

## AMP C1: CROP TREE MANAGEMENT

### Strategic Management Opportunity Category(s): FDCV12

**Primary Objective:** To maintain or increase the production and availability of storable mast (usually acorns) within a registered management compartment.

The following is for the most part adapted from: **Crop Tree Management in Eastern Hardwoods**  
[http://www.fs.fed.us/na/morgantown/frm/perkey/ctm/ctm\\_index.html](http://www.fs.fed.us/na/morgantown/frm/perkey/ctm/ctm_index.html) (accessed 7-20-09)

Crop trees are enhanced by removing other trees whose crowns touch or extend above or below their crown. This provides the crop trees with more sunlight, moisture, and nutrients, allowing them to grow more rapidly. For *N. magister*, this will commonly involve removing red maples and black birch to allow the canopies of adjacent oaks (or hickories if you can find them) to expand and grow more rapidly. The highest priority crop trees will be those that rain acorns or hickory nuts into rock crevices that are accessible to the rockrat, but not to larger species like deer.

Sources of winter storable food may impact both the survival and reproduction of *N. magister*. Crop Tree Management can benefit NEMA by increasing production of mast from individual trees. The greatest mast production within a stand comes from dominant and codominant trees. Intermediate or suppressed trees produce very little mast because their crowns receive limited sunlight. By removing trees with small, sparse crowns, we allow trees with large, healthy crowns to expand and produce more mast. The important thing to remember when releasing mast producing trees is to expose as much crown-surface area to sunlight as possible. One large, released crown produces more mast than two or three small crowns on trees of the same species. Remove those trees that when they are cut will leave from 5 to 20 feet of open space on at least 2 sides of the crop tree crown. You may need to remove only 1 or 2 adjacent trees to properly release a crop tree. Trees to be removed may be cut down or girdled and left standing.

#### BOX 1

Adapted from:

[http://www.myminnesotawoods.umn.edu/forest/fore\\_thinning.html](http://www.myminnesotawoods.umn.edu/forest/fore_thinning.html)

Crop tree thinning for *N. magister* involves carefully maximizing the growing space available to the best or potentially best hard mast producers in the stand. Crop tree thinning involves the following steps:

1. Walk through the stand and identify the trees with the greatest potential future value. These are your crop trees. Mark your crop trees using flagging tape. "Value" for NEMA primarily means hard mast producers (primarily oaks and hickories) and a variety of tree species.
2. Identify any trees (concentrate on common species like black birch and red maple) that are in direct competition with your crop trees. To identify competing trees, look up at the crowns. Any tree with a crown that's touching the crown of your crop tree is competing with it.
3. Remove some or all of the competing trees. Be careful not to overdo it. If your crop trees have been growing under intense competition for years, they could be shocked and stressed if all trees around them are removed at once.

Crop tree release can begin when trees are 3" to 4" in diameter, but can still be effective when trees average up to 12" in diameter. The best time to select crop trees is in the fall when you can see which oaks, and hickories are producing the heaviest mast crops. If none of the trees are producing mast, which can happen because crops are sporadic, look for trees with large, healthy crowns.

## Neotoma magister Management Workshop: Adaptive Management Practices that Stress Cutting

A study at the West Virginia University Forest near Morgantown compared acorn production of released trees to that of unreleased trees. In an average acorn crop year for white oak, the production of acorns from individual released crop trees was seven times that of unreleased trees. For red oak in a poor year for acorn production, individual released crop trees produced double the acorns of unreleased trees. When the increased production for both species was evaluated on a per-acre basis, there was twice as much mast produced on the areas where the crop trees were released as there was where they were not. Although soft mast, catkins, and buds are important sources of food for many species of wildlife, hard-mast producers are usually preferred for selection as crop trees over soft-mast producers. Hard mast is generally available for a longer period of time, and, because it is a winter-storable food, it is critical for some wildlife species.

White oak acorns are generally preferred over red oak acorns by many species of wildlife. However, they are available as food for a much shorter period of time. They germinate in the fall rather than in the spring, which limits their usefulness as a winter food source. Red oak acorns are not as tasty to wildlife as white oak acorns, but they are often more abundant. They do not germinate until spring, so they are an available food source for a longer period of time. Some species produce more mast than others. For example, on the average, red oaks produce more than either chestnut or white oaks both of which produce more than black oaks. The average red oak between 14 and 16 inches dbh produces two or three times as much mast as the average black oak of the same size. Some trees habitually produce more mast than others of the same species, crown condition, and canopy position. This is probably because of genetic variation. If adequate management time is available, these historically-reliable mast producers can be found by visiting the woods during several successive seasons and observing which trees yield the greatest crops. These top producers can then be targeted for selection as wildlife crop trees. Unfortunately, this intensity of management for mast production usually requires more lead time than many landowners and foresters have available.

Frequency of good seed crops is another mast-production consideration. Red, black, and scarlet oak tend to have good seed crops more frequently than white and chestnut oak. Hickory has good seed crops more frequently than oak. Abundance of mast production can vary by species in different regions of the Country. Frequency of good seed crops is another mast-production consideration. Some species optimize production at a larger diameter than others. For example, the average white oak will be 20 to 22 inches dbh before it produces as many pounds of mast as a red oak 16 to 18 inches in diameter. If you are working with a young stand, remember that chestnut oak may start yielding acorn crops at an earlier age than many other oak species. Having a mixture of mast producing species is the best way to minimize the probability of a total mast-crop failure.

### MORE INFORMATION

- Technical Guide to Crop Tree Release in Hardwood Forests  
<http://www.utextension.utk.edu/publications/pbfiles/PB1774.pdf>
- Crop Tree Field Guide: Selecting and Managing Crop Trees in the Central Appalachians  
<http://www.na.fs.fed.us/pubs/ctfg/index.pdf>