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ATLANTIC WHITE-CEDAR BEING ELIMINATED BY EXCESSIVE ANIMAL DAMAGE IN SOUTH JERSEY

Atlantic white-cedar, which grows in the swamps of the New Jersey Pine Region, is a prized timber species. Most areas now growing white-cedar have been clearcut 4 or 5 times since 1700. In contrast, the associated swamp hardwoods—red maple, blackgum, and sweetbay—rarely produce wood that is valuable enough to harvest.

In bygone days white-cedar was used for shingles, siding, boat boards, posts, poles, and similar products. Today it is not much used for shingles or siding, but is still used for posts, poles, and boat boards, and much of it now goes also into paneling and into rustic furniture and fences. The dense stands that this species forms provide not only a valuable timber crop, but also an aesthetic attraction to tourists and an excellent habitat for wildlife, especially deer.

Present evidence clearly shows that, because of excessive damage by wild animals, white-cedar is not forming new stands in many areas after clearcuttings or killing wildfires. Rabbits clip the small seedlings, and deer so relish the twigs and foliage as winter browse that, in areas where the deer population is high, many white-cedars are killed and the survivors are reduced to stunted bushes.

Effects of the excessive deer pressure on white-cedar reproduction are shown by a small study established on the Wharton Tract in September 1955. The study site was a swamp where a stand of white-cedar trees

Figure 1.—Ten years after the fire: left—fenced plot; right—unfenced plot. The two foreground cedars in the fenced plot are about 12 feet tall, and many others are taller than the man.

ranging from 3 to 7 inches d.b.h. had been killed during a large wildfire in July 1954. In September 1955, two small plots, each about 20 feet square, were established; one plot was fenced against deer and the other was left open. Tallies of twenty-five 1/4-milacre quadrats in each plot showed an abundance of white-cedar reproduction at that time: 210,720 seedlings per acre in the fenced plot and 111,520 seedlings in the companion unfenced plot. All quadrats in the fenced plot and 96 percent of those in the unfenced plot were stocked to white-cedar.

Nine years later the fenced plot still had more than 57,000 white-cedar seedlings per acre, and 96 percent of the 1/4-milacre quadrats were stocked. But in the unfenced plot the number of white-cedars had dropped to

1,440 per acre, and only 20 percent of the quadrats still had white-cedar seedlings. Already the number and distribution of seedlings in the unfenced plot were too poor to form a well-stocked stand.

Height differences were even more marked. The average height of the tallest white-cedars on stocked quadrats in the fenced plot in 1964 was 7.6 feet, as compared to 1.5 feet in the unfenced plot. On the basis of 1,600 well-distributed dominants per acre (the number of trees often found in well-stocked merchantable stands 45 to 50 years old), the difference was even more marked: the average height of these dominants in the fenced plot was 10.3 feet, or about 7 times the height of the browsed and mutilated dominants in the unfenced plot (fig. 1).

The differences between the two plots in white-cedar stocking and growth are attributed to deer. In both plots rabbits clipped many of the seedlings, but rabbits do not uproot the young plants, and they seldom clip stems more than 3 years old. Deer continue to browse white-cedar trees as long as they can reach the foliage. They also uproot many small seedlings because they tend to jerk the twigs sharply when browsing, and the young seedlings are poorly anchored in the moss and soupy peat of the swamps.

The importance of deer browsing in white-cedar regeneration is shown not only by these two small plots, but also by the regeneration developing in other swamps that were burned during the same 1954 wildfire. Even though this fire covered 19,500 acres and thus provided a tremendous amount of fresh browse in pine seedlings, pine and hardwood tree sprouts, and shrub sprouts, the pressure on white-cedar regeneration has been overwhelming. We estimate that about 500 acres of white-cedar stands were killed by this fire, and our observations indicate that the white-cedar reproduction starting on these sites in 1955 ran around 150,000 seedlings per acre. Today little of this reproduction can be found. Only in rare spots, as where a tangle of windthrown fire-killed trees has provided protection, do white-cedars occasionally give promise of being a part of the next stand.

The evidence is incontrovertible that excessive deer browsing is now eliminating Atlantic white-cedar from many swamps in the New Jersey Pine Region where the species had maintained itself fairly successfully through three centuries of the white man's cuttings and fires.

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