

TREE REGENERATION AT HOLT RESEARCH FOREST: IMPACTS OF RED MAPLE REMOVAL AND WHITE-TAILED DEER BROWSING

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Tree regeneration was measured at Holt Research Forest in 1997 and 2002 to assess the response to a group-selection harvest in 1987/1988. Circular 25m² (0.006 acre) plots were located in canopy openings of three types (harvest gaps, ledge gaps, and tree-fall gaps) and in control areas with intact canopy. All trees >0.5m in height and less than 9.5cm DBH were tallied by species and damage by deer browse or white pine weevil were evaluated. Data was used to assess the differences between gap types and intact canopy, the changes in densities between sampling period, the effectiveness of a 2001 removal of red maple stump sprouts, and damage affecting the development of the regeneration.

In all gap types, white pine was the dominant species with densities of 780 to 2000 stems/ha. Yellow birch densities were high in harvest gaps (1800 stems/ha) but low in ledge gaps and nonexistent in tree-fall gaps. Balsam fir (986 and 795 stems/ha) and white pine (679 and 826 stems/ha) were the dominant species in intact forest. Red maple densities were high in all locations except ledge gaps and seed generated and stump sprouts were of equal density in 1997 in the harvest gaps.

In the harvest gaps, all hardwood species, except witch hazel, declined while white pine, red spruce, balsam fir, and hemlock all increased. The combination of a TSI and natural mortality resulted in a 69% reduction in red maple density. Our objectives were to reduce the red maple component to allow other species a chance to become established. No detectable response attributable to the TSI was expected in the first year. Densities remained relatively stable in other gap types and the intact canopy with no dramatic changes except decreases in red oak in tree-fall gaps and intact forest.

Noticeable damage due to white pine weevil was present in 4% of stems in 1997 and 27% in 2002, as the white pine ages it becomes more susceptible. Damage due to deer browse was detected in over 60% of red and white oak stems while in other hardwoods the rates were 3% or less in 1997. In 2002, these numbers remained about the same for oaks while deer increased their browsing on other hardwood species significantly. As red and white oak densities were reduced from 1997 to 2002, most likely because of browsing induced mortality, deer were forced to rely more heavily on other species. Deer populations have been shown to be steadily increasing over the last 10 years so these impacts will continue and the difficulty of establishing oaks will likely become more problematic as has been the experience in areas south of Maine.