

# 6.1 MAST

## BACKGROUND

### **Mast is critical to wildlife survival.**

Fruits, nuts, and seeds of woody plants are called *mast* when referring to their use by wildlife for food. *Hard mast* refers to nuts and seed and *soft mast* refers to fruits and berries. Seeds can regenerate the forest immediately following a natural disturbance or in conjunction with a harvest, but during most of the life of the forest, the majority of the seeds don't germinate and grow into seedlings—most of the time they are eaten by wildlife as mast, the focus of this chapter.

Masting cycles, insects and disease, plant species, plant age, tree diameter and dominance, weather, and genetics all affect mast production. “Masting” refers to the natural cycle in which trees and shrubs produce abundant seeds one year, followed by a year or more where mast production is moderate or low. Plant species, weather, and genetics are believed to control masting cycles. Genetics likely play the most important role in determining how much mast any individual tree or shrub is capable of producing. Some individual plants produce regular, abundant mast crops, while others consistently produce poor crops. Few physical features of plants allow managers to identify genetically superior mast-producing plants—even these plants don't produce superior crops every year. In general, mature plants exposed to full sunlight, with little competition from surrounding plants, will be most likely to produce abundant mast crops when all the other conditions affecting mast production are favorable. Insect damage can reduce tree vigor or damage young fruits, resulting in at least a temporary reduction in the amount of mast

### **Hard Mast**

American beech, hickory, and red, white and black oak are important in the diets of white-tailed deer, black bear, wild turkey, ruffed grouse, wood duck, and more than a dozen other mammals and birds. Beechnuts are an important autumn food source for black bears in northern New England. Beech trees begin heavy nut production at about 50 years or 8 inches in diameter at breast height (DBH) and produce good crops at 2- to 8-year intervals.

Red oaks bear heavy acorn crops at 2- to 5-year intervals, reaching peak production at 19 to 22 inches DBH. White oaks bear heavy crops at 4- to 10-year intervals, and peak in production at 24 to 30 inches DBH. There is considerable variation among trees, but individual trees tend to produce consistently good or poor acorn crops. White oak acorns are more palatable than red and black oak acorns, because the former contain lower tannin levels. Ash, birches, maples, and conifers are also important sources of hard mast. Sources of hard mast have changed during the last century; most notably, when chestnut blight eliminated the American chestnut.

### **Soft Mast**

Black cherry is the primary soft-mast producer and provides an important food source for bears, small mammals, and 28 bird species. While 10-year old saplings may produce fruit, peak production occurs between 30 and 100 years of age. Good crops occur at 1- to 5-year intervals, although black cherries usually produce some fruit every year.

Black cherry trees may vary widely in fruit production, making the production history of individual trees an important consideration when selecting trees for harvest or retention. Other important sources of soft mast include pin and choke cherries, wild apples, mountain ash, shadbush (also called serviceberry or juneberry), brambles (blackberries and raspberries), dogwoods, viburnums, blueberries, hackberries, elderberries, and grapes.

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Sources of soft mast have changed with increases in non-native invasive shrubs such as autumn olive, barberry, buckthorn, honeysuckle, and multiflora rose. Some studies suggest berries produced by non-native plants may have a lower nutritional value than those from native plants, but this depends on the species being compared. Invasives raise many other concerns regarding their impact on wildlife habitat. Landowners and forest managers are encouraged to take appropriate measures to eliminate and control the spread of these plants.

## OBJECTIVE

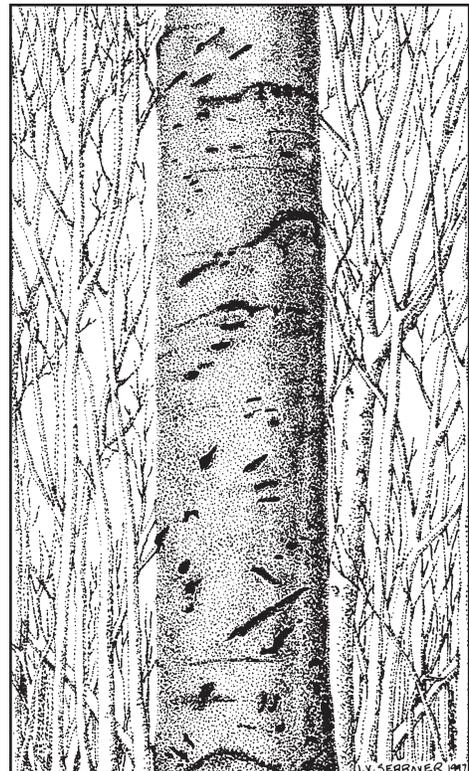
**Manage mast-producing trees and shrubs for a continuous source of wildlife food and quality seed for regeneration.**

## CONSIDERATIONS

- The diversity and amount of mast lessens as you travel north.
- Individual oak, beech and black cherry trees may be poor timber quality but an invaluable source of mast. Such trees may have greater value left for wildlife than harvested for wood products.
- Beech bark disease may affect management decisions in infected stands.
- Understory or edge shrubs such as highbush blueberry, huckleberry, maple-leaved viburnum, hazelnut, silky dogwood, and northern wild-raisin (witherod) are an important source of mast and their mast production can often be improved simply by removing overtopping trees.
- It is illegal to plant non-native invasive such as multiflora rose, winged euonymus, non-native honeysuckle species, autumn olive, and other species per RSA 430:51-57.

## RECOMMENDED PRACTICES

- ✓ When managing stands with multiple mast-producing species, maintain the diversity of mast sources.
- ✓ Manage oak and beech stands on long rotations (100 to 125 years), growing trees to greater than 18- to 20-inch diameters to maximize acorn production and timber value. Maintain oak in well-stocked stands by retaining vigorous trees with dominant crowns.
- ✓ Retain beech trees with bear claw marks on the trunk or clumps of broken branches in the crown. Retain beech older than 40 years in stands supporting wild turkeys.
- ✓ Improve mast production by leaving dominant and codominant trees with healthy crowns. Remove neighboring trees that have crowns touching the crowns of the trees you are saving. Remove competing trees from at least three sides to provide gaps into which the trees you retain can expand their crowns
- ✓ When harvesting stands with black cherry, retain some trees with high fruit production or any tree that shows evidence of use by bears (e.g., clumps of broken branches in the crown).



**Beech tree with bear claw marks**

- ✓ Retain wild apple trees and gradually release them from competition.
- ✓ Retain mountain ash when harvesting timber at high elevations.
- ✓ Whenever possible, avoid harvesting mast stands during spring (April through May) and fall (September through November), foraging periods favored by bears and other wildlife.
- ✓ Consider identifying high-quality hard-mast sites as “mast-producing areas” devoted specifically to long-term mast production for wildlife.
- ✓ Retain softwood “fingers” extending into mast stands and dense, brushy growth around them to provide wildlife with protective cover. This is important when managing near old apple orchards.
- ✓ Allow log landings to regenerate naturally to promote the growth of mast-producing shrubs such as brambles and strawberries. Encourage brambles by retaining down woody material in and around the landing.
- ✓ Favor the regeneration and maintenance of natives over non-natives. When planting mast-producing shrubs, select native species.

### CROSS REFERENCES

2.3 Regeneration Methods; 2.4 Managing for High-Value Trees; 5.1 Insects and Diseases; 5.2 Invasive Plants; 6.4 Overstory Inclusions; 6.5 Permanent Openings; 6.9 Deer Wintering Areas; 6.10 Woodland Raptor Nest Sites.

### ADDITIONAL INFORMATION

Elliott, C.A. 1988. *A Forester's Guide to Managing Wildlife Habitats in Maine*. University of Maine Cooperative Extension, Orono, Maine.

RSA 430:51-57. *Invasive Species*. <http://www.gencourt.state.nh.us/rsa/html/XL/430/430-mrg.htm> Accessed May 26, 2010.