

THE ESSENTIALS OF A MANAGEMENT PLAN FOR FOREST WILDLIFE IN NEW ENGLAND¹

The planned management of forest lands involves much more than facilitating the maximum in wood increment for every part of a forest area. It may mean the devotion of certain parts to so-called forest weeds, because of their superior value for such related forest uses as wildlife, and, in turn, human uses through added recreational facilities. The forester of today and tomorrow is offered a unique opportunity in planning and providing for related uses in their proper relations and proportions. In this report the subcommittee of the New England Section outlines the data, records, and measures requisite for building up and maintaining the productiveness of forest lands in their region as a source of the native game animals and birds.

FOREST management plans are, of course, nothing new; but such plans considering wildlife, its potentialities and needs, have only been outlined in the past few years, during which recreational developments have assumed such increasing importance.

The need for considering both the animals and the timber, giving each its proper place, is everywhere apparent. One finds, on one hand, the idea spreading that pure coniferous plantations have no game food in them, so all such plantings should be avoided as a detriment to the game range. This entirely neglects the timber value and the great value of conifers well interspersed with the other types as cover for game. Also, spruce, balsam, and especially white cedar are important winter foods of deer in the more northern sections. On the other hand, most forest management takes no account of the needs of game. A grapevine which could furnish food for a covey of game birds well into the winter is cut down because it is overtopping a tree, no matter whether the tree is valuable or not.

So far, our concern about game has been mostly in trying to guess whether it was holding its own and in wondering what restrictive legislation to foster next. We have not considered what we actually had for breeding stock, how many adults could be safely removed without depleting this breeding stock, whether the population was increasing or not, and what

necessary environmental elements needs changing for best results with game.

The recent national awakening to the need for increasing recreational facilities has focused considerable attention on wildlife and its needs. Work has been done here and there to improve this factor or that for certain species, but the complete picture of all the needs has seldom been developed.

Realizing that each tract of forest is a case in itself, requiring a particular treatment, we have attempted to outline in general terms the basic information needed for efficient management in our region.

Before a management plan is actively started, a reconnaissance should be made to determine whether or not the area in question is adapted to wildlife management. This should be made by someone well enough versed in game work to rapidly evaluate the tract as to its suitability for the species which can be expected to succeed there. Other things to consider before a decision is reached are land values, whether the land is apt to continue indefinitely as forest or be taken for some other use after a few years, whether the human population is apt to increase or decrease on the area, whether the project will be supported by local sentiment or not, and, naturally, if the returns to be expected will justify the expense of the necessary management measures.

The management plan proper should

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have enough of a description of the tract to enable one not familiar with it to get a good idea of its location and salient features.

A history of the area as it affects game is very valuable as a means of interpreting both past changes and present conditions. Among the pertinent things to be considered are man-made changes such as cuttings, cultivation of the land, abandonment, reforestation, etc. Natural events such as the trend of forest succession are very helpful in determining what to expect in the natural development of given forest types.

The policy which should govern game management is a big subject in itself, but on any given tract the policy on which management rests depends largely on the wishes of the owner. Game is seldom the only interest in a piece of property, and the importance and location of agricultural activities, pastures, sugar orchards, lumbering operations, etc., must always be considered. The wildlife species which the owner wishes to favor decide in a general way the management measures to be undertaken. The plan should naturally be set up according to the amount of money available for the work and the length of time over which it is available. Whether any artificial stocking or feeding is to be done is another question of policy to be settled early.

Actual stock taking on the area should be started with the making of maps. A topographic map of the area, such as a U. S. Geological Survey sheet or enlargement from it, is usually sufficient to show the main features of the tract. Supplementing this, and providing the basis for improvement plans, records, and inventories, is a type map, which is a real necessity. This follows the usual forest type map in construction, but requires additional information such as occurrence and density of forest understories, food plants and hedgerows, the location of berry patches, shrub areas, possible

artificial pond sites, and such other features as influence the animal species considered. Notes on soil conditions are helpful in designating where plantings of food plants are most apt to succeed.

The usefulness of the type map, of course, depends on its interpretation; and in this a thorough knowledge of the needs of the animals involved is necessary. For instance, the white-tailed deer is quite content over the period from early spring until deep snows come on a hilltop overgrown with brush, briers, wild herbaceous growth, and occasional clumps of conifers under which beds can be made during storms. But unless there is an area nearby, preferably on a south or east slope or in a swamp, where older coniferous stands give greater protection, the deer will leave during severe winters and go far enough to find these conditions. And whether such a stand will be used as winter shelter depends also on the availability of advance-growth hardwood, young sprouts on cut-over land, ground hemlock undergrowth or other suitable food near at hand (2). In other words, recognition of complete or nearly complete natural units including all the types necessary for a species within its daily cruising radius is necessary to show where we can expect this species to thrive and to show where silviculture can often complete or improve the necessary conditions. A large area of even-aged old timber is, in itself, often a loss so far as most game species are concerned; but if this is broken up by cuttings which produce nesting grounds for grouse and hardwood browse for deer, cottontails, or white hares, the productivity of the area for game is greatly increased.

Having acquired an idea of the present capacity of the area for carrying game, the next step is to determine what breeding stock is present to utilize this capacity and where it is located. Here guesses are next to useless. Although accepted census methods have not been worked out for

some species, such as squirrels, most fur bearers, and rabbits, a systematic cruise of the area on good tracking snow gives a great amount of useful information and is surprisingly accurate as a census method, especially with non-hibernating species and low population densities. Good census methods have been worked out for game birds (5 and 6) and for deer in sections where they yard in winter. Any general census of an area should follow the methods of forest cruising, applying the number of animals tallied on the strip within a cover type as a factor to the stands of that type only, and making the percentages of total strip within types approximate the corresponding percentages of total area represented by these types. Censuses run at different seasons show the rate of increase and the use of different types and topographic units by the animals throughout the year.

The representation of sexes and ages should be included, wherever possible, in census work. This is especially important with species which are polygamous and in which only the male is killed, since it shows whether there are sufficient breeding males.

It is also very helpful to build up from old records and interviews with old residents a record of the species which formerly were present on the area, but which for one reason or another have disappeared. This may indicate species which can be brought back (3).

Following the inventory of breeding stock, the next step is calculation of the increase to be expected from this stock and the allowable kill, if any. This calculation depends on the biological potential or maximum increase with a given breeding stock, sex ratio, and brood or litter size. Practically, however, such a calculation applied without correction would come far from the actual increase. As a case in point, Bump has found that in New York from 100 ruffed grouse eggs only 12 birds mature under natural con-

ditions, and of these three are killed by hunters, leaving nine to go into the second year (1). Many factors enter into this actual rate of increase, such as climatic extremes, predation, condition of the breeding stock, etc. Also, it has been shown by King (3) that just at the peak of abundance of ruffed grouse the average size of egg clutch decreases considerably, and this continues during the decline in the cycle. Accurate prediction of increase of the species on an area makes necessary a good knowledge of the life histories and local habitat factors, but enough information is available to serve as a good guide.

Regulation of the kill of game is probably the most important problem in the management of our native species. It is also the one in which human relations figure most strongly. American hunting since colonial days has been based on the fact that wild game belongs to the state and becomes the property of anyone who obtains possession of it under the provisions of the state laws. With the intensive hunting which prevails over central and southern New England, it is obvious that attempts to build up a population of game on an area where hunting is not restricted would often be fruitless. The only answer in such cases seems to be in a limitation of the number of gun-hours of hunting allowed under a permit system. Such systems have been successfully used on many projects and are being used in some areas by the Forest Service in game management work (4).

As a means of evaluating the results, the calculations of allowable kill should be converted into money values. Whether this is done on the basis of meat, replacement, or recreational value is largely to be determined by the desires of the owner.

Game management is reduced to its simplest terms by Leopold in his statement that it consists of locating the limiting factor with a species on a given area and so changing the conditions that this factor is no longer limiting. This will,

naturally, make some other factor limiting if a still greater rate of game production is to be brought about.

Under New England conditions, food is very apt to be a limiting factor. It is true that some native species, such as the ruffed grouse and deer, can get through the winter by budding and browsing, but one only needs to consider the place taken by apples in their food as long as these are available to appreciate how much such a food means in preparing the animal for the winter period, with its poor diet. The effect on game of such work as that done in some sections by the C.W.A. men in hunting out and cutting down wild apple trees is obvious.

Any game management plan should provide that valuable food plants should be favored during silvicultural operations. Also, much harm to the game range can be avoided by leaving food plants wherever possible in trail, road, and fire line construction.

Where funds for such work are available, shrub and tree plantings for game food and cover offer attractive possibilities for waste areas, roadsides, fire line borders, etc.

Thinnings, weedings, partial cuttings, and group or strip cuttings all favor food production.

Cover is not often a limiting factor over large areas, but much can be done to improve individual stands by introducing coniferous groups into them. Planting of large solid blocks of conifers is not advisable from the standpoint of game, because only the edges can be used from the time the stand has been closed a few years until advance growth begins to come in.

Nesting sites for grouse are often lacking over large areas. Cuttings, with their slash and young growth, remedy this lack. Slash piles are usable as cover by cottontail rabbits for several years.

Cover suitable for roosting may be critical over large areas with grouse. They

require conifers for protection during extreme cold when there is little snow.

Diseases and parasites may be critical factors with certain species, but, aside from the sanitation measure of preventing high concentrations of the species, little is known of control measures.

Accidents such as snow crusts lasting for unusually long periods may at times cause serious decimation of game. Provision of abundant food near good coniferous cover is a good insurance against such calamities.

Non-breeding females are not apt to be a serious element in management in New England. However, as experience in Pennsylvania has indicated, this condition may become acute in case the older buck deer are hunted hard and only immature ones are left as breeders.

In conclusion we may say that plans for game management, no matter how well worked out, will produce little in the way of results unless those who apply its provisions are interested in game and try to understand its needs. Since forest growth and forest animals are inseparable, the forester has in his activities the means of either favoring or hindering the increase of game species. If an attempt is made to work out the life histories and peculiarities of the animals on a forest and to improve the conditions which are holding back their increase, great strides can be made toward more complete and profitable land use.

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UNIVERSITY OF FLORIDA DEPARTMENT OF FORESTRY

A DEPARTMENT of Forestry has been established at the University of Florida, with Harold S. Newins as its Head Professor.

Professor Newins (M.F. Yale'11) began his forestry teaching as an instructor in the Forestry Department at Oregon State College, and advanced there to the position of Professor of Forestry. He was in charge of inspection of airplane wood and dry kiln lumber at the New York District office of the United States Air Service during the World War. Following 5 years as Professor of Wood Utilization in the Forestry Department of Penn State, he became in 1929 West Virginia's first state forester. Two years later he returned to academic work at Michigan State College, where he was serving as Associate Professor of Forestry when he received the call to Florida. He assumed his new duties with the fall opening of the University. A two-year curriculum for rangers is offered those 18 years old or over who desire practical instruction preparatory to this type of work. Students entering degree courses may major in forestry in the College of Agriculture, but the degree B.S. in Forestry will not be offered until the faculty, equipment, and holdings reach the standard recognized as necessary to its being given thoroughly. Students completing the curriculum as now arranged can secure a forestry degree by one year's further study at a forestry school of standard rating.