AN EVALUATION OF THE FOREST RESOURCES OF THE BEAR MTN.-HARRIMAN SECTION, PALISADES INTERSTATE PARK

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JACK J. KARNIG CORNWALL-on-HUDSON, NEW YORK

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INTRODUCTION: Forestry reports are usually detailed accounts of a given forest wherein a great wealth of statistical data is presented. Species composition, growth rates, timber types, volumes per acre and many other technical matters make such timber cruises difficult to understand for the layman. To the forester, however, the collecting of such data in a periodic inventory is essential to the wise management of a commercial forest.

Realizing that the Bear Mtn.-Harriman Section of the Palisades Interstate Park is not a commercial forest, this writer feels that such a detailed description of the forests would be of small merit. Instead, it seems prudent to view many representative areas within the Park and to evaluate their present condition. Under scrutiny were such important factors as health of the dominant trees, soil stability and reproductive vigor of each important site condition. (1)

Knowing what past practices produced the forests on the Park and having viewed them together with thousands of similar acres of adjoining forests, this writer feels some predictions as to the character of the forest can be safely made for a period of from fifty to seventy-five years. Such predictions can only be made providing present management

(1) Refer to the attached map for the locations of places visited.

policies remain essentially similar in the future. This means that the greatest bulk of the land now forested will continue to be protected from cutting, from wild fires and from excessiv use by the public.

Forests, as we know them are fashioned by two basic influences: nature and man. Up until the creation of the Bear Mtn.-Harriman Section of the Palisades Interstate Park, the forests were drastically modified from time to time through frequent cuttings and occasional wild fires. This resulted in generally small timber mostly of sprout origin.

Fifty years of zealous protection of the timber resource under Park management has evolved what in forestry terms is called an even aged forest where, within certain limits, most of the dominant trees are about the same age. Typical of this even aged forest is some degree of size differentiation due to species mixture and micro-site variations. Also, if one observes closely, there is usually a deficiency of young seedlings in the understory. This is due to excessive shade cast by the dominant overstory of light-seeking trees.

Tree growth on the north and north-east aspects appear to be most thrifty and varied in composition. One such area visited was Turkey Hill Lake where such desirable species as tulip poplar, basswood, sugar maple and ash were conspicuous by their high representation in the well watered coves. Several other areas were forested with a similar mixture of trees. They were Deep Hollow, Anthony Wayne and parts of Island Pond.

It is hardly necessary to state that northern red oak is the most prevalent species throughout the park with chestnut oak also high on the list. These two species form the backbone of the two dominant timber types, namely chestnut oak on the dry sites and red or mixed oak on the remaining better quality soils.

Red oak, depending on various site conditions, is mixed with all other species in countless variations. On the intermediate growth quality situations it is nearly pure. On poorer soils it grades into chestnut oak, on the best sites red oak is dominated by sugar maple, tulip poplar, basswood and ash.

Some of the north slopes are heavily covered with hemlock. These evergreens, however, rarely attain much size when they grow any great distance from streams or other sources of abundant water.

Some mention should be made of growth rates since this is the type of information needed to estimate future trends. Increment borings were taken at random in one representative area (Anthony Wayne) on the very best specimens of large dominant trees. The result of these borings taken from a fifty acre area are tabulated below:

SPECIES	DIAMETER AT BREAST HEIGHT IN INCHES	NUMBER OF ANN. RINGS IN LAST INCH OF GROWTH
White oak	17	11
" "	19	12
Red oak	15	16
" "	21	9
Tulip poplar	19	10
Red oak	16	10
Tulip poplar	18	8
Chestnut oak	14	14
Tulip poplar	20	8
Red oak	14	8
Tulip poplar	17	10
Black oak	18	10
Red oak	16	9
	Approximate average	10 rings/inch

To translate the growth of 10 rings per inch to usable terms, we can say that in ten years an average thrifty tree will grow two inches in diameter. This is good growth by local standards but we should not become too optimistic since this is growth for only the very best trees growing under favorable conditions. We would be much safer and closer to reality by assigning a growth rate of about one-half of the above rate to the average tree situated within the Park.

At the modified rate of one inch growth in diameter for each decade, a ten inch tree would be fourteen inches in diameter in the year 2000. We can hardly expect, therefore, that for the remainder of the 1900's and well into the 21st century that the forests within the Park will have reached their biological maturity. Until this age is reached, there seems to be no reason for concern over the maintenance of adequate forest cover in currently wooded areas.

Scattered throughout the Bear Mtn.-Harriman Section of the Palisades Interstate Park, this writer observed coniferous plantations which appeared to be about forty years of age. These plantings, due in part to species composition and site quality, have developed to diverse degrees of quality. The plantations growing within the new picnic area at Anthony Wayne have surprisingly thrifty individuals of red pine and larch even though they have been untended since planting. Fortunately, some hardwoods managed to compete on even terms with the conifers, thus, an ideal mixture was obtained. Other plantations are overcrowded and have stagnated. Ultimately, these unthrifty evergreens will disintegrate and little more than trash will succeed them as the future forest.

If any timber operations beyond outright salvage can be justified within the Park, the best of these plantations should be thinned for usable timber products such as poles and posts. Such operation, if carefully handled by Park personnel, could be aesthetically acceptable and the products cut could find ready use on the premises.

It would be advantageous to have a forester mark these plantations for selective thinning, since little benefit would result from too light a cut and a severe thinning might induce storm damage and insect outbreaks.

Sizeable tracts of land were acquired by the Park as recently as thirty years ago. One such area is located on the north and south sides of Baileytown Road. These lands were largely open fields or partially forested pastures at the time ownership reverted to Palisades Interstate Park. It is significant that very little natural tree growth is becoming established in these open areas. Only one basic reason is apparent for this lack of tree growth within such openings and that is high deer concentrations. To a lesser degree, this heavy deer use, based on the condition of the understory, is observable on many of the south facing slopes where deer normally bunch up during periods of deep snow.

Deer are naturally attracted to these abandoned fields since they, like all other wildlife, find food and cover most abundant along edges. They are also attracted to green grass along highways during spring and fall when motorists see them

and deduct that visible deer represent an enormous population which must be hidden in the woods. Couple this with the fact that Bear Mtn. Park deer have no reason to fear man, it follows that it is perfectly natural to see large numbers of whitetails and then to assume staggering over-populations.

Floral evidence makes it quite clear that the deer "problem" is not one of total numbers but of distribution. The abundance of sprout, sapling and other woody growth follows a definite pattern. Within and adjacent to openings, some significant overbrowsing is noticeable. However, the total acreage of this condition is small compared to the vast interior wooded expanses of the Park where the impact of deer on the vegitation is barely discernible. One such area is the Island Pond region where pedestrian traffic is quite low and the forest canopy is almost unbroken. Here there is an abundance of underbrush composed of laurel, hemlock, white pine and countless native broadleafed species.

Although the above mentioned Island Pond area was given as an example of an apparent low deer population region, it is only one of several localities which show light evidence of deer browsing. Other representative areas include: Turkey Hill Lake, Deep Hollow, Owl Lake, Lake Stahahe, Pine Meadow and Breakneck Pond.

Forest resources invariably depend upon soils, water and climate for their normal development. Man has little influence upon water relationships except for building impoundments and occasionally diverting water for his own use. Over climate,

fortunately, or otherwise, he has no direct influence. Soils, however, have often been abused to the extent that erosion has become an unchecked cancer in some localities. Within the Park no evidence of soil erosion was evident except for some heavily traveled paths within some of the older campsites. Since this is a problem created by original layout and aggravated by lack of remedial action, the author will not profess to being a park planner and propose solutions. It is my impression that corrective action of any kind would be expensive and this consideration alone would preclude action in this direction.

RECOMMENDATIONS:

The natural product of any evaluation of a condition, such as described above, would be the development of a set of guides for directing future management practices. A few specific forestry oriented ideas which should be incorporated by the Park management in the near future are as follows:

1. Build two deer exclosures of woven wire fencing at least twelve feet high, each covering an area of at least one quarter of an acre. One of these should be installed in an open field site, the second in an average forested area. At the time of installation, permanent survey sample plots of vegetation should be established to record plant conditions and characteristics both within and immediately outside each exclosure. Annual or bi-annual remeasurements should be made of the sample plots in order to determine if deer are in reality causing a significant modification in the quality and quantity of the biologic complex.

2. Protection of ornamentals from buck rubbings along the Parkway and other heavy use arteries could be improved by the simple procedure of driving two $1\frac{1}{2}$ x $1\frac{1}{2}$ inch stakes into the ground directly alongside and on opposite sides of each sapling. Buck deer will be discouraged from polishing their antlers on saplings protected in this manner.

3. Deer populations within the Park do tend to level off at a point where their numbers are equal to the carrying capacity of the range or the areas they most normally frequent. One exception to the above is caused by periodic hard winters when unknown numbers of deer perish from exposure. This will create a below normal population for a year or two. In order to maintain a somewhat reduced overall herd (if this is desirable), and to discourage the tendency of deer to congregate along the edges, killing all cut tree stumps with an herbicide should be initiated. Starting such a program on a Park-wide basis would materially reduce available browse, particularly in those areas where construction is under way or just being completed. Stump treatment should be applied in the form of 2 4 5-T or ammate in kerosene or fuel oil. Elimination of sprouts will aid the appearance of the forest adjoining new developments and more important, their reduction will aid in distributing deer more evenly over the entire Park.

(Signed) JACK J. KARNIG
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