioration. Utah indicates that the only reason for the regulations is to protect "aesthetic amenities" and visibility. However, the regulations governing prevention of significant deterioration also require consideration of social, economic, and environmental factors. For one thing, stimulating the development of better and cheaper pollution control devices is sound economic policy and would enable more pollution sources to locate in a given area. Another benefit stems from no longer permitting major polluting sources such as powerplants to avoid installing controls by escaping to areas that presently have clean air.

NPCA also pointed out that the need to protect clean air areas arises in substantial part from the necessity of protecting health, crops, and timber; Utah does not consider these questions.

The proposal states that no natural features other than "national parks, monuments, primitive and wildtiness

study areas, etc." are worth preserving. No provisions are made for expansion of existing parklands or for accommodating new ones. NPCA criticized the plan for overlooking an "inexcusably large number of areas already recognized as outstanding." This Association included a lengthy list of areas that should be protected. These include areas such as the North Escalante Outstanding Natural Area and even proposed wilderness areas and wild and scenic rivers that Utah would designate as Class III. Utah omits Hovenweep National Monument and Golden Spike National Historic Site, NPS units, from Class I designation. Many parks would be given inadequate protection by the plan.

NPCA concluded that the proposal is merely a "blueprint for industrial development" that is indifferent to the need for preventing significant deterioration of air quality.

The next battle environmentalists will face in the state is a proposed 3,000-megawatt coal-fired powerplant that would be located just eight miles east of the north section of Capitol Reef park. A representative of the project applauded the Utah air plan.

Get Involved: Write the Hon. Douglas Costle, Administrator, Environmental Protection Agency, Washington, D.C. 20460, and urge him to reject the Utah air quality plan. ■

FEDERAL WATER PROJECTS

NPCA Backs Carter on Opposition to Boondoggles

NPCA has congratulated President Carter on his proposal to delete funding for nineteen major federal water projects from his proposed budget for fiscal year (FY) 1978. Carter set up a review panel in February to look at these and any other projects posing serious safety, economic, or environmental problems.

The panel, headed by Secretary of Interior Cecil Andrus and including representatives from the Office of Management and Budget, the Council on Environmental Quality, the Army, and the White House, has been conducting public hearings and investigations, and hopes to complete the review by April 15 when Congress produces the first budget resolution.

The nineteen projects originally proposed for deletion by Carter were suggested by the Army Corps of Engineers upon Carter's request for a list of questionable projects. Although the list is by no means complete, it includes a number of projects long opposed by NPCA—such as the Dickey-Lincoln Dams in Maine. (See April 1975 issue.) This project and many of the others are economically unsound.

Yet, these Corps of Engineers and Bureau of Reclamation projects would cost taxpayers more than \$5 billion. If carried to completion, they will inundate rich farmlands and scenic valleys. They will destroy important fish and wildlife habitat, including that of en-

Continued on page 28

reader comment

January Issue Will Help the BWCA

I want to tell you how very much I appreciated the January issue of the magazine. It was simply beautiful from beginning to end: your editorial to President Carter, the reproduction of "Frontiers," the beginning chapter of my new book *Reflections from the North Country* with the many interesting sidelights from other books, the "Challenge at Voyageurs," "Confusion at Boundary Waters Canoe Area," and finally the wolf article by Dave Mech. What a magnificent bringing together of all the problems facing this area.

I was particularly happy about the excellent article by Dean Rebuffoni on the Boundary Waters Canoe Area. Coming right now it will do a lot of good. As you know Congressman Don Fraser and also Congressman Oberstar [have introduced] . . . bills. I think we will win with Fraser's bill [HR 2820] which will give full wilderness status for the first time to this beautiful area, status it needs badly.

Sigurd F. Olson
Ely, Minnesota

Wolf "Recovery" or Extinction?

The conflicts of habitat and species conservation versus land use (mining and logging) are well shown in your January 1977 volume. Mech's Eastern Timber Wolf "Recovery" Team program stands on loose ground (no pun intended) after reading Rebuffoni's article in the same volume on the fight for northern Minnesota "resources" and the plight of this wilderness area and its wolves.

The "team" holds that the wolf in Minnesota is not endangered but should be reclassified as "threatened." This is not simply a semantic difference, but one which the team believes to be scientifically valid. . . . The restricted protected zones for the wolf proposed by the team cannot be guaranteed (especially after one reads Rebuffoni's article). The wolf is surely even more endangered in Minnesota considering the pressures of "resource" interest groups. The scientific method alone is not appropriate for the Minnesota wolf conservation, because it is not a scientific problem: it is a psychological one—one of human values

and priorities, economics (mining and logging "rights"), and politics.

While the Mech recovery team may be acting in good faith, their ethical framework is surely limited by enforced compromise between different interest groups. Should the rights of the wolf be compromised? It is obviously endangered, as is its habitat, and to reclassify it would begin to erode what protective standing it has. . . .

Data on actual numbers of domestic livestock killed by wolves in Minnesota are questionable. Verification by veterinary or other qualified experts as to the cause of death is usually lacking: feral dogs, coyotes, disease, and natural causes (lightning strike, cold exposure) are variables not usually considered. It is convenient to attribute all lost livestock to the most notorious local predators—wolves, rustlers, etc.

An earlier suggestion by Minnesota Department of Natural Resources Chief Robert Herbst and others to manage the Minnesota wolf as a game animal similarly confused and alarmed many conservationists and humanitarians, as does the present management (re-labeled as "recovery") program and the proposal to declassify the wolf from its endangered status. *Numbers of animals alone cannot be used as an index of survival status.* The Timber Wolf Recovery Plan would better re-focus upon habitat/ecosystem protection, since its present position in Mech's article echoes hollow and ominously of just another management program—a compromise between the interests of wolves and people. It is surely neither idealistic nor unrealistic to make no compromises, and to establish a National Wolf Refuge in northern Minnesota which belongs to the wolf and all America, independent of the state and conflicting human interest groups who make claims upon the last refuge of the wolf. . . . The Mech Recovery Plan represents a transition between "sport" management and true stewardship. May the final balance be in favor of the latter!

Dr. M.W. Fox, M.R.C.V.S., Director
Institute for the Study of Animal Problems
Humane Society of the United States
Washington, D.C.

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Continued from page 26

dangered species, and areas of scientific importance and historical significance.

Spending money on these projects to create alleged recreational benefits in remote areas neglects the recreational needs of urban residents while simultaneously flooding out areas that in their natural condition already provide a wide range of recreational opportunities.

The projects are: Central Arizona Project, Arizona, \$1.675 billion; Garrison Diversion Project, North Dakota, \$565.5 million; Auburn Dam, California, \$1.1 billion; Atchafalaya River, Bayous Chene, Boeuf, Black Project, Louisiana, \$20.3 million; Lufata Dam, Oklahoma, \$30 million; Cache River Project, Arkansas, \$93.2 million;

Dayton Project, Kentucky, \$7.6 million; Freeport Project, Illinois, \$9.4 million; Dickey-Lincoln Dams, Maine, \$533 million; Savery-Pot Hook Project, Wyoming and Colorado, \$73.9 million; Grove Dam, Kansas, \$86 million; Paintsville Dam, Kentucky, \$41.1 million; Yatesville Dam, Kentucky, \$56.9 million; Meramac Park Dam, Missouri, \$124 million; Dolores Project, Colorado, \$186.3 million; Fruitland Mesa Project, Colorado, \$87.3 million; Central Utah Project, \$771.8 million; Oahe Diversion Project, South Dakota, \$457 million; Trotter Shoals Dam, Georgia and South Carolina, \$248 million.

The response from affected members of Congress and governors was quick and bitter, although many who do not have such projects in their districts or

states expressed approval. President Carter seems to be firmly committed to this course of action, but Congress has the power to include appropriations for the projects in the budget on their own.

In fact, at press time the Senate had just given Carter his first major legislative defeat by tacking onto the President's public works bill an amendment supporting the water projects. The Senate voted 65 to 24 to block Carter from holding up funds budgeted for the projects in FY 1977, even though Carter had not announced any plans to cut already appropriated funds. The amendment also indicates that the senators will oppose any attempts by Carter to rescind or defer any FY 1978 funds that Congress approves for the projects. ■

Alaska Frontier '77

Not since Uncle Sam bought Alaska from Russia in 1867 for less than two cents an acre has the United States had such a great opportunity as we have during this Congress. Battle lines are forming between developers and conservationists who want to save some of our last great wilderness frontier in Alaska before a December 1978 deadline.

The magnificence and variety of resources at stake are staggering—practically incomprehensible to people living in the lower forty-eight states. In the proposed Gates of the Arctic National Park, Alaska means an immense arctic wilderness—tundra ponds, craggy peaks, and a caribou herd numbering a quarter of a million. In interior Alaska in the proposed Yukon-Charley National Preserve, you can explore a pristine river rushing through unspoiled canyons, marshes supporting thousands of ducks and geese, and historic gold-rush districts. In the proposed Kobuk Valley National Monument in the western part of the state, Alaska includes great sand dunes well above the Arctic Circle and

lichen-carpeted woodlands. In the proposed Lake Clark National Park to the south, you could find a Swiss Alps-type mountain setting, glaciers, volcanoes, turquoise lakes, and a lush coast on the Cook Inlet where whales are common. And in the proposed expansion of Mount McKinley National Park in south central Alaska, there is hope for protected habitat for wolves, caribou, grizzlies, and moose—habitat now threatened by hunting and mining damage.

These are just a sampling of the areas that would be protected by measures now under consideration. Meanwhile, the forces of development in the state are rapidly advancing: increasing timber sales, urbanization, proposed massive offshore oil leasing, mining, and other developments.

Under the Alaska Native Claims Settlement Act of 1971, Congress gave native peoples claim to 40 million acres of public domain and also authorized consideration of other areas as national interest lands. But Congress has only until December 18, 1978, to give these lands permanent protection. This

is a very involved undertaking, so time is of the essence.

Rep. Morris Udall (D-Ariz.), chairman of the House Interior Committee, has introduced HR 39, the Alaska National Interest Lands Act of 1977. HR 39 (and its Senate companion bill, S 500) would protect a total of about 116 million acres including 64.3 million acres in the National Park System, 46.5 million acres in the National Wildlife Refuge System, 4.07 million acres in the National Wild and Scenic Rivers System, and up to 1.6 million acres in the National Forest System. All areas added to the park, wildlife, and wild and scenic rivers systems by the Act would be designated wilderness areas, and wilderness areas would be designated within existing national parks, forests, and refuges as well. The bill would double the National Park System, creating eleven new NPS units and expanding Mount McKinley National Park and Katmai and Glacier Bay national monuments.

The Secretary of Interior is authorized to permit continuation of subsistence uses of areas. Sport

conservation docket

Under the new allocation of subcommittee jurisdictions in the House, the Subcommittee on National Parks and Recreation has been combined with the former Subcommittee on Territorial and Insular Affairs and is now called the Subcommittee on National Parks and Insular Affairs. This subcommittee retains all its former jurisdiction except over Alaskan D-2 lands but now has the added responsibility of jurisdiction over the territories of the United States.

The members of the newly reorganized subcommittee are as follows: Phillip Burton (D-Calif.), chairman; Robert Kastenmeier (D-Wis.); Jonathan Bingham (D-N.Y.); Antonio Won Pat (D-Guam); Ron de Lugo (D-V.I.); Bob Eckhardt (D-Tex.); Goodloe Byron (D-Md.); Paul Tsongas (D-Mass.); James

Florio (D-N.J.); Dawson Mathis (D-Ga.); John Krebs (D-Calif.); Peter Kostmayer (D-Pa.); Baltasa Corrada (D-P.R.); Austin Murphy (D-Pa.); Lamar Gudger (D-N.C.); Joe Skubitz (R-Kans.); John Clausen (R-Calif.); Philip Ruppe (R-Mich.); Keith Sebelius (R-Kans.); Robert Bauman (R-Md.); and Robert Lagomarsino (R-Calif.).

Within the House Parks subcommittee, early action is expected on legislation to solve the problems caused by clearcutting upstream and upslope from lands in **Redwood National Park**, California; a bill to add the **Mineral King Valley** to Sequoia National Park; and a bill to add 1,300 acres to the **Manassas National Battlefield Park**; and to establish the **Chattahoochee River National Recreation Area** in Georgia.

We will report on other committees next month.

S 315, introduced by Senator Henry Jackson, would establish **National Park System wilderness areas** in certain NPS units including Big Bend National Park, 533,900 acres of wilderness; Bryce Canyon National Park, 16,303 acres; Carlsbad Caverns National Park, 30,210 acres; Cedar Breaks National Monument, 4,370 acres; Colorado National Monument, 7,700 acres; Crater Lake National Park, 122,400 acres; Cumberland Gap National Historic Park, 6,375 acres; Death Valley National Monument, 1.9 million acres; Dinosaur National Monument, 10,274 acres; Everglades National Park, 1.3 million acres; Glacier National Park, 927,550 acres; Grand Teton National Park, 115,807 acres; Great Smoky

hunting would be banned in national parks and monuments but permitted in other areas including "national preserves" of the National Park System.

Conservationists contend that this proposal is superior to other proposals because it includes the best representation of a great variety of land forms and ecosystem types and protects *complete ecosystems*. This is very important. Wild animals of the Arctic and Subarctic require large areas of land to sustain themselves. For example, the international Porcupine caribou herd of 102,000 roams over 90 million acres of tundra to find food during the year.

HR 39 and S 500 aim to balance great development pressures by preserving key lands. Preserving wilderness, wildlife habitat, recreational areas, subsistence-living resources, and scientific and cultural resources is in the national interest. As one example, millions of waterfowl that migrate across most of the world's continents nest and produce young on lands in Alaska that are proposed for protection. These birds are valued by



A brown bear fishes for salmon near Katmai National Monument. HR 39 and S 500 would expand this monument and protect complete ecosystems in many areas of Alaska.

naturalists and sportsmen alike. Jurisdiction for Alaska D-2 lands matters in the House now comes under the New General Oversight and Alaska Lands Subcommittee. The subcommittee is chaired by John Seiberling (D-Ohio). Members include Morris Udall (D-Ariz.), Phillip Burton (D-Calif.), Lloyd Meeds (D-Wash.), Ronald de Lugo (D-V.I.), Jim Santini (D-Nev.), Peter Kostmayer (D-Pa.), Bruce Vento (D-Minn.), Matthew McHugh (D-N.Y.), Teno Roncalio (D-Wyo.), Austin Murphy (D-Pa.), Baltasar Corrada (D-P.R.), Donald Young (R-Alaska), Joe Skubitz (R-Kans.),

Philip Ruppe (R-Mich.), Eldon Rudd (R-Ariz.), and Mickey Edwards (R-Okla.).

The subcommittee plans public hearings in April in Washington, D.C., and around the nation in subsequent months. At press time regional hearings were tentatively slated for Atlanta, Chicago, Denver, San Francisco, and Seattle; field hearings will be held in a number of Alaskan locations.

The public lands in question belong to all Americans, not just the moneymakers. But how will history record the fate of our last great wilderness? ■

conservation docket

Mountains National Park, 390,500 acres; Guadalupe Mountains National Park, 46,850 acres; Hawaii Volcanoes National Park, 123,100 acres; Katmai National Monument, 2.3 million acres; Mount Rainier National Park, 210,700 acres; North Cascades National Park, 515,880 acres; Olympic National Park, 62,139 acres; Organ Pipe Cactus National Monument, 299,600 acres; Rocky Mountain National Park, 239,835 acres; Sequoia-Kings Canyon national parks, 721,970 acres; Theodore Roosevelt National Memorial Park, 28,335 acres; Yellow-

stone National Park, 2.01 million acres; Yosemite National Park, 646,700 acres; and Zion National Park, 120,620 acres.

The Senate Energy and Natural Resources Committee held informal hearings on the progress of an oil tanker superport on the **Palau Islands Trust Territory** on March 24. Government agencies testified on the effects of the superport, and local representatives of both those favoring and those opposing the project presented their views. The project would involve construction of an oil refinery, a petro-

chemical plant, a floating storage basin, storage tanks, moorings for supertankers, support facilities, a thermal powerplant, a desalinization plant, and possibly even a nuclear powerplant. Most of these facilities would be located on coral atolls that are considered highly valuable by marine biologists and have been proposed for park status. NPCA members can help by asking Sen. Henry Jackson (D-Wash.), chairman of the committee, to schedule further hearings on the Palau issue and by expressing to him opposition to the project. ■

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Continued from page 2

come out. The related provisions authorizing coastal states to prohibit or limit the taking of marine mammals within their economic zones should be retained.

WHAT THEN, of oceanic pollution, the second matter of major concern to environmentalists? In our optimistic early days we dared to hope that planetary institutions might be set up to deal in a measure with the pollution of the seas from the land. Constantly the farms of all the world pour pesticides by air and water into the oceans. Continually, without surcease, the traffic and the factories everywhere pour lead and the like, again by air and water, into the helpless sink of the sea.

The RSNT exhorts the nations to cooperate to do something about land-based pollution; it states (without providing sanctions) that they shall enact legislation; but it does nothing more. We have suggested that the nations might at least set up a desk for information and cooperation, with adequate personnel and finance, to get along with the job. Why not try it?

PROVISION of a sort is made in the RSNT for the control by the International Authority of pollution from deep seabed mining in the international area beyond the 200-mile economic zone. Environmental experts may have places on some of the standard-setting commissions; a limited use will be made of environmental assessments and emergency orders. The new negotiators should review these sections of the RSNT and improve them.

The control of pollution from oil and gas exploitation in the 200-mile zones will be in the hands of the coastal states. The RSNT lays down a general mandate upon all states to enact laws and to cooperate in the prevention of oceanic pollution everywhere. But what if they do not? Truly, with signature of the treaty we shall be starting again at the beginning.

As to pollution of the seas from ships, the so-called vessel-source pollution, coastal states have sought extensive protective powers; they have been denied them in respect to construction standards for ships within the new 12-mile territorial seas: segregated ballast, double bottoms, bow-thrusters, and the like. The maritime

powers, including the United States, opposed such authority, contending that tankers could be trapped by the unreasonable demands of a single coastal country.

THERE HAS ALWAYS been a simple solution to this dilemma: provision in the treaty against unilateral legislation of an arbitrary, unreasonable, discriminatory, or retaliatory nature, with interpretation by an adequate judicial system. The present writer has urged such a course for years; one can always try again.

The United States has fought for the compulsory settlement of disputes. Were we to give the coastal states more help in getting authority over construction standards (which American environmentalists desire for ourselves), we might get restrictions over the exercise of arbitrary power. And there are other linkages which could be added, were we not wasting all our bargaining strength on deep sea mining.

SHORT OF such an internationalist approach, some American environmentalists, with whom we have declined to join, have been urging the unilateral extension of U.S. controls to a 200-mile pollution-control zone. This follows the destructive pattern of the 200-mile fishery zone and the trend toward going it alone in deep seabed mining.

All such lone-wolf policies reduce the chances that the United States can achieve the international goals it seeks in the LOS Conference. Among these goals are freedom of navigation and freedom of scientific research: no small matters. Among them also is the binding settlement of disputes as to mining, pollution, and living resources, a vital step toward worldwide legal order, indispensable in the end to world peace.

What are the stages ahead? First of all, a determined effort to strengthen the RSNT as suggested. Secondly, restraint by American environmentalists as against any unilateral efforts, whatsoever, whether as to living resources, pollution, or mining. Thirdly, the treaty must not set up barriers, whether to amendment or otherwise, which will prevent subsequent efforts to establish better worldwide systems. And finally, what cannot be done at once can still be done tomorrow, though our tomorrow may be short unless we act as vigorously as we can today.

—Anthony Wayne Smith



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