

Plant Enhancement Activity – PLT24 – Crop tree release in young hardwood stands



Enhancement Description

Crop Tree Release (CTR) in young hardwood stands is a silvicultural technique used to enhance the health and productivity of individual trees, while improving other resources such as wildlife habitat, recreation, timber value, and aesthetics.

Land Use Applicability

Forestland

Benefits

CTR is a practice that speeds the growth of desirable crop trees by selectively cutting or killing less desirable competing trees in younger, overstocked forests. Overstocked forests often become unhealthy due to a lack of air circulation and the stress that crowding produces as trees compete for resources. Availability of sunlight is often the most limiting factor for tree growth. When crowns of adjacent trees touch each other, growth rate is reduced. By cutting/killing unwanted trees whose crowns are touching the crown of crop trees, more space is created for crown expansion. Additional wildlife benefits include increased mast and forage production, and habitat diversification both at ground and canopy levels.

Conditions Where Enhancement Applies

This enhancement applies to hardwood forest land use acres with non-merchantable trees that are crowding potential crop trees in an overstocked forest and which has a Forest Management Plan that recommends a thinning within the next 3 years.

Criteria

Implement the following actions on young, pre-commercial stands (trees that are too small for market), with diameters ranging from 4 to 8 inches (measured at 4.5 feet above the ground). In older, larger diameter forest stands, CTR is a commonly used commercial practice not included in this enhancement.

1. Develop a CTR plan which includes:
 - a. Priority for the most productive forest sites (e.g., site classes I-III) first, and less-productive sites (e.g., site class IV and below) second.
 - b. Identifies the number of crop trees to be retained based upon site productivity and the corresponding spacing guide developed within each state for the existing tree species.
 - c. Base spacing upon the most abundant tree species, if more than one tree species are present. Suitable species will vary by state or region of the country.
 - d. Incorporates the landowner’s objectives for the forest. This includes desirable species, with desirable growth form (straightness) and grade (lack of defects).



- e. Retain a mixture of tree species to reduce the potential of an epidemic event (e.g. insect outbreak) that may kill some/all trees, as applicable.
2. Identify trees that meet landowner objectives and have good future growth potential. This includes desirable species, with desirable growth form (straightness) and grade (lack of defects).
3. Crop tree crowns should be in the upper level of the forest canopy, and not suppressed by other tree crowns.
4. Mast-producing trees should be favored for retention, both as crop trees and non-competing trees.
5. Dead trees may be left standing to provide wildlife habitat, or cut down to become downed dead wood on the forest floor.
6. Apply to the best forest sites, with a suitable number of desirable trees retained. An average of 25-35 crop trees per acre are needed to merit application of this activity. Suitable species may vary by state or region or according to landowner objectives. Often, species in the white and red oak groups have both a high timber and wildlife value and are a high priority for retention and release.
7. Cut or kill all trees whose crowns touch the crown of the crop tree on three to four sides. Special note: cut/kill only those trees whose crowns are affecting the crop trees. Trees that are not touching a crop tree crown or are below a crop tree crown should be retained. These additional trees help to protect crop trees from wind damage and epicormic branching (unwanted branching on the lower bole), and provide diversity for wildlife habitat.
8. As applicable, additional actions include:
 - a. Cutting damaging vines away from crop trees
 - b. Treatment of invasive plants that may be stressing crop trees
 - c. Pruning side branches of crop trees

Adoption Requirements

This enhancement is considered adopted when each criteria has been implemented on the land use acre.

Documentation Requirements

1. Copy the CTR plan including the pre-treatment conditions and the post-treatment conditions.
2. Representative digital images/photos of the area showing before and after treatment conditions.

References

Miller, G.W. 2000. Effect of crown growing space on the development of young hardwood crop trees. *Northern Journal of Applied Forestry* 17(1): 25-35.

Miller, G.W., J.W. Stringer, and D.C. Mercker. 2007. Technical guide to crop tree release in hardwood forests. Publication PB1774. University of Tennessee Extension, Knoxville, TN.

Perkey, A.W.; Wilkins, B.L.; and Smith, H.C. 1994. Crop tree management in eastern hardwoods. NATP-19-93. USDA Forest Service, Northeastern Area State and Private Forestry, Morgantown, WV.