

# **Multiple-Use Forest Management Plan**

for

## **Black Hawk Park: North Area**

Revised: December 15, 2010

Original: 12/23/2009

### **Statement of Management Goals**

The overall goal of this undertaking is to manage the forest for sustainable, multiple-use forest benefits, including recreation and beauty, wildlife habitat, environmental benefits, and forest products. The practices and techniques recommended in this plan aim to optimize this complex suite of benefits in a sustainable fashion.

Recreational activities include game hunting, bird watching, hiking/walking, mushrooming, and simply enjoying nature. The park has a very high use rate by citizens of the County and maintaining or improving the quality of users' experience is of highest priority.

The provision of high quality habitat for wildlife, both game and non-game species, is also a very high priority of management efforts.

Basic environmental services that the forest can provide include air, soil, and water quality protection, floodwater attenuation, plant & animal biodiversity, and carbon sequestration. Under no circumstances should management activities compromise the ability of the forest to provide these services.

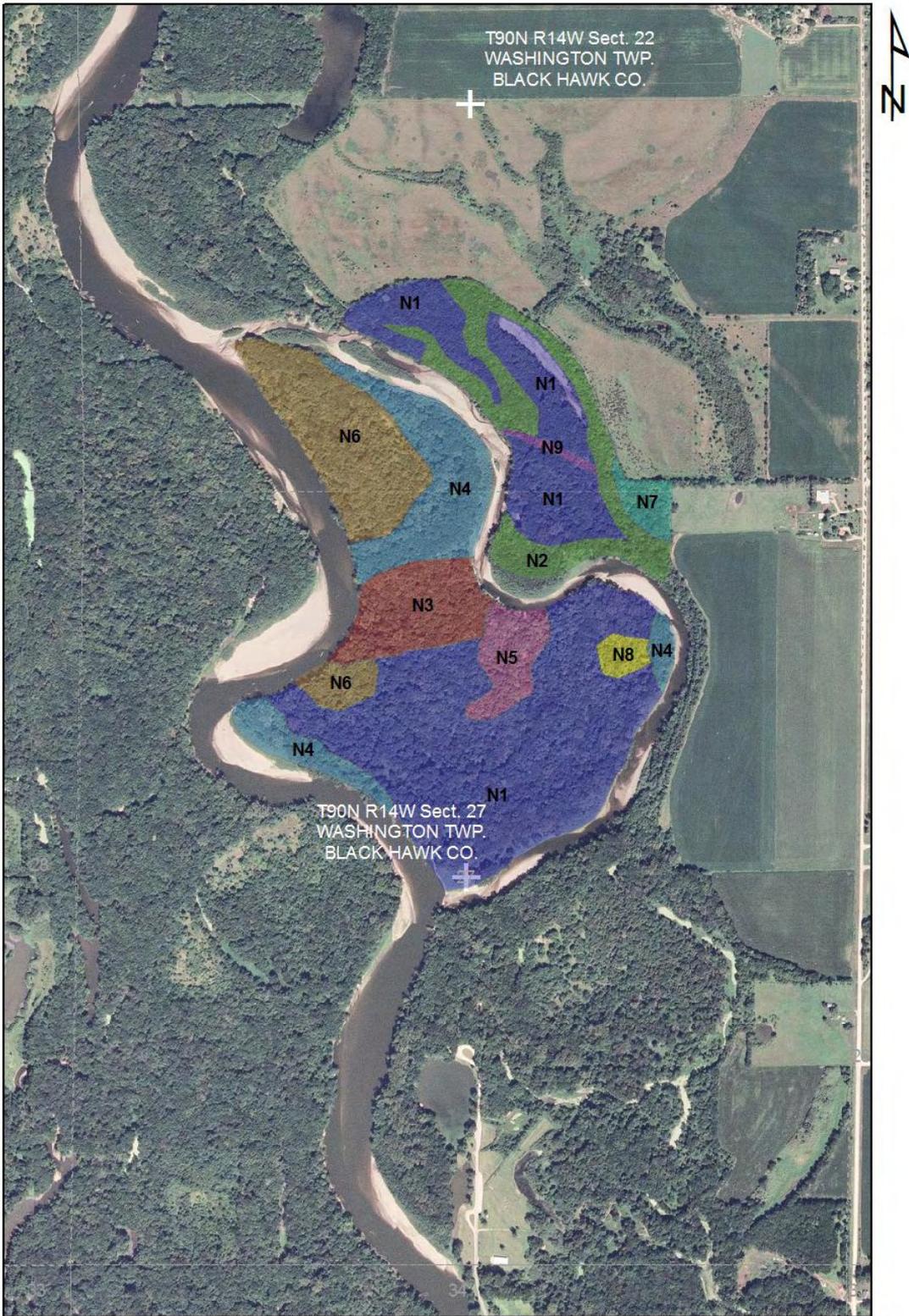
The provision of commercial forest products/timber from the park is recognized as a way to salvage value from a renewable resource that will otherwise be lost to Mother Nature's natural processes. Carefully planned timber harvests create a natural patchwork of different forest successional stages (young, middle-aged, and old) which will improve forest wildlife habitat diversity and overall ecosystem stability.

### **Overview of the Forest**

In this portion of the park, 170 acres of forest were observed in the field to assess the current conditions in terms of age-class structure/successional stage, species composition, forest health, and management needs.

The forest was divided into 9 different "stands" or management compartments, labeled on the first map "N1" through "N9." Each stand represents a unique situation in terms of the species mix, age-class/successional stage, canopy layering, and/or management needs. A description of each stand is given in the Appendix of this plan.

In general, the forest contains bottomland species native to this part of Iowa, including silver maple, cottonwood, willow, green ash, American elm, honey locust, bur oak, hackberry, and walnut. Kentucky coffee tree, eastern red cedar, black maple, and other species which are unusual for this environment can also occasionally be found where soils are exceptionally well-drained and flood waters do not persist too long. Tree sizes vary from saplings to overmature



**Black Hawk Park Forest Units (North Area)**

1 inch = 1,100 feet

sawtimber trees 40” in diameter, and stands vary from pure even-aged cohorts to 2-aged to multi-aged forests.

### **Management Strategy**

Forest management aims to mimic Mother Nature’s processes in order to attain our stated goals. Forest management involves three basic activities over the course of a forest’s lifespan: 1) planting/tree initiation; 2) tending the forest for optimal growth & health (Timber Stand Improvement, or TSI); and 3) harvest/regeneration.

1. Planting/tree initiation can be accomplished using both natural techniques (seed from surrounding trees) and/or artificial means (seedling planting) to achieve the desired mix. Soil & water table conditions will largely determine species mixtures, with silver maple & cottonwood stands occupying low-lying clays and hard-mast trees (oak, walnut, coffee tree) being planted on higher/sandier ground.
2. Timber Stand Improvement, or TSI, is a broad term used to describe a variety of cultural practices used to enhance a woodland for a specific objective. TSI is a non-commercial activity --- it does not generate income, but rather is a management expense. In this plan, TSI will usually mean one of two things:
  - a. Crop tree release: thinning that is done in young, immature stands of trees (4”-14” in diameter) where trees are spaced too closely and are crowded. See technical description of “Crop Tree Management” in appendix.
  - b. Weed tree removal & culling: thinning that is done in older, mature stands to eliminate unwanted species and make more space for new, desirable trees to start growing. See technical description of “Weeding & Culling” in appendix.
3. Harvest/Regeneration is done in such a way that mimics natural disturbance patterns in nature, in both frequency and magnitude, so that old trees may give way to new ones. Natural disturbances that affect Iowa’s forests include mortality by lightning strikes, tornados and windthrow, ice & snow overload, hail, disease & insects, fire, and flooding. A selective harvest of dying & declining trees every 15-20 years captures the natural mortality that would be likely to occur on old trees, and ultimately creates a more balanced forest of small, medium, and large trees. When choosing trees to harvest, those which are healthy enough to survive another 20 years are usually left; high-risk trees, on the other hand, may be cut. Efforts are made to create a mosaic of both small openings (single tree mortality) and larger clearings (group mortality) for both sun-loving and shade-loving trees. Standing dead trees (snags) or living trees with active cavities/nests/dens are left for wildlife use.

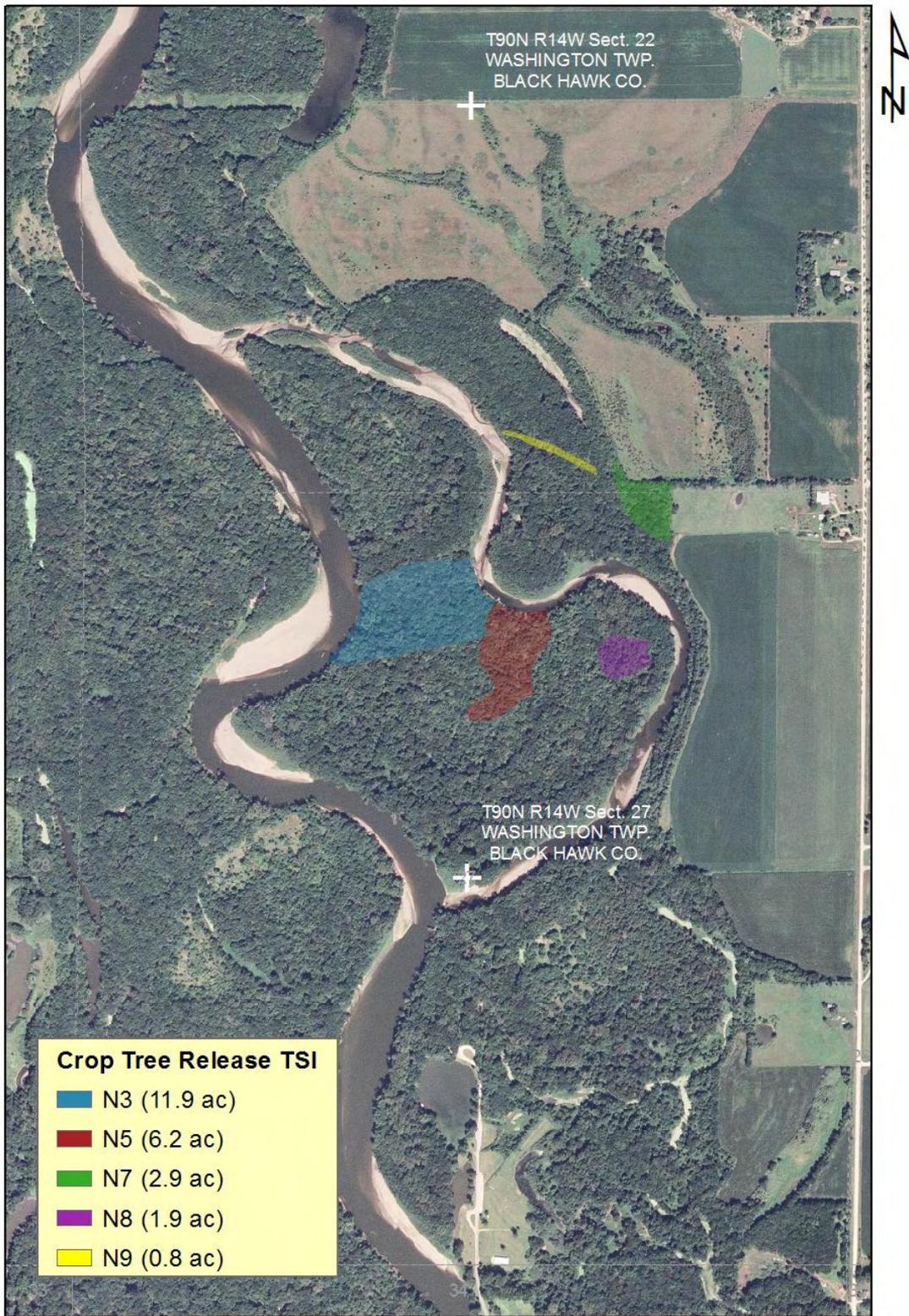
### **Management Priorities**

In summary, the break-down of management priorities is as follows:

#### **170 acres total**

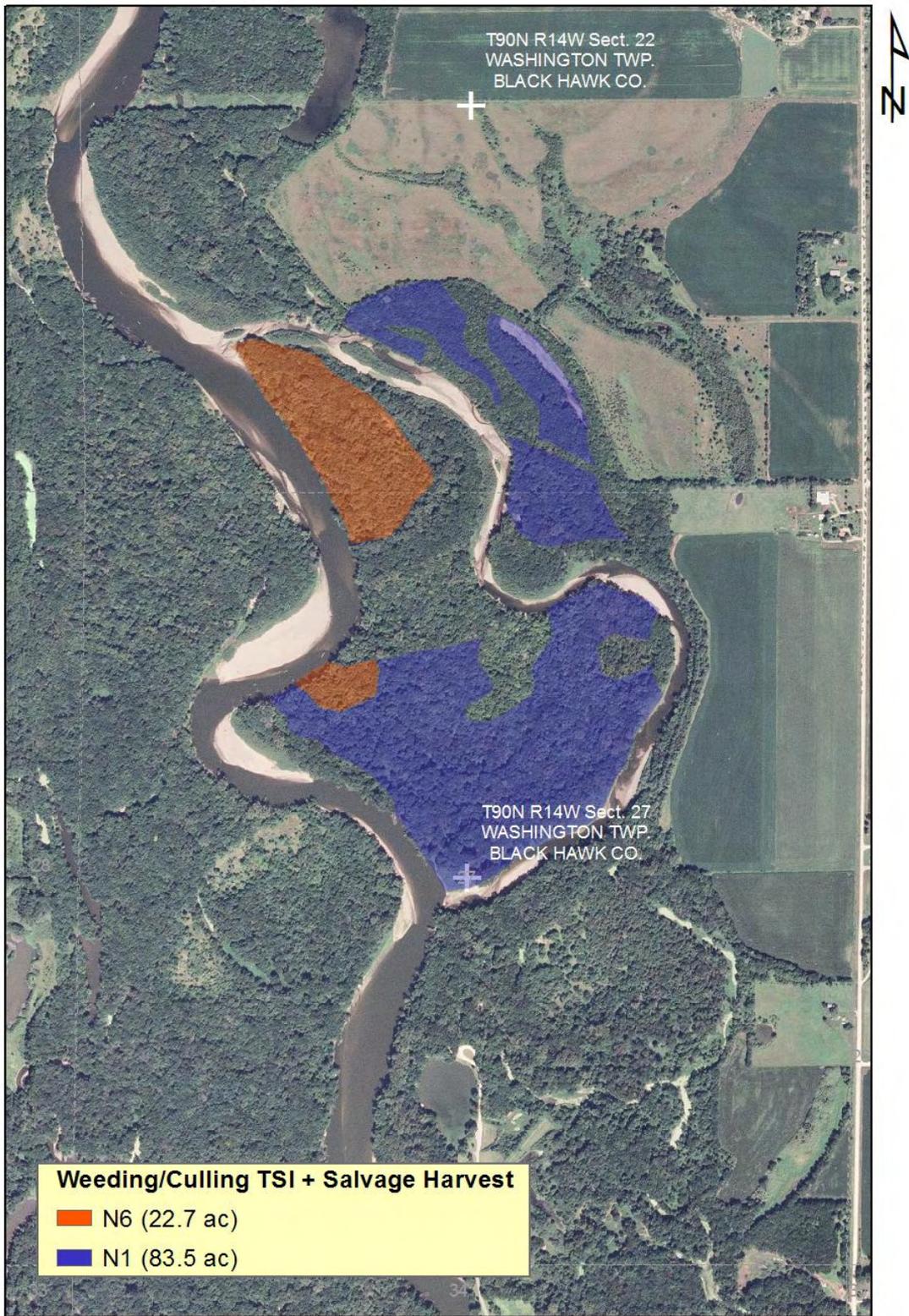
- 23.7 acres are in need of Crop Tree Release TSI (highest TSI priority) (Stands N3, 5, 7, 8, and 9)
- 106.2 acres are in need of Weeding & Culling TSI, and may have potential for salvage commercial harvesting (Stands N1 and N6)
- 40 acres is healthy and growing and doesn’t call for immediate attention (Stands N2 and 4)

The enclosed maps depict the geographic locations of stands with high management priorities --- that is, TSI and harvesting opportunities.



**Black Hawk Park Forest Units (North Area)**

1 inch = 1,100 feet



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**Short-Term Management Schedule**

- Winter 2010: Mark trees for selective harvest in Stand N6; following harvest operations, conduct weeding & culling TSI
- Winter/Spring 2010: Conduct crop tree release TSI in Stands N3, N5, N7, N8, and N9 (23.7 acres)
- Fall 2011: Depending on status of harvest/TSI in N6, consider moving on to another selective harvest + TSI on approximately half the area of Stand N1
- Fall 2012-2013: Conduct selective harvest + TSI in remaining portion of Stand N1 once all TSI operations are complete in previous stands

**Long-Term Management Schedule**

- Repeat the cycle of selective harvests and weeding & culling TSI every 20 years or so
- Stand N4 (22.5 acres) will be nearing maturity in approximately 2020, and can begin undergoing harvests & TSI
- Stand N2 (17.5 acres) will near maturity in approximately 2030

### Description of Individual Stands

**N1** of 83.5 acres is a multi-aged stand of mixed bottomland hardwoods. Isolated large silver maple & cottonwood trees 30-40" diameter can be found scattered about. They are generally falling apart & dying, becoming good "snags" for wildlife. Over the past 50 years, new generations of mostly shade-tolerant trees have begun filling in the gaps since livestock grazing ceased, with the majority being 6-12" diameter elm, ash, hackberry, and honey locust. Some 12-18" silver maple, ash, locust, & elm are also scattered about and represent the only commercial timber potential at this time. *Recommendation:* The stand can be allowed to continue as a multi-canopied/multi-aged forest of elm, ash, locust, and hackberry, with occasional pallet log salvage harvests (selective) occurring at irregular intervals. Perform TSI weeding & culling in concert with all harvests to eliminate undesired trees.

**N2**, 17.5 acres, is relatively pure even-aged silver maple & cottonwood of fairly good quality. The average diameter is between 8-11", meaning the trees are roughly 1/3 to halfway through the rotation. The stand could be thinned using TSI techniques, but with the fast growth rates of these species, it is not necessary in my opinion. *Recommendation:* let grow and consider harvest/regeneration in approximately 20 years.

**N3**, 11.9 acres, is a 2-aged stand. The older generation are 25-30" bur oaks spaced far apart, and the second generation (~50 years old) contains a diverse mixture of polesized (4-11") hardwoods: hackberry, elm, cedar, basswood, walnut, cherry, and the occasional oak & hard maple. Prickly ash and brush are abundant & thick on the ground. *Recommendation:* perform crop tree release TSI for the very best & most desired hardwoods.

**N4**, 22.5 acres, is another pure even-aged stand of cottonwood w/ some silver maple. Average diameter runs 12-18", putting this stand closer to a harvest in approximately 10 years. *Recommendation:* Let grow for another 10 years or so, then harvest & regenerate.

**N5**, 6.2 acres, is a cedar thicket that acts as excellent bedding cover for wildlife. Mixed hardwood poles (same as found in N4) accompany the cedar. *Recommendation:* Perform crop tree release TSI for the best young hardwoods.

**N6**, 22.7 acres, has some excellent large walnut trees 22" and larger. Many have suffered damage from floods around the base and show incipient decay. The understory/regeneration is occupied by hackberry, elm, and ash. *Recommendation:* harvest & sell the high-risk trees that are merchantable by lump-sum sealed bid auction. Then conduct weeding & culling TSI after the operations is done.

**N7**, 2.9 acres, is a very nice 2-aged stand of old growth bur oak over young upland hardwoods growing on well-drained soils. 10-14" diameter black walnut & cherry are prevalent, along w/ locust, hackberry, elm, and boxelder. Invasive bush honeysuckle is present as well. *Recommendation:* perform TSI crop tree thinning & pruning, and kill invasive honeysuckle.

**N8**, 1.9 acres, is a small patch of poletimber bur oak & walnut. This area contains the only significant number of young oak trees in the entire 134 acres that we could find. Therefore,

it warrants attention to make sure they are not outcompeted by other less desirable species.  
*Recommendation:* Crop tree release TSI.

**N10**, 0.8 acres, is an old linear fenceline/dike which contains a strip of excellent young walnut trees all along it. The trees can be cultured for higher value & increased growth and vigor along with stands N8 & 9 using crop tree release TSI.

## Technical Description of TSI Thinning Operations

Timber Stand Improvement activities will center around two themes: 1) thinning overcrowded young or mid-rotation stands to achieve optimal spacing for health & fast growth; and 2) weeding & culling in old/mature stands at or just before harvest time. A description of each process is provided below.

### Crop Tree Management

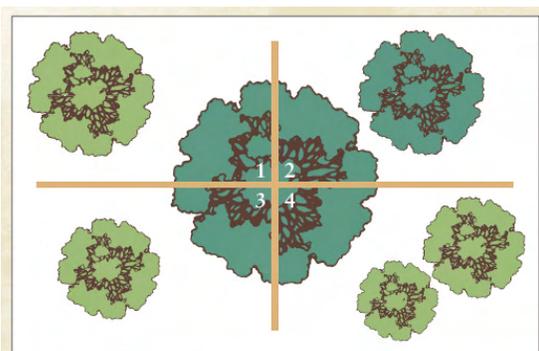
Crop tree management is the process of selecting and managing specific trees to maturity in a woodland. At maturity, there is only room for 40-50 large, dominant trees per acre. Practicing crop tree management involves pre-determining which trees in your woods will be these final 40-50 trees. The selection process should begin when the trees are still young and in the pole-sized stage (4-11 inches diameter), but can be applied to older stands in certain situations.

Crop trees can achieve multiple objectives of providing wildlife value, timber production, and overall stand diversity. With this in mind, crop trees should always be selected based on the following core attributes: species, form, health, and crown:

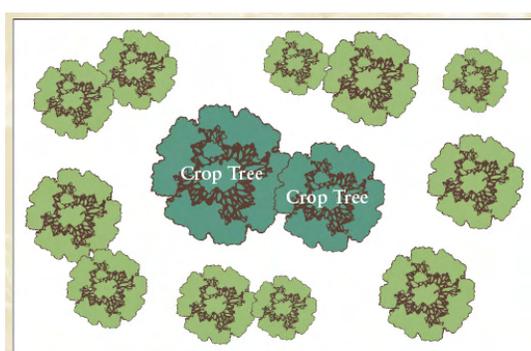
- *Species:* Favor oaks & hickories for their wildlife benefits, and silver maple for its sawtimber value. Avoid choosing elms as crop trees since they have a limited lifespan.
- *Form:* Choose only trees that have strong central leaders and strong crowns. Don't select trees with forked stems, narrow branch angles, or crooked trunks unless.
- *Health:* Select trees that have good health and predictably long lifespans. Avoid choosing trees with signs of disease or decline, dead limbs, epicormic branches, or long-lasting damage.
- *Crown position & size class:* Crop trees should show a genetic predisposition to fast growth and dominance over weaker trees. They should have either dominant or co-dominant crowns in the main stand canopy and should be in the largest diameter class. Intermediate or suppressed trees won't respond to release and should be avoided.

When you have selected a good balance of crop trees throughout the stand, release them on all four sides of any competition touching or overtopping their crowns (see figures below). In older stands with larger trees, sometimes a 2 or 3 sided release is all that can be done. This can be done by felling or girdling. No chemical application is warranted.

To increase wildlife value through this practice, trees that are cut can be "hinged" and directionally felled into brushpiles during the growing season. This practice leaves part of the tree attached so that it resprouts for browse and cover, while also creating dense brushpiles of tree canopies with their leaves still attached.



The space around a crop tree is divided into four sides or quadrants for thinning.



Two crop trees growing close to each other are treated as a single when thinning around them.

## Weeding & Culling

Weed & cull tree removal can be done anytime during a stand's rotation to improve species composition or aesthetics, but it isn't absolutely necessary until the stand is ready to be regenerated.

A "weed tree" is any species of tree that doesn't meet your management objectives for whatever reason --- commonly they are trees that tend to be thorny, messy and/or spread easily, have brittle or weak wood, are short-lived, may be non-native, have little wildlife value, or do not grow into attractive or valuable trees for lumber or shade. While one person's list of weed trees may differ slightly from another's, most people accept the following species as common weed trees found in the forest: **boxelder, mulberry, elm, honeylocust, ironwood, honeysuckle, buckthorn, and autumn olive**. To some people, hackberry, basswood, bitternut hickory, and ash are also weed species, but it depends on your situation.

Weed trees can usually be killed by felling or girdling and by applying herbicide to the fresh wound. Herbicide treatments may include Tordon RTU, Pathfinder II, or straight Roundup (41% glyphosate). The best time to accomplish this work is late summer, fall, and early winter when sap is being moved down to the roots for winter storage. Chemical treatment of weed trees should generally be avoided in late winter and spring when the sap is rising, as it will not be as effective. Follow all label instructions as required by federal law.



Stump-cut chemical treatment, chainsaw girdle, and hatchet girdle methods of weeding.

"Cull" trees have no future market potential because of poor form, defect, damage, disease, or otherwise. These may be old hollow "wolf" trees, or they might be young, stunted saplings which have been growing in shade for too long. Cull trees occupy growing space which could be otherwise utilized by high quality desirable trees.

Cull trees that are of a desired species should not be treated w/ chemical; rather, cut them off at ground level in late winter and allow them to resprout from the base. This practice, known as "coppicing," works on most deciduous trees less than 12" in diameter that are young & healthy.

Culls may also be double-girdled using a chainsaw and left standing, creating dead standing "snags" for insects & cavity-nesting wildlife.



Example of a cull tree

### **Technical Description of Harvest/Regeneration Operations**

Harvesting can be done to establish a new generation of desirable trees, to create early successional forest habitat for wildlife, or to salvage value from mature/declining trees for reinvestment into other habitat projects w/ management expenses. Not all harvest activities are commercial ventures, depending on what species are present, their quality, and quantity --- in some areas, there may be no merchantable trees to sell. If a harvest area contains merchantable trees, they will be sold as markets allow; all other non-merchantable trees will need to be managed so they do not impede the establishment of the next generation of seedlings.

Harvest/regeneration areas will be individual tree gaps or designed as irregularly-shaped polygons to promote a natural appearance and provide for adequate natural reseeding by surrounding trees.