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PRESERVATION OF NATURAL AREAS IN THE NATIONAL FORESTS¹

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Biologists and those interested in allied lines are familiar with the movement launched by the Ecological Society to secure the preservation of so-called natural areas where plant and animal life and natural features in general may remain undisturbed by human activities. In seeking such conditions one naturally turns to localities remote from established communities. The National Forests hold out much promise because they contain large sections which as yet are but little affected by industrial development, and because they are under Federal control. The writer has been requested by the chairman of the "Committee on Preservation of Natural Areas" of the Ecological Society to list the National Forests of Arizona and New Mexico as areas which will remain at least in a semi-natural state.

Within these two States are 15 National Forests, whose combined area is nearly 22 million acres. Vegetation zones range from desert or semi-desert at from 3,000 to 4,000 feet in elevation to alpine conditions above 12,000 feet. With rising altitude, the plant associations pass successively from desert grasslands to brushlands, woodlands, yellow pine forest, Douglas fir-white fir forest, Engelmann spruce forest, and finally to treeless areas above timberline. The two extremes of desert and timberline do not often occur within the boundaries of the same forest, although this is the case in several instances.

It is of interest to consider in what measure the National Forests under the existing methods of management will answer the requirements for "Natural Areas." The general policy governing the handling of National Forests is that of highest use to the public. The primary purpose is the production of timber. This implies that when a forest crop is mature it will be harvested. Associated with timber production is the utilization and development of grazing, agriculture, water, mining, recreation, and other resources.

Cutting disturbs natural forest conditions in a degree which varies with the type of forest and with the method of management. Under all systems of management practiced in the Southwest, natural reproduction is the first consideration. Mature and over-mature trees are removed unless needed for seed production, shelter to seedlings, or to control streamflow and erosion. Between the seedling stage and the mature stage are considerable numbers of thrifty young trees which will be ready for cutting before the seedlings reach

¹Read before the second annual meeting of the Southwestern Division of the American Association for the Advancement of Science.

maturity. Under no circumstances is removal so heavy as to destroy what may be termed forest conditions. Cutting does, however, disturb the natural balance prevailing in the virgin forest. This results, at least temporarily, in abnormal development of herbs and shrubs as well as of the trees themselves. Under proper management, the trend of development after cutting will be toward restoration of the virgin conditions. In what measure this end will actually be attained, however, can not be foretold.

Next to cutting, the most important factors are fire and grazing. The devastation of vast areas, as exemplified by old burns in the high mountains, is not likely to be repeated. Fires can not be entirely eliminated, but records show that during the past ten years an average of only two tenths of one percent of the area in the National Forests of Arizona and New Mexico has been burned over each year. In the past grazing has in many instances altered the character of forests by destroying forest reproduction and herbaceous cover. Under forest management these abuses will be practically eliminated. Even under scientific regulation of grazing, however, the composition of herbaceous plant associations will probably not be the same as would be the case if no grazing took place. A strong argument in favor of moderate grazing is that it assists in the control of fires.

With reference to wild animal life, both grazing and human occupancy have a disturbing effect. Each class of stock more or less repels (or sometimes attracts) certain wild species, and each class of stock changes the habits, food supply, and abundance of predatory animals and hence the balance of non-predatory species. Man, by hunting on the one hand, and by control of predatory species on the other, has a separate effect on the habits and abundance of each species, predatory and non-predatory, but under proper management the net result will probably be an artificially sustained balance in favor of game on most areas.

Road building, which is to a large extent associated with industrial development, stimulates tourist traffic. The effect on vegetation is unimportant excepting in so far as it may increase the prevalence of fires. Wild animal life is subjected to greater disturbance than is plant life. Lawful hunting has less serious consequences than indiscriminate shooting of roadside animals, particularly birds.

Although the general administration of the National Forests safeguards them against destructive exploitation, it does not assure that any areas will be kept in a natural state unless specific provision is made to attain that end. It is true that extensive areas, because of inaccessibility, will remain comparatively immune from exploitation for many years; but this is merely a temporary condition which unforeseen developments may terminate at any time. The only way in which the preservation of natural conditions can be assured is by formal withdrawal of specific areas under specific provisions as to future care.

This is not a revolutionary idea among professional foresters. The principle of highest use which is the keystone of our National Forest policy recognizes that although the forests as a whole should be devoted primarily to timber production, specific areas may serve the public better in other ways. Certain tracts may be regarded as chiefly valuable for watershed protection; others may be regarded as chiefly valuable for purposes of recreation. Often these special uses are combined with timber production, but this is not always the case. A plea for special recreational areas is voiced by Leopold in an article, entitled "The Wilderness and Its Place in Forest Recreational Policy," in the November (1921) issue of the *Journal of Forestry*. Leopold would set aside one relatively large area in each State to be maintained in such a condition that it could be truly characterized as a wilderness. Other foresters have expressed a need for reserving typical areas which would remain as examples of the primeval forest after the mass of virgin stands has disappeared.

It is too much to expect the Forest Service to set aside separate areas to satisfy every individual taste, but if all of these interests can be harmonized, there is reason to believe that they can be met. To the true lover of the outdoors, relative inaccessibility by modern modes of travel and the rigid exclusion of all things artificial may seem essential requisites; on the other hand, the scientist who goes into the woods to study rather than to play would welcome a few modern conveniences. Those who are interested primarily in animal life demand large, continuous areas in order to permit the natural movement of animals; those whose chief interest lies in vegetation would prefer a larger number of relatively small areas so distributed as to represent all conditions of altitude, topography, soil, etc. The sportsman wants hunting and fishing; but certain types of nature lovers would protest against the killing of any wild life.

On some points the various conceptions would be wholly incompatible, but on others a compromise would not call for serious sacrifices. The advocates of the "wilderness" idea should be allowed to realize the essential features of their scheme in at least one area in the Southwest. Such an area would also serve most admirably the interests of a large body of scientific workers. A compromise on the road question might be reached by choosing a location well off of main routes of travel, but accessible by roads of the type that can be covered by automobile, though not sufficiently good to attract tourists. Without such transportation facilities, fire protection would be exceedingly difficult. As for hotel accommodations and other modern conveniences within the area, the scientist could reasonably be expected to forego them.

Views differ as to how far restrictions on hunting and fishing should go. Those who would absolutely prohibit these sports probably represent a very small minority who can find the realization of their ideal in National Parks

and Game Preserves. Hunting with modern methods of game management is probably just as favorable to game preservation as no hunting and no management, if not more so.

One or two areas, even though of large size, would probably not represent a sufficient variety of conditions to satisfy foresters and botanists. Their needs could be met by selecting small supplementary areas of from 80 to 640 acres.