NATIONAL PARKS *Magazine*

Margerie Glacier in upper Glacier Bay, Glacier Bay National Monument, Alaska

June 1965

The Editorial Page

The People's Money and the National Welfare

THREE MAJOR ELEMENTS of national policy in land and water management should have better co-ordination to serve the general welfare.

The first is the protection of national interest in the national parks, forests, wildlife refuges, recreation areas, and land reserves; in river basin and watershed management; and in natural beauty and the entire natural outdoor environment.

The second is provision for wholesome outdoor recreation, both gregarious and regenerative, in ways compatible with the first element.

The third is provision for an adequate national highway system of a kind completely compatible with both the first and second elements.

To be specific, Mr. Hugo Fisher, Administrator of the California Resources Agency, recently presented a California State Recreation Plan to the Bureau of Outdoor Recreation. We asked him in public whether California would guarantee to protect Yosemite and Sequoia National Parks, the State Redwoods Parks, and the last refuge of the California condor, against impairment by roads. He replied that the question was "plain arrogance, utter nonsense, and utter foolishness."

A few moments later the Administrator qualified his answers, saying that if such requirements were applicable to all States they would be acceptable. We think the Administrator's fast recovery was a life-saver; guarantees of this kind, in our judgment, are peremptory for all agreements between the Bureau of Outdoor Recreation and the States in dispensing the ponderous financial assistance of the Land and Water Conservation Fund.

Moreover, we need a better system than we have to ensure that the stupendous financial aid by the Government to the States in the form of 50% to 90% grants for road construction shall be conditioned on similar guarantees.

It offends against common sense and decency that the California State Redwoods Parks, created by the contributions of millions of people all over America, should be endangered in any way whatsoever by state or Federal road construction programs. It is intolerable that this danger should be abetted by any possible contribution of Federal highway funds. This comment applies to the widening and straightening of Route 101 through the redwood groves; California has a duty to protect the monumental groves bordering the present park-type roads; it should not receive Federal highway funds or recreation funds unless it agrees to do so. The principle applies, of course, to all the States.

The California State Recreation Plan appears to lean heavily on scenic parkway construction; it should not be approved, either for highway or recreation grants, unless it conforms to the national interest with respect to the protection of land, water, scenic and recreational resources of national significance. Again, the principle applies to all the States.

President Johnson has encouraged preparation of plans for a Redwood National Park; the National Park Service has offered a preliminary proposal. The people of California, and of all America, are definitely interested in the enlargement of park-type public holdings in the coast redwoods zone. Any approved plans for recreation grants to California should be compatible with the impending Federal project; the principle applies generally.

California state highway plans appear to anticipate a wide, high-speed highway through the Levining-Tioga-Oak Flat regions of Yosemite National Park, and another into the Big Tree groves of Sequoia National Park. These plans are inimical to the national interest, and Federal highway and recreation funds should not be available to California until they have been renounced; the principle is general.

A widespread public concern has been growing, throughout California, America, and indeed the world, for preservation of the California condor against extinction. Protective efforts will prove delicate at best, and could be wrecked by construction of a road into the condor's last sanctuary. Such construction, again, would be an intolerable affront to sound national public policy; it should not be abetted by weakness in the dispersal of highway and recreation funds by the Federal government.

Not to belabor California, there is a comparable situation in North Carolina. The Director of the National Park Service has stated that he intends to proceed with the construction of the objectionable road through Great Smoky Mountains National Park, north of the Fontana reservoir. Such construction is said to be required by an old agreement between the Government, the State and Swain County; the road was to replace a highway which lay in the trough of the Fontana reservoir. The agreement contains a reservation that failure by Congress to make appropriations for the road shall not constitute a breach of the agreement by the Government; it is open to attack in other ways also. Recent construction of a small portion of the road has had disastrous effects, and proves the project incompatible with park protection. Further construction should be deferred pending agreement between the Government and the State on comprehensive recreation and highway programs whereby the State and the County would abandon the Fontana road project. Any moral obligation the Government may have had to build this road lapsed long ago with the construction of a fast road by the southern route around the reservoir.

It is a sad commentary on the vast confusion and disorganization of modern times that objections of this kind should have to be pressed insistently; a rational governmental policy, supported by strong public opinion, should have incorporated the necessary integrative principles into its basic fiscal operations long ago. We commend the thought to the attention of the Bureau of the Budget, but above all to the Bureau of Outdoor Recreation, which is starting its operations with a clean slate; the BOR has a chance to lay down some basic principles of good government in its operating policies, and we hope it will do so.

—A.W.S.

You Can Help!

Many people feel that state recreation plans that are approved as eligible for Federal aid ought to contain guarantees against invasion of local or national reserves by roadbuilders. Readers wishing to express their views in the matter may write Dr. Edward C. Crafts, Director of the Bureau of Outdoor Recreation, or Mr. Charles L. Schultze, Director of the Bureau of the Budget, Washington, D.C., 20240.

NATIONAL PARKS *Magazine*

OFFICIAL PUBLICATION OF THE NATIONAL PARKS ASSOCIATION

VOLUME 39 JUNE 1965 NUMBER 213

Front cover illustration by Ansel Adams

Glacier Bay National Monument, on the southeast coast of Alaska, is one of the uncut and unpolished gemstones of the American park system, a scenic and scientific preserve of the first magnitude, and one which annually attracts a modest number of persons interested, for the most part, in its essential flavors—wild, cold, majestic scenery and the living sciences of glaciology and botany. Of this primeval preserve William Cooper, early advocate of the monument, once wrote: "In the course of the next century the aspect of the country will undergo an amazing change. Future visitors to the monument will have available . . . a demonstration of nature, not as a static thing, never changing, but as something constantly and in orderly fashion undergoing development."

The Association and the Magazine

The National Parks Association is a completely independent, private, non-profit, public-service organization, educational and scientific in character, with over 28,000 members throughout the United States and abroad. It was established in 1919 by Stephen T. Mather, the first Director of the National Park Service. It publishes the monthly *National Parks Magazine*, received by all members.

The responsibilities of the Association relate primarily to the protection of the great national parks and monuments of America, in which it endeavors to cooperate with the Service, while functioning also as a constructive critic; and secondarily to the protection and restoration of the natural environment generally.

Dues are $6.50 annual, $10.50 supporting, $20 sustaining, $35 contributing, $200 life with no further dues, and $1000 patron with no further dues. Contributions and bequests are also needed. Dues in excess of $6.50 and contributions are deductible for Federal taxable income, and gifts and bequests are deductible for Federal gift and estate tax purposes. As an organization receiving such gifts, the Association is precluded by law and regulations from advocating or opposing legislation to any substantial extent; insofar as our authors may touch on legislation, they write as individuals.

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NATIONAL PARKS ASSOCIATION, 1300 NEW HAMPSHIRE AVENUE, N. W., WASHINGTON, D. C. 20036

The Saguaro Problem

and Grazing in Southwestern National Monuments

By W. A. Niering and R. H. Whittaker

In certain of our arid southwestern national monuments, the vegetation has been, or is being, degraded by a subtle but highly destructive influence—grazing by cattle. In some situations the native vegetation, with its rich spectrum of desert species, is being replaced by deteriorated communities dominated by "weed" species of grazing disturbance—prickly pear and cholla cacti, snakeweed and burroweed. Visitors to the monuments are mostly not aware of what is happening, for they may see only small parts of the great, remote monuments, and may not recognize the symptoms of grazing deterioration which they see.

What is happening is one instance of a more general ecological observation—vegetation of arid climates is vulnerable to damage and destruction by grazing. This vegetation exists in a difficult adaptation to an exacting environment; its species can survive the hazards of low and irregular rainfall, but many of them cannot survive the additional hazard of grazing. Grazing may act in various ways to shift the balances of their populations so that these populations decline to low levels, or disappear in some environments. Effects of grazing are mostly gradual, often almost imperceptible from year to year. But grazing, even by numbers of cattle that seem to represent only "light" grazing, may produce slow but sure degeneration of vegetation of arid climates.

The manner in which this occurs may be illustrated in a case study of one important species in one monument—the state of the saguaro (*Cereus giganteus*) population in the Rincon Mountains part of Saguaro National Monument. The monument was established in 1933 to preserve these picturesque giant cacti and the plants and animals of the Sonoran Desert associated with them. The location chosen for the monument included a superb saguaro forest—probably then the finest anywhere—on the upper bajada or valley plain at the foot of the Rincon east of Tucson, Arizona, together with extensive saguaro desert and other vegetation on the slopes of the Rincon Mountains themselves. The bajada stand had been grazed for some time when the monument was established, and was subject to continued, rather heavy grazing from that time until 1958. In 1958 a fence was built to exclude cattle from the bajada stand, which includes the "loop drive" area that most visitors to the monument see. Grazing on the rest of the Rincon Mountains part of the monument has continued. In 1961 another desert area including bajada and slopes of the Tucson Mountains, west from Tucson, also became part of the monument.

Fate of the Saguaros

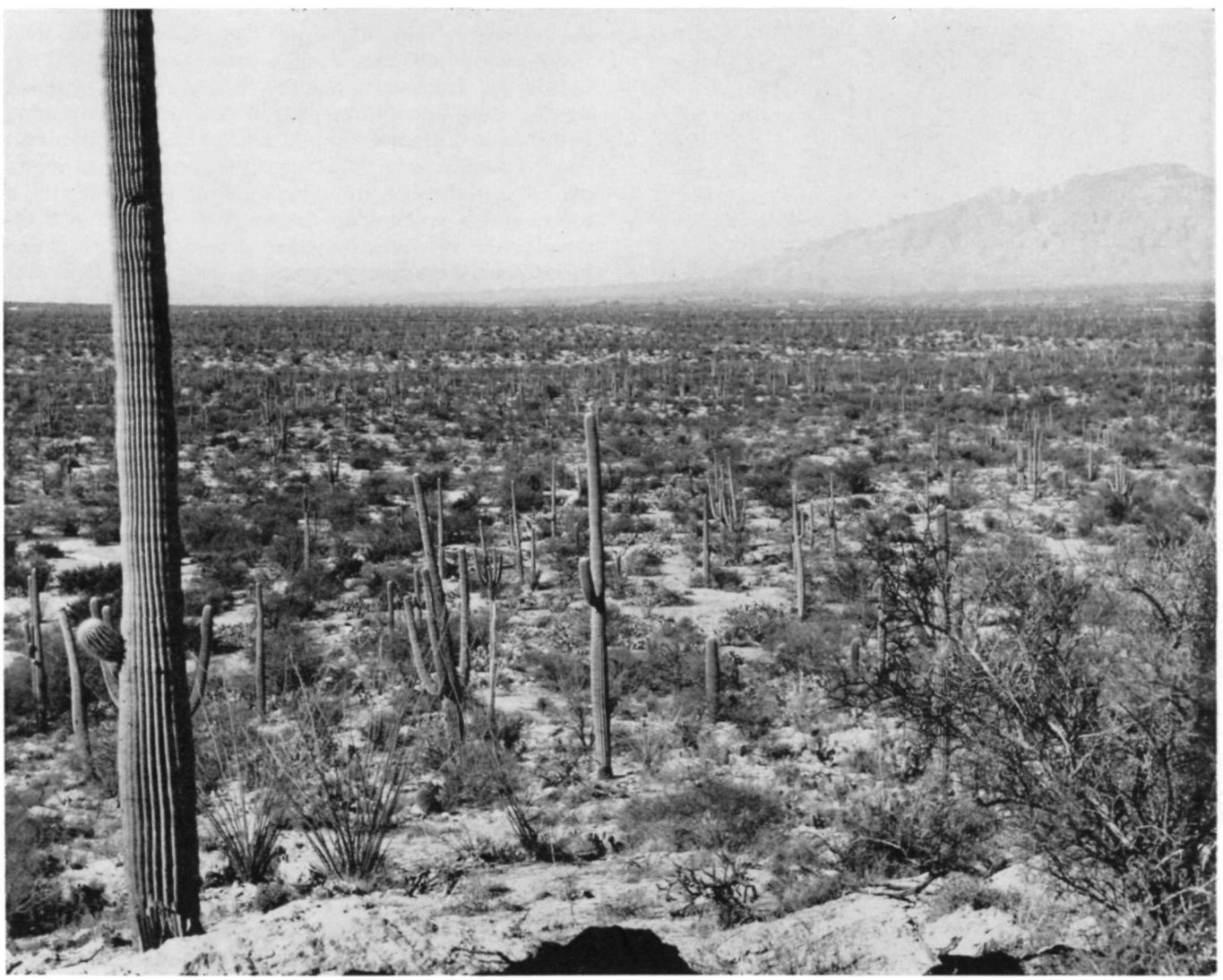
In the loop drive area of Saguaro National Monument the large saguaros that die are not being naturally replaced by reproduction and growth of young saguaros. The saguaro population there is in decline, and it is estimated that by the year 2000 the decline will lead almost to zero—there will be very few saguaro left in this part of the monument.[1] One may well ask—why should this be happening in a national monument established to protect the saguaro? The reason may be complex, for factors affecting the saguaro population may include, at least, grazing, consumption by rodents, predator control, bacterial disease, kills by freezing, protective cover by other plants, characteristics of different soils, and erosion. A number of investigators have been studying aspects of these problems, and the Federal government has supported saguaro research for ten years or more. During 1962-63 we sought, as part of a research project on southwestern mountain and desert vegetation supported by the National Science Foundation, to evaluate the role of the factors which contribute to decline of the saguaro population.[2] It is our conclusion, first, that the essence of the saguaro problem lies in the manner

in which a number of the factors mentioned above relate to one another and the key factor, grazing, and second, that the decline of the saguaro is a striking example, almost a classic example, of man's role in disrupting a balanced desert community through grazing.

Saguaro occurs primarily in the Sonoran Desert of Arizona (and Sonora in old Mexico) on the gentle valley slopes or bajadas, and on lower rocky slopes of mountains up to around 4000 feet.[3] The larger cacti reach 50 feet in height and 2 feet in diameter. The flowers open in May and June and are fertilized, at least in part, by bats.[4] One cactus may produce as many as 200 fruits of 2000 seeds each[4, 5] but many hazards may prevent the seeds and seedlings from developing. Rodents may eat them, their roots may be washed out, or the plants may be killed by freezing temperatures. Those that survive are usually in sheltered spots under "nurse plants" such as paloverde or other shrubs, or on the rocky slopes between rock crevices and in the mats of the moss-like *Selaginella*. It is not uncommon to see a paloverde "nurse plant" that has several larger saguaros which have grown up through its branches to varying heights above it, and additional small saguaros sheltered beneath it. The saguaro grows slowly in its early years, so that a plant ten years old may be only 2 inches high. The larger older saguaro are probably 150-200 years old.[5] In undisturbed stands the mortality for mature individuals is estimated at 0.7% per year.[6] Death may result from washing out of roots, windthrows, freezing, and bacterial infection.

Under normal conditions the population is balanced. The number of plants lost from the population by the various factors that kill saguaros is equaled by the number of plants added to the population by reproduction. When this balance exists, the population is essentially stable, although

A degraded saguaro stand on upper bajada and lower slopes of the Rincon Mountains section of Saguaro National Monument. Paloverde and ocotillo form the conspicuous shrubby cover. Notice the abundance of prickly pear, its increase favored by grazing which continued until 1958. Wood rats are abundant here and saguaro is not reproducing. Santa Catalina Mountains are in the background. Photograph taken in 1963.



not perfectly constant. Although the fraction of young saguaros surviving their early period of slow growth is small, this small fraction is sufficient to maintain a stable population in normal, undisturbed desert communities containing saguaro.

Above: a saguaro community protected for 25 years on the south slope of the Santa Catalinas. Notice excellent ground cover. Here saguaro reproduction is good. Photograph taken in 1963.

Below: a saguaro community currently being grazed on the south slopes of the Rincon Mountains (Saguaro National Monument). Notice lack of ground cover and the presence of cholla cacti favored by grazing. Here saguaro reproduction is poor. Photograph taken in 1963.

Grazing Effects

The saguaro's population balance was tipped by the introduction of large numbers of cattle into Arizona, beginning in the 1870's and 1880's. Grazing may affect saguaro populations directly by trampling and consumption of young saguaros by cattle. More significant in the long run, however, are the indirect effects, involving other plants and animals of the community. Grazing reduces the amount of ground cover of grasses and small shrubs in desert communities; among the shrubs whose coverages are reduced are some of the nurse plants important to the early growth of saguaro. As the coverages of grasses and many of the shrub species normal to the desert community decrease, the amounts of prickly pear and of other shrubs which are unpalatable to cattle and which seem not to serve as nurse plants for saguaro increase. Paralleling the increased amount of prickly pear is increased population density of wood rats, which feed in part on prickly pear (and saguaro and other cacti). Grazing thus changes the character of the community in a number of different, interrelated ways which may affect saguaro populations.

It is well documented that the decline in saguaro reproduction coincides with the introduction of cattle grazing in this region. Around 1900 Dr. Forrest Shreve, an eminent desert ecologist, noted that saguaro was failing to reproduce on certain sites, including those on Tumamoc Hill, a research area overlooking Tucson.[7] Since grazing was destroying the vegetation on these slopes, they were fenced in 1907 and have been protected to the present. It is most revealing that today young saguaros are common on these slopes. They range from less than 6 inches to 3 feet in height, which means they have become established since 1907 when protection was initiated.

For further evidence one can compare the Santa Catalina slopes in the Coronado National Forest which have been protected from grazing for about twenty-five years with comparable slopes currently being heavily grazed on the Rincon slopes of the Saguaro National Monument. Reproduction of young plants is excellent on the Catalina slopes, but poor on the nearby Rincon slopes.

Role of Rodents

The most direct effect on the saguaro population, however, is that of consumption by rodents. Their devastating effects on young saguaro have been well documented on the bajada of Saguaro National Monument. In one test, all but 14 of 800 young saguaro planted in the desert were dead in six months; after two years these 14 and all but 30 of 800 plants in cages were dead. All but about 100 of the 1570 dead saguaro were killed by rodents. The wire cages merely delayed death until the rodents had tunneled under the wire.[8]

The primary culprits were ground squirrels and wood rats, which currently infest the decadent loop drive saguaro community. But why the striking difference in reproduction

on the slopes and bajadas? Could there be a difference in the number and kinds of rodents on these two sites? By trapping rodents on protected slopes where saguaro is reproducing and on the bajada in Saguaro National Monument where it is failing we found an answer, summarized in a table of relative abundances of rodent species, as indicated in catches in traps, in the two environments.[2] On the bajada, ground squirrels and wood rats predominate, and these eat young saguaro, whereas those species which are most abundant on the rocky slopes, the cactus mouse and pocket mouse, do so less frequently or not at all.

In addition, jack rabbits are also abundant in the deteriorated stands of the bajada and adversely affect the plant community by browsing young paloverde and other saguaro "nurse plants," a situation especially pronounced in the loop drive area of the monument.

The practice of "predator control," primarily extensive killing of coyotes, may intensify the problem. By killing the coyotes, which normally contribute to the control of rodent populations, man further unbalances communities; for rodent populations may then increase to very high levels. Coyote control programs do not seem to have affected the saguaro population adversely in the ungrazed areas we have observed, but they may well have contributed to the development of inordinately high rodent populations in the loop drive area of Saguaro National Monument. In the Tucson Mountains section of the monument, more recently acquired and probably now the finest saguaro stand in the world, the lack of young saguaro less than 6 inches tall on the bajada is believed to be a consequence of grazing prior to 1938 and a program of coyote control in the 1930's. The high rodent population which has developed and been favored by the sandy soils has kept saguaro reproduction at low levels from the 1930's to the present.

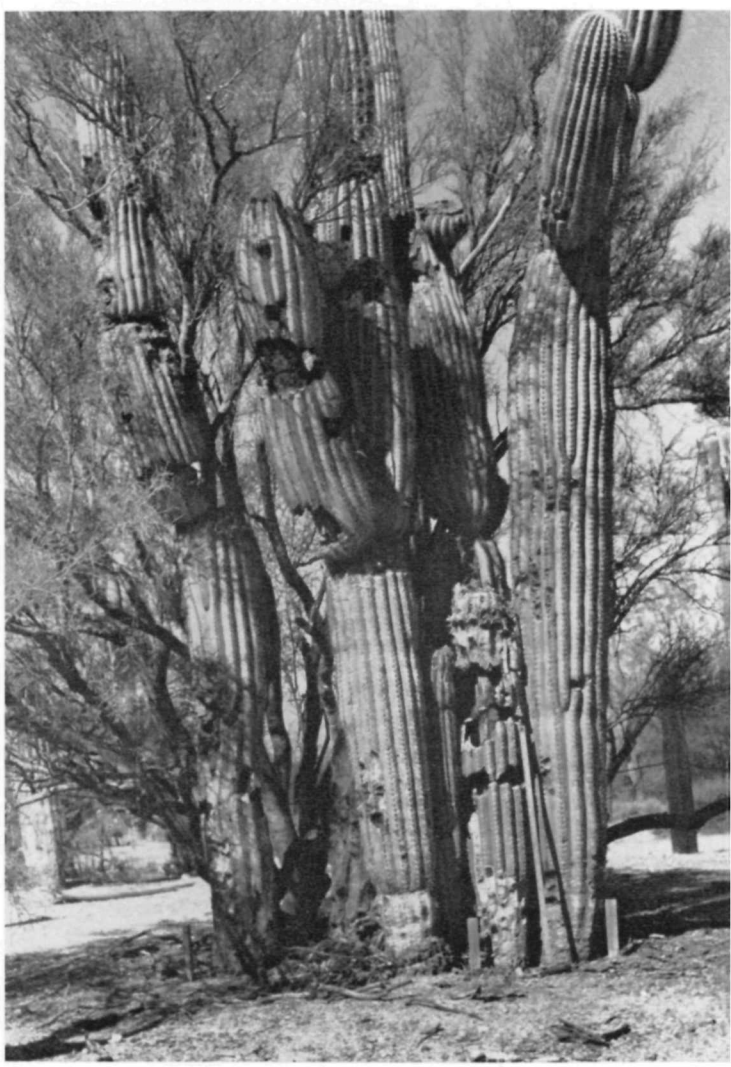
It will thus be seen that, though grazing is the key factor, the reason saguaro has declined in some areas might better be described as grazing-plus-rodents. A causal system is involved in which: (a) grazing reduces the cover of nurse plants while (b) increasing the amount of prickly pear and other indicators of disturbance, permitting (c) increased density of rodent populations which (d) feed with increased intensity on young saguaros left more exposed by the lack of nurse plants.

Soil Texture

To this must be added, however, effects of different kinds of soils. It is on sandy or other soils suitable for extensive burrowing by rodents that the build-up of rodent populations following grazing is greatest. No conspicuous effect of this sort occurs on rocky mountain slopes and on the kind of bajada that supports paloverde-bursage desert. It is for this reason that one can observe some areas (primarily, those with rockier soils) that have been moderately grazed and still contain young saguaros, whereas in other areas (primarily, those with sandy soils) grazing has resulted in the virtual absence of young saguaros. The degree to which saguaro reproduction fails thus depends on *both* the grazing-plus-rodents cause, and the extent to which the kind of soil is favorable to the build-up of rodent populations. The pathetic state of the loop drive saguaro forest results from the combination of long-continued grazing and a soil favorable to the increase of rodent populations.

On the rocky slopes of the Rincon Mountains above the loop drive there are still young saguaros, though not nearly so many per unit area as on comparable, ungrazed slopes of the Santa Catalina Mountains. On these slopes of the Rincon Mountains grazing has much reduced the cover of nurse plants and other undergrowth, and resulted in soil erosion, in contrast to the higher undergrowth cover and relative freedom from soil erosion of ungrazed slopes of the Santa Catalina Mountains. Soil erosion implies washing out by the roots of some saguaros; both erosion and reduction of nurse plant cover may contribute to reduction of the saguaro population on the slopes of the Rincon Mountains. Since there are some young saguaros there, the saguaro population may be expected to survive. But the fact that there are few young saguaros there now means that some decades from now there will be few large sa-

Group of saguaro which became established under paloverde nurse tree, showing severe rodent damage. Wood rat den occurs within the clump and an internal spiral rodent runway may be seen in second stem from right. Upper half of large saguaro on right has toppled since photograph was taken in 1963. These specimens occur on upper bajada of Rincon Mountains section of Saguaro Monument.



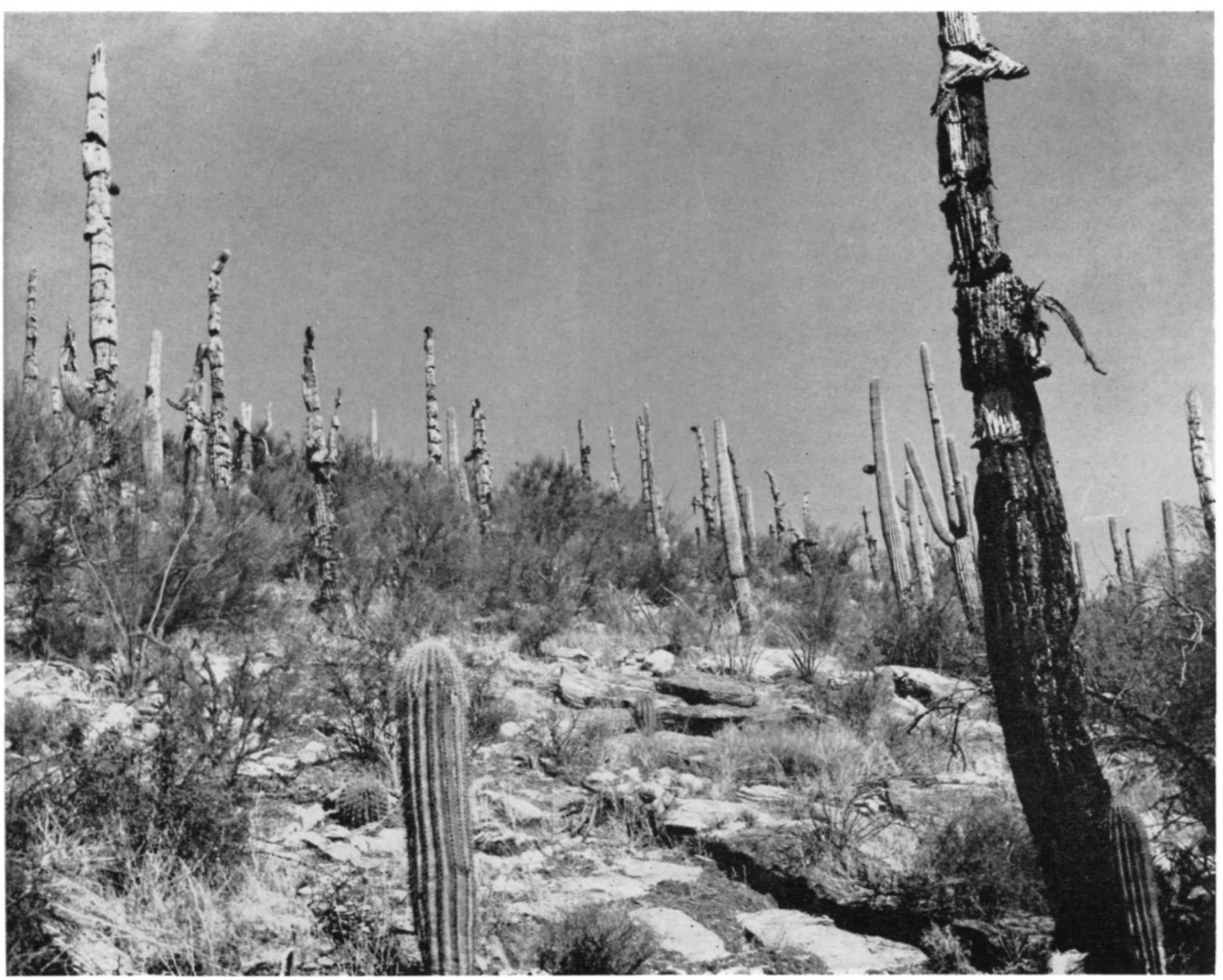
guaros there. In general it seems that grazing tends to reduce the reproduction and density (numbers of individuals per unit of area) of saguaro in rocky slopes; but on sandy soils favorable for rodent populations, grazing results in the reduction of the saguaro population toward extinction.

Low temperatures also have detrimental effects on saguaro. When winter freezing temperatures persist for more than twenty-four hours, some saguaros are killed, as was observed by Dr. Charles Lowe and his students in January 1962 on certain slopes in the Catalinas [2]. During the first night some of the smaller saguaros were killed and the second night many of the larger plants were frozen. Although the population of large saguaros was much reduced, it is pertinent to note that up to 70% of the small saguaros less than 6 inches in height survived under the protection of shrubs and club-moss (*Selaginella*) cover. Such freezes, although catastrophic, are a normal part of the community dynamics and all evidence points to a return of saguaro to its original condition. Actually the loss of young saguaros due to freezing on such slopes or on the bajada results in part from the loss of protective ground cover as a result of grazing.

Bacterial Disease

Some saguaros are afflicted by bacterial necrosis, a massive decomposition of tissue which leads to their death. Bacterial necrosis primarily affects older saguaros, not younger ones, so far as we have been able to observe in the field. It appears also that bacterial necrosis often follows freezing or other damage to the saguaro. It is probable that necrosis is less a disease that kills saguaros, than a manner in which many weakened saguaros die. In stands in which grazing has caused deterioration, bacterial necrosis is more common, and the rate at which saguaros are dying is greater than in undisturbed stands. Rate of death of older saguaros, with accompanying bacterial necrosis, is particularly high in the loop drive stand. There is no evidence known to us, however, that bacterial necrosis

Saguaro hit by January, 1962, freeze on south slope of Santa Catalina Mountains (3400 feet), showing damage caused by freeze and by bacterial necrosis that followed. In this stand young saguaro 1 to 6 inches high are numerous to replace this catastrophic loss of large plants. Paloverde and ocotillo comprise conspicuous shrubby vegetation. Notice excellent ground cover as a result of 25 years of protection from grazing. Photograph taken in 1963.



The authors are ecologists from Connecticut and Brooklyn Colleges respectively; they have recently completed a three-year study on southwestern mountain vegetation under National Science Foundation support.

is responsible for the deterioration of that stand: the high frequency of bacterial necrosis in that stand is one symptom of its degeneration. Neither freezing nor bacterial necrosis seems to cause the decline of saguaro populations, though they may contribute to the rate of that decline by killing larger saguaros.

Climate

Climatic change has been a favorite hypothesis as a possible cause for saguaro failure, but available data do not indicate continued droughtiness since the late 1800's which would adversely affect the population. In fact, saguaro has been reproducing successfully almost continuously on the Catalina slopes, except possibly for a slight decrease during the earlier grazing hey-day which affected these slopes prior to their protection. It is worthy of note that early photographs indicate saguaro reproduction on steep inaccessible slopes during this early grazing period. Recent drought (since 1942) has caused death of oaks in oak woodlands of southwestern mountains, but our data do not show reduction of saguaro populations in ungrazed stands as a result of drought. In fact the best saguaro reproduction, with largest numbers of young individuals, may be found on some of the driest, hottest, south-facing lower slopes of mountains. Drought hardiness of saguaro can be observed also in such arid situations as MacDougal Crater in the Pinacate Mountains, where paloverde and the very drought resistant creosote bush have died in the recent drought, while saguaro has survived. Since saguaro is reproducing well in some of the driest environments it occupies, drought does not provide a plausible reason for the reduction in saguaro reproduction that has occurred during the period of extensive grazing.

Conclusion

Ecological problems, involving relations of organisms to environment and one another, are characteristically complex. The reader may judge for himself the number of factors bearing on the essential balance of reproduction and mortality in the saguaro population—we have not discussed all, only those thought most important. Complex problems often have a primary meaning, though this is not to be mistaken for a sole meaning. Grazing is the primary factor responsible for the decline of saguaro populations toward extinction in some of the environments they occupy, even though effects of grazing may be mainly indirect through such other factors as nurse plant cover, rodent populations, erosion, and increased mortality with bacterial necrosis. Grazing so tilts the balance for this population as to imply decline toward extinction in some environments, such as those with sandy soils, or decline toward a reduced but surviving population in other environments, such as those on rocky soils.

The fate of the saguaro population in part of Saguaro National Monument is but one dramatic example of the consequences of grazing in the Southwest. Other plants than saguaro are affected—our data on the loop drive stand show decline in paloverde and other desert species that parallels the decline in the saguaro population. Other areas are similarly affected. We have observed comparable, extensive grazing damage in Organ Pipe National Monument, and the damage in the Guadalupe Mountains of Texas, an area recently acquired by the Park Service, is reported by F. R. Gehlbach in the March, 1963, issue of this publication [9]. Grazing effects are complex, the responses of different species to grazing differ, and the rates of damage differ widely between different environments, as illustrated by the contrast of loop drive and rocky slope stands in the Rincon Mountains. But damage is to be expected when arid southwestern vegetation is subjected to grazing.

Our southwestern monuments were created to preserve some of the most fascinating desert vegetation, and some of the most splendid desert landscapes, in the world. It is unfortunately the case that grazing has much damaged these monuments and can, if it acts through additional decades, destroy their value as preserves of desert vegetation. Grazing is an important industry in the Southwest, and grazing use of national forest lands there, particularly the less vulnerable woodlands and grasslands, is an accepted practice we would not challenge. Some of the southwestern monuments probably could not have been established had grazing been excluded from them at the time. Nevertheless, grazing is now a threat to the meaning and value of these monuments. Many of the Park Service personnel with whom we have talked are as fully aware of the problem as one could ask, and the Park Service has, where it could, sought to protect the monuments by reduction of grazing. Change in existing grazing allotments is difficult, however, and in some cases no active effort toward ending grazing in the monuments is planned. It is consequently our feeling that there is need for increased awareness of the problem and support for the Park Service in dealing with it. It does seem that this great nation should be able to find means, which will be fair to the holders of grazing allotments in the monuments, to protect these desert monuments which have with foresight and wisdom been set aside for future Americans to enjoy. ■

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The Case For The Golden Eagle

THE GOLDEN EAGLE, MAJESTIC IN flight and bold in character, once soared a vast expanse of the mountain country of North America. Today most of our golden eagle population is concentrated in the western part of the United States and Canada. Small populations of the animal still persist in Maine and northern New York, and possibly in Tennessee and Georgia; but over the years shooting and habitat destruction in these Eastern regions have all but exterminated *Aquila chrysaëtos*, the golden eagle.

This large, bronze-feathered bird of prey mates for life; where good habitat is available a pair of nesting eagles will claim and defend a territory of from 25 to 100 square miles. Where there is crowding due to lack of suitable habitat, a pair will settle for a territory of perhaps 15 to 20 square miles. Golden eagles are long-lived, and until man's interference the lack of natural predators enabled the big birds to keep their population stable by successfully rearing only one eaglet every two or three years. However, systematic killing programs and destruction of habitat have taken a heavy toll, and experts now estimate the remaining number of breeding pairs at approximately four thousand, and the total population of golden eagles in North America at no more than eight or ten thousand. Although the species has definitely declined in recent years, and although many scientists fear the golden eagle may be on its way toward eventual extinction, the recent first revision of *Rare and Endangered Fish and Wildlife of the United States*, compiled by a special committee for the U. S. Bureau of Sport Fisheries and Wildlife, fails to list the eagle as either rare or endangered. At the same time, however, several other species of birds with breeding populations of approximately the same numbers are listed as "rare."

National Audubon Society photograph, C. G. Hampson

Historically, the golden eagle has always been an object of admiration, especially among certain tribes of American Indians. It has also been the object of intense scientific observation; when it was found in 1961 that the golden eagle population was steadily declining, Congress extended the same protection to this bird as is enjoyed by the bald eagle, America's national symbol, which has been protected by law since 1940. In this way, Congress intended to protect the golden eagle not only for its esthetic values, and because of its "value to agriculture in the control of rodents," but to provide additional protection for the bald eagle. The two species, so alike in size and characteristics, are almost impossible to distinguish at a distance, especially when the bald eagle is in its immature plumage; as a result, shooters often bring down the bald eagle when their targets are the golden. Some further protection was granted the golden eagle in 1962 when Congress enacted Public Law 884; but the law contained a provision requiring the Secretary of the Interior, upon request of a governor, to allow sheepmen or their agents to take golden eagles without a permit to prevent supposed predation on livestock. This year eight counties in Wyoming were opened to the killing of golden eagles; the killing period was extended six weeks in 32 Texas counties; and Montana opened 52 counties to eagle depredation programs. Other States in which eagles are regularly hunted are Utah, New Mexico, and Colorado.

In 1963, Secretary of the Interior Stewart L. Udall issued an order forbidding the poisoning of golden eagles or the shooting of the birds from airplanes. That order has, to some extent, cut down on the killings; but the birds are still shot from the ground or trapped and killed, and some authori-

ties believe that illegal use of aircraft and poison persists.

Conservationists contend that stockmen are, with little justification, destroying a valuable bird that is an integral part of the American scene. This contention is documented in a recent National Audubon Society study by Dr. Walter R. Spofford, who conducted field studies on eagles and their predation in sheep-raising districts of Texas and New Mexico. Dr. Spofford's findings have been published as *Audubon Conservation Report Number One*, and indicate that the killing of golden eagles to protect livestock is not scientifically justified; also that "the whole eagle population is endangered by a wholesale destruction which pays no heed to the fact that the golden eagle is a species with a relatively small population and an exceedingly low reproduction rate."

Protection Is Inadequate

Despite such scientific concern, "shoot-offs" of golden eagles in some southwestern States continues; before aerial shooting was prohibited by Secretarial order, more than a thousand eagles were killed yearly by sheepmen who claimed that the birds were responsible for killing lambs. Such shooting programs are conducted primarily at lambing time, which can vary from State to State in accordance with planning of herd reproduction by individual ranchers. Although there is only the barest circumstantial evidence to indicate that golden eagles kill lambs, ranchers claim that during lambing period the birds cause heavy mortality. Eagles seen on or near sheep ranches at lambing time are immediately pursued; the eagles are also killed in surrounding areas around ranches as a precautionary measure. During the past February a Point Reyes, California, sheep rancher shot two eagles—one golden and one bald—claiming that he saw the eagles cooperating in a kill by taking turns carrying a lamb aloft and then dropping it in an apparent attempt to cripple and then consume it. Scientists are aware, however, that full-grown eagles, which weigh about ten pounds, cannot carry a weight heavier than themselves; Dr. Spofford also pointed out that in early morning, when most eagles are on the hunt, the heavy-bodied birds have trouble finding enough wind and thermal lift to get off the ground, and consequently ". . . the eagle can carry very little, and even under the best of conditions usually not over six or eight pounds." In some species of sheep a healthy young lamb usually weighs about 12 pounds; in other species a lamb will weigh eight to ten pounds when it first leaves its mother's side and thus exposes itself to predation. Reports of the Point Reyes shooting led a Federal game management agent in Sacramento to request that the rancher be prosecuted by a United States attorney. Investigation disclosed that the killed eagles had merely been feeding on a lamb which had died earlier.

Knowledge of the feeding habits of the golden eagle is important in any scientific attempt to determine whether or not sheep ranchers are justified in killing golden eagles to protect livestock. Some eagles may prey upon lambs, but ornithologists have long known that for the most part golden eagles feed on small wild mammals and on reptiles, rodents, and occasionally insects. While eagles are often sighted feeding upon lambs, there is little evidence to support the argument that the lambs were actually killed by the eagles. Dr. Spofford found that lambs being eaten by eagles were dead when the eagles found them; it is generally established that in cold weather eagles feed heavily upon carrion. Dr. Spofford's observations were recently further substantiated by a study done at a western university, in which it was found that golden eagles in Montana consumed mainly reptiles and small wild mammals and that, although sheep were raised in the area where the study was conducted, "there was no evidence of any predation on sheep or other domestic stock in the study area itself."

According to Dr. Spofford, ranchers in the Edwards Plateau of Texas generally agree that although sheep ranching has been a major occupation there for more than a century, problems of eagle predation have arisen only where land has been stripped of juniper and oak as a "range improvement" measure. This practice not only exposes domestic stock and game animals to the attention of all predators, but removes essential habitat where eagles can find natural prey. Perhaps poor management on the part of sheep ranchers, coupled with a naturally heavy mortality among lambs, has caused ranchers to blame losses on eagle predation.

One damaging misconception about eagles which seems widespread among sheep ranchers is that Big Bend National Park in Texas is a reservoir for golden eagles and other predators that range beyond park boundaries to prey upon stockmen's sheep and goats. This belief persists despite the fact that Big Bend Park is not large enough to accommodate even a minute fraction of the region's winter eagle population.

Steeped in traditional misconception and devoid of scientific evidence to show that the golden eagle constitutes a significant threat to their stock, sheepmen are nevertheless taking a heavy toll of this great native bird. If sheepmen could produce valid evidence of heavy eagle predation upon domestic livestock, they might be justified in keeping the eagle population at a reasonable level through a humane, scientific, and carefully planned eagle-depredation program. Until such evidence is produced, however, the killing of golden eagles should be held in abeyance pending a further acquaintance on the part of ranchers with the ecological realities of the situation—perhaps with professional guidance through a Federal or State educational program. "I found a general lack of understanding about all predators and most other wildlife in the regions I visited," noted Dr. Spofford in his eagle study. If such lack of understanding is allowed to persist unchecked, it is possible—perhaps even likely—that the golden eagle, a native treasure, will eventually be lost to Americans. ■

Your Views Are Needed!

Governors of States in which there are golden eagle control programs base their requests for authorization of control programs on complaints by sheepmen. Governors should also be hearing the scientific and esthetic sides of the question. Association members wishing to express their views may do so by writing to the Governors of the States involved. Names and addresses of Governors are found in the Congressional Directory, or in your local newspaper or library information services.

Glacier Bay National Monument

By Eugene B. Flanegan, with photographs by Ansel Adams

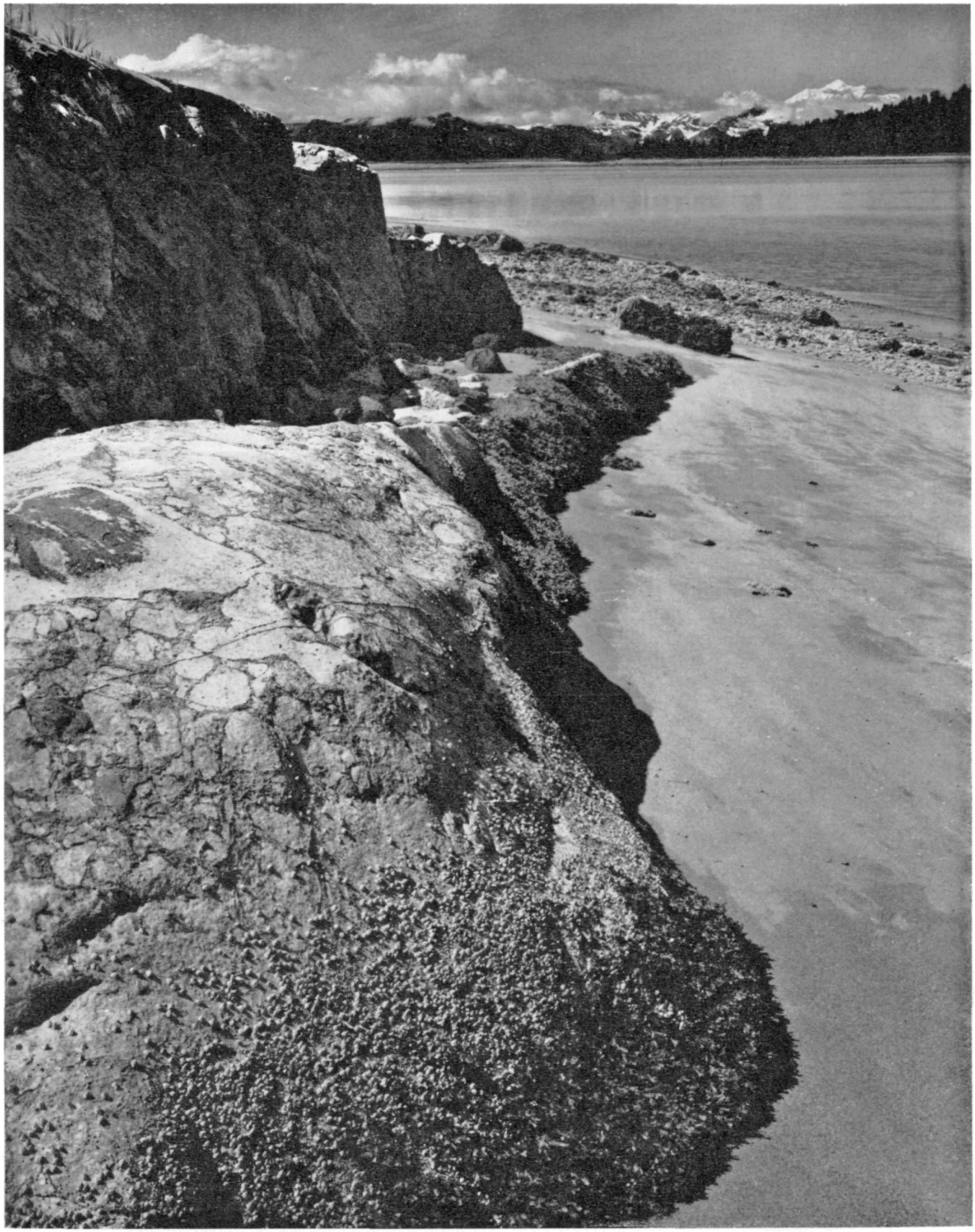
Glacier Bay in the vicinity of Muir Inlet, and the Saint Elias Range

GLACIER BAY NATIONAL MONUMENT, a great wilderness preservation in every sense of the word, lies athwart the southeastern coast of Alaska a few-score miles west and north of Juneau, the State's capital city. It is a primeval monument that contains some of the world's great tidewater glaciers, magnificent scenery, and a rich population of bird, mammal and sea life.

The monument, established by proclamation of President Coolidge in 1925, embraces nearly 3600 square miles of north-country hinterlands—some 2,275,000 acres—and includes within its boundaries majestic sweeps of snowy peaks, rivers of ice, and long fingers of the cold North Pacific. Many of its glaciers flow all the way to tidewater from the high St. Elias and Fairweather mountain ranges, terminating at the sea as towering cliffs which, from time to time, shed huge slices of debris-laden ice. Such falls frequently give rise to great waves that fan out over the tidal inlets.

Some ninety miles at its widest point, and about seventy miles from north to south, the monument is roughly bisected by Glacier Bay and its numerous, finger-like inlets; the bay itself is approximately fifty miles long, and varies in width from about three to ten miles. The lower, or southern, portion of the monument, in the vicinity of the mouth of Glacier Bay, is clothed for the most part with forests of virgin hemlock and spruce, where, as the National Park Service has pointed out, visitors may roam a terrain which may in places have been untrod by the white man.

The wildlife of Glacier Bay Monument includes a number of bears—the Alaskan brown, the grizzly, the black, and the rare glacier bear, a bluish-colored bruin which biologists hesitantly classify as a smallish color phase of the American black bear. Then there are the mink, marten, beaver, red fox, wolverine, Sitka black-tail deer, mountain goat, and smaller land mammals, while the waters of Glacier Bay are frequented by the porpoise, whale and hair seal. Various waterfowl inhabit the coves and inlets of the bay—loons, ducks, geese, king eiders, many gulls and shorebirds, cormorants, puffins, murrelets and guillemots. In spring and summer, during the spawning season, salmon crowd the rushing streams of the monument, a phenomenon that attracts many bears to the streambanks on fishing expeditions. In Beartrack Cove, for example, the big mammals have worn deep,



Some miles north of Park Service headquarters, on the east margin of Glacier Bay, is South Sandy Cove.

winding trails along the waterways.

Conditions in the monument are still natural and primitive throughout, and it is possible to spend weeks in the area without meeting another party of visitors. All travel to or from the preserve is by boat or seaplane. Hiking is, of course, unlimited, and the photographer is presented with opportunities circumscribed only by the imagination and endurance. This vast monument is especially suited to those who wish to be far from the beaten paths, the drumming and vending, the crowds and the traffic.

Glacier Bay itself is literally filled with islands, some heavily wooded, others mere treeless rookeries for the sea-birds. At times floating ice occurs in great quantity in the bay and its inlets, and kelp-beds and sandbars are present in many of its parts. Daily tides in monument waters average between eighteen and twenty feet, and masses of ice, falling from the snouts of glaciers to become bergs in the seawater, may create waves thirty feet high; so the National Park Service realistically points out that small craft ought not approach an active glacier-snout closer than half a mile, and adds that an iceberg ought not be approached at all.

Just to the southwest of Glacier Bay is lovely, winding Dundas Bay, with heavily-wooded shores; from the northernmost end of Dundas, nearby Taylor Bay may be reached by way of a short overland hike. From these bays the monument stretches west to the open, storm-wracked North Pacific, then northwest up the Alaskan coast to a point beyond Cape Fairweather. Two-thirds of the way up the monument's coast, Lituya Bay projects abruptly inland toward the Fairweather Range, a scenic finger of water in a setting beyond comparison. However, a trip by small boat into Lituya is not for the novice, and the bay can be dangerous for even the expert. The violent currents produced in the narrow entrance of the bay by the rise and fall of the tides, and accompanying impoundment and release of a tremendous quantity of water, make Lituya Bay a fearsome place for small craft.

There are no public accommodations within Glacier Bay National Monument, but a lodge is maintained in fairly close proximity to the preserve. Otherwise, visitors must either live aboard boats or supply their own complete camping outfits. ■

In Beartrack Cove, ursine fishermen have created winding trails.

Oregon's Hart Mountain Antelope and Sage Hen Refuge

By Albert Antrei

Photographs by Bureau of Sport Fisheries and Wildlife

TO MANY WHO SEE THE DARK VOLcanic rock-heaps that characterize Hart Mountain Antelope and Sage Hen Refuge in the arid lands of southwestern Oregon, the refuge represents an edge of the world, pointing its steep face to the alkali, greasewood, and dead-lake basins below its western chin. There is something mysterious about the way in which Hart Mountain and adjacent Adams Butte have been joined in geographical matrimony. There are verdure, good soil, and hot springs here. Antelope and deer share a habitat that has, to a great extent, escaped the effects of civilization. A shallow divide at about the middle of the jointure of Hart Mountain and Adams Butte starts trickles of water flowing down each side of the divide in opposite directions. The one dribbling to the south-southeast is Guano Creek; the one to the north-northeast is Rock Creek. Both start out bravely in the spring, but by July first they are almost dry. From Adams Butte only one little stream asserts itself vigorously, and then only in time of good rain.

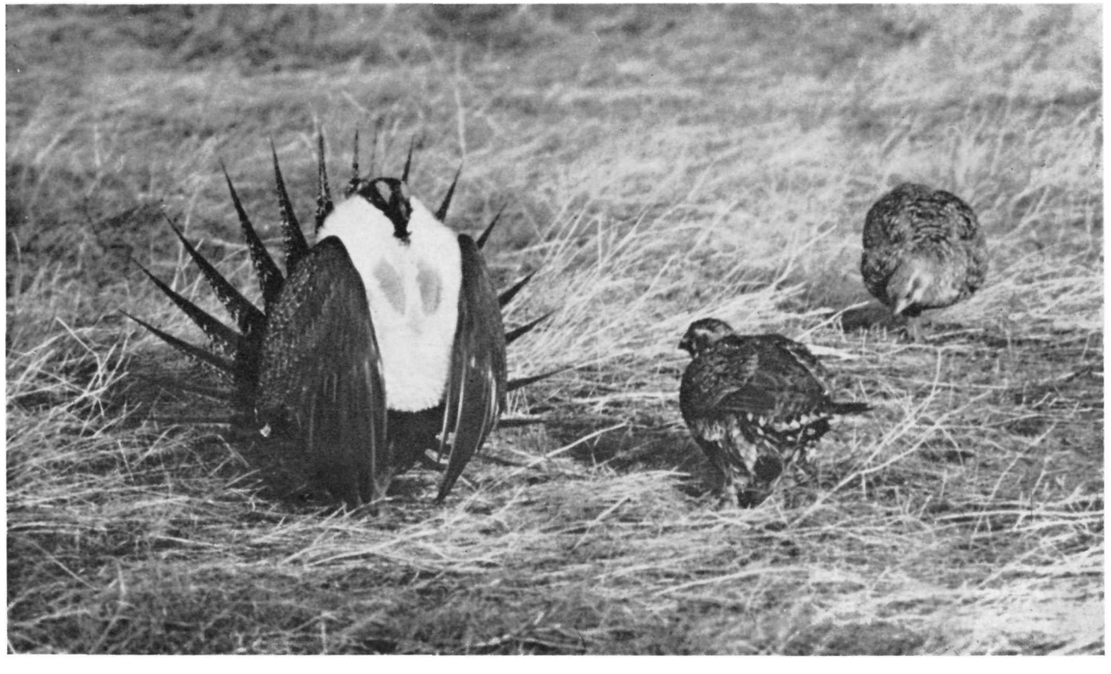
Although the land is arid, it does rain here. The long flats that broaden out to the east towards the Steens Mountains have basins in them, and in wet years they hold glimmering water well into July. Desert Lake, Spanish Lake, and Flook Lake are sometimes full enough to attract long-legged wading birds such as curlews, sandpipers, ducks, and other waders and swimmers; when the antelope come down to course the edge of the water and dip their muzzles in it, or lie on the sedgy shores to chew their cuds, there is an essence of unspoiled wilderness about this desert-like refuge. There are occasional wet years when 20 to 25 inches of rain drenches the countryside; this alternates erratically with years of eight to fifteen inches. A surprised hiker may emerge from acres of heaped basaltic rock and suddenly find himself on deep soil or coarse sandy loam; just as suddenly a downpour may greet some visitor who found only sun and dry soil the year before. Several horses died of thirst one year when their owner forgot and left them for several weeks in a dry Hart Mountain pasture. A year or two later I rode by and—ironically—saw their decomposing bodies lying in water.

Some ecologists feel the area is in the Upper Sonoran life zone, pointing to indicators of grass and sagebrush. The next year, however, it may seem more like Lower Sonoran than Upper, and indicator grasses barely peek through the sagebrush.

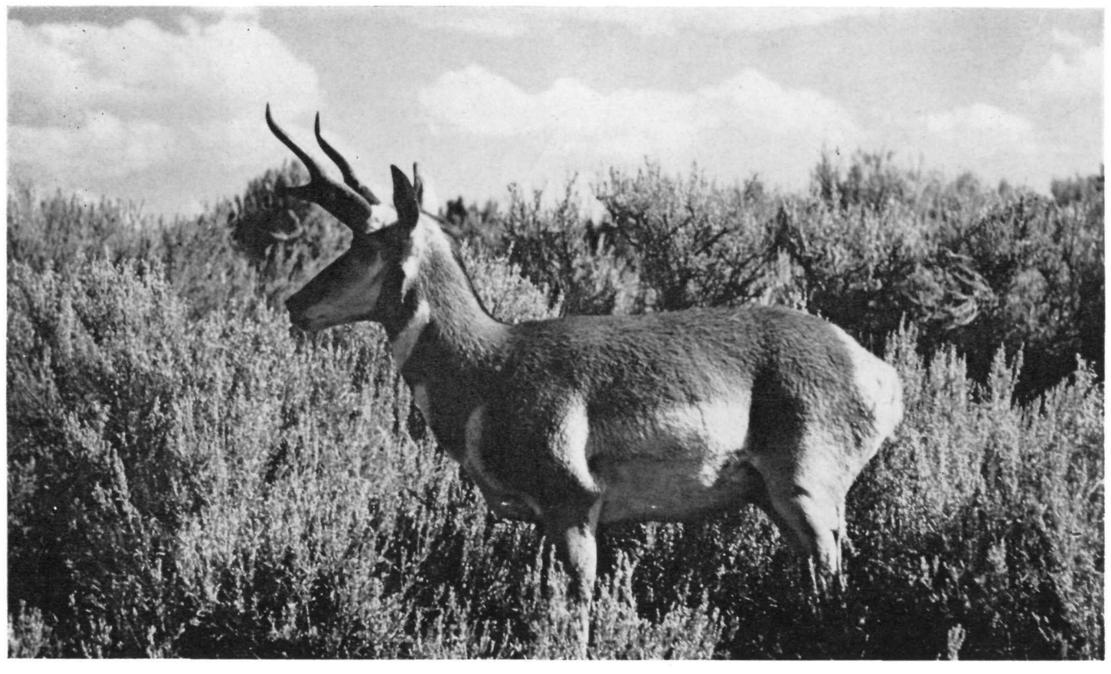
This basalt plain has so far escaped the commercial interests, although there were angry rumblings in nearby Lakeview when the Federal government bought the land and took it off the State tax rolls in 1938. Because the Hart Mountain Refuge has remained essentially in its natural condition, the antelope, sage hen and mule deer are still here. The sage hen is one of the four sub-species of prairie grouse, and is closely related to the extinct heath hen and the now endangered prairie chicken. Not long ago some mountain sheep — missing since 1890 — were "planted" on Hart Mountain in an effort to round out the native fauna of the area. From an initial band of twenty, planted in 1954, officials estimate that there are now between 120 and 130 mountain sheep in the area, fifteen of which have been transplanted to the Steens Mountains within the past three years. Some Indians of the region claim that the area housed buffalo before cattle were permitted to graze there, and relics seem to support the theory.

When winter comes, the antelope fol-

Two sage hens watch as a male puffs his feathers, inflates yellow throat sacs, and spreads his tail in preparation for ritual courtship dance.



Alert for signs of possible danger, an adult pronghorn antelope pauses briefly in thick sagebrush cover to scan the horizon.



low their traditional trail south to the Charles Sheldon Game Refuge in Nevada, possibly because the terrain of the Charles Sheldon is more protective against blizzard winds. The migration is, however, not as definite as the spring and autumn flights of animals like ducks and geese. Perhaps it is habit rather than instinct, but the trails are hard and the habit must therefore be a firm one. In a wet year, especially in spring, these trails may be washed over by deep water and occasionally swimming antelope are drowned in their determination to follow the route. In dry years the trial may blow out towards the Owyhee Desert in Idaho and antelope may fall parched along the established route.

Wildlife May Be Seen

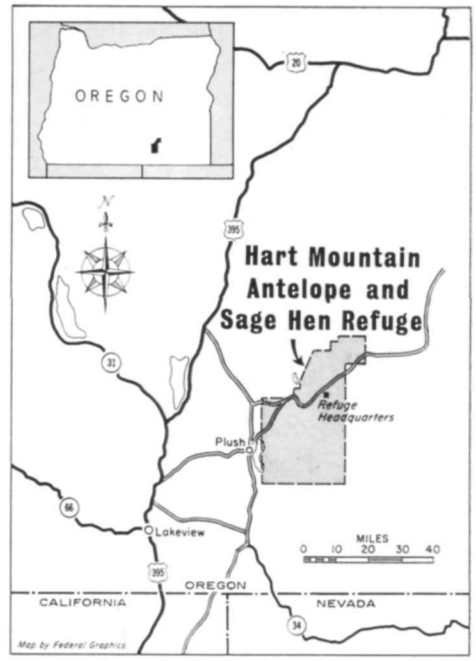
Visitors to the Hart Mountain Refuge have a good chance of spotting wildlife. The best approach to the area by automobile is from the west via Lakeview, Drake's Flat, and Plush. A dusty drive of about seventy miles from Lakeview takes one to refuge headquarters on Rock Creek, at the head of a short, steep grade overlooking Campbell and Warner Lakes.

Most herds are concentrated in the southeastern part of the refuge, although individual animals and smaller herds can sometimes be seen around the headquarters itself and on Adams Butte, which begins immediately south of headquarters. Roads are relatively unimproved on the refuge itself, but there is a main route along the east base of the Butte. The road terminates at the south end of the Butte, at the site of an old army post of the 1860's. Some maps label the old structure "Fort Warner."

If one wishes to see large herds of antelope, hiking is best—unless one has a horse. A trek over the shortsage plains (*Artemisia arbuscula* plains) in the areas of Spanish and Desert Lakes may yield fascinating views of antelope in their natural habitat, and a few other species of wildlife may occasionally be seen. On one memorable horseback trip to the refuge in 1938 I saw two eagles, one of which was resting on its prey at the foot of Hart Mountain, about a half-mile west of headquarters. The other plummeted from the sky above the Desert Lake flats with a *whoooo-oooosh*, and passed me only twenty yards away. The experience startled me, but my horse barely cocked an ear —the animal seemed to have seen and heard eagles before.

Rough Terrain Awaits Explorers

Whether one uses a horse or his feet, going will be rough, for the heaped basalt rock of the refuge makes travel difficult for both horse and man. The terrain does not seem to bother



antelope, however. The agile antelope makes his way with scarcely a ripple in his stride, but one must have time and patience to overcome the terrain. An automobile can be helpful, but how far one can drive into the main antelope range on auto trails is determined by the current condition of the trail, the type of car, and the alertness of the driver. A high-centered automobile is essential off the "main road." There are no accommodations on the refuge other than those the visitor provides for himself. Help and information may be obtained from Hart Mountain-Charles Sheldon combined refuges manager Ben M. Hazeltine, whose office is in Lakeview, Oregon. The assistant refuge manager lives at headquarters all year.

According to Oscar V. Deming, the biologist for both refuges, some basic changes in the area are occurring because of a shift in the climatic cycle. Dr. Deming believes that the antelope is a descendant of certain grassland ungulates of the Miocene period, a species that reached its numerical and distributive peak during the Pleistocene; and with subsequent warming—and aridity—of the middle latitudes it decreased in numbers.

Changing Climate and Flora

Flora of the area is also changing. *Artemisia cana*, or silver sagebrush, supposedly has a higher moisture requirement and tolerance than *A. tridentata*, or big sagebrush; it is the leader in the advance northward,

Moody clouds move gently above the harsh, flat terrain of the Hart Mountain Refuge.

while in Nevada and southern Oregon it is approaching relict status. This is probably due to the continual drying of the climate, and now the silver sagebrush is found primarily around lake shores and other areas where it can obtain more moisture than is supplied by annual precipitation in the Hart Mountain area.

Antelope Survival Is Poor

This change of climate, resulting in alteration of flora upon which the antelope depends for food, may be one reason why the delicate animals are not increasing in numbers in and around the refuge area. Observed herds within the refuge contain a preponderance of adult animals; reproduction in the area is abnormally low, and there is a high mortality rate among kids. Biologists of the Fish and Game Commissions of California, Nevada, and Oregon suspect that changing weather and food supplies are adversely affecting antelope within the Hart Mountain Refuge.

The antelope migrate not only between the Oregon and Nevada refuges, but also penetrate into California in areas that lie northeast of the Sierra Nevada. For this reason the animals are managed on a tri-state basis; their protection, as well as occasional special hunts, are determined jointly by officials of the Fish and Game Commissions of each State involved. In past years permits have been issued to harvest from 200-400 antelope. But the barely stable population of these animals and the undetermined reason for their inability to produce healthy offspring seems to indicate a halt to shooting until scientists discover the cause of high kid mortality.

A close relative of this antelope—the Sonoran pronghorn antelope, *Antilocapra americana sonoriensis*—which ranges throughout restricted areas in Arizona and in some parts of northwest Mexico, is listed as an animal in danger of extinction in the revised report on endangered American animals compiled by the U.S. Bureau of Sport Fisheries and Wildlife. This smaller, lighter-colored pronghorn usually produces only one kid per doe annually, and although reasons for its decline are not similar to those suspected for the Oregon antelope, studies have not been conducted to determine the animal's management needs. Studies have not been done on the Oregon antelope either; investigations should be made of both sub-species to discover possible relationships in reproduction and survival which might shed light on the future status of the species as a whole.

Natural antelope habitat is fragile; nature's ecological balance at Hart Mountain figuratively rests on a razor's edge. Livestock grazing and modern agricultural methods have greatly altered ecological conditions on antelope ranges elsewhere. In some places in the United States antelope are found in the so-called "pygmy forests" of piñon pine and juniper. Observers feel that in these places the animals are seeking habitat where ecological factors are more in keeping with historic ranges. Assurance of perpetual antelope habitat is the prime concern in managing this antelope-muledeer-sagehen refuge. Nature cannot be reversed; a Pleistocene climate cannot be created in a laboratory. But when necessary, nature can sometimes be manipulated.

Scientists had noted that after a storm in the refuge, moisture penetrated to a depth of three inches directly under sagebrush. In the intervening space between sagebrush plants, soil moisture was five inches. Where the space between sagebrush plants was doubled, a penetration of six inches was noted; where the intervening space was occupied by grass and forbs, rains sank to seven inches. All this suggested that periodical manipulation of sagebrush density by controlled burning might help insure favorable conditions for the growth and spread of grass. Controlled burning was tried in the autumn of 1962, and according to refuge officials, the burn was a "huge success."

The Hart Mountain Antelope and Sage Hen Refuge looks out upon a grey world from under greenish-yellow brows. It is a world of rocky ridges and sandy flats of sagebrush which break away from Adams Butte to the distant Steens Mountains, blue and beckoning on the eastern horizon. The aspen patches in the draws of Hart Mountain and Adams Butte, the mountain mahogany and junipers of the ridges and rims, and the surprising ponderosa pines at headquarters lack the mystery of the coastal forest, perhaps; and when it is hot the basalt feels as though it were still fresh from the crater. But this vast antelope refuge has a charm of its own. It is broken by basins and ridges, spots of meadow, patches of tall sagebrush, and great flats of lake bottoms and short-sage clumps. Distance signals, rather than repels. Little box-canyons with black rims hide occasional small springs and waterholes, and there are the enigmatic riddles of long-gone Piute rock-scratchings. Indeed, the refuge is attractive to many people in its own quiet way, and possesses its own special sense of mystery. ■

The graceful movements of a young antelope are reflected in the still waters of a small pond in the refuge. Ponds like these overflow in wet years, flooding portions of the antelope range.

News and Commentary

Wild Rivers

Past issues of the Magazine have traced the development of the national wild rivers system idea since it first crystallized a number of years ago in a Senate Select Committee on National Water Resources. One of the recommendations of the select committee was, that "certain streams be preserved in their free-flowing condition because their natural scenic, scientific, esthetic, and recreational values outweigh their value for water development and control purposes now and in the future." The committee suggested several rivers which might be preserved wholly or partly as free-flowing—the Allagash, the Current, the Eleven Point, and the Rogue.

Then the idea was endorsed by the Outdoor Recreation Resources Review Commission in its far-reaching report of 1962—the so-called Rockefeller Report. A little later a joint Interior-Agriculture Wild Rivers Study Team was formed to investigate possibilities, and by early 1964 it had made a selection of twelve streams [*National Parks Magazine:* Feb., 1964, p. 16] and had suggested a number of others for future consideration. Out of the study-team's report came Interior Department recommendations, presented to Congress in March of this year, and shortly afterward a bill, S. 1446, was introduced by Senator Church of Idaho, for himself and not less than 28 other Senators, to establish a National Wild Rivers System.

In April the Senate Committee on Interior and Insular Affairs held public hearings in Washington on the bill, and at the same time on S. 897, by Senators Nelson and Mondale, to create a St. Croix National Scenic Waterway on the St. Croix River, which for many miles traces the boundary between Wisconsin and Minnesota. S. 897 would, essentially, retain a portion of the St. Croix in its primitive condition while promoting more intensive types of outdoor recreation in the adjacent lower portion. In response to the invitation of Senator Jackson, chairman of the committee, Anthony Wayne Smith, president and general counsel of the National Parks Association, prepared a statement of his views concerning both proposals.

Mr. Smith's testimony in regard to both bills was commendatory; he did, however, suggest that the proposed wild rivers[1] mentioned in S. 1446 should comprise the very minimum for the system, and that one stream—the Little Tennessee, on which the Tennessee Valley Authority proposes to build the Tellico dam—should definitely and promptly be added to the wild rivers system. The statement pointed out that the Tellico dam would flood out scenic, historic and prehistoric resources, including Indian communities, which have great cultural and economic value to the American people. "The TVA should abandon the Tellico dam," said Mr. Smith, "and this committee might well help it do so by declaring the undammed portion of the Little Tennessee River a wild river," Also, retention of the section presently in the bill prohibiting the Federal Power Commission from authorizing dams on wild rivers (without prejudice to the authority of Congress to consider special cases) was seen as essential to the plan's workability.

Comment concerning the St. Croix Scenic Waterway bill was in general similar to that on the wild rivers bill; the question was raised, however, whether the right of use and occupancy of waterway lands, retained under certain circumstances by owners of improved property, should not extend to commercial agricultural uses, since the agricultural countryside is also properly a part of the American scene. In summary, both bills reflect a rapidly growing body of strong public sentiment for the protection of natural beauty and the natural environment, Mr. Smith said.

[1] For immediate denomination as wild rivers: segments of the Salmon, in Idaho; Middle Fork of the Clearwater, in Idaho; Rogue, in Oregon; Rio Grande, in New Mexico; Green, in Wyoming; all of the Suwannee, in Georgia and Florida. For future consideration: all of the Buffalo, in Tennessee; all of the Cacapon, in West Virginia; segments of the Eleven Point, in Missouri; Hudson, in New York; Missouri, in Montana; Niobrara, in Nebraska; Skagit, Cascade, Sauk and Suiattle, in Washington; Susquehanna, in New York and Pennsylvania; and Wolf, in Wisconsin.

A Citizen's Voice in Government

Organizations like the National Parks Association, which enjoy special privileges of tax exemption, may not advocate or oppose legislation to any substantial extent.

Individual citizens of a democracy, however, enjoy the right and share the responsibility of participating in the legislative process. One of the ways citizens of a democracy can take part in their government is by keeping in touch with their representatives in the legislature; by writing, telegraphing, or telephoning their views; by visiting and talking with their representatives in the national capital, or in the home town between sessions. Every American has two senators and one Congressman with whom he may keep contact in this manner.

The best manual of information for such purposes is the official *Congressional Directory*, which can be bought through the Government Printing Office, Washington, D.C. 20402, at the price of $3.00 for the regular edition or $4.75 for the thumb-indexed edition. It tells you who your senators and congressmen are, and lists the membership of the various Congressional committees. It also gives full information on the personnel of the various executive bureaus of the government.

Population Committee Formed

Over the past decade many American scientists and conservationists have voiced concern over increasing world population, feeling that uncontrolled population increases must eventually lead to loss of natural esthetic values and to acute food and housing shortages; to increased human anxiety; and perhaps to disregard for human life. Despite such fears, there has been no specific group to represent to Congress the concern of those who are aware of the implications of over-population. But now, according to report, there is a "new national campaign for deeper Governmental involvement in promoting birth control." Such a campaign will be conducted by the newly-formed "Population Crisis Committee," with former New York Senator Kenneth B. Keating as national chairman of the group.

Mr. Keating, now a practising attorney, has long been interested in the problem of overpopulation. He is now particularly concerned with obtaining an increase in Federal expenditures for research on birth control. Such expenditure is justified, says Mr. Keating, because overpopulation "threatens the success of the Alliance for Progress, the war on poverty, foreign aid, and innumerable domestic programs to which Congress has committed billions of dollars."

Mr. Keating's contentions apparently are shared by some state and local gov-

ernments and by many business leaders. At least thirteen States have recently begun individual birth control programs or studies. In addition, business leaders across the nation have seemingly discovered that an endlessly expanding population may eventually be detrimental to business instead of stimulating further industrial growth. Representing part of the business community, Mr. Lammot duPont Copeland, president of E. I. du Pont de Nemours and Co., has recently stated that "I confess, like many others, I once took for granted the notion that a rapidly growing population almost automatically meant rising profits. . . . I have learned that for the world as a whole this is not so. And for America, it will not be so much longer."

Protection for Boundary Waters

As many of this nation's prime wilderness areas are bulldozed, encased in concrete, or overdeveloped, public anxiety for protection of such areas becomes more acute. For some time a flurry of such anxiety has been generated over possible misuse of the beautiful and rugged Boundary Waters Canoe Area within the Superior National Forest of Minnesota. The area is administered by the Forest Service, within the Department of Agriculture. Not long ago a group of interested individuals, including conservationists, voiced fears that increased timber-cutting, road-building and other non-wilderness uses were hurting the area; in response to the allegations Secretary of Agriculture Orville L. Freeman appointed a special committee to investigate, and possibly suggest some changes in management of the area.

One of the recommendations of the committee, which worked in cooperation with the President's newly-formed Quetico-Superior Committee, would have the effect of denying permits for mineral exploration and development in the Canoe Area, but permitting such activity in the "multiple-use" area of the forest. Conservationists are now more hopeful that the wilderness values of the Canoe Area itself will be thoroughly protected.

Starker Leopold Honored

Professor, administrator, researcher, writer, and distinguished conservationist A. Starker Leopold, who has devoted much of his varied career to wildlife research, has recently received the highest honor of the Wildlife Society: the Aldo Leopold Memorial Award. The award was named for Professor Leopold's father, and granted to him this past March at the annual banquet of the 30th North American Wildlife and Natural Resources Conference, held in Washington, D.C. Professor Leopold was chosen on the basis of what the Society termed "outstanding service and distinguished contributions in the field of wildlife research and in furthering the cause of sound conservation."

Australia's Gray Kangaroo

The wide-eyed gray kangaroo, whose delightfully strange characteristics have marked it—at least in the eyes of many Americans—as the national symbol of Australia, is now coming precariously close to the point where it may become a species in danger of extinction. Although some Australians claim that gray kangaroos are maintaining a stable population, up to 100,000 of the animals are killed yearly by professional hunters hired by Australian stockmen. Stockmen contend that kangaroos consume large quantities of vegetation, and thus compete heavily with domestic sheep for food. Alarmed by sharp population declines in other species of kangaroos, and possibly in the gray kangaroo, conservationists have been encouraged by a recent study report made by an Australian zoologist. The report shows that the gray kangaroo consumes only about half as much "green feed" as does a sheep, and therefore constitutes little or no threat to stockmen. With this scientific evidence at hand, it is hoped that the unnecessary slaughter of kangaroos in many parts of Australia will cease.

Wisconsin Conservation Camp

To encourage young men with a keen interest in the out-of-doors to chose conservation as a life career, the Natural History Society of Minneapolis, Minnesota, will operate a camp program in northern Wisconsin's lake-and-woods country. Located in Wolf Springs Forest, near Minong, the camp will offer a variety of opportunities to young men of senior high school age (16 and 17) to participate in and learn many types of forestry and conservation activities.

The Forest itself is ideally suited to studies involving watershed, wildlife habitat, timber management, soil conservation, and other conservation activities, and there will be field trips to nearby waterfowl refuges, tree nurseries, logging operations, fish hatcheries, and other sites of field activities involving conservation practices. Camp instructions will be given in mapping, forest improvement, tree identification, wildlife cover development, watershed conservation practices and fire protection, while prominent visiting lecturers will supply new and varied viewpoints from their professional experience in managing natural resource programs.

The camp will be operated for two sessions—one in July and one in August, and thirty young men will be accepted for each month. Financial assistance by the American Conservation Association will make a limited number of scholarships available. A previously demonstrated interest in conservation (schooling, essay contests, or other evidence) will be a prerequisite for enrollment. The camp tuition fee will be $200 per student for a one-month enrollment; and conservation organizations and civic groups may sponsor student-campers for all or part of their tuition. Further details and application forms may be obtained by writing the Natural History Society, 315 Medical Arts Building, Minneapolis, Minnesota 55402.

Reviews

GUARDING THE TREASURED LANDS. By Ann and Myron Sutton. J. B. Lippincott Company, Philadelphia and New York. 160 pages, amply illustrated, cloth-bound. $3.75, and

TURTLE LORE. By Gale Koschmann. Everglades Natural History Association, Homestead, Florida. 60 pages, spiral-bound, paper cover, with illustrations in color. $1.40, postpaid.

Once there was somebody stumbling in quest of a term that would describe the peculiar sort of idealism and devotion which animates the employees of the National Park Service. He came up with the word "mystique." The term is acceptable. As well as any word can do, it accounts for the animating spirit of this sodality of cheerful, relatively unselfish workers who choose their kind of work because they love it and believe in its importance to human happiness. This mystique is not exclusively American. You find it among park people all over the world. "It goes with the job."

When these same enthusiasts take to writing, they usually carry into the printed word all of the spirit and much of the helpfulness and understanding they dispense in their field work. Ann and Myron Sutton, for instance, are "old China hands" in natural history. Eighteen years, spent in many different areas of the national park system, have not dulled the edge of their enthusiasm, nor their delight in imparting it to others. Themselves still possessed of a naïve capacity for wonder, that sole avenue to understanding, this newest venture of theirs, aimed at younger readers, will satisfy two desirable ends: to show how and why the National Park Service is what it is, and to illuminate the mystique that guards it so zealously. Many a youth who reads this book will set his mind upon becoming a "park ranger." But the Suttons have not "glamorized" the work. If there is satisfaction, there is disappointment (mostly with people.) If there are days of excitement, there is also drudging.

The Sutton book is not written down to an age. Hence it would not be surprising if Junior has to wait for Father to finish it first.

Gale Koschmann's little book is altogether charming, in matter and manner. In her preface she says she is "not an authority—just an enthusiast." This bit of modesty will fool nobody. She knows her South Florida turtles, as a competent naturalist. But she is right about the enthusiasm. The little book bubbles with it.

If the reader were to visit Gale, in her apartment nearby to Everglades National Park, he would probably have this experience: first, a yellow-orange cat would come to the door, stare insolently at the intruder, and emerge, tail-high, into the night. Then he would fall over Robustus. Robustus is a *Gopherus polyphemus*, or gopher turtle. He is only one of several species of turtles you would see here, but he is the largest, and from the tinge of pride with which his owner speaks of him, probably the favorite. He is, perhaps, fifty years old, and he thinks slowly, because, unlike an ephemerid, he has so much time to think. His family ties go back about 240 million years, which is before human beings began to think at all.

Then, after seeing Robustus, you would begin to see other turtles in the apartment. Even sea-going turtles, who have to be maintained in brackish water. Turtles, turtles and more turtles. They make good pets, as the salespeople in the dime stores know. Most of the turtles kept in a bowl by children are the so-called "baby sliders." Sometimes "box" turtles are preferred. Gale has an appendix full of sound advice for those who are prepared to take on the responsibility of entertaining and making happy a few complacent reptiles.

One interesting revelation about Ro-

bustus the gopher: he snores dreadfully. There is no use telling him he is lying on his back, because he isn't. And no use telling him to turn over, because he won't. Perhaps *Gopherus polyphemus* has powers of imitation? —*Freeman Tilden*

FIRST WORLD CONFERENCE ON NATIONAL PARKS. *Proceedings of a conference organized by the International Union for Conservation of Nature and Natural Resources.* Edited by Alexander B. Adams. Superintendent of Documents, U.S. Government Printing Office, Catalogue Number I 29.2:P 21/13. Washington, D. C. 20402. 471 pages, illustrated, with index. Paper cover, $1.75.

This volume crystallizes the thinking and philosophy of 262 dedicated professional park people from 63 countries scattered over the six continents and intervening seas. It is a monumental work appropriate to a monumental occasion: the First World Conference on National Parks, held at Seattle, Washington, from June 30 to July 7, 1962.

The table of contents sparkles with the names of giants in the conservation field. These authorities come from nations as far away as Tanganyika, Uganda, Thailand, Australia, Venezuela, and Senegal, to name a few. The topics cover an equally broad scope, and deal with the purposes, scientific, economic, and cultural values of national parks, research, interpretation, and optimum use. Philosophical concepts are discussed, and various topics such as marine conservation, African culture and African parks, conservation in the Antarctic, and many others receive attention in the book. Important topics like international and state parks, preservation of endangered species, preservation of wilderness itself —which transcends the boundaries of parks and equivalent reserves—have their moment in the spotlight.

The book, as did the conference, begins with a word of welcome from the late President Kennedy, who reminds readers that ". . . we must be careful to safeguard adequate and representative examples of the natural environment, where people may reflect, study, and enjoy the benefits of the earth." Secretary of the Interior Stewart L. Udall's keynote address—as prepared for the occasion but not as actually delivered by the dynamic Secretary—is also included. Secretary Udall has the extraordinary gift of pouring his soul into his subject with spontaneity, and radiating his inspiration without slavishly following text. He needs no "precooked" script; and this conference was challenging enough to try the stoutest champion.

In addition to technical and summary papers, the work includes expected appendices such as reports of *rapporteurs* and conference committees, as well as resolutions adopted. It also contains a history of the IUCN and the conference, a chapter on parks around the world, and accounts of the conference field trips to Mount Rainier, Olympic, Yellowstone, and the Snoqualmie National Forest. Twenty-four photographs of park subjects in twenty-one different countries around the world embellish an otherwise severely plain format. Like the statement on the well-known plaque honoring Stephen Tyng Mather, founder and first director of our own National Park Service, it may prophetically be said that there will never be an end to the good this conference has done.

—*George C. Ruhle*

The Conservation Docket

Up to 15,000 acres of historical and recreational land bordering the Potomac River would be preserved by a Chesapeake and Ohio Canal National Historical Park, proposed in *S. 1322*, (Sen. Brewster, Maryland, and twelve co-sponsors.) The measure provides for inclusion of the existing C. and O. Canal National Historical Monument, and is now under consideration by the Parks and Recreation Subcommittee of the Senate Interior and Insular Affairs Committee. No Committee action is expected until the Department of the Interior submits its plan to President Johnson for development of a model Potomac River Basin.

Rep. Morris has introduced H.R. 3165 to establish a Pecos National Monument; the reserve would contain 342 acres of scenic, and historically important, land in New Mexico.

The controversial San Gorgonio Wilderness Area within California's San Bernardino National Forest is the subject of two recent bills —H.R. 6891 by Rep. Dyal and H.R. 7490 by Rep. Corman, both of California, which would create a winter recreational center in the wilderness area. A similar proposal was eliminated from the Wilderness Act. Both bills were sent to the House Interior and Insular Affairs Committee.

Pennsylvania's Rep. Saylor has introduced H.R. 89, to establish a Tocks Island National Recreation Area in Pennsylvania and New Jersey. H.R. 89 has been favorably reported out of House Subcommittee on Parks and Recreation, and is now under consideration by the House Committee on Interior and Insular Affairs.

H.R. 1111, Rep. Aspinall's proposal to create a Water Resources Planning Council to coordinate planning by government and private interests for sound river basin development, has been passed by both Senate and House. The bill has been sent to a House-Senate conference committee to resolve differences.

S. 4, introduced by Sen. Muskie to create a Water Pollution Control Administration, has been passed by the House and now goes to conference committee to iron out House and Senate differences in the measure.

Weldon F. Heald

A handsome and healthy specimen of the saguaro cactus, typical plant of the Sonoran Desert region of the American Southwest.

As America's leading conservation organization concerned primarily with our national parks and monuments, the National Parks Association strongly supports the Park Service in its efforts to eliminate practices—such as the grazing of livestock in some of the Southwestern monuments—which tend to lower the scenic or scientific values of the areas. You can assist your Association in this work in any of a number of ways: by renewing your membership in the Association promptly; by helping to secure new members; by raising your own membership classification, or by contributing to the general funds of the Association over and above regular dues. From time to time some of our members also remember the Association in their estates. All dues, over and above basic annual dues, and all gifts and bequests, are deductible for Federal income, gift, and estate tax purposes.

National Parks Association

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