

## IV. Managing Wildlife Crop Trees

Fish and wildlife habitat improvement is important to many woodland owners. Often cited as a primary management objective, this area of technical assistance can be as complex as manipulating multiple vegetative communities to benefit turkeys or as simple as increasing hard-mast production for squirrels. Landowners whose properties include riparian areas are often interested in enhancing fish habitat and encouraging reproduction of desirable fish species.

Before you can develop a wildlife management strategy, you need to determine what type of wildlife your client is interested in. Is it game, non-game, or a combination of both?

*Interests of the landowners you serve are as varied as the landowners themselves. For this reason, you should be prepared to determine the habitat requirements of a wide variety of wildlife species.*



Some landowners are realizing they are not limited to managing the fin, feathers, and fur species. There are those who are interested in insects, like bees and butterflies, and still others who want to know how to favor such species as reptiles and amphibians.

Once you know the kind of wildlife the landowner wants to favor, determine if the property is capable of supporting it. If it is, manage crop trees that will provide food and cover to satisfy the habitat requirements of the preferred species.

Following is an ***example*** of selection criteria developed for wildlife crop trees.

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## Wildlife Crop Tree Selection Criteria

### Mast-producing species:

- Dominant/codominant trees
  - Healthy crown; large in relation to dbh
  - A few dead, upper-crown branches are acceptable
  - Stump-sprout or seedling-origin stems are acceptable
- Hard-mast producers preferred over soft-mast producers; strive for species variety
- Expected longevity of 20+ years
- Cavities and large, broken branches are acceptable

### Cavity trees\*:

- Trees of any species, size class, and crown position are acceptable
- Dead, upper-crown branches and cavities in the main bole are acceptable
- Expected longevity of tree isn't important

\* If a cavity tree is also a mast producer, release it. Otherwise, it need not be released.

Crop Tree Management can benefit wildlife by increasing production of mast from individual trees. Important mast-producing indicators are:

- 1) size of crown relative to dbh
- 2) crown position
- 3) species
- 4) genotype

The greatest mast production within a stand comes from dominant and codominant trees.



*Depending on the wildlife species being managed, hard-mast producers may be preferred over soft-mast producers. Sources of winter-storable food are critical for survival of some species of wildlife.*



*If a tree qualifies as a wildlife crop tree only because it can be used as a den, it doesn't need to be released.*



*One large, released crown produces more mast than two or three small crowns on trees of the same species.*

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.

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 to 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.

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**When releasing mast-producing trees, expose as much crown-surface area to sunlight as possible.**

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*These 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 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.

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.



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*Frequency of good seed crops is another mast-production consideration ..... hickory has good seed crops more frequently than oak.*

To help ensure long-term mast production, select wildlife crop trees with an expected longevity of at least 20 years. Cavities are acceptable. In fact, a good mast producer which can also provide shelter is a doubly important wildlife crop tree.

Den trees are another type of wildlife crop tree. Generally, a tree of any species, size class, and crown position can qualify as a den tree if it can fulfill the need for shelter. It can have dead branches in the upper crown, holes in the main bole, and large broken branches, and still be acceptable. In fact, even its expected longevity is not a limiting factor.

It is important to identify trees with cavities currently being used as dens. Scratch marks around the entrance of the cavity are an indication of present use. Also look for trees with developing cavities that have potential to become future dens.

*The scratch marks around this cavity indicate it is being used for a den. Cavities are an important habitat feature that shouldn't be overlooked if the landowner is interested in managing wildlife species that utilize den trees.*



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**Den sites near water are especially valuable to wildlife.**

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To some degree, you can manage den and potential den trees to benefit whatever species of wildlife the landowner desires. The optimum size and location of the den vary with the wildlife species you are trying to favor. Certain species of trees tend to form cavities more readily than others. Beech, basswood, sycamore, black gum, ash, and the maples are particularly likely to develop good dens.

Dens and potential den sites near water are very valuable to certain species of wildlife. Consequently, you need to be especially watchful for the opportunity to maintain cavity trees in the riparian zone.

Another consideration in managing habitat for wildlife is retaining dead trees for use by various species of wildlife. Dead-tree habitat provides an important source of food. For example, woodpeckers feast on insects found in standing, decaying wood. Snags are used by several species of wildlife as perches for resting and observation.

To create dead-tree habitat for wildlife, you may want to consider girdling a few of the trees that would otherwise be cut to release crop trees. Girdling some of the competing trees may not provide release as quickly as cutting them does, but the slight delay is often offset by the wildlife benefit gained. Appendix C, *Creating Snags for Wildlife*, contains specific information regarding this process.

You may sometimes find that coordinating silvicultural activities to benefit one wildlife species may hinder another species. For example, the number of crop trees released affects the density of the understory that develops. A dense understory may not be ideal habitat for an ovenbird, but it can be very desirable to a red-eyed vireo. Therefore, some trade-offs may need to be discussed with the landowner.

Openings created in the canopy when crop trees are released allow sunlight to reach the forest floor. Understory vegetation response and regeneration are almost immediate. Of course, in some areas, high deer populations may inhibit such regeneration.

Maintaining various stages of reproduction and age classes throughout the forest provides habitat for numerous species of wildlife. Under proper management, this may enhance activities such as hunting, trapping, fishing, birdwatching, and photography.



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helps maintain the  
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*Leaves that fall into streams add organic material to the water, thus contributing to the energy source on which productive fisheries depend.*

Frequently, the riparian zone is where many species of wildlife are more abundant and most active. Therefore, special attention should be given to helping this area reach its fullest potential.

If diversity of tree species is important to produce wildlife benefits, the riparian zone can often play a key role in maintaining those benefits. Because this zone is frequently topographically and edaphically different, it often contains tree species that may not be present elsewhere on the property. Even if the species are available for selection as crop trees on other sites, their presence in the riparian zone may enhance production of benefits such as food and shelter for preferred wildlife.

Crop Tree Management is also compatible with maintenance and improvement of fish habitat. In order to achieve and maintain productive fisheries in streams, suitable habitat for fish and their invertebrate food source must be maintained. The major source of food on which both vertebrates and invertebrates depend, the nearstream deciduous vegetation, may be managed to increase its productivity.

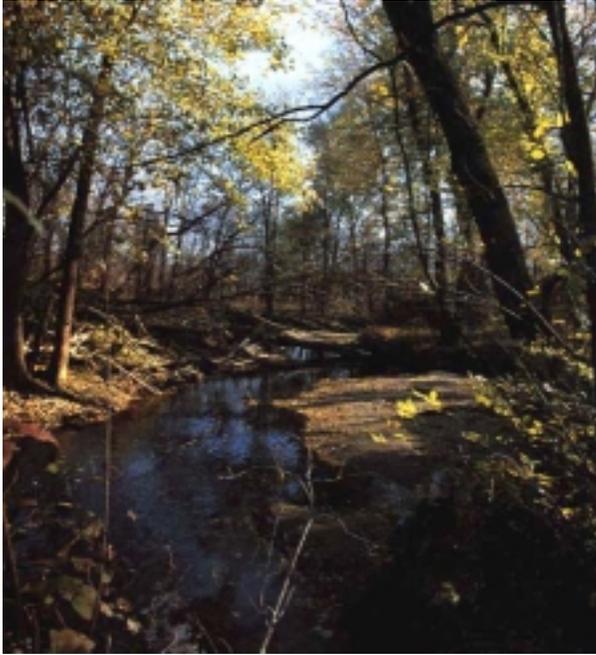


Leaves that fall into streams add a large quantity of organic material (detritus) to the water. This organic load is the basis of increased productivity. Invertebrate populations increase and, through the food chain, corresponding increases in fish growth and food production occur.

Along the water's edge, Crop Tree Management helps maintain the aquatic food source by favoring deciduous species for crop trees.

Both vertebrates and invertebrates favor deciduous vegetation over that of conifers because the leaves are thin and easier to consume. This doesn't mean, however, that all conifers should be ignored during crop tree selection. Conifers also provide wildlife habitat, year-round shade, and aesthetic diversity.

An additional benefit can be gained by retaining big, limby trees that lean out over the water. These trees may contribute to the energy source for many years as their leaves and twigs drop into the waterway. When the trees eventually fall into the water, they become large, woody debris which aids in development of excellent habitat for fish.



*Large, limby trees that hang out over the water provide shade and add organic matter to the stream.*

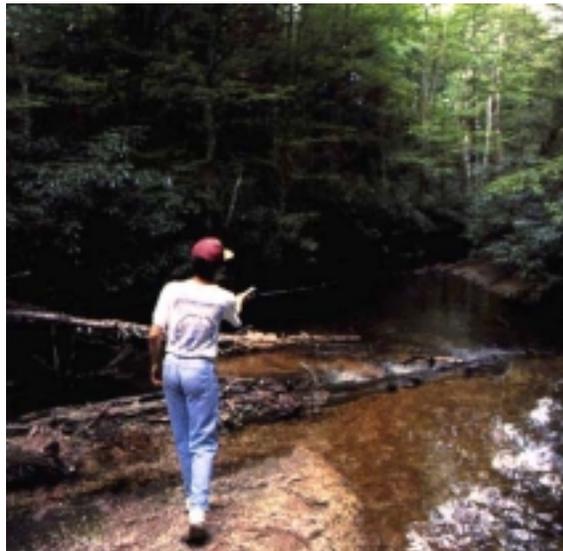


*A bonus benefit is gained when these overhanging trees eventually fall into the water and provide habitat for fish. If the fallen tree has some large limbs, they may help keep the bole off the bottom of the stream, extending the useful life of the cover.*

If shade is needed to keep water temperatures low for fish habitat, then a dense stand in the area adjacent to the stream must be maintained. When this is the case, few crop trees should be selected and released. For example, in most 40 to 60-year-old Eastern hardwood stands, no more than 20 crop trees per acre should be released.

*Some landowners may not realize the cooling effect trees along waterways can have on the water – and the beneficial influence that results for the aquatic life that inhabits the stream.*

Studies have shown that trees keep streams cooler in the summer months and warmer during the winter. This is important information to remember if fisheries are a consideration. If water temperatures are too warm, preferred fish species stop reproductive activities. On the other hand, cooler water temperatures prevent undesirable fish species from increasing in the aquatic community. Therefore, trees



along a stream play a vital role in establishing and maintaining desirable fish habitat.

The cooling effectiveness of trees decreases with increasing stream size. However, if temperature control is accomplished in the smaller streams, it will help reduce temperature-

associated problems in larger downstream locations.

If water temperature isn't a primary concern, there is more flexibility in the number of crop trees that can be released adjacent to waterways. In most Eastern hardwood forests, applying a crown-touching release to more than 25 crop trees per acre admits sufficient light to encourage patches of dense understory development.

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## V. Managing Aesthetic Crop Trees

Aesthetic enhancement is an idea that appeals to many private, non-industrial landowners. They may not want timber production as a primary objective because they know their forestlands can also produce non-priced benefits such as spring blossoms and colorful fall foliage. The beauty of the forest increases recreational enjoyment of the property, which encourages stewardship of the forest resource.

Following is an example of selection criteria developed for aesthetic crop trees.