

NATIONAL PARKS & *Conservation Magazine*

The Environmental Journal

May 1974



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The Oceanic Fisheries

NO MORE striking example of the dependence of human society on the planetary ecosystem could be found than our increasing reliance on the endangered oceanic fisheries.

The rising tides of famine lap at the shorelines of all the continents.

Powerful modern technologies make it possible to exploit the living resources of the seas beyond their strength. Overfishing will be presented as an imperative of survival for the present generations of men, and will doom generations to come. New institutions of democratic world order must be created promptly to avert this catastrophe.

THE EXISTING intergovernmental machinery for the utilization and protection of the oceanic fisheries is inadequate. The Convention on Fishing (1958), with 33 nations parties, including the United Kingdom and the United States, could be used to develop additional international agreements or to permit unilateral protective action on a nondiscriminatory basis, but Japan and the Soviet Union have not become parties, and the United States has never enacted enabling legislation.

There are several multilateral agreements covering specific oceanic regions and species: for the Northwest Atlantic (herring, flounder, mackerel, cod, and others); the South Atlantic (tuna); the Tropical Pacific (tuna); the North Pacific (salmon, halibut, herring). In varying degree these conventions have been used to establish catch limitations or the equivalent, intended to maintain maximum sustainable yield of the harvested species. But the processes require unanimity for the most part, are weighted with burdensome proof requirements, and have been slow and cumbersome. Indispensable countries have not become signatories.

THE Indo-Pacific Fisheries Convention engages only in studies and reporting, and China is not a party, while populations climb in Java to the point where famine can be combated in Indonesia in the future only by a great expansion of oceanic fishing, which will place a dangerous burden on the unprotected stocks.

The United States is party to a number of bilateral agreements: three with Canada, on salmon, halibut, and reciprocal rights in the Contiguous Zone; two with the Soviet Union, exchanging fishing restrictions for port calls; one

with Japan and one with South Korea on limitations and gear conflict; and another recently with Brazil allowing access to waters claimed by Brazil for shrimp fishing, and limiting catch. A number of other conventions cover special problems or regions around the world. Most of these measures have merit but great inadequacies as well.

AMONG THE SUBJECTS to be considered at the UN Conference on the Law of the Sea which will resume in June at Caracas, Venezuela, will be the oceanic fisheries. Several years ago, it seemed possible that general rule-making powers, covering fisheries among other matters, might be conferred on the Ocean Resources Authority which the conference is expected to establish.

Rather soon, however, this hope was abandoned for coastal state managerial authority over coastal and anadromous species and jurisdiction over the so-called highly migratory species like tuna, which are to be listed specifically, by existing or similar international organizations. This is now the official position of the United States, but coupled with certain principles of conservation, utilization, and allocation which would be applicable worldwide. Its ultimate effect on the existing conventions covering coastal and anadromous species is difficult to appraise at this time.

The United States has proposed, with respect to the highly migratory species, that the regulations of the international organizations apply to all vessels fishing the regulated resource, even though the flag state is not a party to the regional convention. Thus no state could escape regulation by refusing to join the organization, and this would be a considerable advance. Unfortunately there is no requirement that organizations be established where none exist.

THE CONSERVATION principles proposed by the United States, while meritorious, are in our judgment inadequate. We would amend them to provide for regulations designed not only to maintain or restore populations of all harvested species at levels adequate for maximum sustainable yield, but also to maintain or restore populations of all species associated with or dependent upon harvested species at levels of abundance where possible, and adequate to prevent endangerment and extinction; and to pro-

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FRONT COVER *Yellowstone bison, by Michael S. Sample
The National Park Service, dedicated to maintaining under natural conditions the last wild, free bison in the United States, may have trouble protecting them against a proposed USDA brucellosis eradication program. (See page 9.)*

BACK COVER *Brandywine Falls, by John F. Seiberling
Brandywine Falls cascades seventy feet to churning waters below, making it the largest waterfall in scenic Cuyahoga Valley, Ohio, which is proposed for preservation as a national historical park and recreation area. (See page 4.)*

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CUYAHOGA VALLEY

symbol of grace in a congested world

The Cuyahoga, the famous "burning river" of several years ago,
is proposed as the heart of
a new national historical park and recreation area

by JOHN F. SEIBERLING

SEVERAL YEARS AGO the Cuyahoga River in northeast Ohio became famous as the river that caught on fire. An oil slick ignited, and debris in the river burned for several days. It was a freak occurrence, but it demonstrated to the world the extreme problems of water pollution. Within the confines of Cleveland, the river is greasy, grossly polluted, and devoid of marine life. Totally dominated by factories, docks, and warehouses, it is inaccessible to the public.

By contrast, only a few miles upstream the Cuyahoga flows virtually unimpeded through a green-sheathed floodplain. North of Akron the river changes again, becoming a narrow, wandering, scenic, and nearly wild stream in a pastoral setting. Here, only a few miles away from the factories and smokestacks of Akron and Cleveland, the river flows through the Cuyahoga Valley—a swath of green, nestled between the sprawling suburbs of the cities.

The Cuyahoga Valley is one of the most scenic areas in northeastern Ohio and is the only major open space remaining between Akron and Cleveland. Through a quirk of nature, the valley until now has been spared from heavy industrialization. Its steep, wooded slopes, while contributing greatly to the valley's scenic beauty, presented a great physical impediment to commercial development. Most of the valley is located on a floodplain, presenting serious problems to potential developers. The alluvial soil, although agriculturally productive, has low bearing capacity. And builders were further discouraged by

the limits to the size of future development imposed by the width of the valley floor, which varies from five hundred to five thousand feet.

Thus the Cuyahoga Valley and its river have been left as a tremendous resource to the people of Ohio, the Midwest, and the entire country. But today it is threatened on all sides by prospective commercial and high-density developers who wish to build in the area in spite of the inherent difficulties presented by geography. Several priceless parcels of land have already been lost to urbanization, despite activities of local park boards and the state of Ohio to acquire threatened lands in the valley. A bill now before Congress would make the valley into a national resource and would help meet the critical national shortage of public recreation lands near urban areas. And it would preserve for future generations the outstanding natural and historical qualities of one of our nation's largest urban areas.

The Cuyahoga Valley is biologically unique. It is a "botanical crossroads," a meeting place for plant life of the East, West, North, and South. The western edge of the Appalachian plateau crosses the Cuyahoga River near the town of Independence and turns south just west of the valley. The Cuyahoga thus becomes a dividing line between eastern mountain and western prairie botanical provinces. Beeches and sugar maples dominate the hillsides along the river. Stands of oak and hickory crown the drier ridges, while red maples, ashes, and a few remaining American elms occupy the more moist upland areas. Ohio buckeye



The gentle Cuyahoga River meanders through a verdant valley rich in plant and animal life.

is common in the valley floor. On the floodplain are lofty sycamores, cottonwoods, boxelders, and black walnut trees.

Northern hemlocks survive in many of the hundreds of ravines that run back from the valley floor into the rolling uplands. An outstanding example is Tinkers Creek Gorge, a registered national natural landmark. Here northern and southern vegetation meet. The gorge contains a virgin forest, representative of presettlement forests. A beech-maple-hemlock association thrives on the moist, cool floor of the gorge, while an oak-hickory association grows on the drier areas at the top.

Several species of willow thrive on sandbars and along the riverbanks. Wildflowers and grasses color the open fields. In spring the woods are dotted with trillium, mayapples, Solomon's seal, hepatica, anemone, dogtooth violets, Dutchman's-breeches, wild ginger, and trailing arbutus. The Stumpy Basin Nature Conservancy area supports a dozen or more rare species of plants including buffalo berry, two species of juniper, yellow oak, burr oak, three species of gentian, rough-leaf dogwood, and prairie grasses.

The river, marshes, meadows, and woods offer permanent and temporary homes to a variety of animal life. Among the more familiar animals are cottontail rabbits, opossum, white-tailed deer, red foxes, chipmunks, woodchucks, and raccoons. Birdlife includes common birds such as the cardinal, eastern blue jay, song sparrow, turtle dove, bank swallow, redwing blackbird, robin, goldfinch, downy woodpecker, wood

thrush, tufted titmouse, and black-capped chickadee. The valley is also frequented by less common species such as the indigo bunting, pileated woodpecker, scarlet tanager, eastern bluebird, evening grosbeak, Baltimore oriole, and bald eagle. It is within the winter range of the snowy owl and the summer range of the turkey buzzard. Migrating ducks and geese find the floodplain a favorable resting place during their long flights north and south on the flyway.

The Cuyahoga Valley has long played a significant role in American history, and many historical landmarks remain. An Indian tribe of the mound-building culture occupied the valley from 600 B.C. to 800 A.D., and more than 300 sites of archeological interest have been identified. Later residents included other Indian tribes, explorers, missionaries, farmers, and craftsmen. The Cuyahoga offered the shortest portage between the Great Lakes and the Ohio and Mississippi valleys. It was so important to the Indians as a trading route that they declared the valley sacred ground to ensure that it remained open and free from warfare.

The Indians named the river the Cuyahoga, which is generally thought to mean "crooked river." It is one of the most unusual rivers in the world because its upper reaches run parallel to and in opposite direction from its lower reaches. It begins as a trickle many miles east of the valley mouth and joins with another stream flowing south until the combined waters meet the Akron escarpment. After cascading over waterfalls in a magnificent ravine, the river



makes a majestic turn from its southerly course to flow north to Lake Erie. The river's mouth forms the port of Cleveland.

For a short time the Cuyahoga River was the boundary between the United States and Indian lands. It soon became a major gateway to the Northwest Territory when settlers streamed across the Indian lands to the west of the rivers.

Prosperity came to the valley with the construction of the Ohio Canal in 1827. The river and its tributaries were harnessed to power gristmills and sawmills. This was the valley's most colorful era. The canal provided the means of opening up and developing inland Ohio. It provided a water passage between the Great Lakes waterways and the overland route to the east and the south, making it possible to transport goods cheaply.

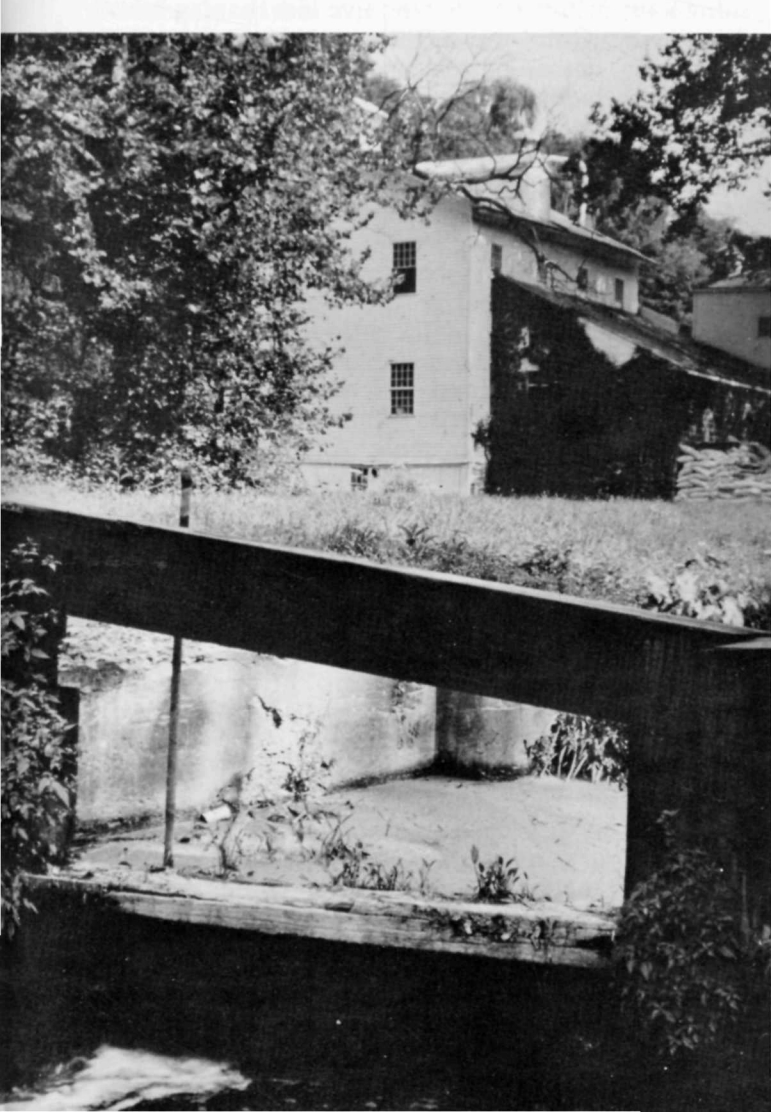
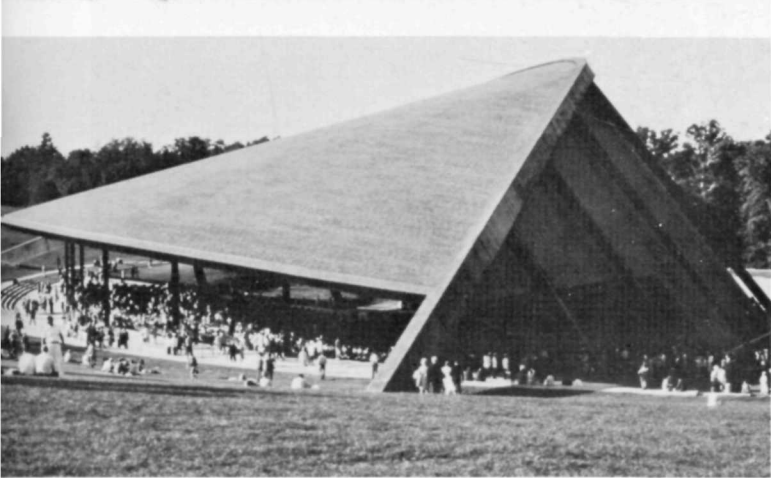
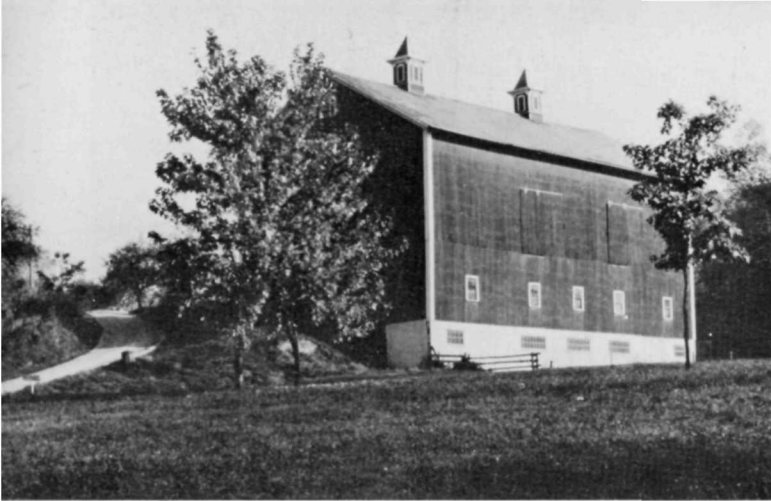
The canal's demise began with the coming of the railroad in the 1850s, and the canal ceased operations in 1913. However, much of the canal, with its locks and diversion dams, remains intact. The village of Peninsula, which once sported five hotels and fourteen bars and was the resting spot for barge passengers and crew, has been restored. A 1½-mile section of the canal near Tinkers Creek is listed in the National Register of Historic Places. The area includes two locks, an aqueduct over the creek, a mill, and a house, all dating from 1832.

TODAY THE CUYAHOGA VALLEY is a sleepy, rural area with few permanent residents. Although

the river is polluted, most of its tributaries are not. The Army Corps of Engineers has undertaken a major restoration program for the river, and construction of a regional sewage treatment plant is underway. In addition, many local citizens have participated in projects to clean up the river and have strongly supported efforts to preserve the valley's natural and historical resources.

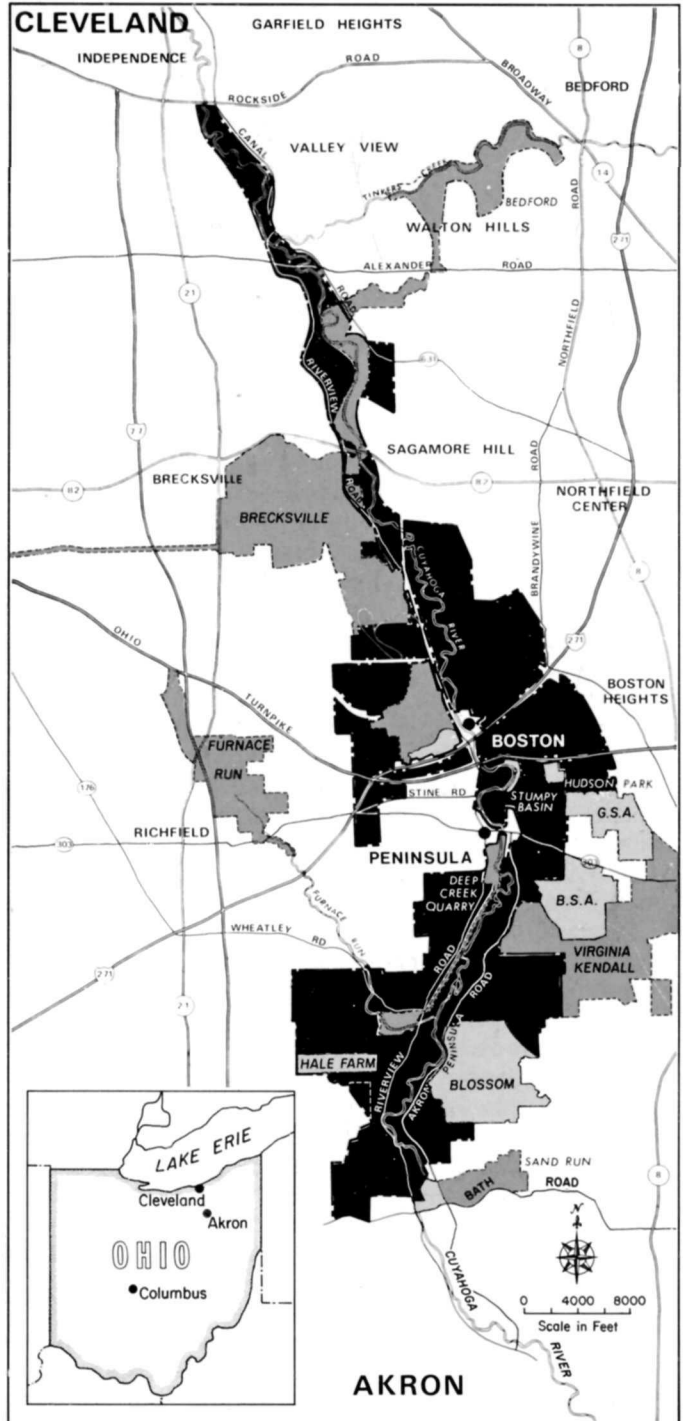
The idea of preserving the Cuyahoga Valley is not new. As long ago as 1925, the famous landscape architectural firm founded by Frederick Law Olmsted declared that the valley was the most important scenic asset in the Akron area and recommended that it be preserved in its entirety as a rural park. In the mid-1960s an Ohio State Department of Natural Resources report reached the "indisputable conclusion that the valley must be preserved as open space land."

Following publication of the study, the Akron and Cleveland Metropolitan Park Districts joined in an effort to create a 20,000-acre park in the valley region. The state of Ohio named preservation of the Cuyahoga Valley the state's most important recreation goal and has joined with the two park districts to help preserve 14,500 acres. The Bureau of Outdoor Recreation has provided \$6 million in matching grants as the beginning of a \$35 million, twenty-year program. However, within five years, many large and key sections of the valley may be lost to development. The price of land, which is still relatively reasonable, will escalate sharply in the time period outlined by the state plan.



CUYAHOGA—LAND OF GRACE

The proposed Cuyahoga Valley National Historical Park and Recreation Area will encompass federal, state, and local lands to offer a rich diversity of attractions—not only natural and scenic areas, but also the historic Jonathan Hale homestead, established by one of the valley's first settlers and including a gracious restored home; magnificent huge barns scattered through the pastoral valley; the modern open-air Blossom Music Center; and the historic Ohio Canal, which, with locks, buildings, and towpath, retains the colorful and nostalgic ambiance of the 1800s.



- EXISTING METRO PARKS
- QUASI-PUBLIC LANDS
- FEDERAL PARK AND BOUNDARY



Serene glades in Cuyahoga Valley offer respite from nearby congested cities.

In 1972, the National Park Service conducted an intensive feasibility study on the proposed plan to create a Cuyahoga Valley National Historical Park and Recreation Area. The unofficial draft report recommended a federal area of about 15,000 acres. It would be managed in cooperation with 7,500 acres of nonfederal areas abutting the federal unit to form an "umbrella" park of some 22,500 acres.

Within the park would be such public and quasi-public areas as the historic Jonathan Hale Farm—a preservation project honoring one of the valley's first settlers—and the nineteenth century Western Reserve Village, which has been reassembled in the valley. Also within the park area would be the Blossom Music Center, the outdoor summer home of the Cleveland orchestra. Adjacent to the park would be several public and private areas such as Cleveland's lovely Brecksville Reservation and Akron's Virginia Kendall Park, which contains cliffs exposing the most magnificent Paleozoic rock found in the valley.

The Park Service study envisions an overall transportation network including the canal and railroad. Automobile traffic would be limited to local traffic. Trail systems for bicycling and hiking would be integrated with those of the metropolitan parks of Cleveland and Akron. With much of the valley ultimately restricted from development, an 1800s aura can be restored. Primitive, walk-in camping areas could be provided along the river. Large areas of the park would remain undisturbed, offering a vast outdoor laboratory for students and visitors. Access to the river would be available to boaters, canoers, and picnickers. Most service functions and facilities would be located on the edge of the park.

The park would serve the recreational needs of some four million people who live less than an hour's drive away. Ohio, the sixth most populous state in the nation, has no national parks or national recreation areas. Indeed, the eastern north-central region of the country—Ohio, Indiana, Illinois, Michigan, and Wisconsin—makes up 20 percent of the total population of the country, yet only 1 percent of all federally administered recreation areas are located within this five-state region.

The Cuyahoga Valley National Historical Park and Recreation Area would preserve for present and future generations a magnificent scenic and historic open green space. The image of the upper river as a haven for canoers and rafters would replace the image of the "burning river" mouth. The Cuyahoga would cease to be an example of the worst of pollution and would become a symbol of how America can preserve natural grace and harmony within easy reach of the residents of our congested, urban world.

Thoreau's words, spoken of a village, are yet truer for the inhabitants of a modern metropolis, who will be "saved not more by the people in it than by the woods and swamps that surround it." ■

Congressman John F. Seiberling represents the Fourteenth District of Ohio, which includes Akron and part of the Cuyahoga Valley. A member of the House Committee on Interior and Insular Affairs, he serves on the subcommittee on National Parks and Recreation, Mines and Mining, and the Environment. He has lived in the Cuyahoga Valley for fifteen years and has photographed it extensively.

YELLOWSTONE'S BISON

a unique wild heritage

The only remaining wild bison in the United States
are threatened
by a questionable brucellosis eradication program

by MARY MEAGHER

THE YELLOWSTONE BISON—their history of exploitation, protection, and management—epitomize the evolution of much of our present thinking about wildlife and natural areas. When the area we now know as Yellowstone National Park was set aside “for the benefit and enjoyment of the people” in 1872, little thought was given to the wildlife found so abundantly within the region. The wonders of the Yellowstone—spectacular geysers, colorful hot pools, the Grand Canyon of the Yellowstone—motivated those who promoted the idea of a national park. Wildlife protection consisted only of a provision against “wanton destruction.”

Wanton destruction—by whose definition? Hunting for camp meat was permissible and gentlemen hunters came specifically for sport shooting. The early hide and meat hunters, killing for profit, took a tremendous toll of some wildlife species. Although regulations that prohibited hunting were passed in 1883, real protection for wildlife did not begin until 1894, when the Lacey Act was passed to provide both effective penalties and jurisdictional authority for killing wildlife in the national park.

The Yellowstone bison provided the impetus for passage of the Lacey Act. More than any other “game” species, they had been hunted mercilessly within the park. As wild bison elsewhere throughout the West were systematically exterminated, ever higher prices paid for heads provided great incentive for poachers to run the risk of small penalties for killing bison in Yellowstone. The capture of Ed Howell in the act of killing some of the few remaining Yellowstone bison in March of 1894 so aroused public indignation that the Lacey Act became law. This act was a major safeguard, but the monetary rewards for poaching bison were still so attractive that protection was not finally assured until coupled with adequate laws in all three surrounding states—in about 1901. Thereafter, the small band of bison that had survived in the remoteness of the Pelican

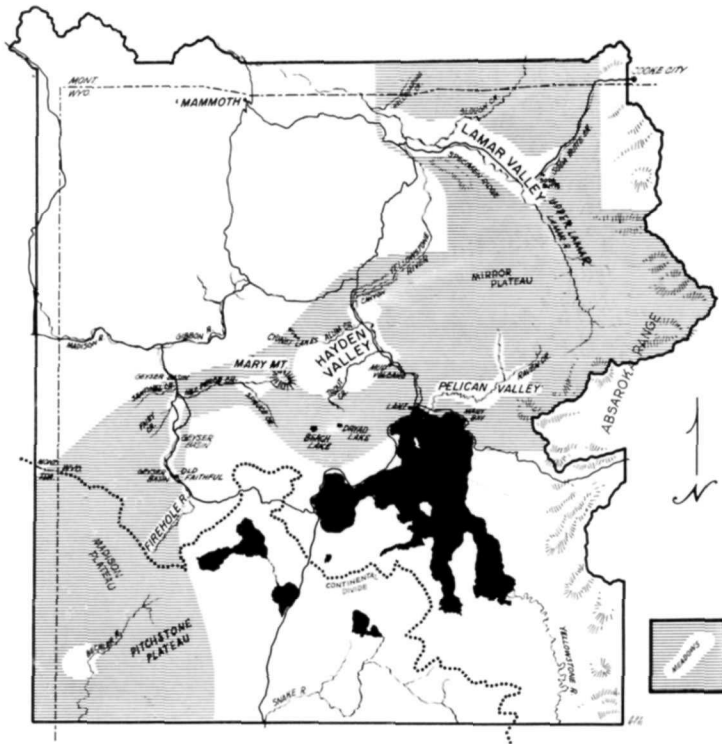
country began to increase. Today, Yellowstone is the only place in the United States where a wild bison population has persisted since European man first arrived on this continent.

The original bison inhabitants of the Yellowstone were mountain bison that had already disappeared from much of their range by 1840. Skulls and portions of crania suggest that this form may be distinct from the plains bison, but the quantity of available material may be insufficient to settle the question. Historical accounts do generally agree that, compared to the plains bison, these mountain animals were more hardy, fleet, and wary, with darker, finer, more curly hair. Sex and age differences among animals sighted may account for differing reports of size. The mountain bison migrated seasonally along altitudinal gradients. Small bands were characteristic in contrast to the large herds that inhabited the plains.

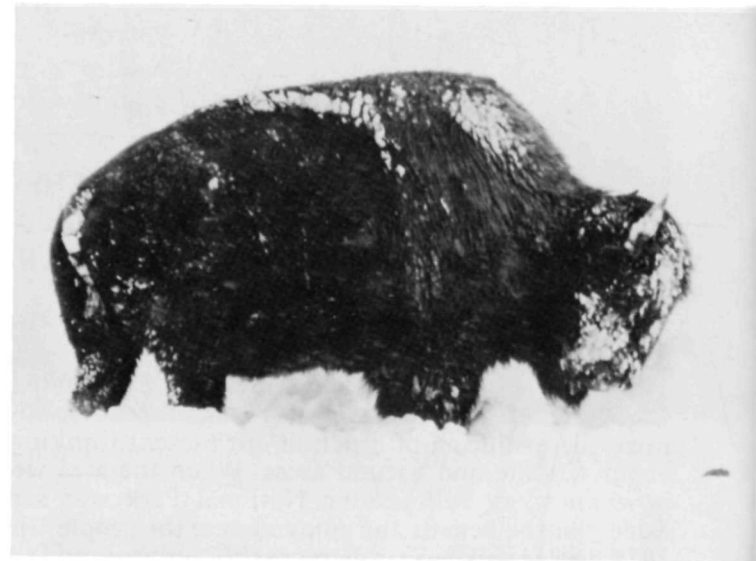
By the time the Yellowstone bison were effectively protected by laws, wild bison had been eliminated from the historic wintering areas of the Lamar in the northeast part of the park and from the centrally located Mary Mountain area (Hayden Valley–Firehole). To the park administrators of the time, extinction of the remnant population still existing east of the Yellowstone River seemed quite possible. In 1902 they arranged for plains bison from two semidomesticated herds to be introduced to the park at Mammoth. In 1907 this fenced herd was moved to what became the “Buffalo Ranch” in the Lamar Valley. During the next several decades the semidomesticated herd prospered, subject to herding, artificial feeding, castration, and other usual ranching practices. Throughout the same period, the original wild herd persisted and slowly increased to intermingle and interbreed with introduced plains bison beginning in the 1920s. Today the bison of the park can be considered one population genetically.

In 1936 bison were trucked from the Lamar to the Mary Mountain area to reestablish a population on

Severe winter weather is the major limiting factor on the Pelican Valley bison herd; only about a hundred animals survive the harshest winters. In deep snow bison use their heads as snowplows to uncover forage; only a few can utilize a ridgeline where the wind has blown the feed clear of snow. Other factors than weather regulate bison numbers in other areas of Yellowstone because winters are less severe there or because habitat is more varied than in Pelican Valley.



Yellowstone National Park. Bison rarely occur outside the shaded belt. Distribution within this area varies according to the time of year.



BRYAN HARRY

that historic range. Today distribution of bison within the park closely resembles the historic distribution, to the extent that we can make comparisons. Wintering populations center in the Lamar and Pelican valleys and the Mary Mountain area. In summer the populations range widely within the park; the distribution occurs within a broad strip extending roughly from northeast to southwest. Only the northwest and southeast corners are not in the habitually used bison range at some time during the year.

ABOUT 1930 the philosophy of bison management began to change. The buffalo ranching operation in the Lamar Valley was gradually phased out, concurrent with the development of a policy for the administration of natural areas. The last vestiges of buffalo ranching terminated with a token winter feeding of hay at Lamar in 1952. Ranching had never been practiced with bison elsewhere in the park.

In keeping with a range-livestock viewpoint, management was to be limited to the regulation of population numbers (reductions) where winter range conditions seemed to indicate a need. Bison numbers in Lamar had been regulated by man as part of the ranching operation, when artificially high numbers were maintained. Regulation of other population segments began in 1955 when the Mary Mountain population numbers greatly increased. (This increase was probably related to the reestablishment of bison

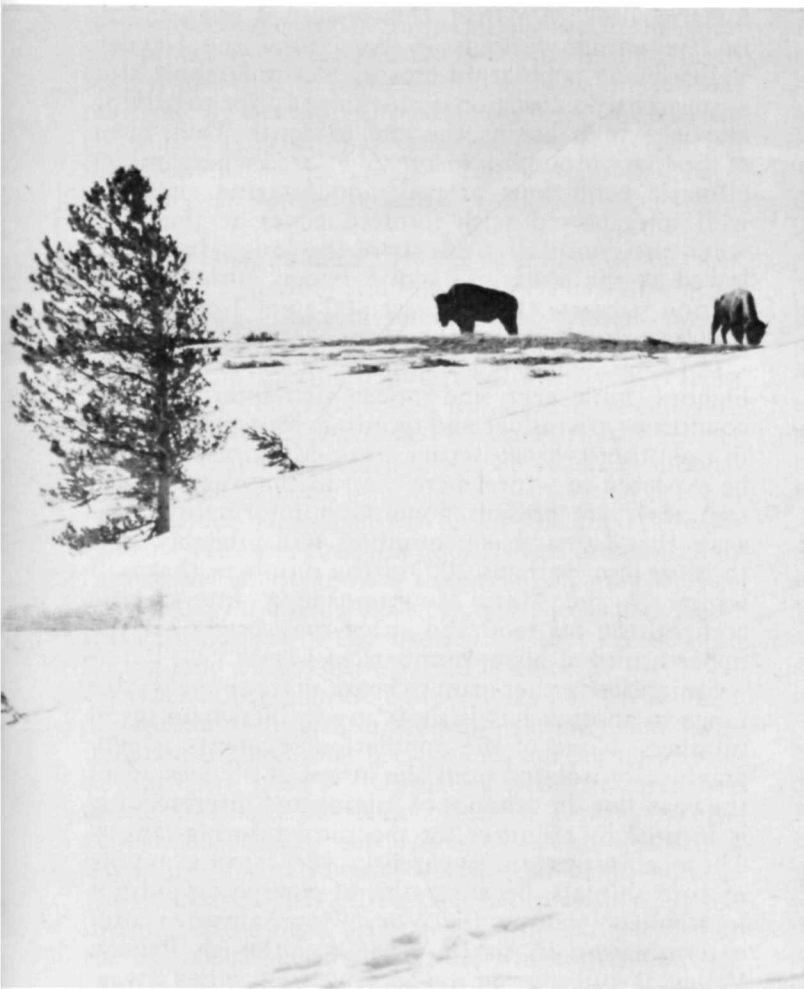
on a long vacant but suitable winter range; if so, a comparable increase should not again occur.) Reductions were held at irregular intervals on all population segments between 1955 and 1966.

Research that began in 1963 provided the basis for a reevaluation of the need for bison population control by man's interference. The Pelican segment had been subject to only two small reductions since near-extirmination at about the turn of the century. Movements of the bison were unrestricted by any but natural influences such as snow depth. Establishment and use of a national park by man did not particularly influence their habitat. Inasmuch as bison had apparently inhabited the Pelican area for centuries before establishment of the park, their ability to persist without man's help seemed likely.

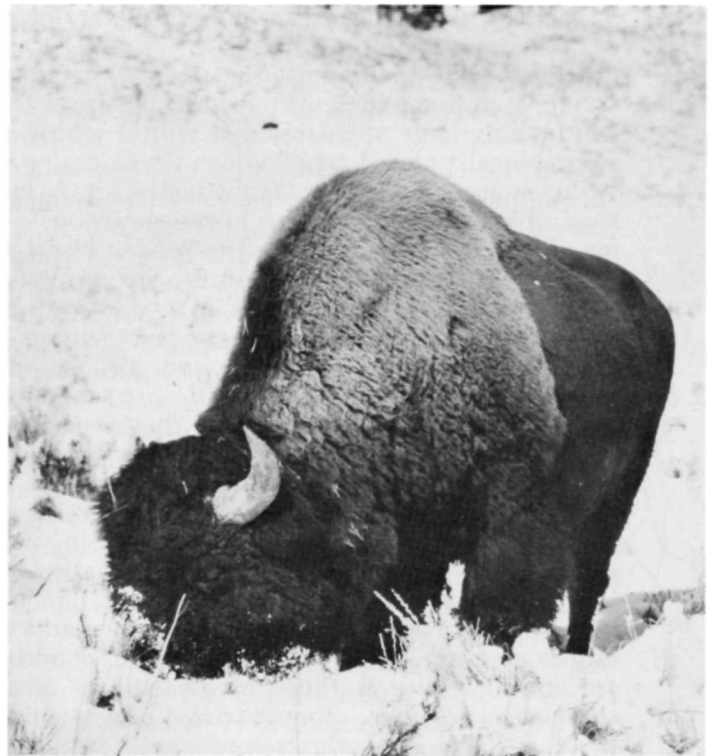
We do not yet fully understand the mechanisms involved in natural regulation of the three bison population segments, but the available information does not suggest a need for future reductions. Comparatively low reproduction rates, low increment rates, and heavy mortality during exceptionally severe winters are the major influences on population size among the park bison. A combination of intrinsic and extrinsic factors seems to be involved. The three population units of bison show three different recent short-term population trends: Pelican valley, decrease; Mary Mountain, increase; and Lamar Valley, near stability. This difference suggests that the natu-



MARY MEAGHER



MICHAEL S. SAMPLE



MICHAEL S. SAMPLE



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Although predation on bison is rare and has no effect on population numbers, bison that die of natural causes are sometimes a vital source of food for scavengers—coyotes, ravens, magpies—and for rare or endangered species such as grizzly bears, wolves, and eagles.

ral factors that regulate population size vary in kind or intensity among the three.

Pelican Valley represents the simplest regulatory system among the three bison wintering areas. Bison are the only large ungulates that winter within this geographically closed area (Pelican Creek drains into Yellowstone Lake rather than directly into a larger river system flowing toward lower elevations). The main regulatory influence on the Pelican bison herd seems to be frequent severe winter weather; winters with population consequences may occur at least twice within a decade. Even average winters are harsh; snow blankets the ground almost seven months of the year, minimal depths are several feet, and the wind blows the length of the exposed open valley most days. A few scattered thermal areas apparently provide a threshold-carrying capacity that permits about a hundred animals to survive the most severe winters. Without these areas, bison would probably not persist for long in Pelican Valley.

The effects of weather on other population units in the park are less pronounced because habitat conditions are more varied or because winter conditions are not so severe as those in the Pelican area. A complex of weather, other extrinsic effects, and intrinsic behavioral responses seems to interact to regulate the numbers in these other population units. Hayden Valley on the east side of Mary Mountain winters large numbers of bison and a few elk; the Firehole to the west winters large numbers of elk compared to relatively few bison. Winter climatic conditions in Hayden Valley are comparable to those in the Pelican area, but here the open terrain is much more varied, providing more alternatives among

foraging sites. Moreover, this system is open-ended; in late winter perhaps 75 percent of the Hayden Valley bison population crosses to the Firehole side—apparently a traditional movement prior to calving season, which begins the end of April. Thus most of the Mary Mountain bison are located where milder climatic conditions prevail, and foraging sites are well interspersed with forested cover at the time when the cumulative effects of the long winter, followed by the stress of calving, occur. Present information suggests that at least 400 to 600 bison may consistently winter in the Mary Mountain area.

In Lamar, where large numbers of elk, some bison, bighorn, mule deer, and moose all winter, climatic conditions are milder and terrain is more varied than in the other two wintering areas. More bison might be expected to winter here than in the Mary Mountain area; yet present population information suggests that Lamar bison numbers will probably be a third or less, perhaps 200, of the numbers that will winter in the Mary Mountain area. Interspecific competition for food and space may partly set the upper limits of bison numbers in Lamar.

Emigration either from the park or from one winter range to another has little if any influence on bison numbers. None of the population segments is geographically isolated from the others at all seasons of the year, but the amount of mixing and interbreeding is limited by affinities for specific wintering ranges. These affinities are apparently very strong among mature animals, because a bison population did not reestablish itself in the Mary Mountain area after extermination in the late 1880s, although Pelican Valley is only seven easily traversed miles away.

Census information and limited marked-animal data also indicate that use of a given wintering valley is habitual.

Habitual use of particular areas in both summer and winter explains the lack of emigration of population groups from the park. No boundary fences exist around Yellowstone's 3,472 square miles, but bison do not leave the park except for scattered individuals, nearly all of which are bulls. Past records show mixed herd groups (bulls, cows, calves) occasionally leaving near Gardiner, Montana, during a severe winter, but this exodus has happened only when artificially high numbers were maintained in the Lamar Valley by winter feeding. Historically some population groups that summered inside the park regularly wintered outside, but these bison groups are long gone. These winter ranges outside the park are no longer available, which precludes reestablishment of groups that habitually move outside the park boundaries.

Likewise, predation and disease have no apparent role in the regulation of bison numbers. Predation is a rare occurrence; even a weakened bison is a formidable antagonist, and calves are usually well protected in the herd units. Parasite and disease organisms are few in kind and negligible in effect.

Bison management in Yellowstone National Park now may be termed "no management," with its goal of maintaining this truly wild, free-ranging population subject only to the influences of natural regulatory processes. This objective is unique in the United States. Most other populations of bison are fenced; many are domesticated to some degree. Numbers are controlled by hunting or cropping. But the bison "no management" objective for Yellowstone has been seriously challenged recently.

BRUCellosis (Bang's disease, undulant fever) was first tested for and reported in the Yellowstone bison in 1917. Rate of infection has varied considerably among tests made in different years, and also among the wintering populations of a given year. In 1964-65, 129 animals tested in Lamar showed a rate of 59 percent, 33 tested in Pelican showed a rate of 42 percent, and 302 tested at Nez Perce Creek showed a rate of 28 percent.

Brucellosis is caused by an organism called *Brucella abortus*. Whether *Brucella abortus* was introduced or is endemic is not known; the organism may well be native to wild bovids. Possibly brucellosis arrived on this continent with the bison when they crossed the Bering land bridge during the Pleistocene.

Evidence suggests that brucellosis has little effect on reproduction rates in the Yellowstone bison. Limited data indicate that pregnancies are normal. Rates of pregnancy have not correlated with the incidence of the organism. Abortion "storms" caused by brucellosis as seen in cattle do not occur. Dr. Erling Quorstrup (a veterinarian who tested bison here in 1944) believed that brucellosis had probably existed in the Yellowstone bison for a long time and that the bison had acquired a natural immunity. Further studies may indicate that mutual adaptation exists,

as between parasites and hosts that have long lived together. Thus the presence of brucellosis in Yellowstone bison is entirely compatible with the concept of a natural area.

As the nationwide program for eradication of brucellosis from cattle has progressed, livestock organizations and brucellosis eradication program personnel of the U.S. Department of Agriculture have focused increasing attention on brucellosis in the Yellowstone bison. During 1972 and 1973 considerable controversy has resulted because the National Park Service of the Department of the Interior has refused to engage in a brucellosis program within Yellowstone National Park. Instead, personnel of Yellowstone National Park have developed an alternative program—essentially one of boundary control—to prevent bison-cattle contact.

The brucellosis eradication program proposed to the National Park Service would entail trapping all possible bison, holding brucellosis-free animals in a pasture, and shipping to slaughter all animals that react positive to a test for brucellosis. All bison that could not be trapped would be shot in the field before the herd in the pasture would be released. This program is proposed on the premise that trapping efforts would be conducted on all three of the main bison wintering areas. Proponents of this proposal thus believe that at least 70 percent of the total population could be trapped. Past brucellosis test records suggest that perhaps 30 to 40 percent of those trapped would be reactors shipped to slaughter; total loss (reactors and field shooting) would be 50 to 60 percent of the population.

This proposal fails to recognize that wilderness designation precludes use of trapping operations, together with construction of facilities for handling and pasturing bison on two of the three wintering areas (Pelican and Mary Mountain). Actual numbers of bison that would thus be destroyed are at least 85 percent of the total population because of the wilderness restrictions. Bison would be exterminated from two of the three wintering areas. A fenced herd of perhaps forty or fifty bison would be left in the Lamar. During the time required to eliminate all untrapped bison—perhaps as long as ten years—these fenced animals would become just one more semidomesticated herd. Because brucellosis occurs at a low level in a wide range of other hosts (1.5 percent in the some 12,000 northern Yellowstone elk), there is no assurance that these few fenced bison would remain brucellosis-free. Total eradication of the bison to eradicate brucellosis might finally result.

An understanding of the concept of Yellowstone National Park as a natural area is crucial to an understanding of the position of the National Park Service in this controversy. Bison management objectives are to maintain a wild population under natural conditions. Any program of roundup and elimination of bison would disrupt the whole system of natural relationships: distribution and patterns of habitat use, social structure of herd groups, population, sex and age structure, and availability of a major



MICHAEL S. SAMPLE

food source for park carrion-eaters (which include rare or endangered species such as grizzly bears, bald eagles, and wolves). Opportunity for visitors to see wild bison would be virtually eliminated for an indefinite period of time. A brucellosis eradication program is completely incompatible with the management objectives of Yellowstone National Park as a natural area.

Moreover, the ability of bison to transmit brucellosis to cattle has not been studied. In test situations (by inoculation or by close association in a fenced area) transmission will probably occur. That wild bison will transmit brucellosis to cattle seems theoretical and quite unlikely; brucellosis-free status has been achieved in areas adjoining the park in spite of the bison. The question is academic as it pertains to Yellowstone, because a reasonable and effective alternative to brucellosis eradication within the park exists.

Personnel of Yellowstone National Park have developed a program of boundary control to ensure that those few bison that do leave the park will not contact domestic livestock. Records compiled for a number of years indicate where and when such movements might occur. Bison that move beyond specified locations into areas adjacent to but within the park boundaries will be shot by park personnel and utilized for scientific specimens, if feasible. Cooperative arrangements with the surrounding states are in effect to eliminate bison that do manage to move out of the park. The Park Service anticipates that this program could result in elimination of one or two bison annually, although none has yet been shot. This program exempts bison in wilderness areas.

The boundary control program will achieve both objectives: those of the livestock interests to eradicate brucellosis in cattle for economic and public health reasons; those of the National Park Service to maintain wild bison in the habitat and under the conditions to which they are native.

Controversy over the magnitude of the effects of a brucellosis eradication program obscures the real issue. The Yellowstone bison represent unique and irreplaceable esthetic, scientific, and educational values that cannot be preserved if a brucellosis eradication program is implemented in the park. The obligation of the National Park Service to protect these values takes precedence over eradication of an organism that also may well be part of the natural complex of the Yellowstone environment. ■

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THE ARABIAN ORYX

a desert tragedy

article & photos by D. S. HENDERSON

*Is the handsome Arabian oryx
now extinct in the wild?*



THE PHOENIX ZOO

THE ARABIAN ORYX is a handsome creamy-white antelope with long rapier horns and touched lightly on head and legs with brown markings. Viewed in profile, the oryx's horns seem to grow from a common base and may be the origin of ancient tales of the mythological unicorn. At one time ranging the entire Arabian Peninsula and north into Sinai, Palestine, Jordan, Syria, and Iraq, the species now is rare to the point of extinction. From evidence I found during an expedition deep into south-central Oman, it seems doubtful that any oryx can still exist in the wild.

The purpose of my expedition was to photograph the oryx, because few, if any, good, in-the-wild pictures exist. At the time it was widely believed that the only remaining oryx outside captivity were in Oman—where the Bedouin estimate of the total oryx population was "*Inshallah* (God willing), there *might* be three."

Sultan Qaboos, Oman's young, progressive ruler, gave his permission for the expedition quickly and with a minimum of formality. With his permission came a request to widen the aims of the expedition to include an estimate of the Sultanate's remaining oryx population, information that would be most relevant in determining a suitable area for Oman's planned first national park.

Such a trip off the beaten track into conditions so inhospitable and so far from "civilization" calls for more than casual preparation. Where we were going we would not be able to forage or dig for water or to hunt. In the desert you take along your fuel, food,

and water, with handsome margins for error—or you pay the penalty.

We set off on the afternoon of the fifteenth of October 1972. Our party consisted of John Carter, Arabist and executive of the local oil company whose local knowledge and interest had made the expedition possible; myself; and an orderly and a driver, both Muslims. Late the next afternoon, after a long and tiring drive through harsh, flat, gameless semidesert, we found Sheik Salim bin Huywaylat at ease at his base (four uprights and a rough roof—"all a good Bedou' ever requires") and well tended by a dozen or so of his family. A shortish, well-covered, russet-faced man in his fifties with a white, crisply trimmed beard and a quickly apparent sense of humor, he greeted John Carter with unaffected pleasure and promptly produced coffee and fresh dates.

Sheik Salim, who had been personally instructed by Sultan Qaboos to do all in his power to see that the oryx that remained in the area under his jurisdiction be protected, was the key to the expedition. We need not have worried. He instantly offered his personal services as guide, adding with deadpan humor, "provided, of course, that you can guarantee a good supply of coffee and dates." Thirty minutes later, Carter was on his way south, his mission of introducing me accomplished.

Early next morning, with Sheik Salim and a member of his family—both rifle-armed—bringing our party to five, we climbed into our packed-to-the-gunnels landrover for what seemed certain to be a very cramped trip. Sheik Salim had clearly come to the



same conclusion. Thirty minutes later he flagged down an oncoming landrover, and in no time at all “invited” me to hire it and its driver, stating with studied nonchalance that “we” would be more comfortable with a second vehicle. Fahad Yahir, the hijacked driver, knew little English, and that acquired at desert refueling stations, but he quickly proved himself one of the most capable men I have met and with a splendid sense of humor.

The breakfast that followed the highjacking revealed how well, despite the harshness of the land, the Bedouin can live. We feasted on coffee, invariably freshly roasted and ground; warm and frothy goat’s milk; meat roasted over superheated stones, crisp, slightly charred on the outside, and richly juicy in the center; and dates, staple of the desert, succulent from that year’s harvest.

If that particular breakfast set a standard for the safari’s meals, the day itself established the routine we would follow: a predawn reveille followed by coffee and dates to sustain us for the first few hours; a wide-ranging oryx search until sometime between 10:30 and 11:30; breakfast; a siesta under the nearest thorn—by then the heat was considerable and the sun too high and fierce for good color photography; a resumption of the search sometime between 2:00 and 3:00 in the afternoon; and a nightstop when light finally defeated photography.

During the first day of the expedition, after a siesta, we moved at last into oryx territory—a vast, undulating desert with a gravelly surface intermittently and sparsely vegetated with small, weary-looking succulents. On the outskirts of this area we flushed out a healthy-looking fox. Later, we saw a lone bush rabbit and a pair of intensely shy gazelles. But we

were to see little other wildlife during the trip. Animal populations have suffered greatly from motorized poaching, for in the desert roads or paths do not exist, and visibility is usually many miles. Animals have no place to hide from the poacher.

The same evening, just before dusk, we found seven-to-ten-day-old oryx tracks made by three adults and a young calf moving leisurely across the desert. Clearly pleased to find tracks so quickly and so comparatively fresh, Sheik Salim called an immediate nightstop. In no time Fahad and my orderly had a fire going—dead wood was seldom hard to find—and coffee ground and brewed. The meal consisted of a mixture of canned steak and kidney pie, stewed steak, and canned peas, subtly spiced from a collection of battered tins produced by Fahad.

Well aware that I was enjoying the meal, Fahad watched me put away the final few mouthfuls. While Sheik Salim unashamedly eyed the fruit, I indicated I had finished. “Full tank?” Fahad asked me. Those words were the first English he had spoken, and almost all he knew. The following night, when he had seemingly eaten twice as much as anybody else, I asked him with suitable disbelief in my voice the same question he had asked me the night before. “Me,” he said without changing a muscle of his face, “two tanks.”

We turned in early that evening. The absolute silence of the desert night is much different from the characteristic sounds of the African night: prowling lion, leopard, and hyena; sleeping monkeys suddenly disturbed; the constant buzz and chirp of countless insects. The desert is very different but, in its own way, very attractive too.

The dawn start the next morning began with a

DESERT CAMP

To pitch camp in the desert, one simply stops. On a hot and arduous journey across the Arabian desert in landrovers, meals and campfire jostling are major events that punctuate the tedium of the long hours of travel.



hope-soaring false alarm. Fahad fleetingly saw something through his powerful binoculars far off in the blanket of lingering mist. "*Bin sola?*" (oryx) was his whispered first reaction, followed by a frustrated grunt as the animals faded back into the mist.

Our tactics for the day would be to seek fresh tracks. But the desert can be a misleading place for the uninitiated. Almost everywhere we stopped we found tracks of some kind, mostly of gazelle, quite often of camel, but frequently of oryx. Indeed, at first sight *bin sola* was around in appreciable numbers. However, some of the tracks were as much as thirty years old, and most were at least several years old, so the impression of numbers was illusory. Without rain to wash them away, tracks in the desert simply go on accumulating. It is said that in parts of the Empty Quarter—the vast, shifting inland seas of true dune desert—camel tracks more than a thousand years old and now rock hard still exist.

So we continued our search, occasionally replenishing our water supplies from one of the regularly scattered though far-flung government water dumps. The forty-four gallon drums are filled every few months by government water tankers and provide a vital source of water for the Bedouin and his stock. The dumps tend to be situated in the occasional thickish copse of thorn and scrub, though some consist merely of a single drum dropped in the desert. Inevitably, the water was hot—110°F or more—and most times red with rust, which, however, seemed to harm no one.

A little before dusk, and many miles later, we found five-day-old oryx tracks, again of three adults and a calf. Sheik Salim and Fahad assured me they belonged to the same animals whose tracks we had

found the previous evening. Far more significant, we found five-day-old tracks of two other oryx not more than four hundred yards away. But these oryx had been running. And oryx don't run for sport.

This discovery, although I did not realize it at the time, was to change the nature of the safari. Earlier in the day we had found fresh, perhaps three-day-old tracks made by a landrover. Until then Sheik Salim had ignored every other vehicle track we had seen, some of which, still reasonably fresh looking, had been made by seismic surveys as long ago as the early sixties. But he looked long and hard at these particular tire tracks—and even longer and harder at the tracks of the running oryx. "*Bin sola* maybe already finish," he said after a long silence.

The next day during both our morning and afternoon searches we came upon the tracks of the same two groups of oryx—the three adults and the calf, and the two adults. On all occasions the two had been running. We also found more fresh vehicle tracks, this time of two vehicles traveling in convoy. As a result of what we had found and with the wry comment that at least he would be able to get fresh meat, Sheik Salim diverted us some fifty miles to a Harasis (Bedouin) camp to gather some information about what we had discovered.

En route to this camp Sheik Salim questioned a lone Bedouin grazing a small herd of camels—a tough, alert little man whose actions and manner epitomized the desert Bedouin, first by the instinctive way he went to ground, rifle at the shoulder, when he encountered strangers, and then by his reaction at meeting a non-Bedou—a handshake that involved the merest touching of hands, with his eyes all the time on something in the distance—a perfectly nor-



Sheik Salim bin Huywaylat examines a dead oryx discovered just at sunset.

mal attitude, with no offense meant, but disconcerting to the uninitiated.

The news we received when we arrived at the Harasis camp a little after dusk was disturbing. A hunting party had spent four days in the area and had left only forty-eight hours before our arrival. They had come, we were told, with the intention of capturing "as many oryx as possible" and were led by a Sheik Suleiman (the name has been changed), a man from a northern emirate with a finger in many dubious pies, including gun running, and well known not only to Sheik Salim but to Oman Intelligence as well.

Superstition claims that Arabian oryx horns and stomach juices have aphrodisiac powers and that killing an oryx confers on the hunter the animal's strength and stamina. One wonders, though, what running down an animal with a motor vehicle proves about the hunter's manhood. Recently, however, hunters have begun capturing oryx rather than killing them. Two factors seem to have brought about this change: the 30,000 American dollars that a pair of oryx fetch on the open market, and the two outbreaks in twelve months of a fatal disease in a northern ruler's small captive herd. In other words, Sheik Suleiman must have been acting for some unscrupulous collector or endeavoring to replace the fatalities in the captive herd.

The nightstop provided a fascinating example of the hospitality and way of life of the Bedou'. Coffee and dates over, one of the Harasis, who jointly owned the 150-odd camels and perhaps 300 goats that ap-

peared shortly after dark, and who was to accompany us the following day, brought a goat—the evening meal—to within a few yards of the fire. There he casually and efficiently cut its throat, then brought it to the fireside to skin deftly, unwilling to miss the conversation. Skinning complete, a portion was cut into small steaks and roasted on flat preheated stones that the hosts produced from a sack that they obviously carried around the desert. A portion of the goat was also cut up for cooking with rice and spices. An hour after the goat appeared at the fireside the first steaks were being eaten. Forty minutes later the rice and meat were ready.

I have never found eating with my hands in the Bedouin style particularly easy. Invariably, too, the fingers and mouths of my fellow diners always seemed pure asbestos; they rolled food I could scarcely touch into convenient-sized balls and as easily swallowed it. I had therefore speedily sought "dispensation" and used a spoon, conforming only when we were guests or hosts. Nobody ever deliberately attempted to out-eat me; indeed, the choicer cuts were constantly being put my way. But leisurely dining is not a Bedouin habit, especially when the rest of the hosts, who invariably allow senior family members and guests to eat first, are awaiting their turn, *Inshallah*, before the meal has completely cooled. Not surprisingly, therefore, when we came to eat the rice, I came in a poor last; so obviously last that I found myself still trying to catch up long after Sheik Salim and the rest had finished using the finger bowl. The message was clear. I indicated I had

DISTURBING DISCOVERY

After following sinister tracks for three days across the desert, the discovery of a dead oryx—run to death—and, later, of tire tracks and scuff marks in the sand, indicating a live capture, threw a pall over what had begun as a simple photographic expedition.



Sheik Salim reads the story in the sand: pursuit to exhaustion, and capture.

had enough and accepted the finger bowl. "Half tank," was Fahad's cryptic and deadpan observation.

After dinner I regularly indulged in a rubdown with a well-dampened cloth, which removed most of the day's accumulation of sweat and sand. This nightly catlick always amused Sheik Salim and Fahad and provided more than a little jesting at my expense. This time the humor was heightened when an enormous camel set its sights on the few cups of water I used, actually more soap, dirt, and toothpaste than water. Undeterred by my protests, the covetous animal had temperedly declined to be driven off until it had sucked the bowl dry. *Everything* written about the moods and bloody-mindedness of camels is true.

Next morning Fahad and our hosts incredibly were still locked in animated conversation around the fire. The day, though, was not to be one for levity; we had a sinister feeling that the gap was closing. Notwithstanding, all we found were the same two lots of tracks—the pair of running oryx, now well over fifty miles from where we last saw the tracks, and the same increasingly menacing tracks of two landrovers. The oryx tracks were probably less than five days old; the vehicle tracks were not more than two days old.

Sheik Salim wanted to follow the landrover tracks, but we were running low on fuel. We also had only twelve gallons of water for the whole party—enough, like the petrol, to last another twenty-four hours, but not enough to allow for any margin of error. The practical decision, then, was to return to Heima—the local oil company's refueling and water base deep in

the desert—refuel, and then resume our search early the next morning.

Accordingly, Fahad pointed us to where he said Heima lay, over a hundred miles away, and began to drive in a more or less straight line. About sixty miles later, with the sun very low in the sky, Fahad suddenly diverted hard left and pulled up by the freshest vehicle tracks we had yet seen. After a staccato exchange of dialogue with Sheik Salim, he followed the tracks. Minutes later he pulled up by a dead oryx.

A mature male, the oryx had bled heavily from the head and mouth but was otherwise unmarked and seemed to have been dead for twenty-four to forty-eight hours. A quick check before darkness came showed it to be lying between the tracks of converging vehicles. Sheik Salim considered it had been chased for two days. Apparently, as exhaustion had finally destroyed the last of its strength, it must have been hit by one of the pursuing vehicles—or, in a final despairing jink, smashed into one of them.

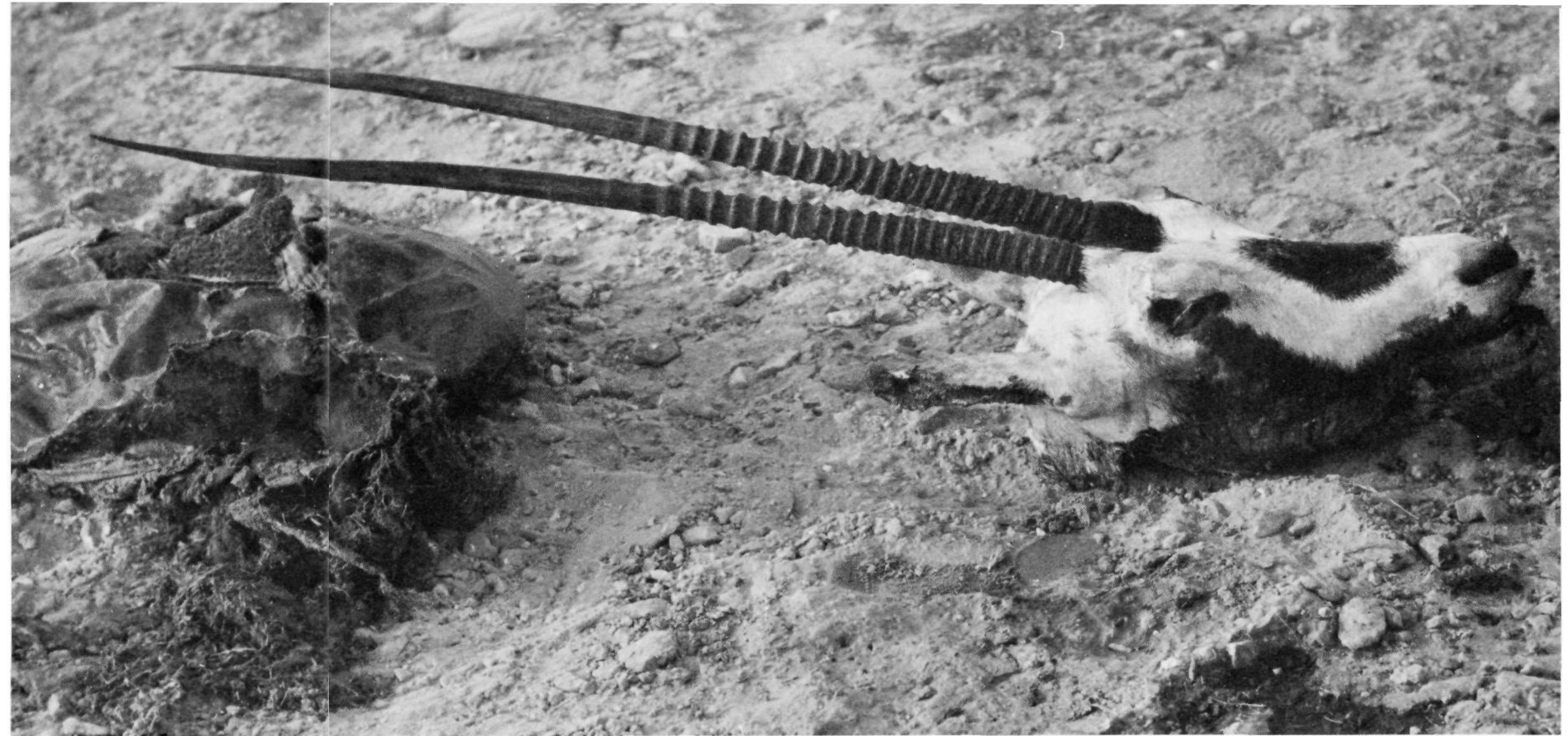
Its pursuers had left it where it had fallen—we saw no human footprints. It was as nauseating and spleen-bursting a sight as I've probably seen: the world's rarest antelope run to exhaustion, killed, and abandoned. Even now I find it difficult to convert my thoughts into words.

Because we could do little except take insurance photographs, we continued our journey into Heima. A little after 8:00 p.m. I radioed a brief report for the Director of Intelligence and arranged to remain at Heima until the following morning to give the



BIN SOLA—FINISH . . .

. . . an epitaph to the tragic end of a rare and beautiful creature. Converging vehicle tracks and the head and stomachs of a female and a calf—slaughtered and eaten—are all that remain of perhaps the last Arabian oryx to have lived in the wild. Now hope for saving the Arabian oryx from extinction rests with Operation Oryx, a captive breeding program.



authorities time to forward instructions. Shortly after nine the next morning we set off back to the dead oryx. Fifty-seven miles later we drove straight onto the dead animal, a sight no less nauseating in the light of day than it had been the previous evening. As I took pictures, Sheik Salim and Fahad backtracked. Some eighty yards from the dead animal they found what they had been half expecting: the marks of thrashing hooves alongside vehicle tracks, where another oryx had been successfully seized. This particular scene was partially obscured by a mass of vehicle tracks, but the story was clear enough: an oryx pursued to exhaustion, grabbed, and hauled sacklike into the vehicle.

The next day destroyed whatever lingering hopes remained for the oryx. Shortly after dawn we followed the vehicle tracks from the dead oryx. Ten minutes' driving time brought us to the remains of two more oryx, specifically to the head, skin, and stomach of a mature animal (possibly more than one) and the stomach of a much smaller beast—a calf. They lay in a welter of tire marks with no sign of capture scuff marks and almost certainly had been eaten. Conceivably the remains could have represented three or even four animals. However, Sheik Salim and Fahad seemed to think that they represented only two animals, and I agreed with them.

Ten minutes farther on we found clear and incontrovertible evidence of the capture of a mature animal: capture scuff marks alongside tire tracks. At two more intervals of ten minutes driving we found equally convincing evidence of the capture of two more mature animals. In effect, during two hours and

over a sixteen-square-mile area we had accounted for at least three captures and three kills. Why and how all the captures and deaths took place in such a relatively small area remains a major puzzle.

"Bin sola—finish," was Fahad's terse summing up.

THE QUESTION REMAINS: Are there any wild oryx left to protect in Oman or anywhere else in Arabia? Sheik Salim and Fahad, after two more days searching the area and questioning other Bedouin, were convinced the answer was "no."

Sultan Qaboos, a very angry sultan indeed when the news of what we had found was brought to him, instructed the Air Force to overfly all areas where a stray pocket of oryx may still survive. To date, although some areas remain to be covered (the war in the south demands the Air Force's attention), no oryx have been spotted.

Therefore, one fears that the only oryx standing between the species and extinction are in captivity. Fifty-four oryx are in captivity in the United States. These, the small Qatar herd, two tiny herds in Abū Dhabi, and a few scattered animals in captivity in the rest of Arabia represent the total breedable Arabian oryx left in the world.

The Qatar herd was badly affected in 1971 by an outbreak of disease. Apparently the herd is being too closely confined and still is not receiving the best veterinary care that it could, a situation that at least in part is due to some misunderstanding between the Fauna Preservation Society of London—with access to the world's most experienced veterinary knowledge—and the government of Qatar. Certainly, as it

stands, the Qatar herd cannot begin to be regarded as a firm base from which the world oryx population can be slowly rebuilt.

This situation leaves America's "world herd" as the only hope for rebuilding the Arabian oryx population. The "world herd" was launched by the Fauna Preservation Society of London in August 1961 as "Operation Oryx" in an attempt to rescue a captive breeding nucleus from motorized machine-gun-armed poachers. The Society's expedition contributed a male and two females; the London Zoo, one female; the Sultan of Kuwait, a female; and the King of Saudi Arabia, two breeding pairs. Located at the Phoenix Zoo, Arizona, because the desert climate and habitat there closely approximate the animal's natural habitat, the original nine animals have increased to thirty-one. In order to disperse the animals and avoid the chance of destruction of the entire breeding stock by disease, six second-generation animals were loaned to the San Diego Zoo and have increased to eight. In addition, the Los Angeles Zoo has fifteen oryx that are in no way connected with Operation Oryx. The increase in the captive oryx breeding population is encouraging but still short of safety should a lethal epidemic strike, and a long way short of being able to reestablish the Arabian oryx in the wild—if and when their safety could be guaranteed.

The Arabian oryx story could scarcely represent a greater wildlife disaster. Yet as long as the captive breeding herds of Operation Oryx are protected and kept viable, there is still a ray of hope that one day the legendary "unicorn" will once again return to its ancestral home to roam the vast Arabian deserts. ■

D. S. Henderson is a Scot whose rural upbringing still influences him in his love of wildlife and wild places. An Oxford graduate, he has worked in many exotic lands, including eleven years in the British Colonial Police in Uganda. Since then he has lived mostly as writer/photographer, except for a recent period of employment with the Sultan of Oman's Defense Department. Now, however, he is resuming his "photographic way of life."

HELP THE ORYX

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (May 1973 Magazine), when ratified by the required number of nations, will help dry up the market for poached animals. Although the United States has ratified, the treaty will probably not be ratified by enough other nations for several years more. For the present, therefore, concerned members can write Mr. Ronald O. Skoug, Chief, International Activities, Office of Endangered Species, Bureau of Sport Fisheries and Wildlife, Department of the Interior, Washington, D.C. 20240, urging him to develop a workable program of education, technical aid, and effective utilization of captive breeding programs so as to ensure survival of endangered species, including the Arabian oryx, outside the United States and to effect successful reintroductions where such are possible.

A curious red saprophyte
enhances the snow-forests
of western mountain ranges

The Snow Plants of California

by BRAD SMITH / photographs by ERIC SMITH

LAST SUMMER my friend Pat, my brother Eric, and I went hiking above Yosemite Valley, where we discovered snow plants. We had never seen them before, and their curious color and shape fascinated us. By the time we left the mountains, we had a lot of photographs and a lot of curiosity. Back in Los Angeles, the UCLA Library satisfied much of our curiosity, largely replacing it with wonder.

If you are in the right place at the right time, you can't miss the snow plants. They are incredibly bright red little shoots that pop up all over the forest floor in the spring, especially where the humus is thick. Their scientific name, *Sarcodes sanguinea*—"bloody flesh"—is grotesquely appropriate.

Snow plants range from the mountains of Southern California to the Cascades in Oregon. They seem to prefer the darkest woods—the same sorts of places the bears like—in the snow-forests: the yellow pine, red fir, and lodgepole pine belts, at altitudes from 4,000 to 8,000 feet. They like to live with the sequoias and firs that grow in these forests, and often you find them growing near snowbanks.

At one time snow plants were believed to be parasites, attaching themselves to and drawing nourishment from roots of trees. But they are not parasites living on live plants: they are saprophytes, living on dead or decaying organic matter. Thus they utilize the energy remaining in the rotting litter of the forest and do not obtain it directly from sunlight as most plants do. Therefore, they don't need chlorophyll to manufacture food from sunlight, which is why they are not green.

The red color of snow plants may be a relic of a time when they did use the little sun that filters down to the forest floor. Some jungle plants that live in deep shade are red. A red surface absorbs green light, which is all that gets through to the bottom of the jungle or a dense forest, and red pigments transfer the energy to chlorophyll. But snow plants don't have chlorophyll now, so the red pigmentation seems to be nonfunctional.

Snow plants don't have leaves, either, in the usual sense. A saprophyte doesn't need leaves. Snow plants have a succulent stem, six to twelve inches long, covered with scaly remnants of leaves and bell-shaped flowers—each one-half to three-quarters of an inch long, with five broad, spreading lobes. Actually, snow plants are mostly root, because they get their living underground. It's what goes on out of sight that is most important to them; what we see is only in response to the underground environment.

Snow plants are related to other saprophytes such as the pale, ghostly Indian pipe of other regions. Indians used to utilize the dried and powdered plants as medication for sores and toothaches; but, used incorrectly, it is reportedly poisonous.

In many ways snow plants fill a niche similar to mushrooms, which also live on decaying matter. However, mushrooms live in damp forests, whereas snow plants live in relatively dry forests, although they are particularly sensitive to moisture. Their food supply is in the upper layers of the soil, and most of the year where snow plants live these layers are either dry or covered with snow. Autumn brings



some rain, but snows and freezing winds follow unpredictably and quickly. In spring when the snows are melting and the weather is warming, snow plants pop up near melting snow banks; the water encourages their growth. The bloom of snow plants follows the snow-melt as it recedes back into the dark forest and up to higher altitudes as spring progresses. Usually they appear at about the time the bears awake from hibernation and the mosquitoes hatch in bogs formed by melt-swollen streams.

Because they are flowering plants—and presumably evolved from plants that turned sunlight, not humus, into food—the snow plants' roots have adapted to a curious relationship. They have no root hairs—the tiny structures that absorb nutrients for most plants. Perhaps root hairs are not efficient enough to absorb all the food a saprophyte needs. Instead, their roots are covered by a sheath of fungus that grows down between the outer cells of the roots—never deeper than the first layer, and never actually *into* the cells. *The fungi absorb nourishment from the soil, and the snow plants absorb their food from the fungi.*

What the fungi get out of the bargain isn't clear. Why don't they just set up shop on their own? Snow plants are succulent; they store a lot of moisture in their tissues. Perhaps the dry microhabitat of the snow plants cannot support fungi alone, so the fungi rely on the snow plants for moisture through much of the year.

The seeds of snow plants ripen in August after the flowers and stalks are faded. Like the seeds of many other saprophytes, the snow plant seeds are very

small (less than a millimeter long), and they contain very little stored food; but there are a lot of them. There would be no point in being supplied with extra food; because if they land in a favorable spot, they can obtain food from the soil as they germinate. They don't have to reach up to the sun to absorb energy. If they land in an unfavorable place—on a rock, say—they will not survive anyway, so stored food to tide them over is pointless. Nature is seldom inefficient.

At the same time that the seeds are ripening in the open air, the roots are growing underground. As fall approaches, the roots form new tiny shoots in preparation for next spring, when they can pop up at the first sign of moisture in the soil. Although they don't actually push up through the snow, they can appear before most other plants—often before the last winter storm arrives and drops more snow around them. It's easy to see how the snow plant acquired its common name.

Next time you're hiking in the western mountains and you encounter a snow plant, examine it closely—then take a wider view. If you observe with knowing senses, you can see more than that little red spike. You can see snow melting, and humus rotting, and sunlight warming earth, and bears, and mosquitoes, and—maybe a little bit of yourself. ■

For several years Brad Smith has been studying the natural history of California's mountains—especially the ecology of the native plants. Backpacking has proved a perfect complement to these studies.

NPCA at work

Public transit for park visitors NPCA President A. W. Smith has asked National Park Service Director Ronald H. Walker to supply the Association with detailed information concerning three areas related to park and regional recreational planning: (1) public transit systems *within* units of the national park system, (2) public transit systems to bring visitors *into* units of the national park system, and (3) long-distance transportation to recreation bases outside the parks.

NPCA has continually advocated provision of public transit within and into the parks in such a manner as to protect the park environment and park visitors from the effects of pollution and congestion. Accordingly President Smith requested descriptions of all existing or projected public transit systems within parks, monuments, recreation areas, and historic units. Such descriptions would include information on concessioners or other parties operating the systems, passenger fare information, and whether each operation is or will be subsidized. Information on transit systems bringing visitors into park system units would include similar details, along with additional facts such as whether each system is or will be operated by a contract or under transportation concession from NPS, and whether in any cases such concessioner operates any of the customary concessions within the park, or recreational resorts outside public lands or park units. President Smith specifically asked for information on whether there is any policy requiring that such resorts be operated outside the park system as a condition for granting a transportation concession. In the case of a public service transportation company providing transportation into a park unit, NPCA wants to know what control the Park Service retains over operations. Where public transit systems are operational, President Smith inquired about regulations on private automobile traffic.

To enable people to enjoy the national park system even though the energy crisis restricts private automobile travel, it will be necessary to pro-

vide long distance bus and rail transportation into the regions in which parks are located. NPCA has recommended that recreational resorts outside the parks serve as take-off places for public transit into the parks themselves. (See editorial in the March 1974 Magazine, and "Pragmatic Alliance: Western Railroads and the National Parks" in the April issue.) President Smith stressed the urgency of the transportation situation, suggesting that the Park Service promptly work out arrangements with interstate bus lines and with Amtrak, the government corporation that manages passenger travel on railroads.

CLARENCE COTTAM

NPCA mourns the loss of Dr. Clarence Cottam, for many years chairman of the Board of Trustees, who died in Corpus Christi, Texas, on March 30, 1974. A biographical sketch and more complete report will be published in the June issue of the Magazine.

Cuyahoga Valley park NPCA supported HR 7167, to provide for the establishment of the Cuyahoga Valley National Historical Park and Recreation Area, in testimony presented on invitation before the House Subcommittee on National Parks and Recreation on March 1, 1974. The Cuyahoga River flows through heavily populated northern Ohio. Sandwiched tightly between Cleveland's industrial complex and the ever-spreading community of Akron, the proposed national recreation area would preserve one of the few unspoiled river valleys in Ohio. (See page 4.) With rising transportation costs, the need for open space and recreation areas near urban centers will increase in the years to come.

NPCA believes that urban-style recreation areas, like the larger wilderness parks, should be based on recognition and preservation of natural values. Furthermore, NPCA stated at the

hearing that the National Park Service should crystallize its management policies for urban-style parks, developing concepts parallel to, but distinct from, its policies for national wilderness parks. If properly managed, an innovative urban-style parks program could educate thousands of citizens on the value of sound park management and preservation, a value that may in fact help to preserve the large national parks.

The sole opponent of the proposal at the hearing was the Bureau of Outdoor Recreation (BOR), which proposed to turn the Cuyahoga over to the State of Ohio, a viable plan but one that would result in less adequate protection for the Cuyahoga River Valley. The BOR statement reflects the inadequate support currently being afforded natural resource protection measures by the current Administration.

Field hearings in Ohio are expected this summer; these will provide Ohio citizens with an opportunity to express their opinions on the proposed legislation. Similar legislation has been introduced in the Senate, but hearings have not yet been scheduled.

Endangered Species symposium NPCA will participate in the first international meeting on the exact status of endangered and threatened species of North American wildlife and their habitats scheduled for June 11-14, 1974, in Washington, D.C. The milestone Symposium on Endangered and Threatened Species of North America is being sponsored by the Wild Canid Survival and Research Center Wolf Sanctuary (WCSRC) in St. Louis, Missouri.

The symposium theme will be "Balancing Human and Animal Needs." Mrs. R. Marlin Perkins, Acting Director of WCSRC, Mrs. Rogers Morton,



Mrs. G. William Whitehurst, and the members of the Center's board aim to bring together scientists, conservationists, government agency representatives, members of Congress, and government officials for a program consisting of scientific papers, panel discussions, workshops, and film presentations. The NPCA staff was asked to make a presentation about endangered and threatened species of wildlife and the NPCA program.

Lectures by other authorities on the particular species in the greatest danger in North America include Dr. Archie Carr of the University of Florida on sea turtles, naturalist and artist Roger Tory Peterson on birds, Dr. Wayne King of the Bronx Zoo on reptiles, and Dr. Michael Fox of Washington University on wild canids.

The symposium will cover issues such as the role of education in wildlife conservation, hunting, legislation, zoos and wildlife parks, international efforts, and land use considerations.

Inquiries about attending the symposium should be addressed to the WCSRC Wolf Sanctuary, P.O. Box 16204, St. Louis, Missouri 63105.

Rocky Mountain National Park

NPCA reacted strongly in favor of both the master plan and the wilderness plan for Rocky Mountain National Park when the National Park Service held hearings on these plans on January 19, 1974. Both plans contain proposals well in accord with long-standing NPCA policies on national parks management. Mr. Raoul Bates, a member from Denver, represented NPCA at both hearings.

NPCA supported several outstanding proposals in the master plan. NPS proposed closing Hidden Valley Ski Area due to erosion and adverse visual impacts on the park. The Park Service also suggested relocating High Country Stables livery service to avoid excessive trail wear and conflicts with hikers. It would be moved to national forest lands outside the park that could absorb such uses. NPS proposed to phase out part of the Fall River Pass Store operations to reduce traffic, congestion, and litter at Fall River Pass.

In relation to proposed boundary changes, NPCA commented that the upper portion of the Kawuneeche Valley and the lower portion of Black Canyon are excellent additions to the

park. (In mid-March the Nature Conservancy announced its acquisition of land in the Kawuneeche, which it will hold for resale to NPS pending Congressional approval.)

The Park Service plans to conduct an extensive transportation study for this park to research ways to reduce automobile traffic. Several park roads could be excluded from automobile access and limited to bus or shuttle transportation. NPCA backed the proposed study and road closings.

The Association also backed several additions to the wilderness proposal and stated its endorsement of maximal wilderness designation but stated that "it should be clear that wilderness proposals for national parks will dictate land-use policy guidelines which closely conform to the concepts of stewardship practiced in all areas ad-



ministered by the National Park Service." NPCA urged the Park Service to pursue acquisition of water rights and private inholdings inside Rocky Mountain National Park.

NPCA thanks Mr. Bates for donating his time and efforts; his statements carried especial strength because of his years of personal experience in and around Rocky Mountain National Park.

Allowable timber harvest NPCA recently reviewed a plan for an analysis of allowable timber harvest alternatives in the national forests by request of U.S. Forest Service Chief John McGuire. Policies, principles, and procedures for calculating the "allowable cut" in those forests are attracting increasing attention. "Allowable cut" is a technical term that refers to the amount of timber available for harvesting during a given period.

The proposed Forest Service study attempts to provide a better understanding of various considerations involving allowable cuts, as well as a rationale for future policies on this important and highly complex matter. One major NPCA recommendation was that computation of the allowable cut should reflect the total timber supply picture of a given forest region and therefore should not be delimited to national forest administrative units. This practice would recognize the importance of the timber resource to local and regional economies as well as to long-term national needs for a sustained yield of timber and wood products. To put the allowable cut study into proper perspective, such issues as the role of technology in achieving greater fiber utilization, the need for forest taxation reform, and the export of logs from the United States also require analysis.

NPCA asked the Forest Service to explain management assumptions used in current calculations of allowable timber harvests, and especially how these assumptions have changed within the last twenty years. Among these assumptions are the basis for choosing the growth rate currently used for commercial timberland classification and the "rotation age" used in the allowable cut formula. The Society of American Foresters defines the forest rotation as "the period of years required to establish and grow timber crops to a specified condition of maturity." The rotation age has been reduced on many national forests since the 1950s, resulting in considerable increases in the allowable cut of public timber.

NPCA noted that a section of the allowable cut plan entitled "Environmental Constraints on Timber Management and Harvesting Practices" actually deals only with economic constraints. It goes without saying that timber harvesting activities that result from allowable cut policies affect water quality, wildlife habitat, compaction, and so forth. These ecological constraints *must* be incorporated into the proposed plan. NPCA has been urging the application of such constraints for many years through its ecological forestry program.

Because management of the national forests in the public interest is of continuing concern to NPCA, we will re-

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view future reports and will continue attempting to have both concepts and specifics of our ecological forestry program accepted by the Forest Service.

Grand Canyon dam proposal The proposal to dam the Colorado River in the Grand Canyon is not dead. In spite of a sound defeat for this ill-conceived plan in the late 1960s, the Arizona Power Authority (APA) has revived its efforts to promote the dam. In its campaign to gain acceptance for the project, the APA has evoked two powerful and popular arguments: the energy crisis and the economic depression of the Hualapai Indians.

The energy crisis speaks for itself as a nationwide headache that can be solved only by altering our national habit of wasteful energy consumption and searching for energy sources that reduce exploitation of nonrenewable resources. As a potential site for hydropower the Grand Canyon should be considered a unique and nonrenewable resource.

The Hualapai Indian Reservation is adjacent to Grand Canyon National Park, and this land includes the best site for a dam. Accordingly, the APA has renamed its project the Hualapai Dam and already has signed a contract promising employment and a rental fee (\$1 million per year) to the tribe. Although there is undoubtedly a need for economic improvements in the life style of the Indians, these improvements surely could be accomplished by alternate innovative means that would not sacrifice natural resources.

The proposed Grand Canyon Enlargement Act (HR 5900 and related bills) is a key factor in this issue, inasmuch as existing legislation governing Grand Canyon National Park places a moratorium on dam construction. With legislation pending, proponents of the dam considered it the right time to lobby for new provisions allowing dam construction. Representative Morris Udall of Arizona carried a successful fight against the dam during a markup session of the House Subcommittee on National Parks and Recreation on March 4, 1974. He defeated amendments that would allow the dam and introduced several other measures to increase the size of the enlarged national park. NPCA was pleased with the efforts of Mr. Udall and the members of the subcommittee, which par-

alleled our position on the Grand Canyon Enlargement Act (NPCA at Work, January 1974).

In related events, NPCA's Arizona correspondent Robert Coshland testified on invitation before the Arizona State House of Representatives in opposition to the dam. The Arizona State Senate previously had supported the dam, and this endorsement had been carried to the U.S. House of Representatives, where the dam proposal was unsuccessful in the face of Mr. Udall's powerful opposition.

Organ Pipe Cactus wilderness NPCA recently backed wilderness designation for 75 percent of Organ Pipe Cactus National Monument in Ajo, Arizona, at a public hearing held on site at the monument. Commending the National Park Service for recommending inclusion of this land in the National Wilderness Preservation System, NPCA Arizona representative Robert Coshland presented the Association's comments before a large audience, most of whom supported the concept of a wilderness area.

NPCA's recommendations included the suggestion that wilderness boundaries would be more easily discernible to visitors if the wilderness were to terminate along the road rights-of-way or at some fixed distance from both sides of roads. To protect a waterhole used by wildlife, NPCA endorsed a



proposal to reroute a section of Puerto Blanco Drive. However, NPCA could not endorse another proposal to build a second road paralleling part of the drive near the Mexican border in order to enhance visitor enjoyment of the area. Instead, NPCA suggested that interpretive exhibits be placed along the existing road in appreciation of the area's vegetation and that 6,000 or more additional acres in this vicinity be in-

Continued on page 29

OUR NATURAL RESOURCE AGENCIES IN TROUBLE

a staff report



NPCA members may recall a staff report in June of 1973 that detailed the cutbacks that the President's Office of Management and Budget (OMB) was imposing on national wildlife refuges. Although this year no wildlife refuges will be closed, NPCA has found that the detrimental effects of OMB actions are spread throughout the government's major natural resource agencies: the Forest Service, the Bureau of Sport Fisheries and Wildlife, and the National Park Service.

Specifically, NPCA has found that drastic cuts have been made in budgets of the public interest portions of these agencies. Budget cuts inevitably result in decreases in funding or inadequate funding for public services such as interpretation, wildlife enhancement and management programs, acquisition of wildlife habitat, protection of endangered species, and needed research activities.

For example, the Forest Service wildlife management program requested from the OMB an increase of \$1,559,000 to meet high-priority wildlife management needs and to bring the wildlife habitat management program into better balance with increased timber harvest. OMB allowed an increase of only \$209,000 in the program budget, thus reducing necessary and priority expenditures by \$1,350,000 and effectively vetoing the Forest Service wildlife habitat program.

Similarly, the new Forest Service Research Program has been essentially

destroyed. Of \$3.1 million added last year by Congress for high-priority Forest Service research, OMB allowed a request of only \$1.6 million in the budget for the coming fiscal year. Not surprisingly, most of the allowed increases were for research supporting timber production and surface mining. Completely eliminated was \$1.5 million for several important programs: critical research on wildlife habitats (\$775,000), watershed research (\$250,000), destructive diseases and forest insects such as the tussock moth (\$360,000), and forest recreation (\$150,000). This last cutback hits a research team in Seattle, Washington, that has contributed substantially to the improved management of national parks in the Pacific Northwest and Alaska.

In developing budgetary needs for fiscal 1975, the National Park Service submitted a base request for \$213.7 million. This figure represents the *low* estimate of Park Service economists who are experienced at predicting what kinds of dollar figures the OMB is most likely to approve, and it contrasts with a strategy of asking for more than the expected final figures to allow for reductions. As a result, the Park Service is forced into stringent budget planning at the outset, before the OMB has a chance to exercise its authority.

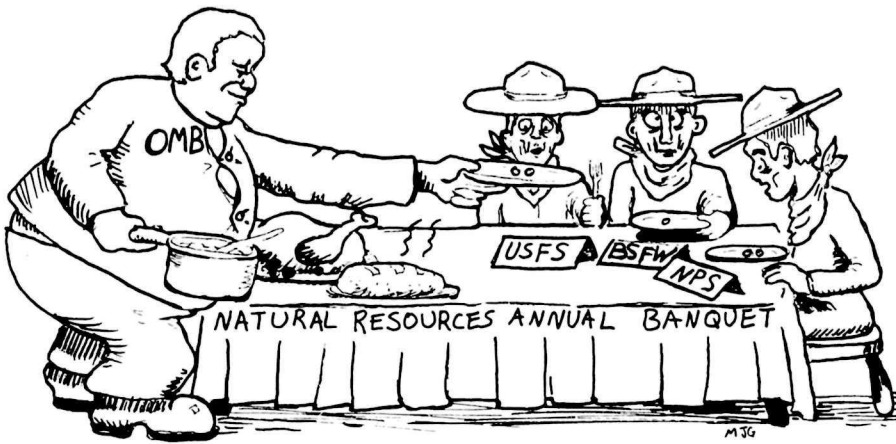
After formulating the initial figure of \$213.7 million, the Park Service waited for further guidance from OMB. When NPS received and applied the "departmental constraints" imposed by OMB, only \$201.4 million remained, a reduction of \$12.3 million, which represented a serious setback in needed programs for 1975.

The National Park System is expanding, and personnel increases *must* reflect the same rate of growth. With the recent addition of two showcase urban recreation areas, Gateway and Golden Gate in New York and San Francisco respectively, the Park Service asked for 260 new positions specifically to launch these programs. OMB responded with authorization for 54 new positions—far below the needed levels—with the recommendation that the Park Service fill in the deficit by drawing staff out of existing national park staff. Thus, it seems new programs to serve the public needs in recreation facilities can be added only at the expense of current programs, and the real losers are the American citizens.

Again, in the initial departmental proposals for fiscal 1975, the Park Service requested an increase of about 300 new administrative and staff positions for national parklands management. However, the OMB refused to allow the requested new positions unless existing positions were left vacant by normal attrition. OMB is again denying the Park Service any of the many needed additional staff positions, with the inevitable result that national park management and interpretive programs will suffer in the coming year.

OMB action concerning the Bureau of Sport Fisheries and Wildlife (BSFW) has been apparently more disastrous than ever. Although the overall BSFW budget for fiscal year 1975 was increased slightly in dollar terms over 1974, pay raises and inflation "ate up" most of the "increases." However, the currently proposed budget, after being cut by OMB, is much worse than the status quo.

Many years ago Congress authorized an accelerated wetland acquisition program to allow purchase of wetlands critical to migratory waterfowl and other aquatic and semiaquatic life. Under this program, the BSFW is allowed to request millions of dollars from Congress each year for wetland acquisition. This year the Bureau wanted to request \$6 million for the acquisition of critical areas; however, OMB refused to allow the Bureau to make any request to Congress for wetland acquisition funds. Thus, at a time when wetlands are being destroyed at an increasingly rapid rate, OMB re-



fused to allow such additional protection of endangered habitats.

Similarly, the Office of Endangered Species of the BSFW wanted to use funds from the Land and Water Conservation Fund to acquire habitat for species in critical danger of extinction. Specifically, the Office of Endangered Species submitted a budget request for \$5.2 million to OMB. OMB released only \$1.3 million, apparently jeopardizing the survival of many species of wildlife in the United States. Furthermore, there is no apparent reason for this refusal to spend money, because the money already is within OMB's control and does not represent requests for additional congressional appropriations.

Although the decisions for the coming fiscal year are irreversible inasmuch as the budget has been submitted to Congress for approval, it is instructive to examine the decisionmaking process within OMB. The OMB controls federal expenditures in at least two powerful ways: (1) it impounds (withholds) funds that have been appropriated by Congress, and (2) it controls the amounts of money requested from Congress in the first place. Consider the second point. By controlling funding requests from agencies, the OMB exerts a major policy influence that is invisible to the public. This is possible because policy decisions are made before the Congress or the public ever learns about the actual budgetary needs of these agencies. We now know, for example, that at least three natural resource agencies originally requested enough money to operate adequate and expanding programs. Instead, before these requests could be analyzed or made public, OMB, through their instructions to the budget offices of the Interior and Agriculture departments,

had indicated what percentage budget increases would be allowed for the coming year, causing budget estimates to be reduced to inadequate levels. Furthermore, before that revised request becomes a part of the Administration budget and is submitted to Congress, OMB takes yet another swing at a budget request that is already likely to be too low to allow the agencies to adequately perform the activities mandated by Congress. This last blow (assuming funds are not impounded following approval by Congress) comes during a hearing before OMB budget examiners. After the hearing, decisions are made, presumably by the budget examiners and others in authority at OMB, regarding the agencies' requested expenditures that are to be allowed. (It is not clear, incidentally, how, or on the basis of what criteria, these decisions are made.)

In any event, once decisions are made, each agency is told individually what its budget requests will be. In recent years the best description of these requests is "inadequate" and "insufficient." (However, it should be made clear that the agencies often have the power to allocate funds among projects.)

The sequence of events, as NPCA understands it, in the approval of an agency's budget for any given fiscal year seems to be as follows: (1) Winter-spring of the preceding year: message from OMB indicating percentage increase in request, if any, to be allowed. (2) Late spring-summer of preceding year: tentative guidelines are developed during contact between OMB and Interior's budget office (or Agriculture's budget office in the case of the Forest Service). (3) September-October of the preceding year: hearings at OMB to decide what requests will

be made. (4) January of the current year: total Administration budget request submitted to Congress for approval. (5) July 1, the new fiscal year: budget takes effect, assuming approval by Congress.

The NPS, the FS, and the BSFW were established to serve the public interest in natural resource management and environmental quality; however, these agencies presently are not allowed adequate money to accomplish this task. Unfortunately—and alarmingly—the problem is bigger than these three agencies alone; it affects the entire departments of Interior and Agriculture, as well as the Environmental Protection Agency. It threatens in a very real way to frustrate the efforts of many government agencies to maintain a liveable, quality environment.

A number of questions remain to be asked in the context of this report. Based on the current astronomical federal budget request—\$304.4 billion—why are the relatively insignificant funds, which can have a dramatic impact on serving the public interest in natural resource management, deleted year after year? Why is the public excluded from these decisions that have such a major influence on social values and environmental quality? How are the decisions made, and by what criteria, that tend to force agencies of government into dereliction of the jobs that are mandated by Congress? The general public apparently cannot even evaluate decisions, because decisions are hidden from view, and internal mechanisms are vague at best.

NPCA has written the OMB requesting answers to these questions. Concerned members who wish to write asking the same or other questions or who wish to urge the OMB to give greater consideration to federal spending for natural resource protection should write:

Frank G. Zarb, Associate Director for Natural Resources, Energy and Science, Office of Management and Budget, Executive Office Building, Washington, D.C. 20503.

(Mr. Zarb's assistants include Eric V. Robinson, Chief of the Agriculture Branch, which handles forestry funds, and Harry C. McKittrick, Chief of the Interior Branch, which handles funds for parks and wildlife.)

Continued from page 26

cluded in the wilderness area. NPCA urged the Park Service to insist on its position concerning grazing elimination.

NPCA responded to references in the Park Service draft environmental statement concerning the establishment of so-called "wilderness threshold areas" at which primitive campgrounds would serve as gateways into wilderness backcountry. Mr. Coshland asked that a brief entitled "Park Wilderness Protection and Recreational Planning," which was prepared by NPCA President A. W. Smith, be incorporated into the hearing record. Among the measures proposed in the document for relieving pressure on the carrying capacity of natural areas is the concept of establishing ancillary services outside park boundaries. Mr. Coshland pointed out that there have been several instances, notably at Yosemite National Park, in which the Park Service has found such remedies to be useful. It is far less painful to undertake such measures before visitation pressure makes them unavoidable than to undergo the destruction and inevitable buildup of overuse in the absence of those measures. In consideration of the possible environmental degradation from the proposed campgrounds at Organ Pipe, and because the sites mentioned are all within brief travel time from either the monument boundary or an established campground, NPCA recommended that any additional campgrounds be located outside the monument boundaries.

Challenge to NEPA Certain officials of the Nixon administration are reportedly advancing a proposal to modify the National Environmental Policy Act (NEPA) by eliminating the requirement for environmental impact statements on energy projects. This landmark environmental law, which was passed in 1969, requires federal agencies to submit statements on the environmental impacts of all major

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projects before initiating the projects. It has provided environmental groups with legal means to halt a project on the grounds that its environmental effects have not been weighed at all or have been inadequately assessed. NEPA is opposed by some administrators who want to develop energy projects at full speed.

Because they require federal permits

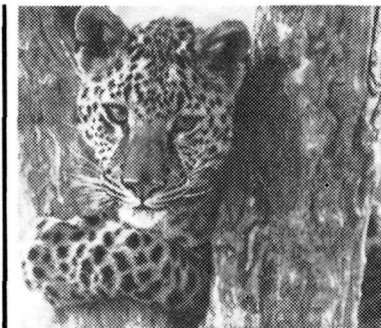
or other federal involvement, energy projects such as strip mining on government land in the West, atomic power plants, and refineries are covered under NEPA.

NPCA President A. W. Smith recently contacted President Nixon to urge him to set a strong course leading to both the protection of the environment and the solution of the energy

TIGER HAVEN

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crisis. Mr. Smith emphasized that this nation is perfectly capable of solving its energy problems without risking grave impairment of our environment. NPCA's president also commended Russell E. Train, Administrator of the Environmental Protection Agency, and Russell W. Peterson, Chairman of the Council on Environmental Quality, for their support of NEPA, assuring them that there will be strong citizen support for a firm position at the top levels of government favoring protection of NEPA.

California desert conservation NPCA supported enactment of legislation establishing a 16-million-acre California Desert National Conservation Area in testimony presented on invitation before the U.S. Senate Committee on Interior and Insular Affairs. NPCA supported S 63 during subcommittee hearings in late February.

The California desert, located in southern California east of San Diego and Los Angeles, is mostly public land administered by the Bureau of Land Management (BLM). Presently the BLM is unable to enforce any kind of

-----BULLETIN-----

On March 29 the Interior Department announced it will review the grizzly bear's status to determine if it should be listed as endangered or threatened in the coterminous states. NPCA has urged that the species be listed for some time. (See previous issues.) Interested members should comment to E. Baysinger, Acting Chief, BSWF, Interior Department, Washington, D.C. 20240.

regulations concerning the recreational use of the desert. Most significantly, the agency lacks both funds and manpower needed to properly regulate off-road vehicle use in the desert. Off-road vehicles (ORVs) pose the greatest threat to fragile desert ecosystems and endangered life forms. (See "ORVs in California Desert" on page 32 of last month's Magazine.) Establishment of a California Desert National Conservation Area by congressional action would preclude the necessity of waiting for adequate BLM administrative

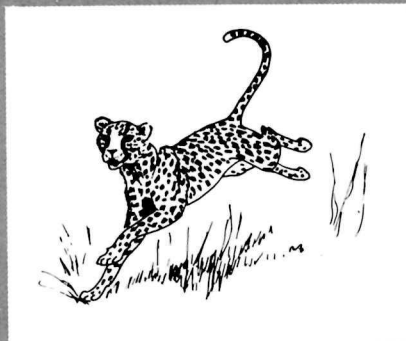
and policy developments. NPCA stated emphatically that the desert environment is being degraded rapidly enough to justify an immediate bypass of the BLM bureaucratic process.

NPCA proposed strengthening amendments to S 63. The Association suggested adding a policy mandate to ensure a specific conservation policy in the future. NPCA also called for more effective law enforcement provisions in the bill, stating that "It is not sufficient for members of the enforcement force to act as traffic officers for off-road vehicles." NPCA urged the committee to write strong legislation that will effectively restrict such vehicles to specific areas.

The main opposition to S 63 came from the BLM, which claimed such legislation is unnecessary because the agency is developing a long-range desert management plan. (This plan may take several years to complete.) In addition, the agency is awaiting congressional action on its own Organic Act, which would establish its powers to enforce BLM land management policies including ORV regulations.

The California desert cannot wait

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for BLM action. Nor can the endangered plants and wildlife in the dry habitats withstand the impact of motorcycle races and dune buggies.

Not for a million dollars Ms. Anne Bacon Tulis told developers she would not sell Sandy Neck—the last large expanse of virtually untouched Cape Cod, Massachusetts, coastline still privately owned—for a million dollars. The developers promptly offered Ms. Tulis just that amount for her 143 acres on Sandy Neck. NPCA recently commended Ms. Tulis for refusing that offer to sell her land for massive commercial development and for her efforts to preserve Sandy Neck in its present state.

Sandy Neck is a six-and-one-half-mile peninsula, created by the tides, which supports beach grass, holly, bayberry, and even linden trees. Its dunes form a natural barrier to protect several thousand acres of marshland of vital ecological importance. (See "Salt Marshes: Ecosystems in Danger" in the March 1974 Magazine.) Ms. Tulis is the only heir to the Bacon Trust, which owns the tip of Sandy Neck and more than a mile of shoreline and beaches on both sides of the peninsula. Her title to the land dates back to the colonial 1600s when her ancestor Nathaniel Bacon received an original grant. The Town of Barnstable has acquired approximately five miles of the dunes and 1,000 acres of marshland. Ms. Tulis would like to sell her land to the town at half the price offered by the developers, because town officials have fought to preserve Sandy Neck. Town ordinances prevent devastation of the beaches by recreational vehicles, and there is a growing concern for regulating boat operations around Sandy Neck. (See "Boats can destroy fragile marsh," page 29, March 1974 Magazine.) Many town officials and townspeople support Ms. Tulis' bargain offer, but an opposition group composed of some businessmen and persons who claim the land is "wasteland" so far has prevented purchase.

NPCA hopes that money and incentive will be forthcoming on the part of responsible local and state officials so that this area, which is so reminiscent of all of Cape Cod before exploitation, can be preserved. The Association is gratified by Ms. Tulis' acceptance of complimentary membership in NPCA.



news notes

Shuttle buses for Grand Canyon Visitors to the South Rim of Grand Canyon National Park have been able to leave the driving to the National Park Service since April 1. Park Service Director Ronald H. Walker announced that the free propane-powered shuttle bus system carries visitors on two loops, one along the scenic West Rim Drive and the other through the Grand Canyon Village area. The low-polluting minibuses are operated for the Park Service by Fred Harvey, Inc., park concessioner, on a contract basis.

"We feel this new system will greatly improve the quality of the visitors' park experience as well as creating substantial fuel savings," Walker said in March. "West Rim Drive will be closed to private cars, resulting in less congestion, pollution, and driver frustration." Hikers and bicyclists are encouraged to use the 8.2 mile West Rim Drive; the other loop serves various visitor facilities. Shuttle buses will operate from April 1 to September 15.

Other National Park Service areas using mass transit systems include Yosemite, Mt. McKinley, Everglades, and Mesa Verde National Parks; Point Reyes National Seashore; National Capital Parks; and Dinosaur National Monument.

Expo '74 and the environment

The attention of environmentalists throughout the world will be focused on the Expo '74 World's Fair in Spokane, Washington, from May 4 to November 3, 1974, as it hosts one of the most ambitious series of international symposia on environmental issues ever attempted.

The U.S. Environmental Protection

Agency, through a grant to the University of Washington, is cosponsoring an International Symposia Series with American Metals Climax Corporation that will bring together leading experts from a number of countries to discuss mutual environmental problems. The three symposia are "Dilemma Facing Humanity" (May 20–21), "World Successes/Case Histories" (July 17–18), and "Agenda for Tomorrow" (October 29–30). During the first symposium, Robert Allen, an editor of the British magazine *Ecologist* and co-author of *Blueprint for Survival*, will participate in a presentation on "Limits to Growth." Dr. Anthony Weiner of the Hudson Institute, futurist Robert Theobald, and many other authorities have also been scheduled for the series.

The United Nations will celebrate World Environment Day on June 5 in Spokane, and will issue a formal Environmental Viewpoint Statement assessing the current level of international cooperation on the environment. A U.N. Earthwatch Center, part of the organization's worldwide system of remote sensors monitoring land, air, and water conditions, will be established on the Expo site.

During National Day celebrations at Expo '74, various nations will issue formal statements of commitment to cooperation on environmental issues. Canada, Russia, Japan, the United States, Australia, and Taiwan have already agreed to make National Day statements, and other nations participating in the fair are expected to follow suit.

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grams, citizens, public officials, and specialists will interact in covering topics such as energy, population, agriculture, health, human settlements, resource recovery, and resource development. A Learning Resources Center will coordinate programs aimed at environmental assessment of local problems in the Northwest United States.

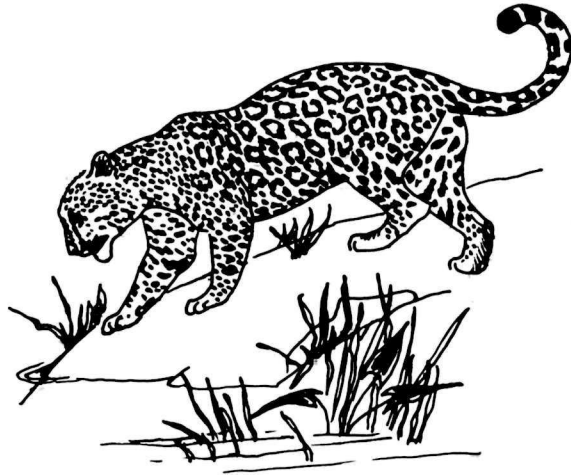
The U.S. National Aeronautics and Space Administration will sponsor an Earth Resources Technology Satellite exhibit that will show environmental changes in the U.S. mapped by the satellite over a five-year period.

Organizers of the International Symposia and related conferences and activities planned during Expo '74 are hoping to bring together some of the foremost experts on environmental issues in the world today—possibly including people such as Nobel Prize-winning economist Wassily Leontief of Harvard, Britain's Lady Barbara Ward Jackson, France's Rene Dubos, and anthropologist Margaret Mead.

Members of the advisory committee include many authorities such as Professor Eugene Odum of the University of Georgia, Dr. Beatrice Willard of the President's Council on Environmental Quality, and Lawrence Slobodkin of the State University of New York at Stonybrook.

Hunting ban in Tanzania Big game hunting will be permanently banned in Tanzania, and professional hunters will never be allowed to operate in the country again, the Tanzanian government announced recently. All hunting associations must close, including many private associations as well as the Tanzania Wildlife Safaris, Ltd., a subsidiary of the National Development Corporation whose profits were utilized by the government for wildlife conservation. A government spokesman in Dar es Salaam explained that peasants will be allowed to hunt certain animals for meat under a plan to be revealed soon.

According to Martin A. Kivumbi, Second Secretary of the Embassy of Tanzania in Washington, D.C., the new ban will include all forms of hunting and will be enforced primarily by closing the hunting associations and preventing operations of big game hunters coming from Europe and the United States. However, poaching will be more difficult to control. Mr. Ki-



vumbi emphasizes that Tanzania, through the new ban, is "tightening the screws" of a long-standing, strong wildlife conservation policy. He says that this policy will result in the loss of millions of dollars of much-needed revenue but that Tanzania is ready to forego the revenue to achieve its goal of wildlife preservation. Continuous hunting by professional hunters would have posed a threat to various species of wildlife including rhinoceros, leopard, and elephant. Mr. Kivumbi does not believe that demographic pressures in the foreseeable future will impinge on Tanzanian wildlife preservation. He anticipates increased productivity due to an increase in the average education of the farmer. Large land areas that are currently not in use have economic development potential that could be realized with technical stimulation of the economy. In addition Tanzania is trying to combat the sleeping sickness that has debilitated many areas. (For another viewpoint on Tanzania's problems, see "Impending Crisis for Tanzanian Wildlife," August 1973.)

Tanzania supports a vast concentration of wildlife. The country has seven national parks, and another three are being established; these areas extend over some 14,000 of Tanzania's 365,000 square miles. Wildlife is fully protected, and human habitation is forbidden. More than one million animals make their home in the Serengeti National Park alone, where wildebeest and zebra participate in spectacular migrations. The nation also has 35,000 square miles of "game reserves" and forty "controlled areas" where hunting was formerly allowed under certain conditions; it is the home of the Ngorongoro Conservation Unit.

Oil shale development The Department of the Interior is selling leases on six tracts of federal land in three western states, opening these lands for large-scale shale development. In January Interior accepted a \$210.3 million bid from Standard Oil of Indiana and Gulf Oil for the first tract, which consists of 5,000 acres in western Colorado. A month later a consortium headed by Atlantic Richfield Company won twenty-year rights to mine oil shale on a second tract of similar size and location for \$117.8 million. The other tracts that will be leased are located in Utah and Wyoming. Phillips and Sun Oil are front runners in bidding for the third tract in eastern Utah as of press time.

The Interior Department program was designed to promote private industrial development and testing of a variety of techniques for "unlocking" billions of gallons of potential petroleum from shale reserves. Oil shale is marlstone containing a brown organic matter called kerogen that can be refined into many petroleum products. The most common method of mining currently is open pit strip mining; a synthetic crude oil is then extracted by heating the marlstone in retorts, a process that expands the rock to twice its original size.

The Interior Department, which controls 80 percent of shale lands, reports that it is providing an opportunity for development "on a commercial basis with environmentally acceptable practices." Each lessee has three years to test mining methods and submit a mining plan. The Interior Department then is responsible for weighing the environmental damage of plans along with energy considera-

tions. The first Colorado tract was designated for strip mining; the second tract was designated for conventional underground mining. The other tracts are designated for underground mines or some form of *in situ* processing. Options for the latter include heating shale conventionally underground, bringing only shale oil to the surface; and an underground *in situ* method of using nuclear explosives to cook oil from the shale. Shale oil processing facilities will be built on each tract.

Meanwhile, several oil companies, attracted by rising crude oil prices, are reportedly considering beginning commercial production on privately owned lands before the Interior federal shale land leasing program gets underway. Most of these companies would probably base their plans on the conventional, most commercially advantageous method of heating in retorts. In an environmental impact statement that was based on the use of such conventional methods, the Interior Department described "adverse and unavoidable" environmental problems involving air and water quality, wildlife habitat and loss of vegetation, gouged mountains, and huge areas of biologically sterile, spent shale. The Federal Energy Office and the Atomic Energy Commission are also reportedly studying commercial development of shale lands.

LBJ Memorial Grove A living memorial will honor the late President Lyndon B. Johnson. The memorial will include a simple stand of 500 indigenous white pines, walking and biking trails, bursts of dogwood and azalea, and golden daffodils. It will be located on the west side of the Potomac River in Washington, D.C., on fifteen acres designated for this purpose in Lady Bird Johnson Park. This stretch of the public park affords a panoramic view of the nation's capital. Serving as a focal point in the grove will be a large rough-hewn rock with selected quotations from President Johnson.

No public funds will be used to plant the LBJ Grove; however, \$2 million is needed to establish the memorial and to provide for its maintenance. Persons who wish to contribute should make donations to the Society for a More Beautiful National Capital, Inc.—LBJ Grove, Box 5557, Washington, D.C. 20016.



conservation docket

Land Use: Following the attempted death blow to the land use bill, HR 10294, by the House Rules Committee (see April issue), the bill's principal supporters in the Interior Committee announced that they would try to revive the bill. Reps. Morris K. Udall (Ariz.), Philip E. Ruppe (Mich.), and John Dellenback (Oreg.) said that they would make this effort to revive the legislation when more public support had been gathered. Although the bill has never lacked broad-based public support, the members of the House Rules Committee argued that they had not received a single indication of support from their constituents. During the many months of discussion concerning national land policy in the House, the version of the bill approved by the full Interior Committee has gained the support of many diverse groups including the environmental community, the American Institute of Architects, various public interest groups, the homebuilders and realtors, and a new coalition of members of the Governor's Conference, the National Association of Counties, the League of Cities/Conference of Mayors, and the National Legislative Conference. Furthermore, the Administration presumably had supported the Interior Committee version until the day before the Rules Committee vote, when the bill's opponents managed to get Administration support withdrawn. Leaders among the opposition to the Interior Committee version of the land use bill included the U.S. Chamber of Commerce, the American Mining Congress, the Forest Industries Association, and the conservative Liberty Lobby.

In attempting to dispel the rumors and clarify the misconceptions surrounding the committee's land use bill, its principal proponent, Rep. Morris K. Udall, issued this fact sheet:

"Myth No. 1: This bill will give the federal and state governments authority to confiscate private property without compensation.

"Fact: HR 10294 does not and cannot alter the rights of property owners under the U.S. or state constitutions. The bill in fact reiterates the Constitutional protection against a 'taking' of property without compensation and does *not* alter property rights.

"Myth No. 2: This bill will lead to federal planning and control over state and private land.

"Fact: This bill does not include any authority for federal planning of state or private land nor does it provide for any federal review of substantive state or local decisions concerning land use. The bill anticipates that states will differ in their approaches to land use planning and only requires that the states develop an adequate planning process and consider certain criteria in their decision making.

"Myth No. 3: This is a 'no-growth' bill conceived by ecologists to halt development.

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"Fact: Just the reverse, this bill will facilitate orderly, planned growth, cutting out multiple levels of bureaucratic red tape and hopefully providing 'one-stop service' for developers. Lack of coordination and planning is what has led to moratoriums on growth and vexatious litigation in many areas.

"Myth No. 4: This legislation is another 'NEPA' which will lead to more federally imposed requirements on states to protect the environment thus adding to the energy crisis.

"Fact: This bill adds nothing to NEPA requirements nor does it give the EPA or other federal agencies additional authority over state and local decision making. More importantly, effective land use planning will enable the states to deal with such problems as indirect pollution sources that are now being regulated by EPA edict. We cannot ignore our planning problems without expecting an increase in the federal presence, perhaps after the fact, in the form of EPA or other agency regulations. We can and should avoid this 'single-focus' federal involvement and replace it with a wholesome mix of public involvement and participation in planning by all interests at the local and state levels.

"This legislation recognizes the need for growth and for the development of our resources—it will facilitate planning and developing such things as new energy sitings and reclamation projects. The goal is to put the right thing in the right place."

Indiana Dunes: Rep. J. Edward Roush (Ind.) has introduced a bill, HR 12970, with 21 additional cosponsors, which proposes expansion of the boundaries of the Indiana Dunes National Lakeshore. This new bill is the same as HR 3571, which Rep. Roush introduced last year, but with the addition of cosponsors. A similar bill has been introduced in the Senate by Senators Birch Bayh and Vance Hartke. Although hearings have not been scheduled, conservationists are preparing to support the expansion effort. The bills propose an additional 5,328 acres of buffer zones, marshlands, dunes, and oak groves, which would double the national lakeshore's present size. These particular areas are increasingly threatened by subdividers and industrial interests.

In the meantime, hearings have been

held on HR 3570, a bill to provide an additional \$7.6 million for acquisition of land within the existing lakeshore. The original amount allotted when the lakeshore was established in 1966 was insufficient due to rising land prices

and relocation assistance payments passed by Congress in 1970. The Senate has already approved the \$7.6 million increase. (See "Rounding out the Indiana Dunes" in the November 1973 Magazine.)



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Continued from page 2

vide an adequate margin for protection against miscalculation and catastrophe.

The United States' proposals also embody the principles of maximum utilization and equitable allocation. The coastal state may harvest what it can; thereafter it must allow access by others in this order: (1) states with traditional fishing rights; (2) other states in the region, particularly landlocked and limited-access states; and (3) all others without discrimination.

WITH RESPECT to enforcement, coastal states may inspect and arrest, and may try and punish unless the state of nationality has established procedures for trial and punishment. The international organization may also inspect and arrest, but must deliver to the flag state for trial and punishment. States party to the organization must provide for trial and punishment by law. Nothing is said of states not party to the organization, although by the proposed articles, they are to be covered by the regulations.

There would also be machinery for the compulsory settlement of disputes between states by special commissions whose decisions would be binding. The compulsory settlement of disputes in all questions dealt with in the conference should be one of the first objectives in the negotiations, and other sacrifices may be acceptable if this principle can be achieved.

NO PROCEDURES are proposed for situations where a coastal state or an international organization fails to protect the fisheries for which it is responsible, however important these may be for world food supplies and oceanic ecosystems. If the recent disastrous decline in catch of Peruvian anchovies is the result not only of a shift in the Peruvian current, but also of overfishing, it affords an ominous warning. Would the United States, which imports much of the product of these fisheries, have used the proposed settlement machinery to compel the sustained yield management of these resources? We doubt it.

Needed are methods to raise questions of a failure to exercise adequate regulatory authority by a coastal state or international fishery organization before the permanent Tribunal which it is hoped will be established by the conference. The plaintiff might be the UN Environment Programme or the new Authority; or where an international fishery organization is the defendant, a nongovernmental organization accredited to UNEP or the Authority. And a rule-making

commission could be set up in the Authority with power to act where coastal states or international fishing organizations did not do so. It may be that the general articles proposed by the United States on dispute settlement confer a power of removal from the dispute commissions to the Tribunal, but if so the problem of initiative remains.

We have learned in the United States that litigation in the public interest is often necessary to compel governmental agencies to discharge their statutory responsibilities. So much the more so, we can assume, with respect to the necessarily cumbersome international institutions which must be created in so many fields in the next few decades.

THERE HAS BEEN a demand from coastal states for the extension of sovereignty out to 200 miles. The U.S. Delegation to the Conference is rightly opposed to such an extension, supporting economic zones of considerable extent within which exploitation must be guided by international principles. The NPCA has testified on invitation against the unilateral extension of sovereignty by the United States in respect to fisheries, recommending that solutions be worked out in the conference and that meantime the Convention on Fisheries of 1958 be implemented.

The coastal nations will have difficulty in policing the fisheries entrusted to them by reason of the vast expanses of ocean involved and the expense of the forces. A Sea Service is needed, financed internationally, available at the request of the coastal nations.

THE UNITED STATES has taken a farsighted position in preparations for the conference in favor of strong international institutions for the protection of the oceans. It has retreated on several important fronts, in a climate of clamorous nationalism elsewhere, and contraction at home, from the draft convention it submitted in 1970. We are well aware of the function of trade-offs and a display of strength in diplomacy, but the coming worldwide battle against famine and the importance of maintaining the oceanic fisheries as permanent food supplies and the oceanic ecosystems for the support of life everywhere are issues which concern all governments. Appeals to the interest of the world community may conceivably turn out to be a more effective tool in diplomatic success than even the most skillfully negotiated appeals to self-interest.

—Anthony Wayne Smith



National Parks and Conservation Association has worked for the protection and enlargement of the national parks system for over 53 years. In addition, NPCA has been vitally involved in other serious environmental problems such as endangered species, good water planning, good forestry practices. In these days of renewed attacks on the environmental movement coupled with ever rising costs,

we need the continued support of NPCA members and their friends.

Your early renewal can help immeasurably. And, if you would send the names of friends who believe in our aims, this too would help. With your help we can build and maintain a more effective Association serving your needs and the needs of our environment.

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